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Maintenance and Service Guide

HP Compaq Business Notebook nc8000
HP Compaq Mobile Workstation nw8000

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January 2004

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

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Maintenance and Service Guide

HP Compaq Business Notebook nc8000

HP Compaq Mobile Workstation nw8000

Second Edition January 2004

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Product Description

The HP Compaq Business Notebook nc8000 and HP Compaq Mobile Workstation nw8000 offer advanced modularity, an Intel® Pentium® M processor with 64-bit architecture, an ATI MOBILITY RADEON 9600 Pro graphics controller with 128 or 64 MB of discrete video memory, and extensive multimedia support.



*HP Compaq Business Notebook nc8000 and
HP Compaq Mobile Workstation nw8000*

1.1 Models

Notebook model information is shown in Tables 1-1 through 1-3. Configuration code **LY2Z** applies to all models of the HP Compaq Business Notebook nc8000. Configuration code **MDBZ** applies to all models of the HP Compaq Mobile Workstation nw8000.

**Table 1-1
HP Compaq Business Notebook nc8000
and HP Compaq Mobile Workstation nw8000
Model Naming Conventions**

| Key | | | | | | | | | |
|-----|------------------------------|-----|----|--|---|----|----------------------------------|---|--------------|
| Cnc | P | 320 | Y7 | 80 | Y | Gg | 10 | H | XXXXXXXX-XXX |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Key | Description | | | Options | | | | | |
| 1 | Brand/Series designator | | | C = HP Compaq | | | nc = nc8000 nw = nw8000 | | |
| 2 | Processor type | | | P = Intel Pentium M | | | | | |
| 3 | Processor speed | | | 170 = 1.70 GHz 160 = 1.60 GHz | | | 150 = 1.50 GHz 140 = 1.40 GHz | | |
| 4 | Display type/size/resolution | | | U = UXGA S = SXGA+ X = XGA | | | 5 = 15.X-inch | | |
| 5 | Hard drive size | | | 80 = 80 GB 60 = 60 GB | | | 40 = 40 GB | | |
| 6 | Optical drive designator | | | D = DVD-ROM Y = DVD+RW/R and CD-RW Combo Drive | | | W = DVD/CD-RW Combo Drive | | |

Table 1-1
HP Compaq Business Notebook nc8000
and HP Compaq Mobile Workstation nw8000
Model Naming Conventions (*Continued*)

| | | | | |
|----|--|---|---|-------------|
| 7 | Integrated communication/wireless device | G = Combination modem + GB NIC N = None | b = 802.11b d = 802.11a/b/g g = 802.11a/b + Bluetooth® i = 802.11b + Bluetooth j = 802.11g + Bluetooth k = 802.11a/b + Bluetooth m = 802.11a/b/g + Bluetooth p = Bluetooth | |
| 8 | RAM | 10 = 1.0-GB | 51 = 512-MB | 25 = 256-MB |
| 9 | Operating system | P = Microsoft® Windows® XP Professional 2 = Microsoft Windows 2000 | | |
| 10 | SKU# | | | |

**Table 1-2
HP Compaq Business Notebook nc8000 Models**

These HP Compaq Business Notebook nc8000 models feature the following:

- Dual point (pointing stick and TouchPad) pointing device
- 128-MB discrete video memory
- 8-cell, lithium ion (Li-Ion) battery pack
- 3-year warranty on parts and labor

| Cnc8000 | P | 170 | U5 | 60 | Y | Gm | 51 | P | |
|--------------|---|-----|------------|----|---|-----------------|----|---|------------|
| Asia Pacific | | | DQ617A UUF | | | Japan | | | DQ617A ABJ |
| Belgium | | | DQ617A UUG | | | The Netherlands | | | DQ617A ABH |
| Denmark | | | DQ617A ABY | | | Norway | | | DQ617A ABN |
| France | | | DQ617A ABF | | | Portugal | | | DQ617A AB9 |
| Germany | | | DQ617A ABD | | | Sweden/Finland | | | DQ617A AK8 |
| Greece | | | DQ617A AB7 | | | United Kingdom | | | DQ617A ABU |
| Italy | | | DQ617A ABZ | | | United States | | | DQ617A ABA |
| Cnc8000 | P | 160 | S5 | 40 | D | Gm | 51 | P | |
| Germany | | | DQ618A ABD | | | United Kingdom | | | DQ618A ABU |
| Italy | | | DQ618A ABZ | | | United States | | | DQ618A ABA |
| Japan | | | DQ618A ABJ | | | | | | |

Table 1-2
HP Compaq Business Notebook nc8000 Models (*Continued*)

These HP Compaq Business Notebook nc8000 models feature the following:

- Dual point (pointing stick and TouchPad) pointing device
- 64-MB discrete video memory
- 8-cell, Li-Ion battery pack
- 3-year warranty on parts and labor

| Cnc8000 | P | 170 | X5 | 60 | W | Gm | 51 | P | |
|---------------|---|-----|------------|----|---|-----------------|------------|---|------------|
| French Canada | | | DH918U ABC | | | United States | | | DH918U ABA |
| Cnc8000 | P | 160 | S5 | 40 | W | Gj | 51 | 2 | |
| Belgium | | | DJ242A UUG | | | The Netherlands | DJ242A ABH | | |
| Denmark | | | DJ242A ABY | | | Norway | DJ242A ABN | | |
| Europe | | | DJ242A ABB | | | Portugal | DJ242A AB9 | | |
| France | | | DJ242A ABF | | | Spain | DJ242A ABE | | |
| Germany | | | DJ242A ABD | | | Sweden/Finland | DJ242A AK8 | | |
| Greece | | | DJ242A AB7 | | | Switzerland | DJ242A UUZ | | |
| Iceland | | | DJ242A A2M | | | United Kingdom | DJ242A ABU | | |
| Italy | | | DJ242A ABZ | | | | | | |

**Table 1-2
HP Compaq Business Notebook nc8000 Models (Continued)**

| Cnc8000 | P | 160 | S5 | 40 | D | Gn | 51 | P | |
|----------------|---|-----|--------|-----|---|----------------------------------|----|---|------------|
| Asia Pacific | | | DN889A | UUF | | Latin America | | | DN889A ABM |
| Australia | | | DN889A | ABG | | The Netherlands | | | DN889A ABH |
| Belgium | | | DN889A | UUG | | Norway | | | DN889A ABN |
| Brazil | | | DN889A | AC4 | | People's Republic of China | | | DN889A AB2 |
| Czech Republic | | | DN889A | AKB | | Poland | | | DN889A AKD |
| Denmark | | | DN889A | ABY | | Portugal | | | DN889A AB9 |
| Europe | | | DN889A | ABB | | Russia | | | DN889A ACB |
| France | | | DN889A | ABF | | Saudi Arabia | | | DN889A ABV |
| French Canada | | | DN889A | ABC | | Slovenia | | | DN889A AKN |
| Germany | | | DN889A | ABD | | Spain | | | DN889A ABE |
| Greece | | | DN889A | AB7 | | Sweden/Finland | | | DN889A AK8 |
| Hong Kong | | | DN889A | AB5 | | Switzerland | | | DN889A UUZ |
| Hungary | | | DN889A | AKC | | Taiwan | | | DN889A AB0 |
| Iceland | | | DN889A | A2M | | Thailand | | | DN889A AKL |
| India | | | DN889A | ACJ | | Turkey | | | DN889A AB8 |
| Israel | | | DN889A | ABT | | United Kingdom | | | DN889A ABU |
| Italy | | | DN889A | ABZ | | United States | | | DN889A ABA |
| Japan | | | DN889A | ABJ | | | | | |
| Japan English | | | DN889A | ACF | | | | | |
| Korea | | | DN889A | AB1 | | | | | |

Table 1-2
HP Compaq Business Notebook nc8000 Models (Continued)

| Cnc8000 | P | 160 | S5 | 40 | D | Gn | 51 | 2 | |
|----------------|---|-----|--------|-----|---|-----------------|----|--------|-----|
| Asia Pacific | | | DN890A | UUF | | Latin America | | DN890A | ABM |
| Australia | | | DN890A | ABG | | The Netherlands | | DN890A | ABH |
| Belgium | | | DN890A | UUG | | Norway | | DN890A | ABN |
| Brazil | | | DN890A | AC4 | | People's | | DN890A | AB2 |
| Czech Republic | | | DN890A | AKB | | Republic | | | |
| Denmark | | | DN890A | ABY | | of China | | | |
| Europe | | | DN890A | ABB | | Poland | | DN890A | AKD |
| France | | | DN890A | ABF | | Portugal | | DN890A | AB9 |
| French Canada | | | DN890A | ABC | | Russia | | DN890A | ACB |
| Germany | | | DN890A | ABD | | Saudi Arabia | | DN890A | ABV |
| Greece | | | DN890A | AB7 | | Slovenia | | DN890A | AKN |
| Hong Kong | | | DN890A | AB5 | | Spain | | DN890A | ABE |
| Hungary | | | DN890A | AKC | | Sweden/Finland | | DN890A | AK8 |
| Iceland | | | DN890A | A2M | | Switzerland | | DN890A | UUZ |
| India | | | DN890A | ACJ | | Taiwan | | DN890A | AB0 |
| Israel | | | DN890A | ABT | | Thailand | | DN890A | AKL |
| Italy | | | DN890A | ABZ | | Turkey | | DN890A | AB8 |
| Japan | | | DN890A | ABJ | | United Kingdom | | DN890A | ABU |
| Japan English | | | DN890A | ACF | | United States | | DN890A | ABA |
| Korea | | | DN890A | AB1 | | | | | |
| Cnc8000 | P | 160 | S5 | 40 | W | Gj | 51 | P | |
| Belgium | | | DJ241A | UUG | | The Netherlands | | DJ241A | ABH |
| Denmark | | | DJ241A | ABY | | Norway | | DJ241A | ABN |
| Europe | | | DJ241A | ABB | | Portugal | | DJ241A | AB9 |
| France | | | DJ241A | ABF | | Spain | | DJ241A | ABE |
| Germany | | | DJ241A | ABD | | Sweden/Finland | | DJ241A | AK8 |
| Greece | | | DJ241A | AB7 | | Switzerland | | DJ241A | UUZ |
| Iceland | | | DJ241A | A2M | | United Kingdom | | DJ241A | ABU |
| Italy | | | DJ241A | ABZ | | | | | |

**Table 1-2
HP Compaq Business Notebook nc8000 Models (Continued)**

| Cnc8000 | RP | 150 | U5 | 60 | W | Gj | 51 | P | |
|----------------------------|----|-----|------------|----|---|----------------|----|---|------------|
| Europe | | | DU250S#ABB | | | | | | |
| Cnc8000 | RP | 150 | X5 | 40 | D | Gi | 25 | P | |
| People's Republic of China | | | DT818P#AB2 | | | | | | |
| Cnc8000 | RP | 150 | X5 | 40 | D | Gp | 25 | 2 | |
| Belgium | | | DJ244A#UUG | | | Norway | | | DJ244A#ABN |
| Czech Republic | | | DJ244A#AKB | | | Poland | | | DJ244A#AKD |
| Denmark | | | DJ244A#ABY | | | Portugal | | | DJ244A#AB9 |
| Europe | | | DJ244A#ABB | | | Russia | | | DJ244A#ACB |
| France | | | DJ244A#ABF | | | Saudi Arabia | | | DJ244A#ABV |
| Germany | | | DJ244A#ABD | | | Slovenia | | | DJ244A#AKN |
| Greece | | | DJ244A#AB7 | | | Spain | | | DJ244A#ABE |
| Hungary | | | DJ244A#AKC | | | Sweden/Finland | | | DJ244A#AK8 |
| Iceland | | | DJ244A#A2M | | | Switzerland | | | DJ244A#UUZ |
| Israel | | | DJ244A#ABT | | | Turkey | | | DJ244A#AB8 |
| Italy | | | DJ244A#ABZ | | | United Kingdom | | | DJ244A#ABU |
| The Netherlands | | | DJ244A#ABH | | | | | | |
| Cnc8000 | RP | 150 | X5 | 40 | D | Gp | 25 | P | |
| Belgium | | | DJ243A#UUG | | | Norway | | | DJ243A#ABN |
| Czech Republic | | | DJ243A#AKB | | | Poland | | | DJ243A#AKD |
| Denmark | | | DJ243A#ABY | | | Portugal | | | DJ243A#AB9 |
| Europe | | | DJ243A#ABB | | | Russia | | | DJ243A#ACB |
| France | | | DJ243A#ABF | | | Saudi Arabia | | | DJ243A#ABV |
| Germany | | | DJ243A#ABD | | | Slovenia | | | DJ243A#AKN |
| Greece | | | DJ243A#AB7 | | | Spain | | | DJ243A#ABE |
| Hungary | | | DJ243A#AKC | | | Sweden/Finland | | | DJ243A#AK8 |
| Iceland | | | DJ243A#A2M | | | Switzerland | | | DJ243A#UUZ |
| Israel | | | DJ243A#ABT | | | Turkey | | | DJ243A#AB8 |
| Italy | | | DJ243A#ABZ | | | United Kingdom | | | DJ243A#ABU |
| The Netherlands | | | DJ243A#ABH | | | | | | |

Table 1-2
HP Compaq Business Notebook nc8000 Models (Continued)

| | | | | | | | | | |
|----------------------------|----|-----|------------|----|---|-----------------|----|------------|--|
| Cnc8000 | RP | 150 | X5 | 40 | W | Gi | 25 | P | |
| People's Republic of China | | | DT819P#AB2 | | | | | | |
| Cnc8000 | RP | 150 | X5 | 60 | W | Gb | 25 | P | |
| Taiwan | | | DT815P#AB0 | | | | | | |
| Cnc8000 | RP | 150 | Y5 | 40 | D | Gb | 25 | P | |
| People's Republic of China | | | DS814P#AB2 | | | | | | |
| Cnc8000 | RP | 150 | Y5 | 40 | W | Gi | 51 | P | |
| People's Republic of China | | | DT817P#AB2 | | | | | | |
| Cnc8000 | RP | 150 | Y5 | 60 | W | Gi | 51 | P | |
| United States | | | DH936U#ABA | | | French Canada | | DH936U#ABC | |
| Cnc8000 | RP | 150 | Y5 | 60 | W | GN | 51 | H | |
| Europe | | | DU256S#ABB | | | | | | |
| Cnc8000 | RP | 150 | Y5 | 60 | W | Gb | 51 | P | |
| Korea | | | DT807P#AB1 | | | | | | |
| Cnc8000 | P | 140 | X5 | 40 | D | Gi | 25 | P | |
| Asia Pacific | | | DQ616A UUF | | | The Netherlands | | DQ616A ABH | |
| Belgium | | | DQ616A UUG | | | Norway | | DQ616A ABN | |
| Denmark | | | DQ616A ABY | | | Portugal | | DQ616A AB9 | |
| France | | | DQ616A ABF | | | Spain | | DQ616A ABE | |
| Germany | | | DQ616A ABD | | | Sweden/Finland | | DQ616A AK8 | |
| Greece | | | DQ616A AB7 | | | Switzerland | | DQ616A UUZ | |
| Italy | | | DQ616A ABZ | | | United Kingdom | | DQ616A ABU | |
| Japan | | | DQ616A ABJ | | | United States | | DQ616A ABA | |
| Cnc8000 | P | 140 | X5 | 40 | D | Gn | 25 | P | |
| French Canada | | | DH917U ABC | | | United States | | DH917U ABA | |

**Table 1-3
HP Compaq Mobile Workstation nw8000 Models**

These HP Compaq Mobile Workstation nw8000 models feature the following:

- Dual point (pointing stick and TouchPad) pointing device
- 128-MB discrete video memory
- TPM security card
- 8-cell, Li-Ion battery pack
- 3-year warranty on parts and labor

| | | | | | | | | | |
|---------------|---|-----|------------|----|---|----------|----|---|------------|
| Cnw8000 | P | 170 | U5 | 60 | Y | Gd | 10 | P | |
| Asia Pacific | | | DU536P UUF | | | People's | | | DU536P AB2 |
| Australia | | | DU536P ABG | | | Republic | | | |
| Hong Kong | | | DU536P AB5 | | | of China | | | |
| Japan | | | DU536P ABJ | | | Taiwan | | | DU536P AB0 |
| Korea | | | DU536P AB1 | | | | | | |
| Cnw8000 | P | 170 | U5 | 60 | W | Gk | 10 | P | |
| United States | | | DQ857A ABA | | | | | | |
| Cnw8000 | P | 160 | X5 | 60 | W | Gp | 51 | P | |
| Australia | | | DS864P ABG | | | | | | |
| Cnw8000 | P | 160 | X5 | 60 | W | Gp | 51 | 2 | |
| Australia | | | DS865P ABG | | | | | | |

Table 1-3
HP Compaq Mobile Workstation nw8000 Models (Continued)

These HP Compaq Mobile Workstation nw8000 models feature the following:

- Dual point (pointing stick and TouchPad) pointing device
- 128-MB discrete video memory
- 8-cell, Li-Ion battery pack
- 3-year warranty on parts and labor

| Cnw8000 | P | 170 | U5 | 60 | Y | Gd | 10 | P | |
|---------------|---|-----|--------|-----|---|----------------|----|---|------------|
| Australia | | | DU535P | ABG | | People's | | | DU535P AB2 |
| Hong Kong | | | DU535P | AB5 | | Republic | | | |
| Japan | | | DU535P | ABJ | | of China | | | |
| Korea | | | DU535P | AB1 | | Taiwan | | | DU535P AB0 |
| Cnw8000 | P | 170 | U5 | 60 | Y | Gn | 51 | P | |
| Asia Pacific | | | DN912A | UUF | | Latin America | | | DN912A ABM |
| Australia | | | DN912A | ABG | | People's | | | DN912A AB2 |
| Belgium | | | DN912A | UUG | | Republic | | | |
| Europe | | | DN912A | ABB | | of China | | | |
| France | | | DN912A | ABF | | Spain | | | DN912A ABE |
| French Canada | | | DN912A | ABC | | Sweden/Finland | | | DN912A AK8 |
| Germany | | | DN912A | ABD | | Switzerland | | | DN912A UUZ |
| Italy | | | DN912A | ABZ | | Taiwan | | | DN912A AB0 |
| Japan | | | DN912A | ABJ | | United Kingdom | | | DN912A ABU |
| Korea | | | DN912A | AB1 | | United States | | | DN912A ABA |
| Hong Kong | | | DN912A | AB5 | | | | | |
| Cnw8000 | P | 170 | U5 | 60 | Y | Gn | 51 | 2 | |
| Asia Pacific | | | DN913A | UUF | | Latin America | | | DN913A ABM |
| Australia | | | DN913A | ABG | | People's | | | DN913A AB2 |
| Belgium | | | DN913A | UUG | | Republic | | | |
| Europe | | | DN913A | ABB | | of China | | | |
| France | | | DN913A | ABF | | Spain | | | DN913A ABE |
| French Canada | | | DN913A | ABC | | Sweden/Finland | | | DN913A AK8 |
| Germany | | | DN913A | ABD | | Switzerland | | | DN913A UUZ |
| Italy | | | DN913A | ABZ | | Taiwan | | | DN913A AB0 |
| Japan | | | DN913A | ABJ | | United Kingdom | | | DN913A ABU |
| Korea | | | DN913A | AB1 | | United States | | | DN913A ABA |
| Hong Kong | | | DN913A | AB5 | | | | | |

**Table 1-3
HP Compaq Mobile Workstation nw8000 Models (Continued)**

| | | | | | | | | | |
|----------------------------|---|-----|------------|----|---|----------------|----|------------|--|
| Cnw8000 | P | 170 | U5 | 60 | W | Gm | 51 | P | |
| Asia Pacific | | | DU534P UUF | | | | | | |
| Cnw8000 | P | 170 | U5 | 60 | W | Gd | 10 | P | |
| Asia Pacific | | | DU535P UUF | | | Japan | | DU529P ABJ | |
| Cnw8000 | P | 170 | U5 | 60 | W | Gd | 10 | 2 | |
| Japan | | | DU530P ABJ | | | | | | |
| Cnw8000 | P | 170 | U5 | 60 | W | Gd | 51 | P | |
| Japan | | | DU531P ABJ | | | | | | |
| Cnw8000 | P | 170 | S5 | 60 | W | Gk | 51 | P | |
| Europe | | | DQ556A ABB | | | Japan | | DQ556A ABJ | |
| France | | | DQ556A ABF | | | United Kingdom | | DQ556A ABU | |
| Germany | | | DQ556A ABD | | | United States | | DQ556A ABA | |
| Italy | | | DQ556A ABZ | | | | | | |
| Cnw8000 | P | 170 | X5 | 60 | W | Gm | 51 | P | |
| Asia Pacific | | | DU532P UUF | | | | | | |
| Cnw8000 | P | 160 | X5 | 60 | W | Gi | 51 | P | |
| People's Republic of China | | | DT821P AB2 | | | | | | |
| Cnw8000 | P | 150 | X5 | 60 | W | Gm | 51 | P | |
| Asia Pacific | | | DU533P UUF | | | | | | |
| Cnw8000 | P | 150 | X5 | 60 | W | Gi | 51 | P | |
| People's Republic of China | | | DT820P AB2 | | | | | | |
| Cnw8000 | P | 170 | U5 | 60 | W | Gm | 10 | P | |
| French Canada | | | DH919U ABC | | | United States | | DH919U ABA | |

Table 1-3
HP Compaq Mobile Workstation nw8000 Models (*Continued*)

| Cnw8000 | P | 170 | U5 | 60 | W | Gg | 51 | P | |
|---------------|---|-----|--------|-----|---|----------------|----|---|------------|
| Belgium | | | DJ294A | UUG | | Spain | | | DJ294A ABE |
| Europe | | | DJ294A | ABB | | Sweden | | | DJ294A AK8 |
| France | | | DJ294A | ABF | | Switzerland | | | DJ294A UUZ |
| Germany | | | DJ294A | ABD | | United Kingdom | | | DJ294A ABU |
| Italy | | | DJ294A | ABZ | | | | | |
| Cnw8000 | P | 160 | S5 | 40 | W | Gn | 51 | P | |
| French Canada | | | DH920U | ABC | | United States | | | DH920U ABA |

1.2 Features

- Intel Pentium M 1.7-, 1.6-, 1.5-, and 1.4-GHz processors, all with 1024-KB L2 cache and 400-MHz processor side bus, varying by notebook model
- 15.1-inch UXGA (1600×1200), SXGA+ (1400×1050), or XGA (1024×768) TFT display with over 16.7 million colors, varying by notebook model
- ATI MOBILITY RADEON 9600 Pro graphics controller with 128 or 64 MB of video memory, varying by notebook model
- 80-, 60-, or 40-GB high-capacity hard drive, varying by notebook model
- 256-MB DDR Synchronous DRAM (SDRAM) at 333 MHz, expandable to 2.0 GB
- Microsoft® Windows® 2000 or Windows XP Professional, varying by notebook model
- Full-size Windows 98 keyboard with integrated numeric keypad
- Dual point (TouchPad and pointing stick) pointing device, with TouchPad on/off button and light
- Integrated Secure Digital (SD) Memory Card flash media slot
- Integrated 10/100/1000 BASE-T Ethernet local area network (LAN) NIC with RJ-45 connector
- Integrated wireless support for Bluetooth® LAN and Mini PCI 802.11 a/b/g LAN devices
- Support for fixed optical drive and MultiBay device
- Support for two Type II/Type III PC Card slots with support for both 32-bit (CardBus) and 16-bit PC Cards

- External 65-W AC adapter with power cord
- 8-cell Li-Ion battery pack
- HP PremierSound audio
- Support for the following optical drives:
 - ❑ 24X Max DVD/CD-RW Combo Drive
 - ❑ 24X Max DVD+RW/R and CD-RW Combo Drive
 - ❑ 8X Max DVD-ROM Drive
 - ❑ 24X Max CD-ROM Drive
- Connectors:
 - ❑ SD Memory Card
 - ❑ Infrared
 - ❑ Two Type II PC Card slots
 - ❑ RJ-11 (modem)
 - ❑ RJ-45 (NIC)
 - ❑ Two Universal Serial Bus (USB) 2.0
 - ❑ S-Video
 - ❑ Parallel
 - ❑ Serial
 - ❑ External monitor
 - ❑ DC power
 - ❑ Docking
 - ❑ IEEE 1394 digital
 - ❑ Microphone
 - ❑ Stereo speaker/headphone

1.3 Clearing a Password

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

1. Prepare the notebook for disassembly (refer to [Section “5.3 Preparing the Notebook for Disassembly”](#) for more information).
2. Remove the real time clock (RTC) battery (refer to [Section “5.15 RTC Battery”](#)).
3. Wait approximately 5 minutes.
4. Replace the RTC battery and reassemble the notebook.
5. Connect AC power to the notebook. Do **not** reinsert any battery packs at this time.
6. Turn on the notebook.

All passwords and all CMOS settings are cleared.

1.4 Power Management

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

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


1.5 External Components

The external components on the front and right side of the notebook are shown below and described in Table 1-4.

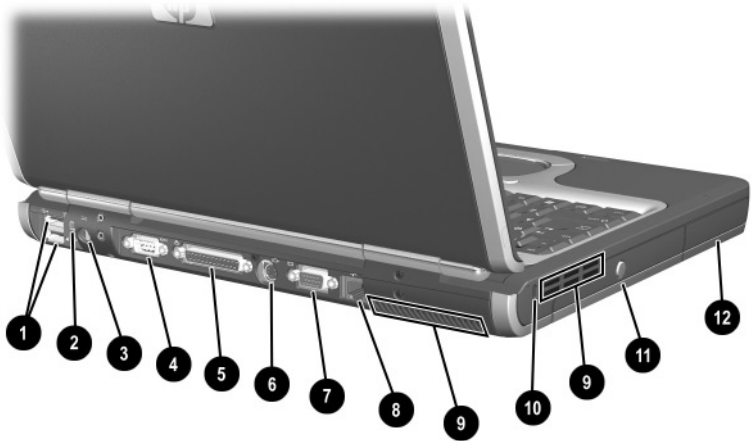


Front and Right-Side Components

**Table 1-4
Front and Right-Side Components**

| Item | Component | Function |
|-------------|--------------------------|--|
| 1 | Stereo speakers (2) | Produce stereo sound. |
| 2 | Display release latch | Opens the notebook. |
| 3 | Mute button | Mutes the system volume. The button lights up when volume is muted. |
| 4 | Volume control buttons | Increase and decrease system volume. Press the volume up button (on right) to increase sound. Press the volume down button (on left) to decrease sound. |
| 5 | PC Card eject buttons | Eject an optional PC Card or Smart Card (if a Smart Card Reader is installed) from the top or bottom PC Card slot. |
| 6 | Audio line-out jack | Connects optional powered stereo speakers, headphones, headset, or television audio. |
| 7 | Microphone jack | Connects an optional monaural microphone. |
| 8 | PC Card slots | Support optional Type I, Type II, or Type III 32-bit (CardBus) or 16-bit PC Cards.  In select notebooks, one PC Card slot can be replaced with a factory-installed Smart Card Reader. |
| 9 | Secure Digital (SD) slot | Accepts SD Memory Card and MultiMediaCards. |
| 10 | MultiBay | Supports an optional MultiBay device, such as a drive or battery pack. |
| 11 | Infrared port | Provides wireless communication between the notebook and an optional IrDA-compliant device. |
| 12 | RJ-11 jack | Connects a modem cable. |

The external components on the rear and left side are shown below and described in Table 1-5.





Rear and Left-Side Components

**Table 1-5
Rear and Left-Side Components**

| Item | Component | Function |
|------|--------------------|--|
| 1 | USB connectors (2) | <p>Connect USB 1.1- and 2.0-compliant devices to the notebook using a standard USB cable.</p> <p>The bottom connector is a self-powered USB connector. It can be used to connect USB 1.1- and 2.0-compliant devices to the notebook using a standard USB cable, and connect an optional External MultiBay to the notebook using the External MultiBay-powered USB cable.</p> |
| 2 | 1394 connector | <p>Connects a device that requires high bandwidth, such as a digital camera or other video or audio device.</p> |

**Table 1-5
Rear and Left-Side Components (Continued)**

| Item | Component | Function |
|-------------|----------------------------|--|
| 3 | Power connector | Connects an AC adapter or an optional Automobile Power Adapter/Charger or Aircraft Power Adapter. |
| 4 | Serial connector | Connects an optional serial device. |
| 5 | Parallel connector | Connects an optional parallel device, such as an external diskette drive or a printer. |
| 6 | S-Video out jack | Connects an optional S-Video device, such as a television, VCR, camcorder, overhead projector, or video capture card. |
| 7 | External monitor connector | Connects an optional external monitor or overhead projector. |
| 8 | RJ-45 jack | Connects a network cable. |
| 9 | Intake vents (2) | <p>Enable airflow to cool internal components.</p> <p> To prevent overheating, do not obstruct vents. Using the notebook on a soft surface, such as a pillow, blanket, rug, or thick clothing, can block airflow.</p> |
| 10 | Security cable slot | <p>Attaches an optional security cable to the notebook.</p> <p> The purpose of security solutions is to act as a deterrent. These solutions do not prevent the product from being mishandled or stolen.</p> |
| 11 | Optical disk drive | Reads and records CD and DVD media. |
| 12 | Battery bay | Holds the primary battery pack. The battery pack ships outside the notebook. |

The notebook keyboard components are shown below and described in Table 1-6.

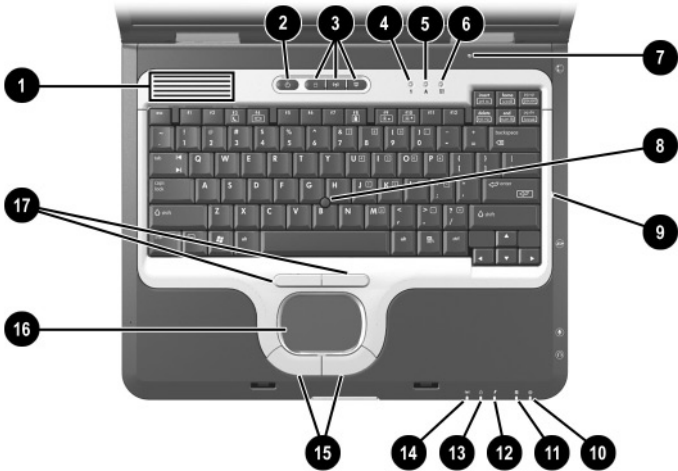


Keyboard Components

Table 1-6
Keyboard Components


| Item | Component | Function |
|-------------|--|--|
| 1 | Windows logo key | Displays the Windows Start menu. |
| 2 | fn key | Executes frequently used system functions when pressed in combination with a function key or the esc key. |
| 3 | caps lock key | Enables capital alphabetic character lock. |
| 4 | f1 through f12 function keys | Execute indicated system functions when pressed in combination with the fn key. |
| 5 | num lk key | Enables numeric lock and the internal keypad. |
| 6 | Internal keypad | Can be used like the keys on an external numeric keypad. |
| 7 | Cursor control keys | Move the cursor around the screen. |
| 8 | Application key | Displays shortcut menu for items beneath the pointer. |

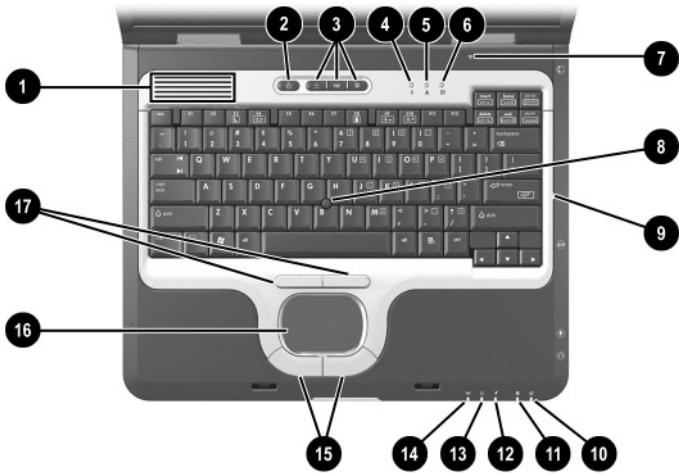
The notebook top components are shown below and described in Table 1-7.



Top Components


**Table 1-7
Top Components**

| Item | Component | Function |
|------|--------------------------|--|
| 1 | Intake vents (2) | <p>Enable airflow to cool internal components.</p> <p> To prevent overheating, do not obstruct vents. Using the notebook on a soft surface, such as a pillow, blanket, rug, or thick clothing, can block airflow.</p> |
| 2 | Power button | <p>When the notebook is:</p> <ul style="list-style-type: none"> ■ Off, press and release to turn on the notebook. ■ In Standby, press and release to exit Standby. ■ In Hibernation, press and release to exit Hibernation. <p>If the system has stopped responding and Windows shutdown procedures cannot be used, press and hold for five seconds to turn off the notebook.</p> |
| 3 | Quick Launch buttons (3) | Enable you to access common functions with a single keystroke. |
| 4 | Num lock light | On: Num lock is on or the embedded numeric keypad is enabled. |
| 5 | Caps lock light | On: Caps lock is on. |
| 6 | Scroll lock light | On: Scroll lock is on. |
| 7 | Display lid switch | <ul style="list-style-type: none"> ■ If the notebook is closed while on, turns off the display. ■ If the notebook is opened while in Standby, turns on the notebook (resumes from Standby). |
| 8 | Pointing stick | Moves the pointer and selects or activates items on the screen. |
| 9 | Microphone | Allows for audio input. |

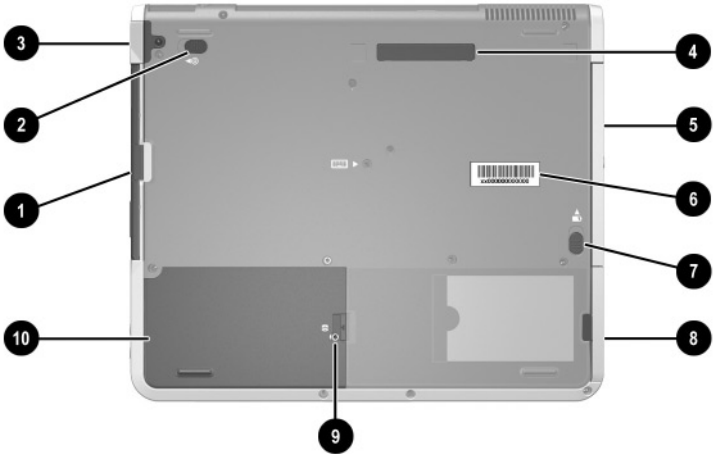


Top Components (Continued)

**Table 1-7
Top Components (Continued)**


| Item | Component | Function |
|------|---------------------------------------|---|
| 10 | MultiBay light | On: A drive in the MultiBay is being accessed. |
| 11 | Drive light | On: One of the following integrated drives is being accessed: <ul style="list-style-type: none"> ■ Hard drive ■ Fixed optical drive |
| 12 | Battery light | On: A battery pack is charging. Blinking: A battery pack that is the only available power source has reached a low-battery condition. When the battery reaches a critical low-battery condition, the battery light begins blinking more quickly. |
| 13 | Power/Standby light | On: Power is turned on. Blinking: Notebook is in standby.  The power/standby light also blinks when a battery pack that is the only available power source reaches a critical low-battery condition. The light turns off when the system enters hibernation or shuts down. |
| 14 | Wireless on/off light | On: An integrated wireless device has been enabled. |
| 15 | Left and right TouchPad buttons | Function like the left and right buttons on an external mouse. |
| 16 | TouchPad | Moves the pointer and selects or activates items on the screen. Can be set to perform other mouse functions, such as scrolling and double-clicking. |
| 17 | Left and right pointing stick buttons | Function like the left and right buttons on an external mouse. |

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



Bottom Components

Table 1-8
Bottom Components

| Item | Component | Function |
|-------------|----------------------------|---|
| 1 | MultiBay | Supports an optional MultiBay device, such as a drive or battery pack. |
| 2 | MultiBay release latch | Allows removal of the MultiBay drive. |
| 3 | Bluetooth compartment | Holds a Bluetooth device.  Bluetooth is not available in all countries. |
| 4 | Docking connector | Connects the notebook to an optional port replicator. |
| 5 | Optical disk drive | Reads and records CD and DVD media. |
| 6 | Serial number | Identifies the notebook. You need this number when calling customer support. |
| 7 | Battery pack release latch | Releases the primary battery pack from the battery bay. |
| 8 | Battery bay | Holds the primary battery pack. Battery pack ships outside the notebook. |
| 9 | Hard drive cover latch | Releases the cover on the hard drive bay. |
| 10 | Hard drive | Holds the primary hard drive. |

1.6 Design Overview

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

The system board provides the following device connections:

- Memory expansion board
- Mini PCI communications devices
- Hard drive
- Display
- Keyboard, TouchPad, and pointing stick
- Audio
- Intel Pentium M processor
- Fan
- PC Card
- MCD modem
- Bluetooth wireless LAN



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

The notebook uses an electrical 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 applications. Exhaust air is displaced through the ventilation grill located on the left side of the notebook.

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 and Diagnostics Utilities

The notebook features two system management utilities:

- **Computer Setup**—A system information and customization utility that can be used even when your operating system is not working or does not load. This utility includes settings that are not available in Microsoft Windows.

- **Diagnostics for Windows**—A system information and diagnostic utility that is used within the Windows operating system. Use this utility whenever possible to:
 - ❑ Display system information.
 - ❑ Test system components.
 - ❑ Troubleshoot a device configuration problem in Windows XP Professional or Windows XP Home.



It is not necessary to configure a device connected to a USB connector on the notebook or to an optional HP Port Replicator.

Using Computer Setup

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

1. Turn on or restart the notebook. Press **F10** while the F10 = ROM-Based Setup message is displayed in the lower left corner of the screen.
 - ❑ To change the language, press **F2**.
 - ❑ To view navigation information, press **F1**.
 - ❑ To return to the Computer Setup menu, press **esc**.
2. Select the File, Security, or Advanced menu.
3. To close Computer Setup and restart the notebook:
 - ❑ Select File > Save Changes and Exit and press **enter**.
 - or-
 - ❑ Select File > Ignore Changes and Exit and press **enter**.
4. When you are prompted to confirm your action, press **F10**.




Selecting from the File Menu

**Table 2-1
File Menu**

| Select | To Do This |
|-------------------------|---|
| System Information | <ul style="list-style-type: none"> ■ View identification information about the notebook, a Port Replicator, and any battery packs in the system. ■ View specification information about the processor, memory and cache size, and system ROM. |
| Save to Floppy | Save system configuration settings to a diskette. |
| Restore from Floppy | Restore system configuration settings from a diskette. |
| Restore Defaults | Replace configuration settings in Computer Setup with factory default settings. Identification information is retained. |
| Ignore Changes and Exit | Cancel changes entered during the current session, then exit and restart the notebook. |
| Save Changes and Exit | Save changes entered during the current session, then exit and restart the notebook. |

Selecting from the Security Menu

**Table 2-2
Security Menu**

| Select | To Do This |
|--|---|
| Setup Password | Enter, change, or delete a Setup password. The Setup password is called an administrator password in Computer Security, a program accessed from the Windows Control Panel. |
| Power-on Password | Enter, change, or delete a power-on password. |
| DriveLock Passwords | Enable/disable DriveLock; change a DriveLock User or Master password.  DriveLock Settings are accessible only when you enter Computer Setup by turning on (not restarting) the notebook. |
| Password Options (Password options can be selected only when a power-on password has been set.) | Enable/disable: <ul style="list-style-type: none"> ■ QuickLock ■ QuickLock on Standby ■ QuickBlank  To enable QuickLock on Standby or QuickBlank, you must first enable QuickLock. |
| Device Security | Enable/disable: <ul style="list-style-type: none"> ■ Ports or diskette drives* ■ Diskette write* ■ CD-ROM or diskette startup  Settings for a DVD-ROM can be entered in the CD-ROM field. |
| System IDs | Enter identification numbers for the notebook, a Port Replicator, and all battery packs in the system. |

*Not applicable to SuperDisk LS-120 drives.

Selecting from the Advanced Menu

**Table 2-3
Advanced Menu**

| Select | To Do This |
|----------------|--|
| Language | Change the Computer Setup language. |
| Boot Options | <p>Enable/disable:</p> <ul style="list-style-type: none"> ■ QuickBoot, which starts the notebook more quickly by eliminating some startup tests. If you suspect a memory failure and want to test memory automatically during startup, disable QuickBoot. ■ MultiBoot, which sets a startup sequence that can include most bootable devices and media in the system. |
| Device Options | <ul style="list-style-type: none"> ■ Enable/disable the embedded numeric keypad at startup. ■ Enable/disable multiple standard pointing devices at startup. To set the notebook to support only a single, usually nonstandard, pointing device at startup, select Disable. ■ Enable/disable USB legacy support for a USB keyboard. When USB legacy support is enabled, the keyboard works even when a Windows operating system is not loaded. ■ Set an optional external monitor or overhead projector connected to a video card in a Port Replicator as the primary device. When the notebook display is set as secondary, the notebook must be shut down before it is undocked from a Port Replicator. |

**Table 2-3
Advanced Menu (Continued)**

| Select | To Do This |
|-------------------------------|--|
| Device Options (continued) | <ul style="list-style-type: none"> ■ Change the parallel port mode from Enhanced Parallel Port (EPP, the default setting) to standard, bidirectional EPP, or Enhanced Capabilities Port (ECP). ■ Set video-out mode to NTSC (default), PAL, NTSC-J, or PAL-M.* ■ Enable/disable all settings in the Intel SpeedStep window. When Disable is selected, the notebook runs in Battery Optimized mode. ■ Specify how the notebook recognizes multiple identical Port Replicators that are identically equipped. Select Disable to recognize the Port Replicators as a single Port Replicator; select Enable to recognize the Port Replicators individually, by serial number. ■ Enable/disable the reporting of the processor serial number by the processor to the software. |
| HDD Self Test Options | Run a quick comprehensive self test on hard drives in the system that support the test features. |

*Video modes vary even within regions. However, NTSC is common in North America; PAL, in Europe, Africa, and the Middle East; NTSC-J, in Japan; and PAL-M, in Brazil. Other South and Central American regions can use NTSC, PAL, or PAL-M.

2.2 Using Diagnostics for Windows

When you access Diagnostics for Windows, a scan of all system components is displayed on the screen before the diagnostics window opens.

You can display more or less information from anywhere within Diagnostics for Windows by selecting Level on the menu bar.

Diagnostics for Windows is designed to test HP components. If HP components are tested, the results might be inconclusive.

Obtaining, Saving, or Printing Configuration Information

1. Access Diagnostics for Windows by selecting Start > Settings > Control Panel > Diagnostics for Windows.
2. Select Categories, then select a category from the drop-down list.
 - To save the information, select File > Save As.
 - To print the information, select File > Print.
3. To close Diagnostics for Windows, select File > Exit.

Obtaining, Saving, or Printing Diagnostic Test Information

1. Access Diagnostics for Windows by selecting Start > Settings > Control Panel > Diagnostics for Windows.
2. Select the Test tab.
3. In the scroll box, select the category or device you want to test.
4. Select a test type:
 - ❑ **Quick Test**—Runs a quick, general test on each device in a selected category.
 - ❑ **Complete Test**—Performs maximum testing on each device in a selected category.
 - ❑ **Custom Test**—Performs maximum testing on a selected device.
 - ◆ To run all tests for your selected device, select the Check All button.
 - ◆ To run only the tests you select, select the Uncheck All button, then select the check box for each test you want to run.
5. Select a test mode:
 - ❑ **Interactive Mode**—Provides maximum control over the testing process. You determine whether the test was passed or failed. You might be prompted to insert or remove devices.
 - ❑ **Unattended Mode**—Does not display prompts. If errors are found, they are displayed when testing is complete.

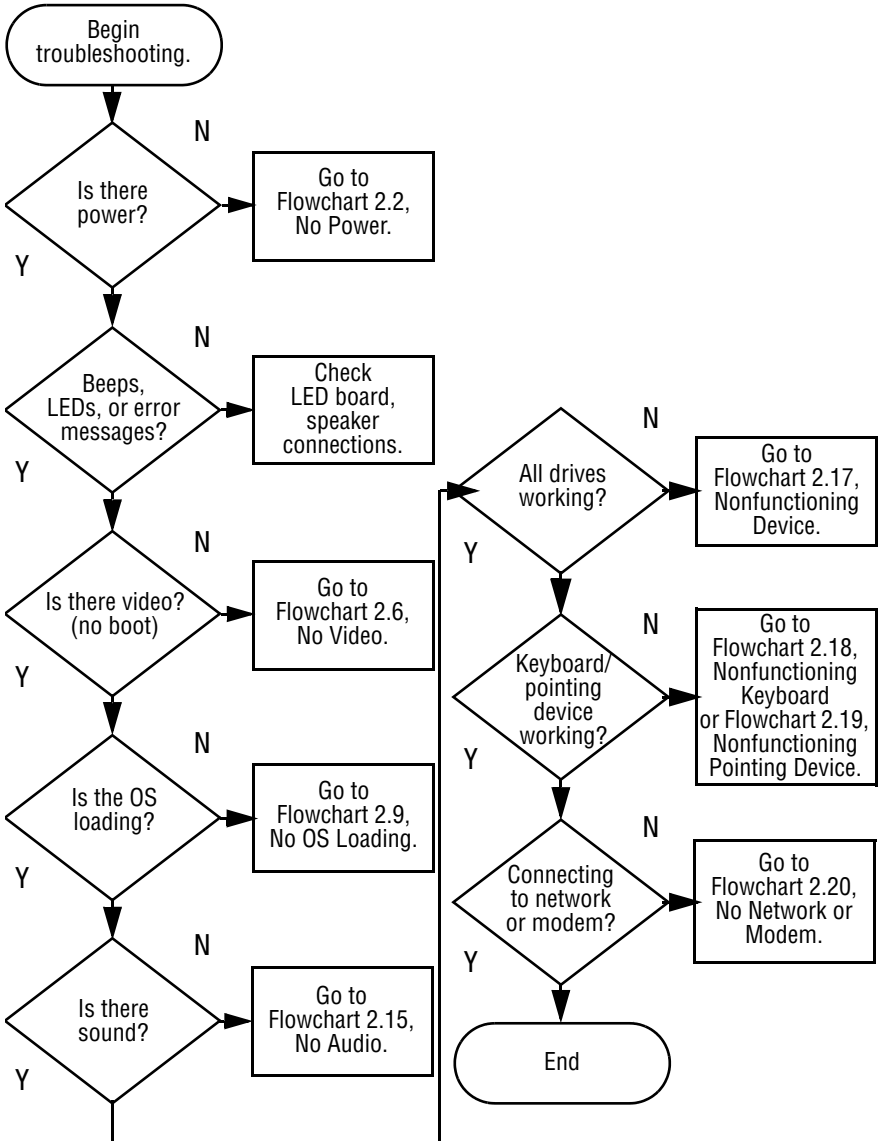
6. Select the Begin Testing button.
7. Select a tab to view a test report:
 - ❑ **Status tab**—Summarizes the tests run, passed, and failed during the current testing session.
 - ❑ **Log tab**—Lists tests run on the system, the number of times each test has run, the number of errors found on each test, and the total run time of each test.
 - ❑ **Error tab**—Lists all errors found in the notebook, along with the corresponding error codes.
8. Select a tab to save the report:
 - ❑ **Log tab**—Select the Save button.
 - ❑ **Error tab**—Select the Save button.
9. Select a tab to print the report:
 - ❑ **Log tab**—Select File > Save As, and then print the file from your folder.

2.3 Troubleshooting Flowcharts

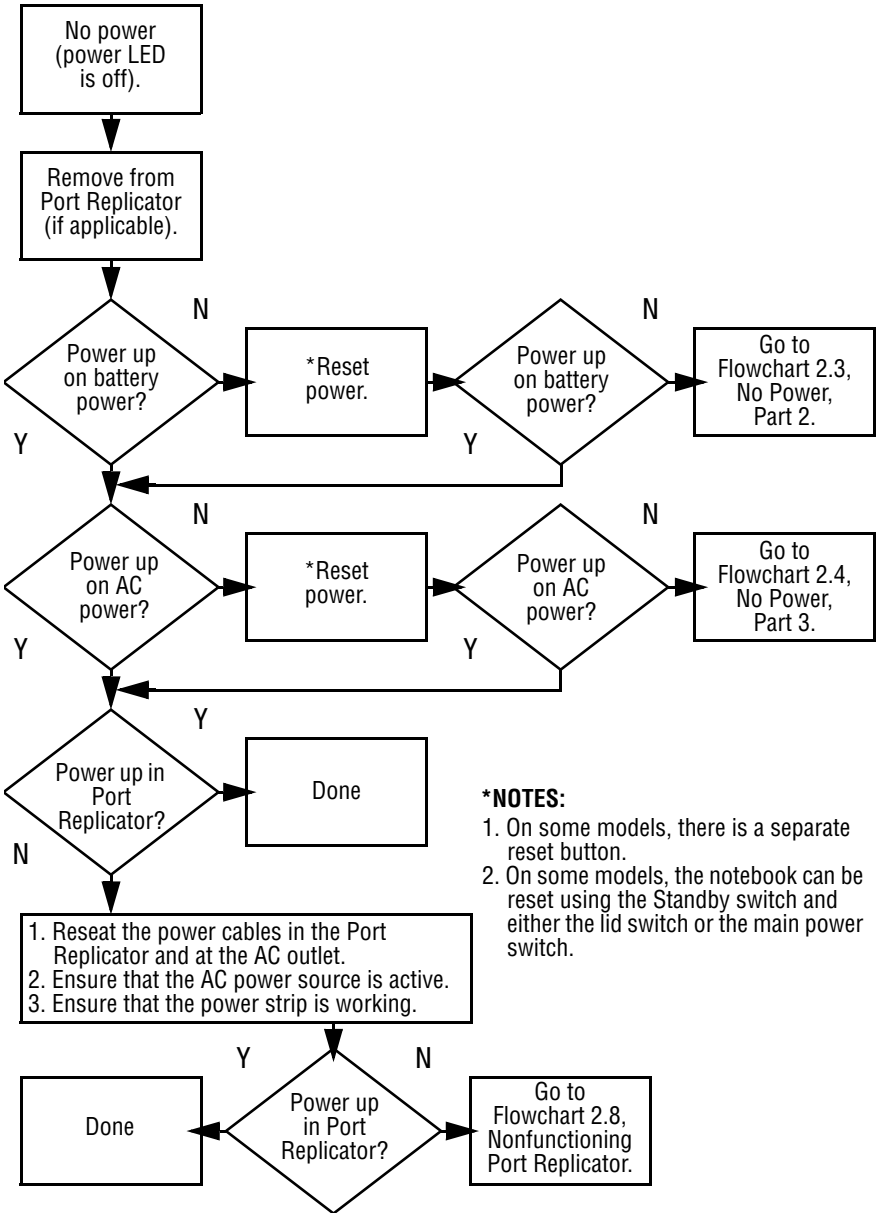
Table 2-4
Troubleshooting Flowcharts Overview

| Flowchart | Description |
|------------------|---|
| 2.1 | Initial troubleshooting |
| 2.2 | No power, part 1 |
| 2.3 | No power, part 2 |
| 2.4 | No power, part 3 |
| 2.5 | No power, part 4 |
| 2.6 | No video, part 1 |
| 2.7 | No video, part 2 |
| 2.8 | Nonfunctioning Port Replicator |
| 2.9 | No operating system (OS) loading |
| 2.10 | No OS loading from hard drive, part 1 |
| 2.11 | No OS loading from hard drive, part 2 |
| 2.12 | No OS loading from hard drive, part 3 |
| 2.13 | No OS loading from diskette drive |
| 2.14 | No OS loading from CD- or DVD-ROM drive |
| 2.15 | No audio, part 1 |
| 2.16 | No audio, part 2 |
| 2.17 | Nonfunctioning device |
| 2.18 | Nonfunctioning keyboard |
| 2.19 | Nonfunctioning pointing device |
| 2.20 | No network or modem connection |

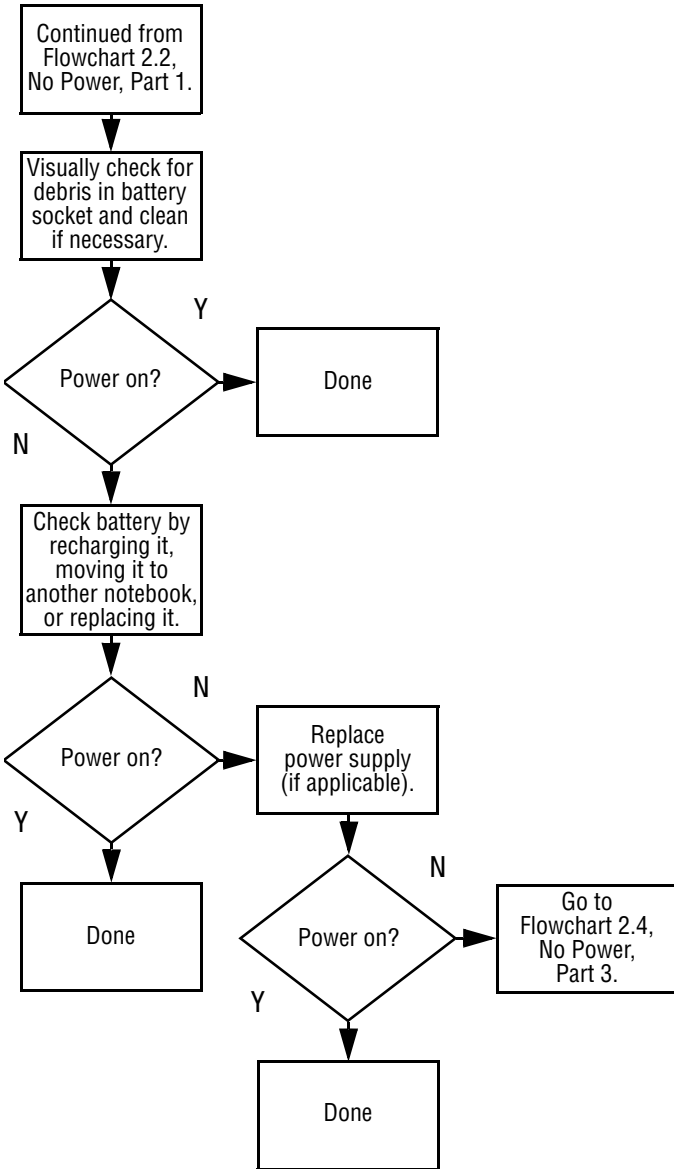
Flowchart 2.1 – Initial Troubleshooting



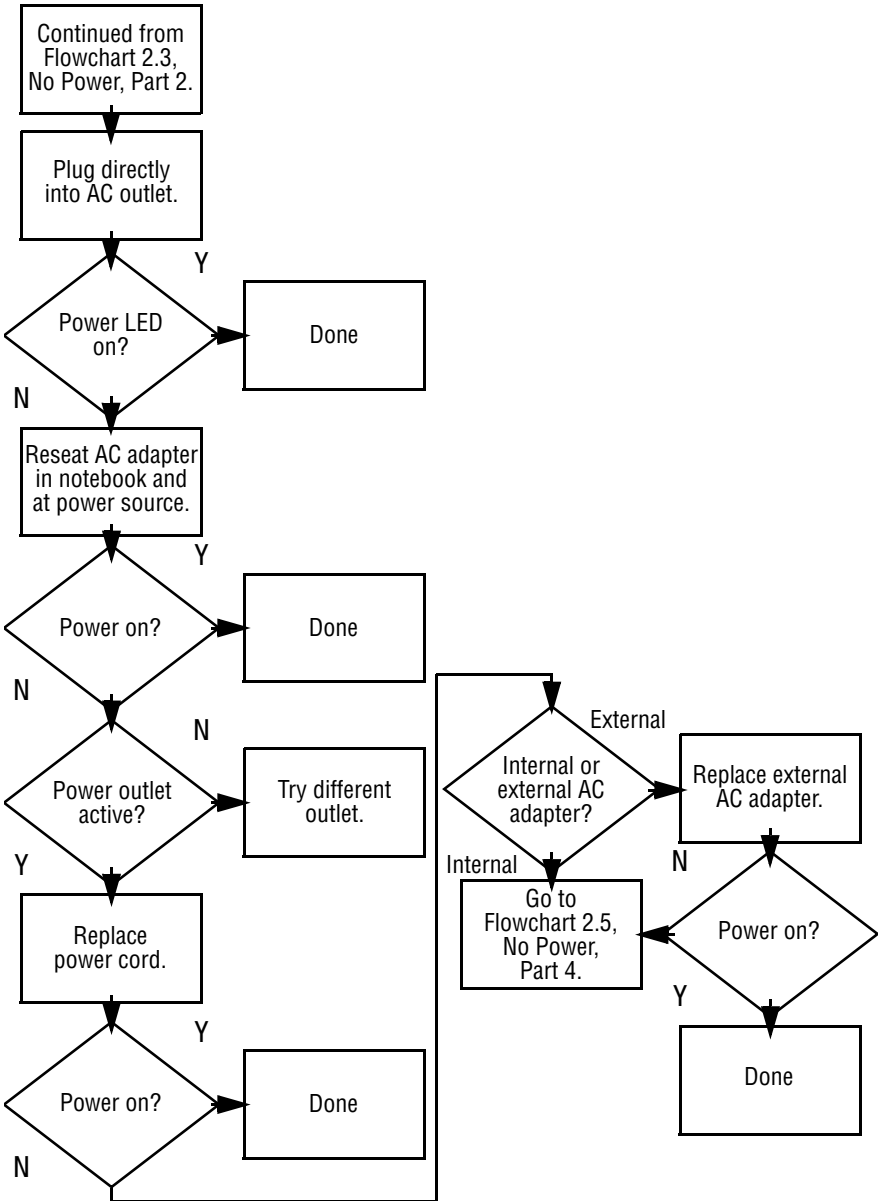
Flowchart 2.2—No Power, Part 1



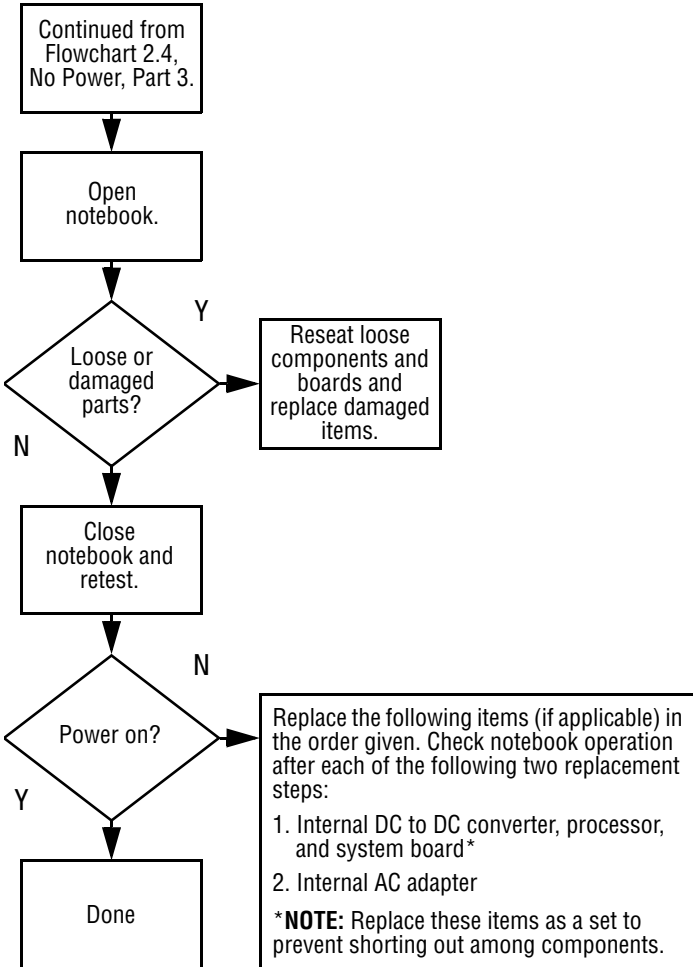
Flowchart 2.3—No Power, Part 2



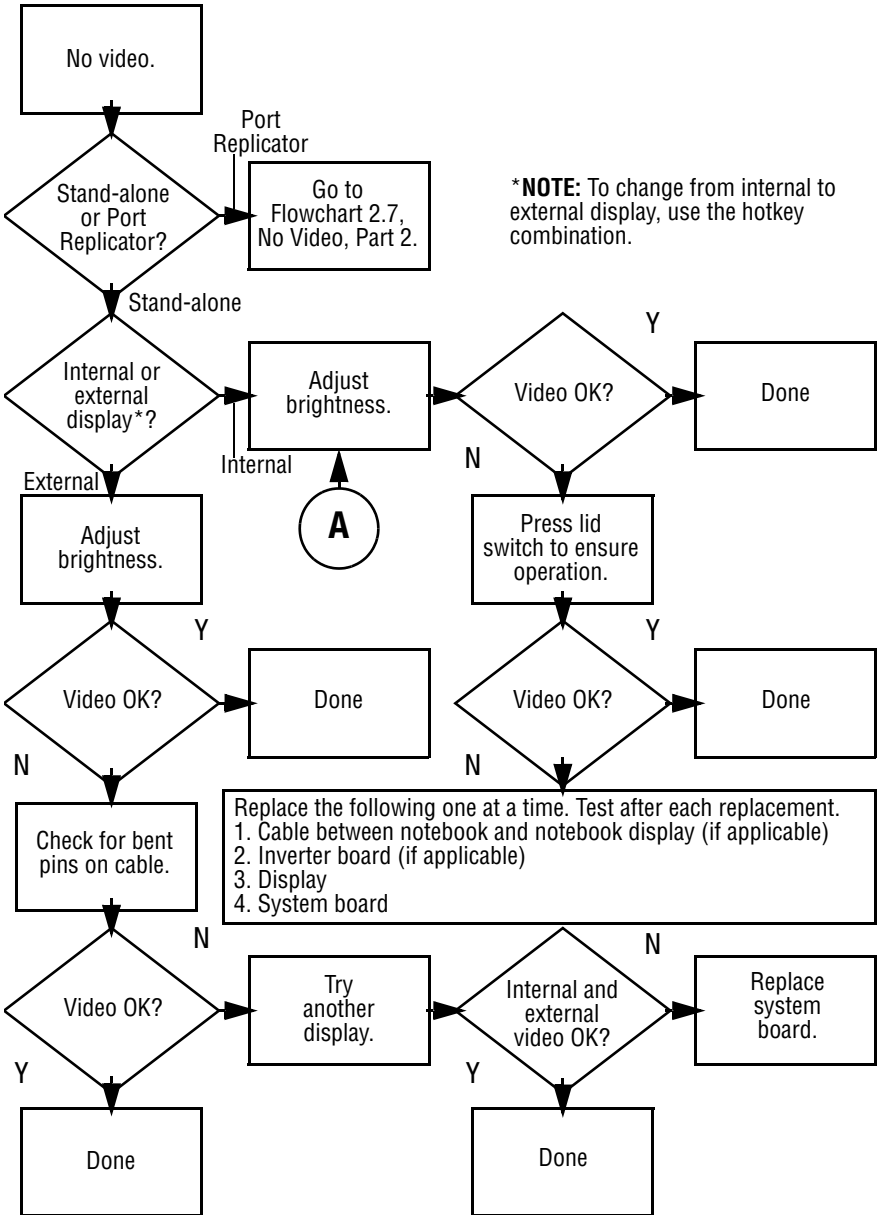
Flowchart 2.4—No Power, Part 3



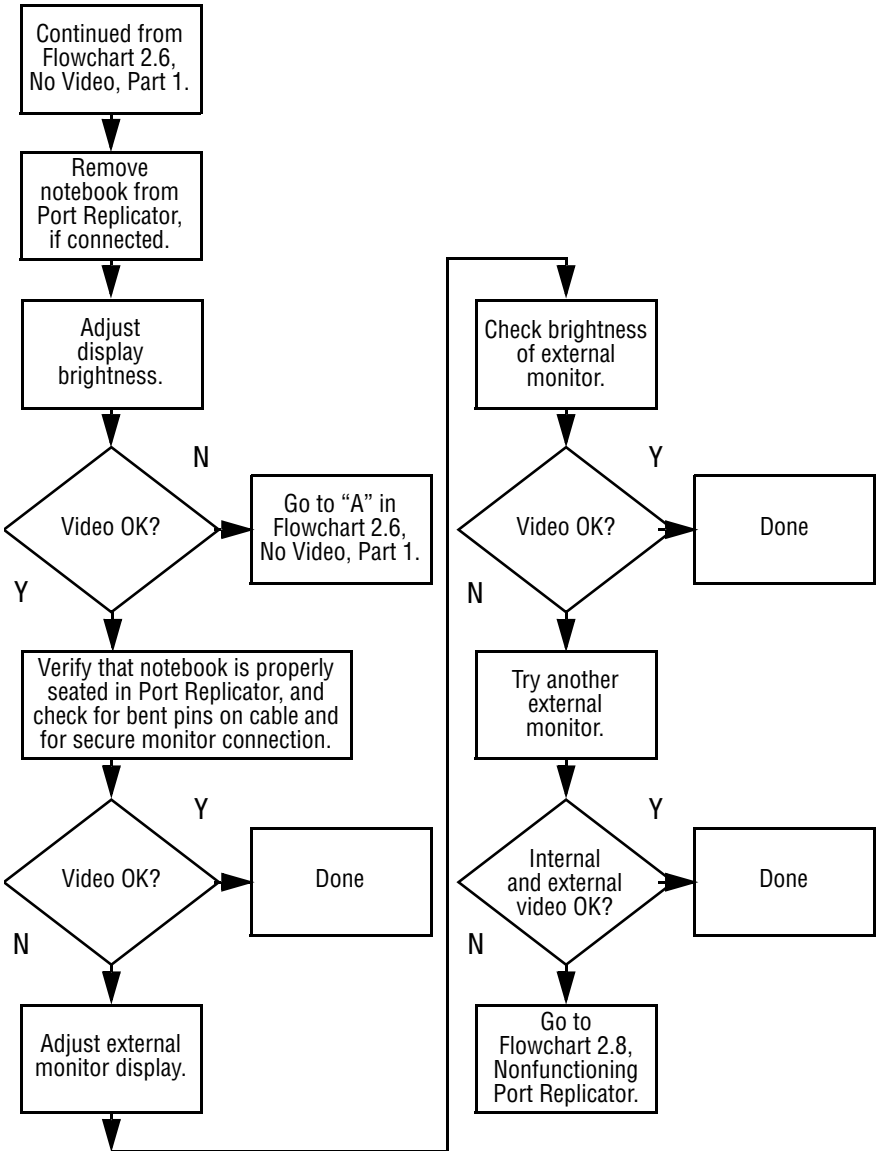
Flowchart 2.5—No Power, Part 4



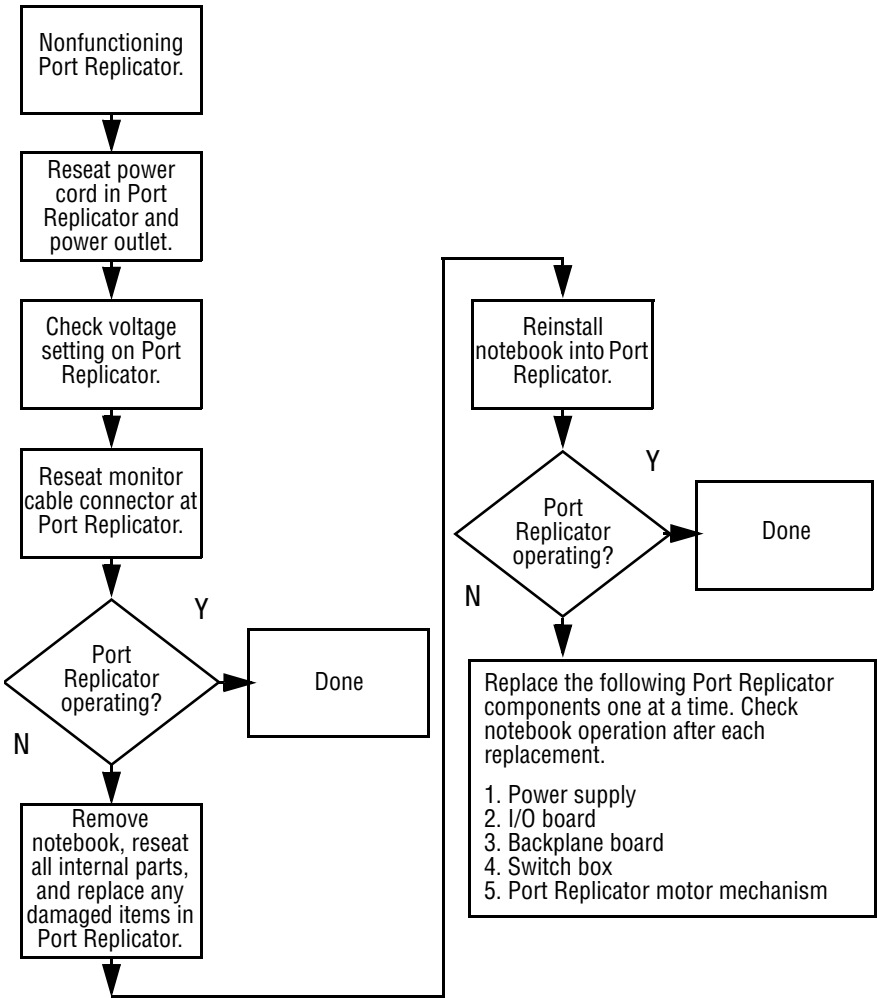
Flowchart 2.6—No Video, Part 1



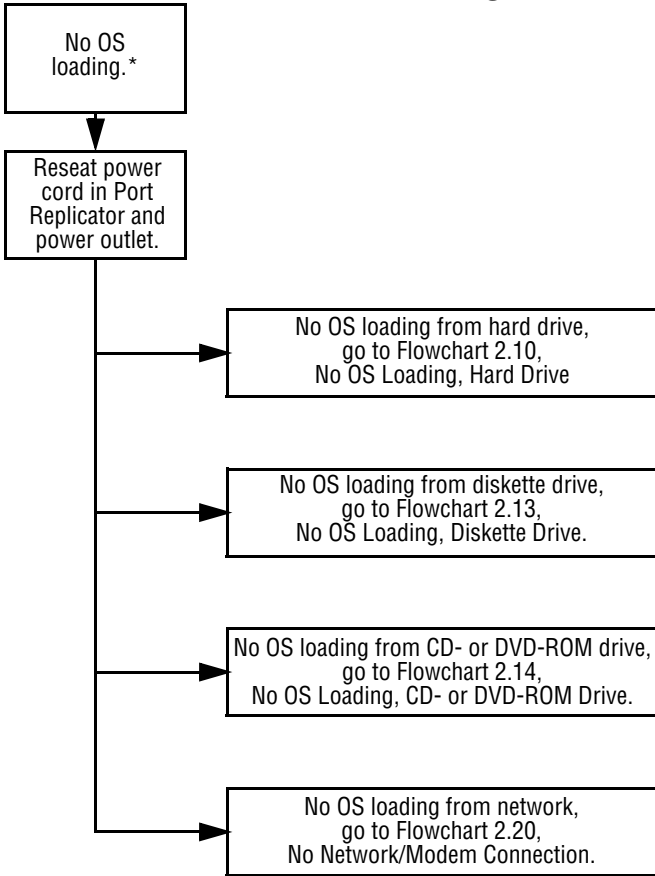
Flowchart 2.7—No Video, Part 2



Flowchart 2.8—Nonfunctioning Port Replicator

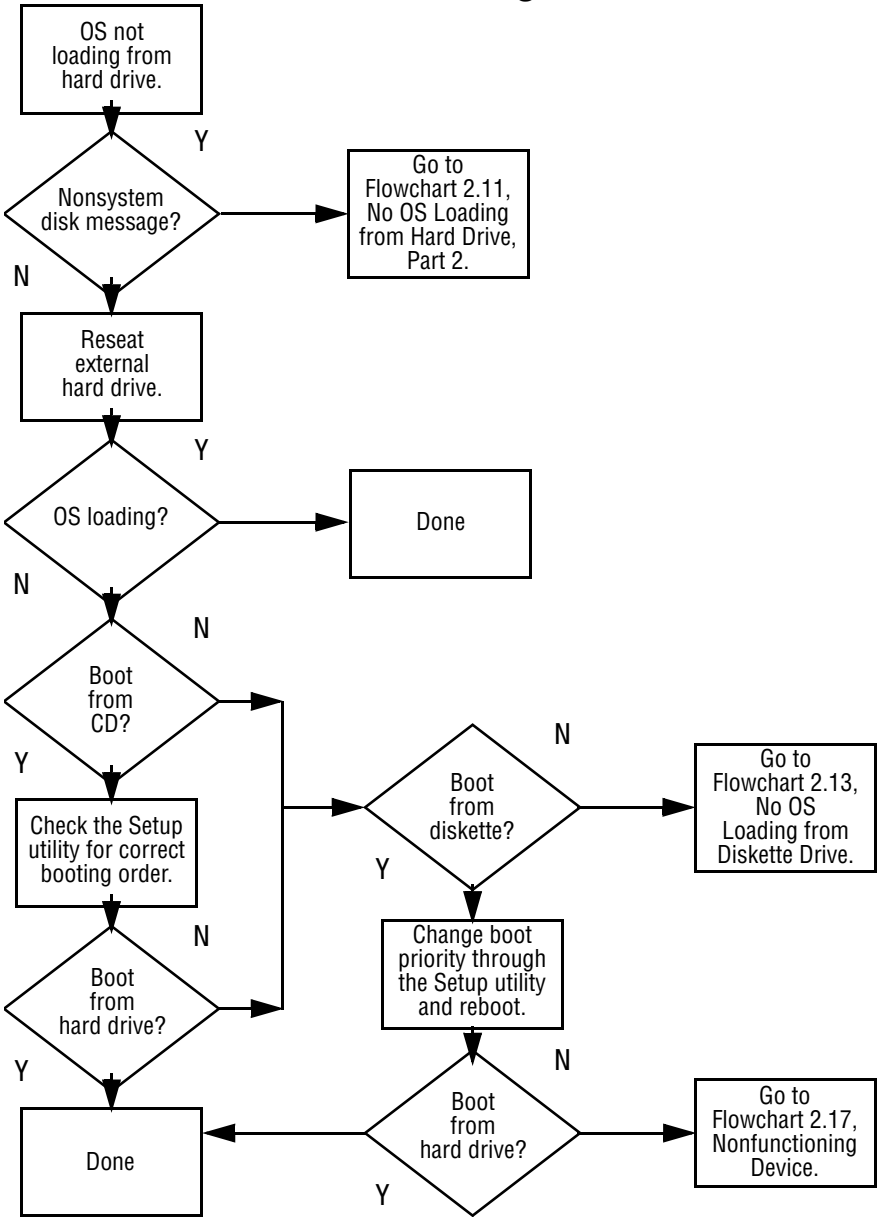


Flowchart 2.9—No OS Loading

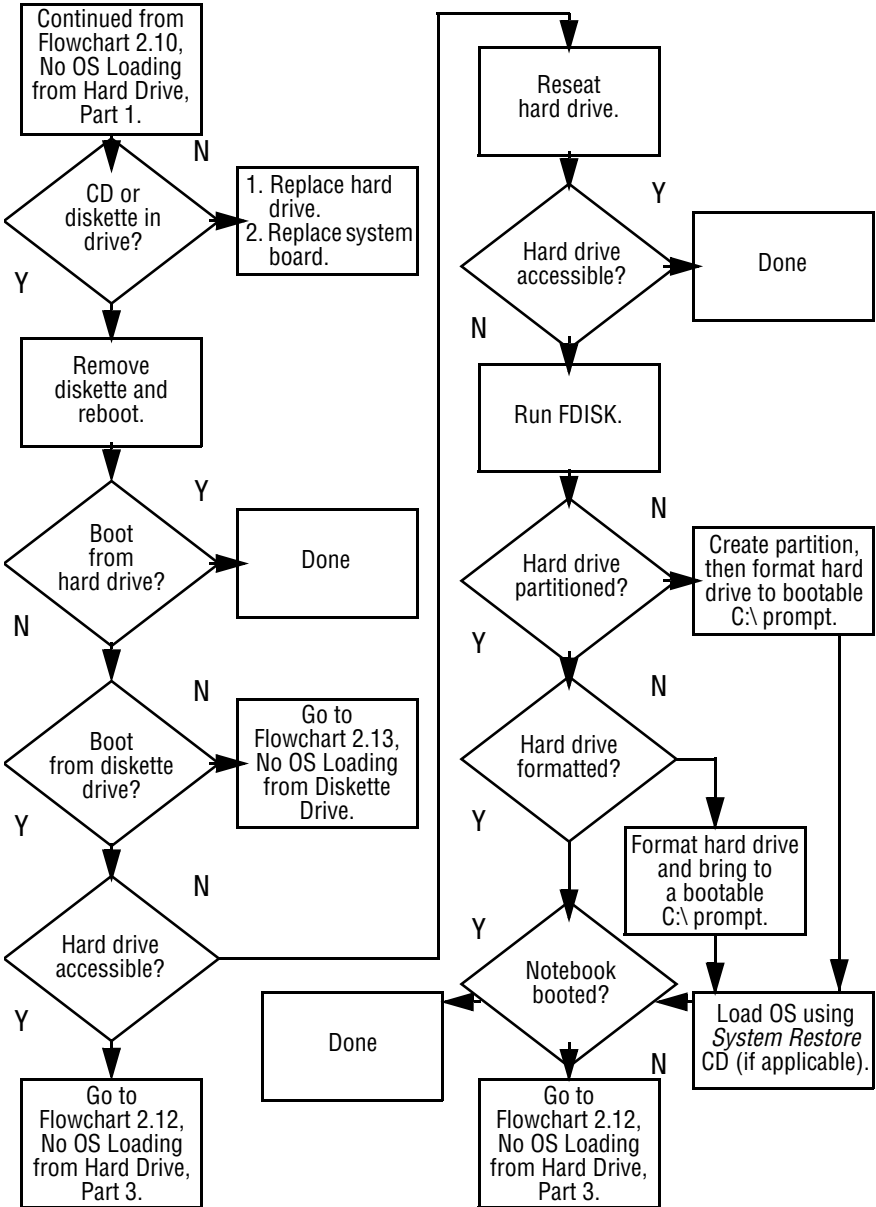


***NOTE:** Before beginning to troubleshoot, always check cable connections, cable ends, and drives for bent or damaged pins.

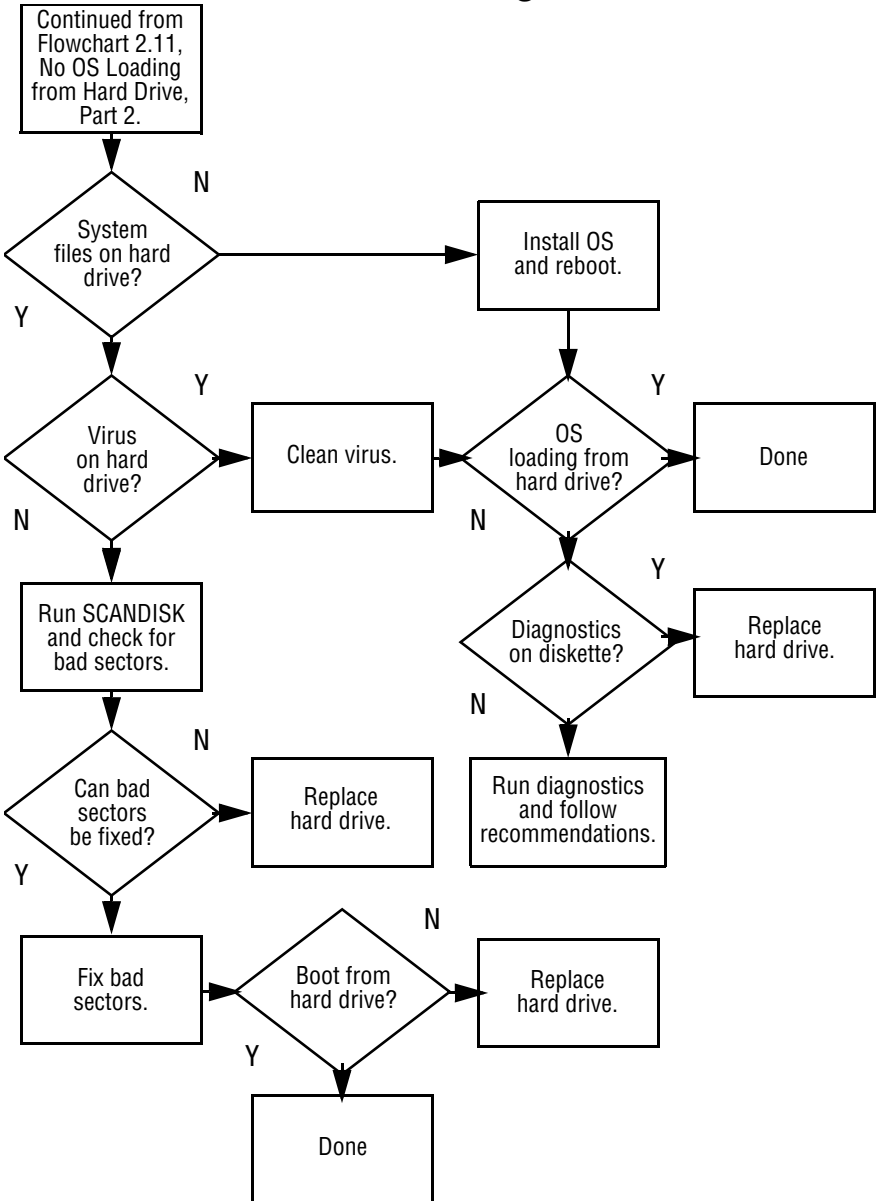
Flowchart 2.10—No OS Loading, Hard Drive, Part 1



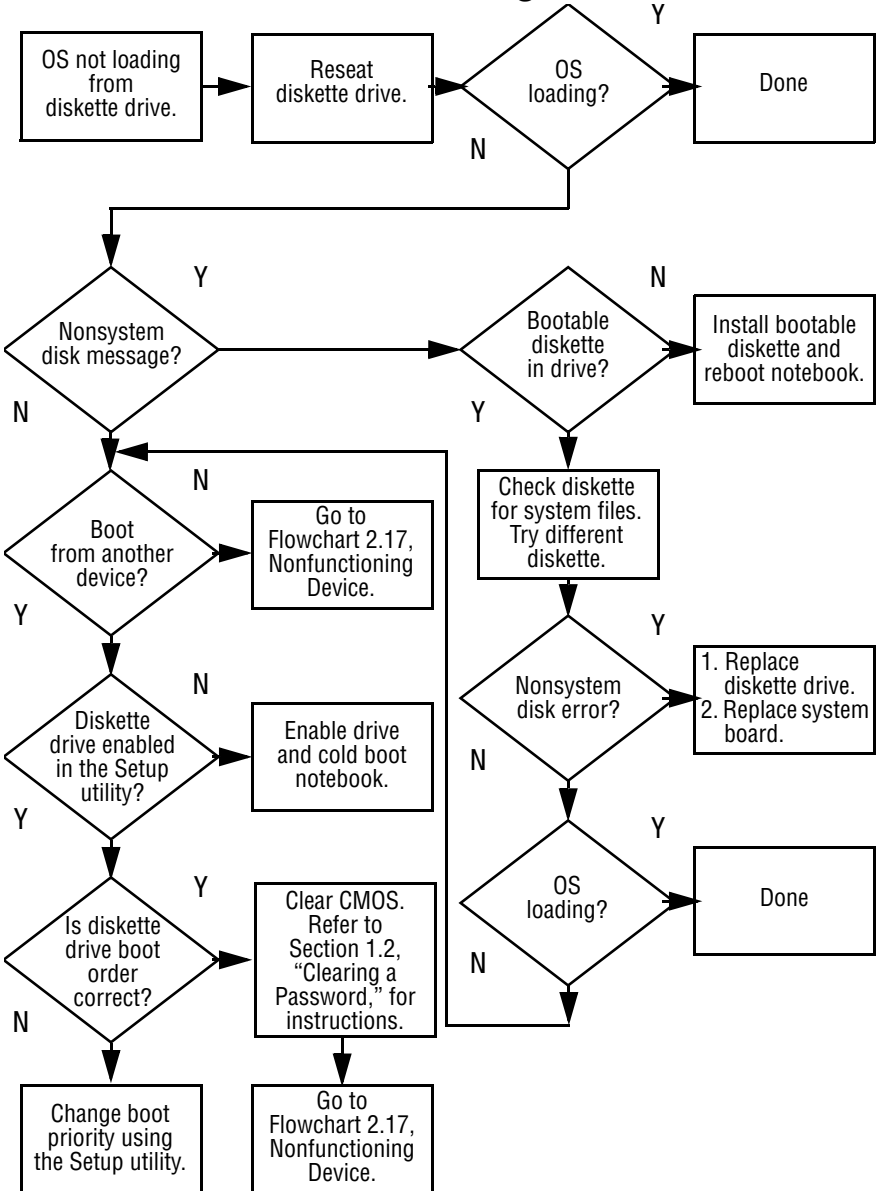
Flowchart 2.11—No OS Loading, Hard Drive, Part 2



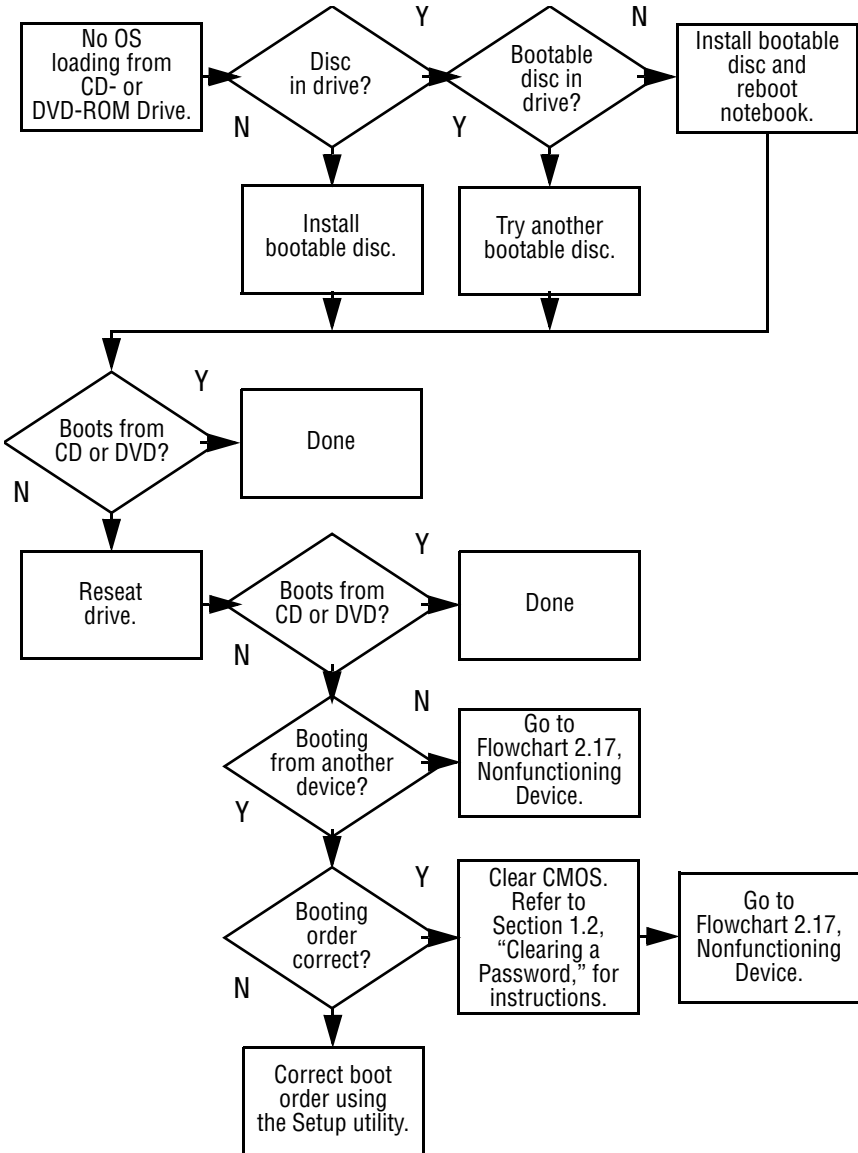
Flowchart 2.12—No OS Loading, Hard Drive, Part 3



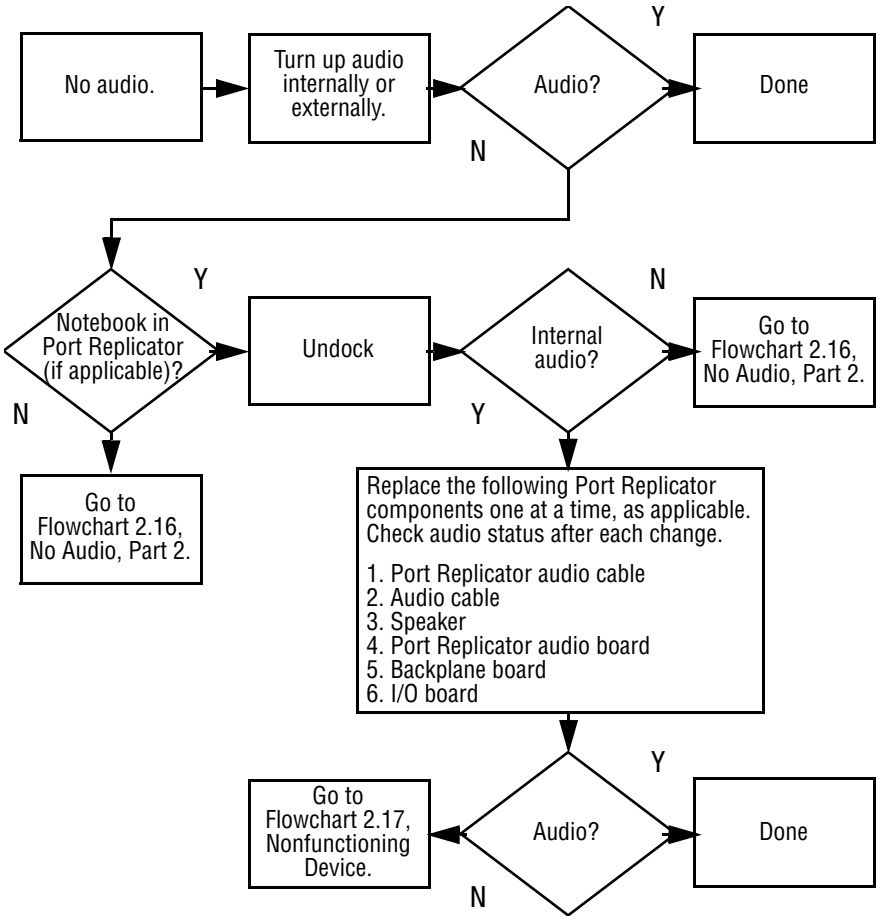
Flowchart 2.13—No OS Loading, Diskette Drive



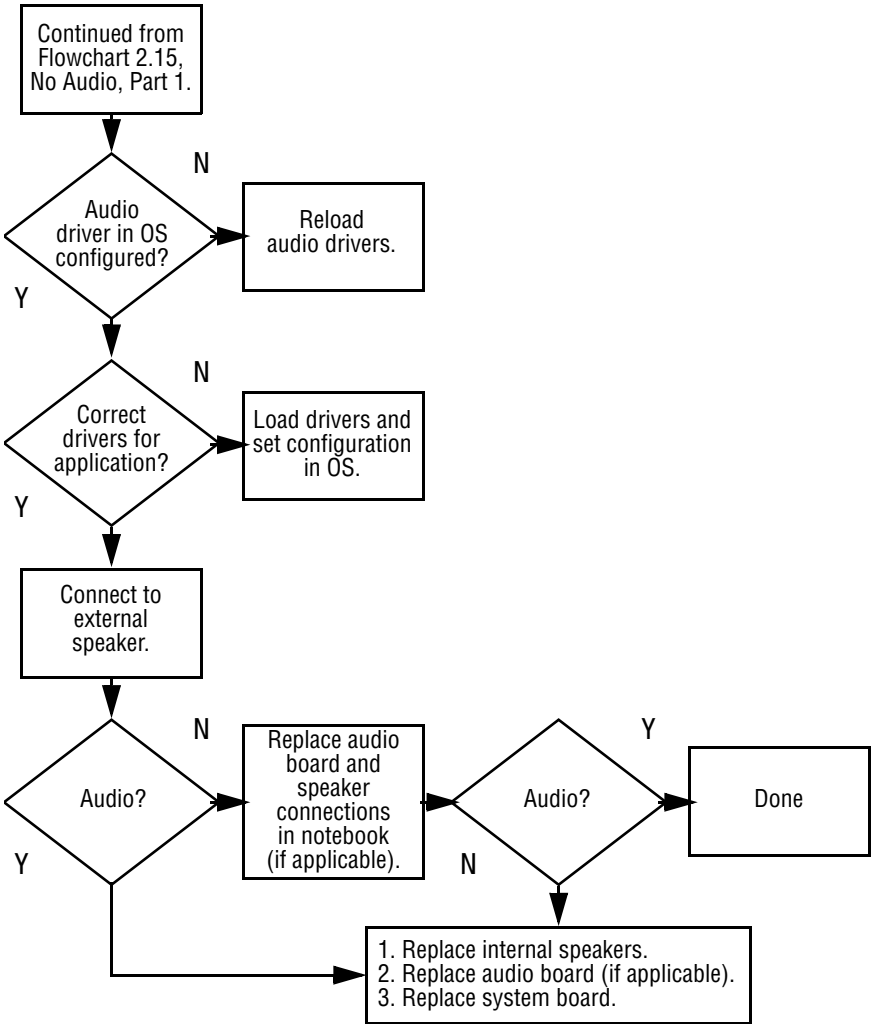
Flowchart 2.14—No OS Loading, CD- or DVD-ROM Drive



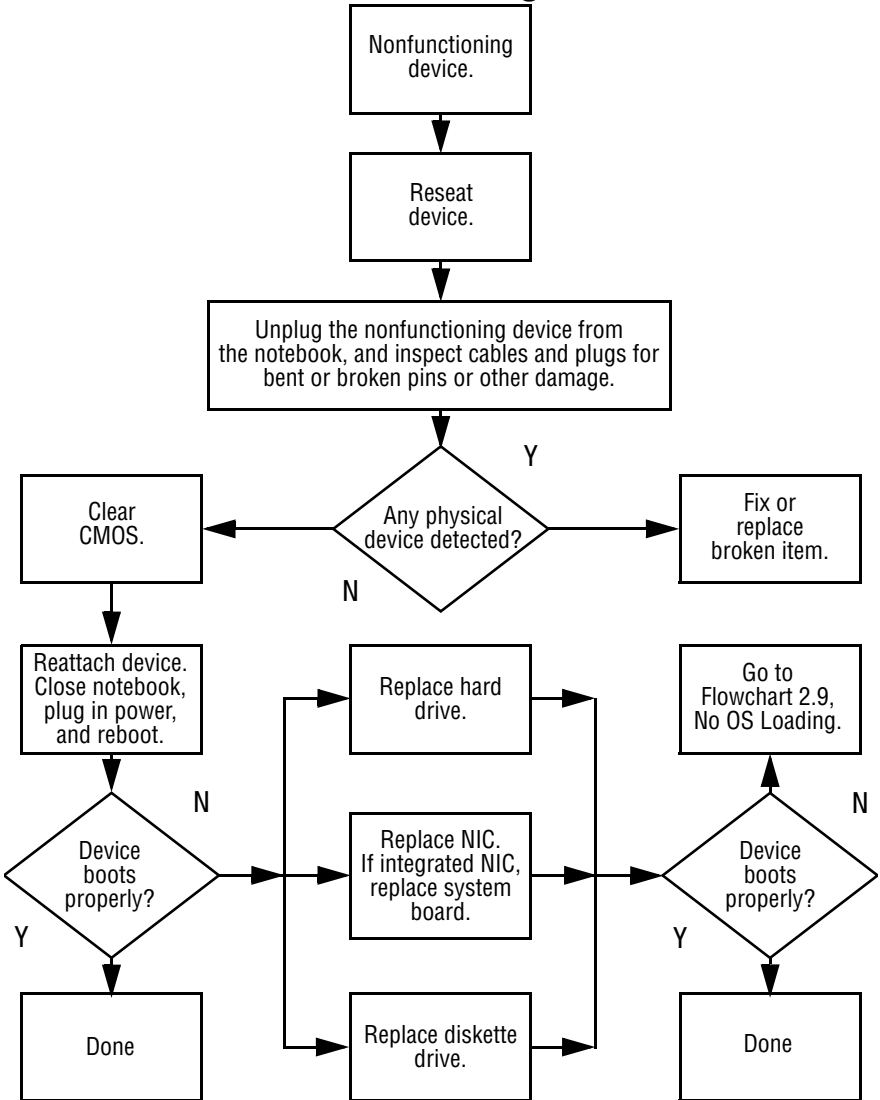
Flowchart 2.15—No Audio, Part 1



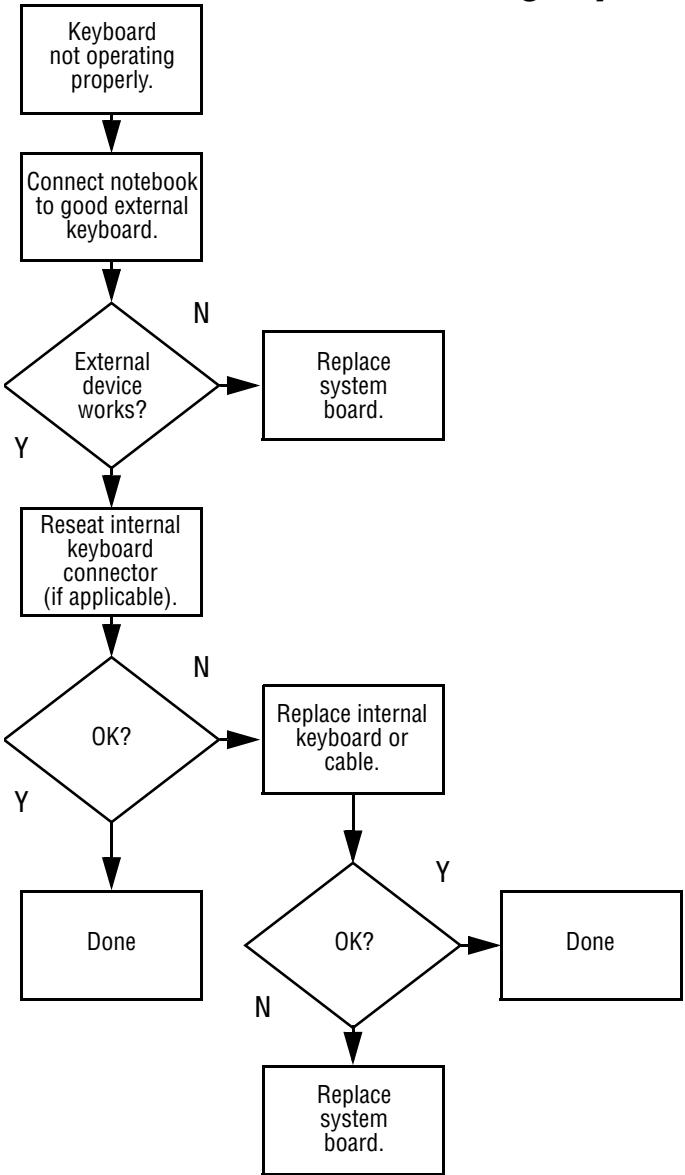
Flowchart 2.16—No Audio, Part 2



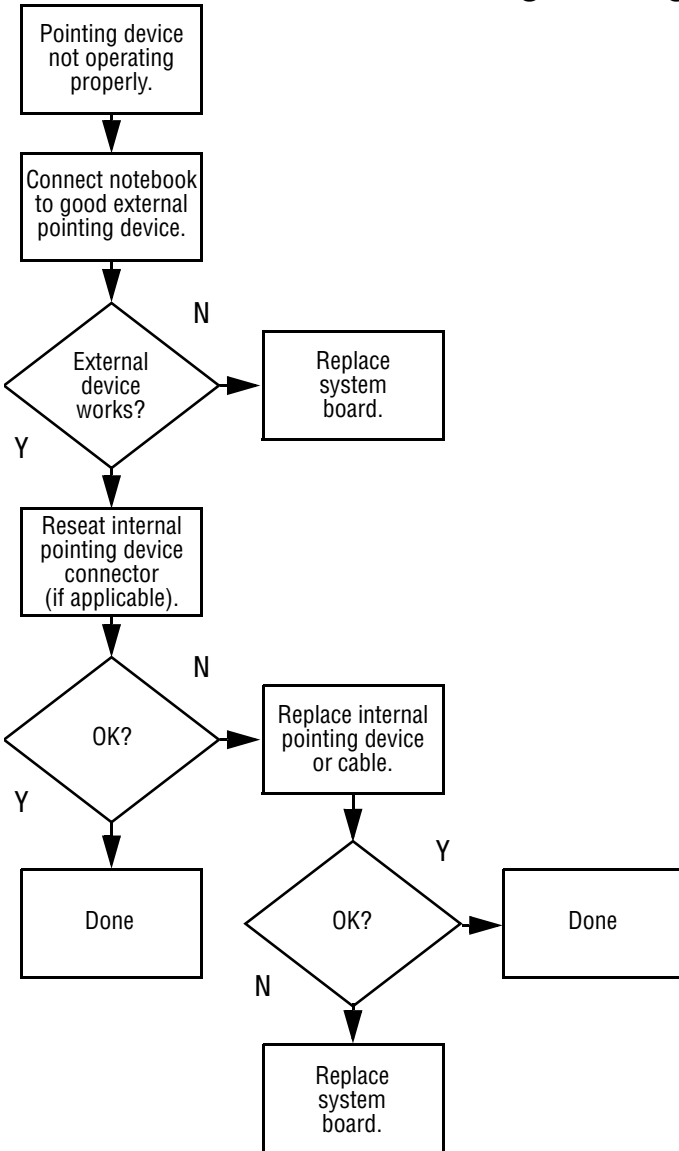
Flowchart 2.17—Nonfunctioning Device



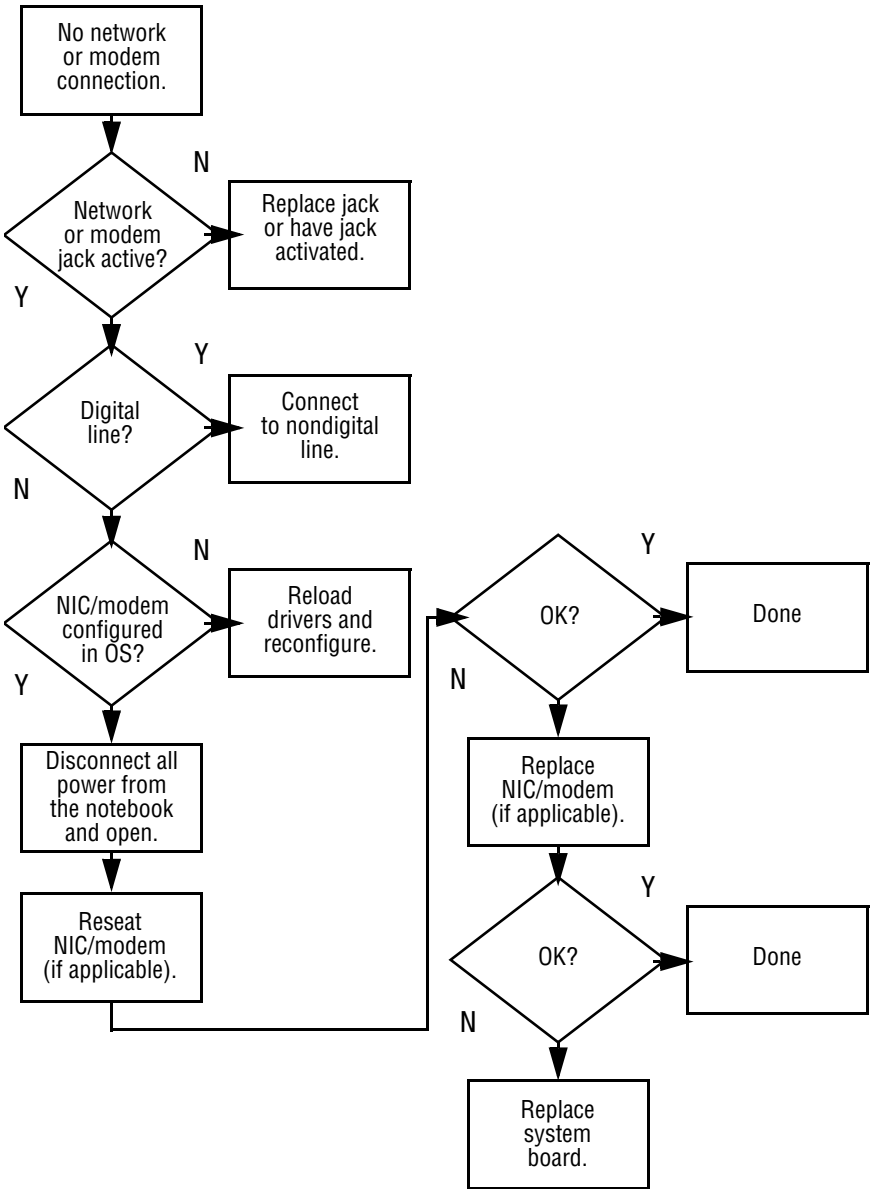
Flowchart 2.18—Nonfunctioning Keyboard



Flowchart 2.19—Nonfunctioning Pointing Device



Flowchart 2.20—No Network/Modem Connection

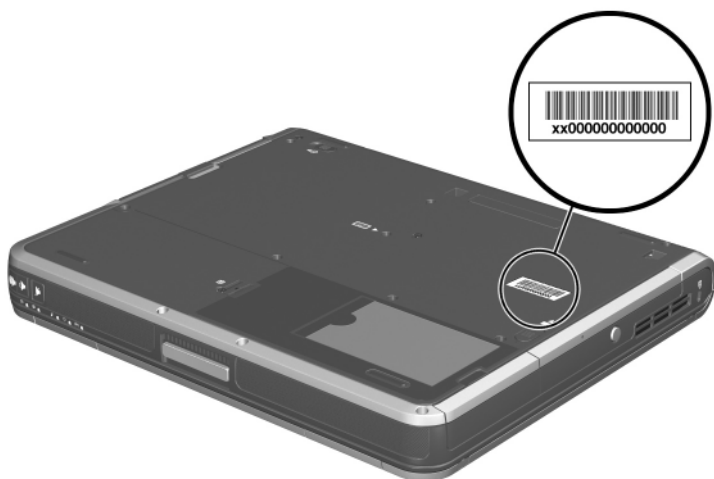


Illustrated Parts Catalog

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

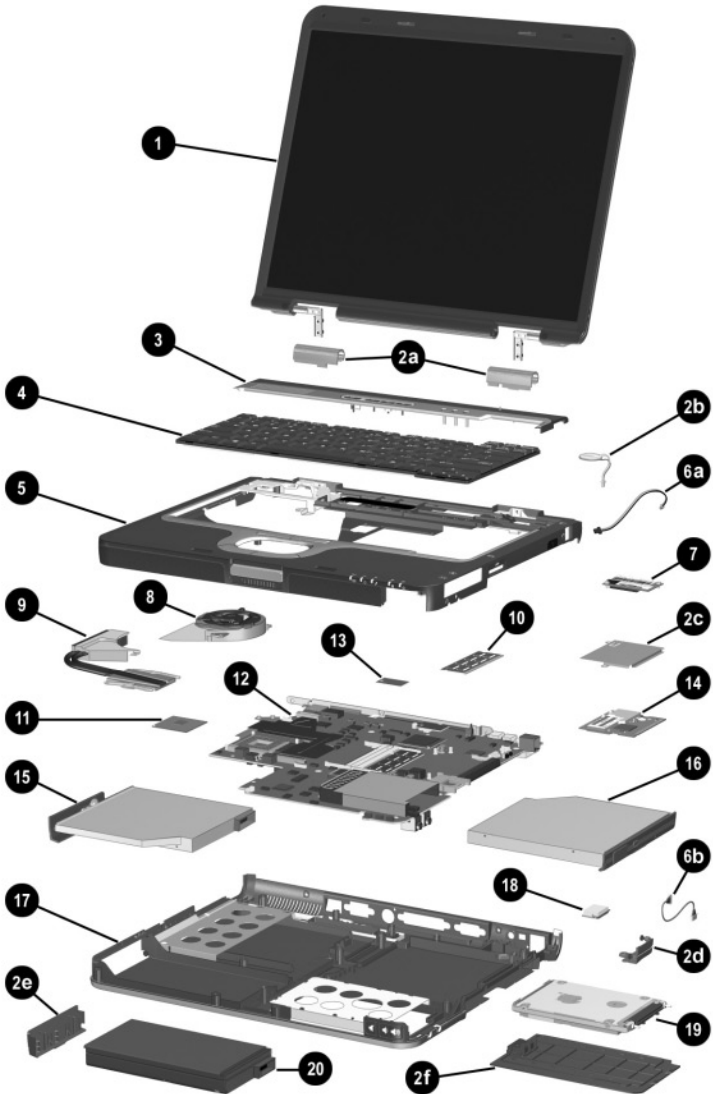
3.1 Serial Number Location

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



Serial Number Location

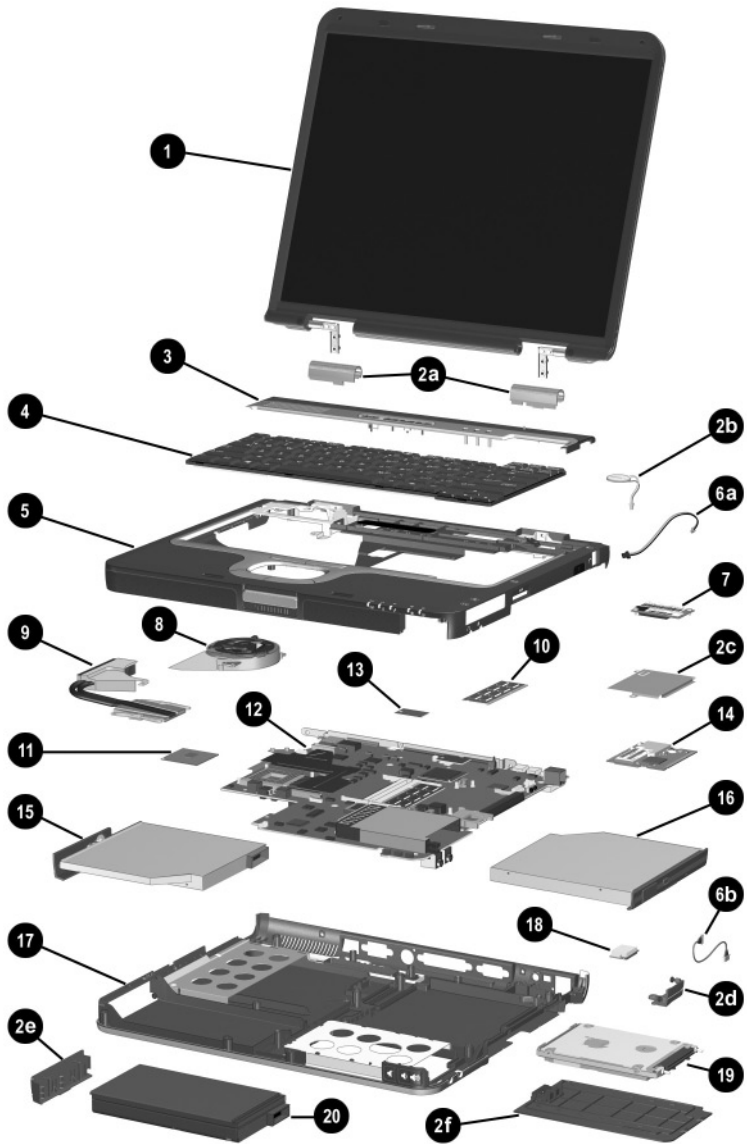
3.2 Notebook Major Components



Notebook Major Components

Table 3-1
Spare Parts: Notebook Major Components

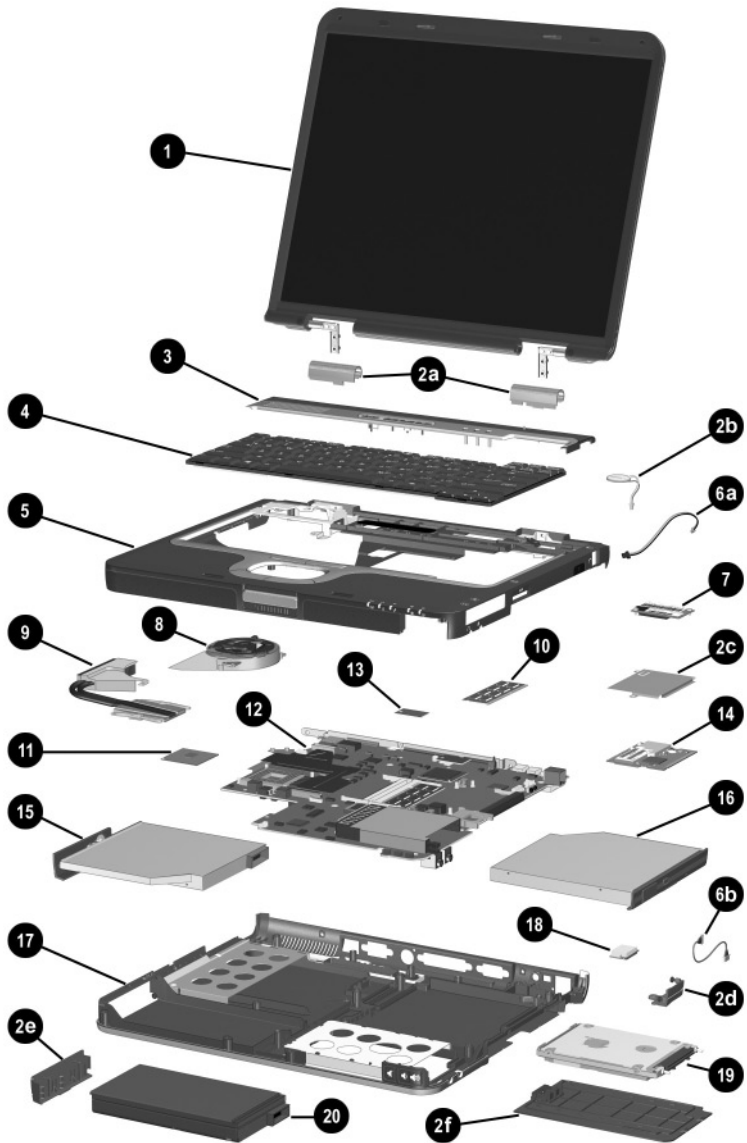
| Item | Description | Spare Part Number |
|-------------|--|---------------------------|
| 1 | Display assemblies | |
| | 15.0-inch, UXGA+, TFT | 345060-001 |
| | 15.0-inch, SXGA+, TFT | 345059-001 |
| | 15.0-inch, XGA, TFT | 345058-001 |
| | Miscellaneous Plastics Kit, includes: | 345066-001 |
| 2a | Left and right display hinges | |
| 2b | RTC battery | |
| 2c | Mini PCI communications board shield | |
| 2d | Bluetooth cover | |
| 2e | Battery bezel | |
| 2f | Hard drive cover | |
| | Not illustrated: Notebook feet (4) | |
| 3 | LED switch cover | 345063-001 |
| 4 | Keyboards (include pointing stick) | |
| | Brazil 341520-201 | Korea 341520-AD1 |
| | Czech Republic 341520-221 | Latin America 341520-161 |
| | Denmark 341520-081 | Norway 341520-091 |
| | Europe 341520-A41 | Portugal 341520-131 |
| | France 341520-051 | Russia 341520-251 |
| | French Canada 341520-121 | Saudi Arabia 341520-171 |
| | Germany 341520-041 | Slovenia 341520-BA1 |
| | Hungary 341520-211 | Spain 341520-071 |
| | Iceland 341520-DD1 | Sweden/Finland 341520-B71 |
| | International 341520-B31 | Switzerland 341520-BG1 |
| | Israel 341520-BB1 | Taiwan 341520-AB1 |
| | Italy 341520-061 | Thailand 341520-281 |
| | Japan 341520-291 | Turkey 341520-141 |
| | | United Kingdom 341520-031 |
| | | United States 341520-001 |
| 5 | Top cover (includes TouchPad and speaker) | 345061-001 |



Notebook Major Components (Continued)

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

| Item | Description | Spare Part Number |
|-------------|---|--------------------------|
| | Miscellaneous Cable Kit , includes: | 345056-001 |
| 6a | Modem cable | |
| 6b | Bluetooth cable | |
| 7 | Modem board | 325521-001 |
| 8 | Fan assembly | 345065-001 |
| 9 | Heat sink (includes grease) | 345067-001 |
| 10 | Memory expansion boards, 333-MHz | |
| | 1024-MB (1.0-GB) | 336579-001 |
| | 512-MB | 336578-001 |
| | 256-MB | 336577-001 |
| 11 | Processors (include thermal grease) | |
| | Intel Pentium M processor, 1.7 GHz | 340165-001 |
| | Intel Pentium M processor, 1.6 GHz | 319777-001 |
| | Intel Pentium M processor, 1.5 GHz | 319776-001 |
| | Intel Pentium M processor, 1.4 GHz | 319775-001 |
| 12 | System boards (include thermal grease) | |
| | With 128 MB of video memory | 349206-001 |
| | With 64 MB of video memory | 345064-001 |
| 13 | Security card | 345856-001 |
| 14 | Mini PCI communications boards | |
| | 802.11a/b/g LAN NIC | 325525-001 |
| | 802.11b/g LAN NIC | 325526-001 |
| | 802.11b W500 modem board (for use in Japan) | 339742-291 |
| | 802.11b wireless LAN (MOW) | 345641-001 |
| | 802.11b wireless LAN (ROW) | 345640-001 |

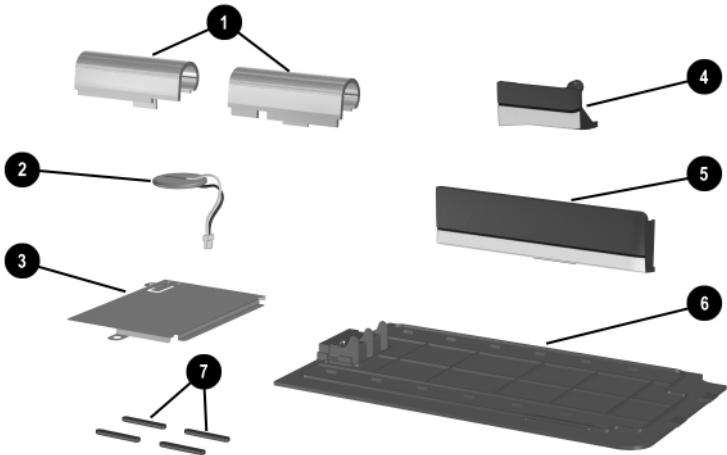


Notebook Major Components (Continued)

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

| Item | Description | Spare Part Number |
|-------------|--|--------------------------|
| 15 | Optical drives | |
| | 24X Max DVD+RW/R and CD-RW Combo Drive | 349242-001 |
| | 8X Max DVD-ROM Drive | 349241-001 |
| | 24X Max DVD/CD-RW Combo Drive | 349243-001 |
| | 24X Max CD-ROM Drive | 349240-001 |
| 16 | MultiBay devices | |
| | 1.44-MB diskette drive | 241995-001 |
| | 24X Max CD-ROM Drive | 228746-001 |
| | 8X Max Slim DVD+RW/R and CD-RW Combo Drive | 251292-001 |
| | 4X Max Regular DVD+RW/R and CD-RW Combo Drive | 344256-001 |
| 17 | Base enclosure (includes optical drive shield, hard drive shield, and four notebook feet) | 345062-001 |
| 18 | Bluetooth board (includes Bluetooth cable, item 6b) | 348277-001 |
| 19 | Hard drives (includes hard drive bezel and frame) | |
| | 80-GB 5400-rpm (all models) | 345632-001 |
| | 60-GB 5400-rpm (all models) | 345631-001 |
| | 40-GB 5400-rpm (all models) | 345630-001 |
| | 60-GB 7200-rpm (nw8000 only) | 345855-001 |
| 20 | Battery pack, 8-cell, 4.4 Wh, Li-Ion | 338669-001 |

3.3 Miscellaneous Plastics Kit Components

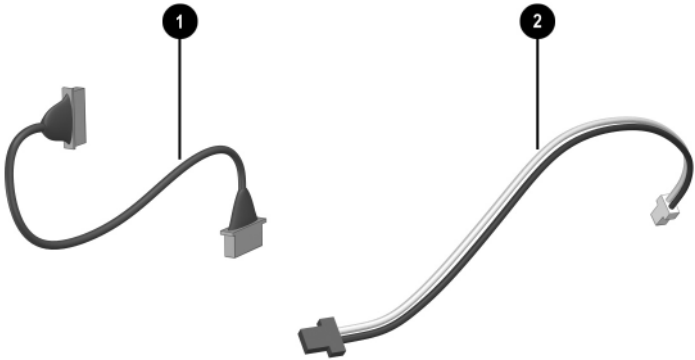


Miscellaneous Plastics Kit Components

Table 3-2
Miscellaneous Plastics Kit Components
Spare Part Number 345066-001

| Item | Description |
|------|--------------------------------------|
| 1 | Left and right display hinges |
| 2 | RTC battery |
| 3 | Mini PCI communications board shield |
| 4 | Bluetooth cover |
| 5 | Battery bezel |
| 6 | Hard drive cover |
| 7 | Notebook feet (4) |

3.4 Miscellaneous Cable Kit Components

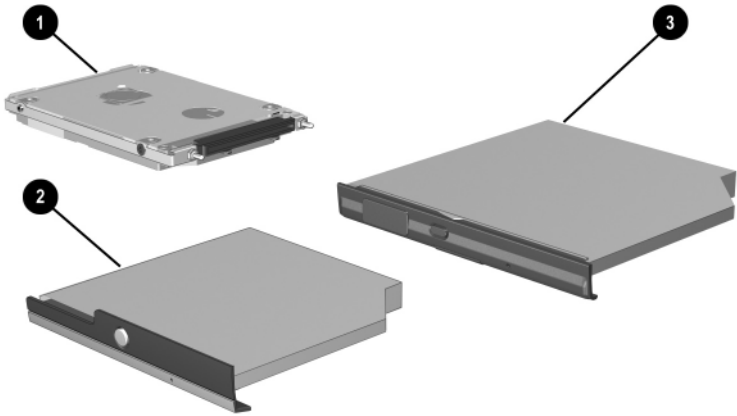


Miscellaneous Cable Kit Components

Table 3-3
Miscellaneous Cable Kit Components
Spare Part Number 340056-001

| Item | Description |
|------|-----------------|
| 1 | Bluetooth cable |
| 2 | Modem cable |

3.5 Mass Storage Devices



Mass Storage Devices

Table 3-4
Mass Storage Devices
Spare Part Number Information

| Item | Description | Spare Part Number |
|-------------|--|--------------------------|
| 1 | Hard drives (includes hard drive bezel and frame) | |
| | 80-GB 5400-rpm (all models) | 345632-001 |
| | 60-GB 5400-rpm (all models) | 345631-001 |
| | 40-GB 5400-rpm (all models) | 345630-001 |
| | 60-GB 7200-rpm (nw8000 only) | 345855-001 |

Table 3-4
Mass Storage Devices
Spare Part Number Information (Continued)

| Item | Description | Spare Part Number |
|-------------|--|--------------------------|
| 2 | Optical drives | |
| | 24X Max DVD+RW/R and CD-RW Combo Drive | 349242-001 |
| | 8X Max DVD-ROM Drive | 349241-001 |
| | 24X Max DVD/CD-RW Combo Drive | 349243-001 |
| | 24X Max CD-ROM Drive | 349240-001 |
| 3 | MultiBay devices | |
| | 1.44-MB diskette drive | 241995-001 |
| | 24X Max CD-ROM Drive | 228746-001 |
| | 8X Max Slim DVD/R+W and CD-RW Combo Drive | 251292-001 |
| | 4X Max Regular DVD/R+W and CD-RW Combo Drive | 344256-001 |

3.6 Miscellaneous

**Table 3-5
Spare Parts: Miscellaneous (not illustrated)**

| Description | Spare Part Number | | |
|--|-------------------|----------------------------|------------|
| AC adapters | | | |
| 90-W, PFC | 239705-001 | | |
| 65-W | 239704-001 | | |
| Carrying cases | | | |
| Leather top load, Samsung | 325817-001 | | |
| Leather top load, SG | 325817-002 | | |
| Nylon top load, Samsung | 325815-01 | | |
| Nylon top load, SG | 325815-002 | | |
| Nylon entry level | 325814-001 | | |
| Port replicators | | | |
| Advanced Port Replicator | 339096-001 | | |
| Common Port Replicator | 339097-001 | | |
| Power cords | | | |
| Australia | 246959-011 | Italy | 246959-061 |
| Brazil | 246959-201 | Japan | 246959-291 |
| Denmark | 246959-081 | Korea | 246959-AD1 |
| Europe/Middle East/Africa | 246959-021 | Switzerland | 246959-AG1 |
| Israel | 246959-BB1 | United Kingdom | 246959-031 |
| | | United States | 246959-001 |
| Screw Kit (includes the following screws; refer to Appendix C, "Screw Listing" for more information on screw specifications and usage.) | | 345057-001 | |
| ■ Torx T8M2.0×6.0 screw | | ■ Phillips PM3.0×3.5 screw | |
| ■ Torx T8M2.0×4.0 screw | | ■ Phillips PM1.5×4.0 screw | |
| ■ Torx T5M2.5×4.0 screw | | ■ Phillips PM1.5×3.0 screw | |
| ■ Torx T8M2.0×3.5 screw | | ■ M2.0×10.0 alignment pin | |

Removal and Replacement Preliminaries

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

4.1 Tools Required

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

- Magnetic screwdriver
- Phillips P0 screwdriver
- 5.0-mm socket for system board standoffs
- Flat-bladed screwdriver
- Tool kit (includes connector removal tool, loopback plugs, and case utility tool)

4.2 Service Considerations

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



As you remove each subassembly from the notebook, 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 notebook, ensure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the notebook.

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 notebook, damage to a removable drive, or loss of information, observe the following precautions:

- Before removing or inserting a hard drive, shut down the notebook. If you are unsure whether the notebook is off or in hibernation, turn the notebook on, then shut it down.
- Before removing a diskette drive or optical drive, ensure that a diskette or disc is not in the drive. 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 that have 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 life 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 them 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).
- 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 using fixtures that must directly contact dissipative surfaces, use only fixtures made of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.
- Handle electrostatic-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

4.7 Grounding Equipment and Methods

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

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

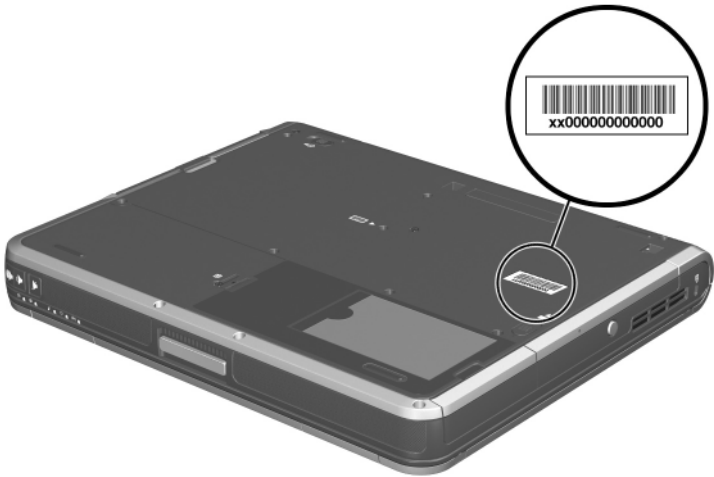
This chapter provides removal and replacement procedures.

There are 62 screws in eight different sizes that must be removed, replaced, and loosened when servicing the notebook. Make note of each screw size and location during removal and replacement.

Refer to Appendix C, “Screw Listing” for detailed information on screw sizes, locations, and usage.

5.1 Serial Number

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



Serial Number Location

5.2 Disassembly Sequence Chart

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

Disassembly Sequence Chart

| Section | Description | # of Screws Removed |
|----------------|--|---|
| 5.3 | Preparing the notebook for disassembly | |
| | Battery pack | 0 |
| | Hard drive | 1 to remove 4 screws and 2 alignment pins to disassemble |

Disassembly Sequence Chart (Continued)

| Section | Description | # of Screws Removed |
|----------------|-------------------------------|----------------------------|
| 5.4 | Notebook feet | 0 |
| 5.5 | MultiBay device | 0 |
| 5.6 | Bluetooth board | 3 |
| 5.7 | Optical drive | 1 |
| 5.8 | Keyboard | 1 |
| 5.9 | Memory expansion board | 0 |
| 5.10 | Modem board | 2 |
| 5.11 | Mini PCI communications board | 2 |
| 5.12 | Heat sink | 5 |
| 5.13 | Processor | 0 |
| 5.14 | LED switch cover | 1 |
| 5.15 | RTC battery | 0 |
| 5.16 | Security card | 1 |
| 5.17 | Display assembly | 4 |
| 5.18 | Top cover | 18 |
| 5.19 | Speaker | 6 |
| 5.20 | TouchPad | 3 |
| 5.21 | Fan assembly | 4 |
| 5.22 | System board | 4 |

5.3 Preparing the Notebook for Disassembly

Before you begin any removal or installation procedures:

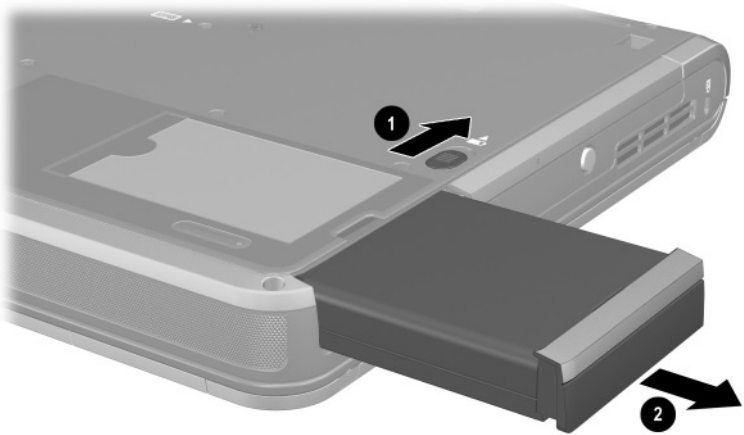
1. Save your work, exit all applications, and shut down the notebook. If you are not sure whether the notebook is off or in hibernation, briefly press the power button. If your work returns to the screen, save your work, exit all applications, and then shut down the notebook.
2. Disconnect all external devices connected to the notebook.
3. Disconnect the power cord.

Spare Part Number Information

Battery pack, 8-cell, 4.4 Wh, Li-Ion

338669-001

4. Remove the battery pack by following these steps:
 - a. Turn the notebook upside down with the front facing you.
 - b. Slide and hold the battery release latch **1** toward the back of the notebook.
 - c. Use the notch in the battery pack to slide the battery pack to the right **2**.
 - d. Remove the battery pack.



Removing the Battery Pack

5. Remove the battery bezel by sliding it down and off of the battery pack.



The battery bezel is included in the Miscellaneous Plastics Kit, spare part number 345066-001.



Removing the Battery Bezel

Reverse the above procedure to install the battery pack and battery bezel.

6. Remove the hard drive by following these steps:

Spare Part Number Information

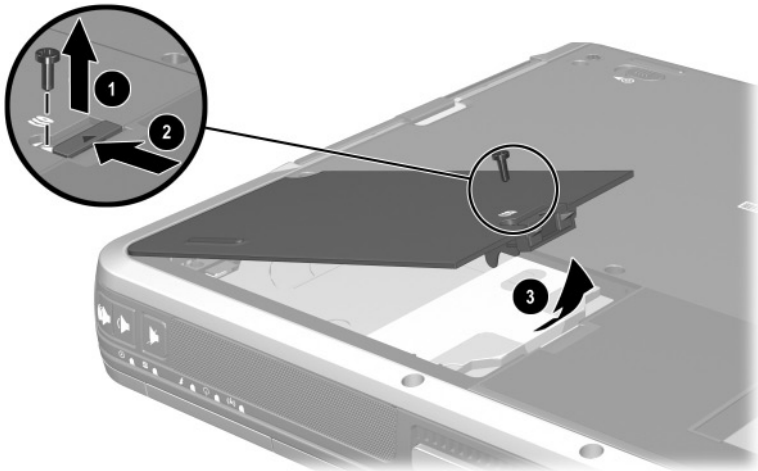
Hard drives (includes hard drive bezel and frame)

| | | |
|----------------|---------------|------------|
| 80-GB 5400-rpm | (all models) | 345632-001 |
| 60-GB 5400-rpm | (all models) | 345631-001 |
| 40-GB 5400-rpm | (all models) | 345630-001 |
| 60-GB 7200-rpm | (nw8000 only) | 345855-001 |

- a. Turn the notebook upside down with the front facing you.
- b. Remove the T8M2.0×6.0 hard drive cover screw ❶.
- c. Slide and hold the tab on the hard drive cover to the left ❷.
- d. Swing the right edge of the hard drive cover up and to the left ❸.

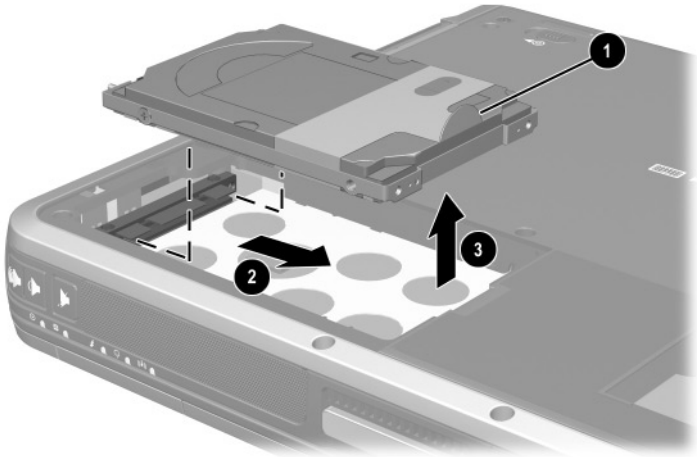


The hard drive cover is included in the Miscellaneous Plastics Kit, spare part number 345066-001.



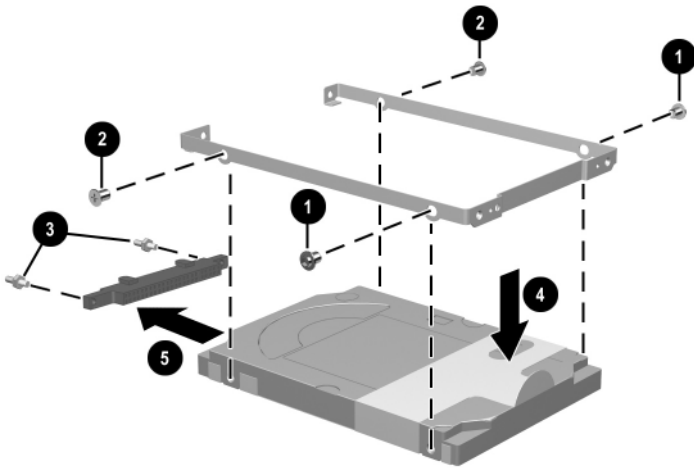
Removing the Hard Drive Cover

- e. Use the Mylar tab ❶ to slide the hard drive to the right ❷ to disconnect it from the system board.
- f. Lift the hard drive straight up to remove it ❸.



Removing the Hard Drive

- g. Remove the two T5M2.5×4.0 screws ❶ and the two PM3.0×3.5 screws ❷ that secure the hard drive to the hard drive frame.
- h. Use a 4.0-mm socket to remove the two M2.0×10.0 alignment pins ❸ that secure the hard drive to the hard drive frame.
- i. Remove the hard drive ❹ from the hard drive frame.
- j. Remove the hard drive connector ❺ from the hard drive.

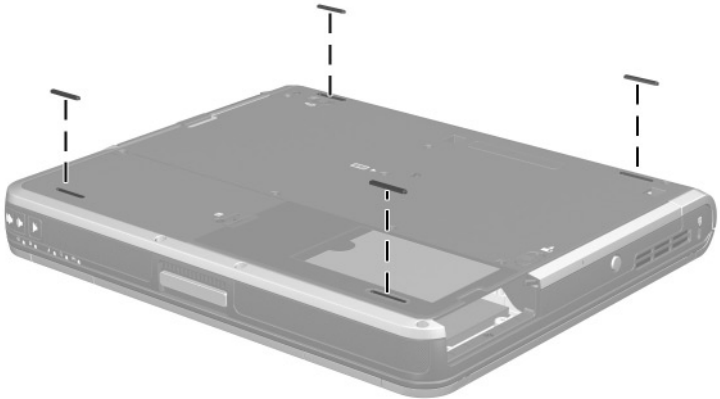


Disassembling the Hard Drive

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

5.4 Notebook Feet

The notebook feet are adhesive-backed rubber pads. The feet are included in the Miscellaneous Plastics Kit, spare part number 345066-001. The feet attach to the base enclosure as illustrated below.



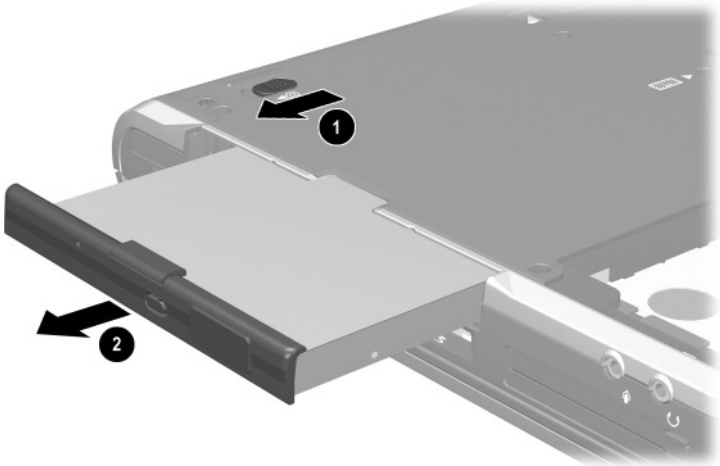
Notebook Feet Locations

5.5 MultiBay Device

Spare Part Number Information

| | |
|--|------------|
| 1.44-MB diskette drive | 241995-001 |
| 24X Max CD-ROM Drive | 228746-001 |
| 8X Max DVD+RW/R and CD-RW Combo Drive | 251292-001 |
| 24X Max DVD+RW/R and CD-RW Combo Drive | 344256-001 |

1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Turn the notebook upside down with the left side facing you.
3. Slide and hold the MultiBay release latch toward you ❶.
4. Use the notch in the MultiBay device to slide the device out of the MultiBay ❷.
5. Remove the MultiBay device.



Removing a MultiBay Device

Reverse the above procedure to install a MultiBay device.

5.6 Bluetooth Board

Spare Part Number Information

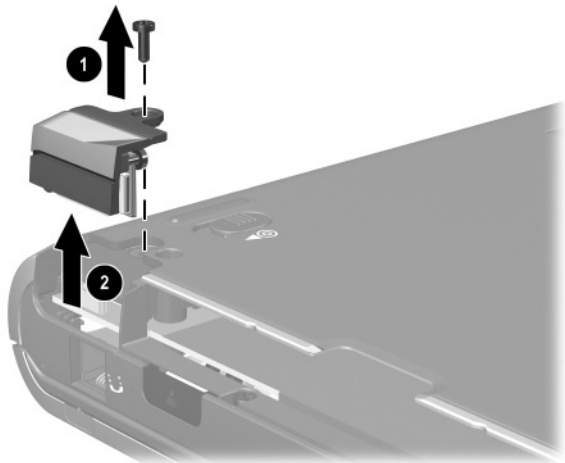
Bluetooth board (includes cable)

348277-001

1. Prepare the notebook for disassembly (refer to Section 5.3).
 2. Turn the notebook upside down with the left side facing you.
 3. Remove the T8M2.0×6.0 screw ❶ that secures the Bluetooth cover to the notebook.
 4. Lift the cover straight up to remove it ❷.
-



The Bluetooth cover is included in the Miscellaneous Plastics Kit, spare part number 345066-001.



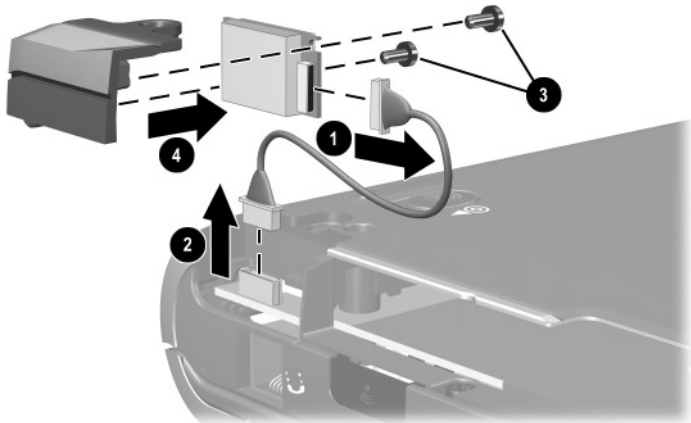
Removing the Bluetooth Cover

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



The Bluetooth cable is included with the Bluetooth board and is also included in the Miscellaneous Cables Kit, spare part number 345056-001.

6. Remove the two PM1.5×3.0 screws ❸ that secure the Bluetooth board to the Bluetooth cover.
7. Remove the board from the cover ❹.



Removing the Bluetooth Board

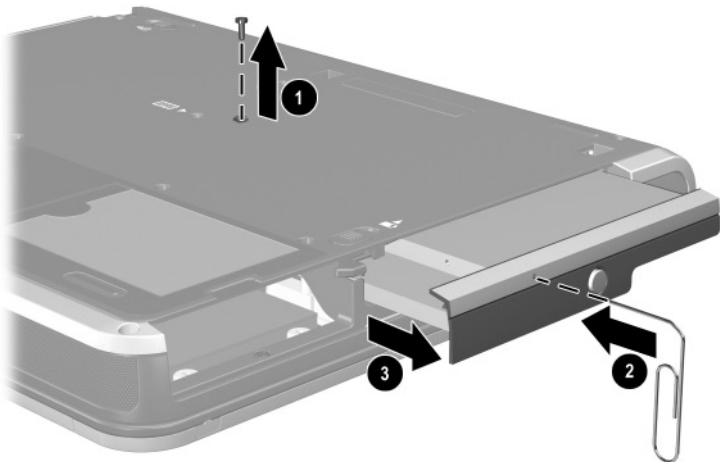
Reverse the above procedure to install the Bluetooth board.

5.7 Optical Drive

Spare Part Number Information

| | |
|--|------------|
| 24X Max DVD+RW/R and CD-RW Combo Drive | 349242-001 |
| 8X Max DVD-ROM Drive | 349241-001 |
| 24X Max DVD/CD-RW Combo Drive | 349243-001 |
| 24X Max CD-ROM Drive | 349240-001 |

1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Turn the notebook upside down with the right side facing you.
3. Remove the T8M2.0x6.0 screw ❶ that secures the optical drive to the notebook.
4. Insert a paper clip or similar tool into the optical drive release hole to open the optical drive tray ❷.
5. Use the optical drive tray to remove the optical drive ❸.



Removing the Optical Drive

Reverse the above procedure to install the optical drive.

5.8 Keyboard

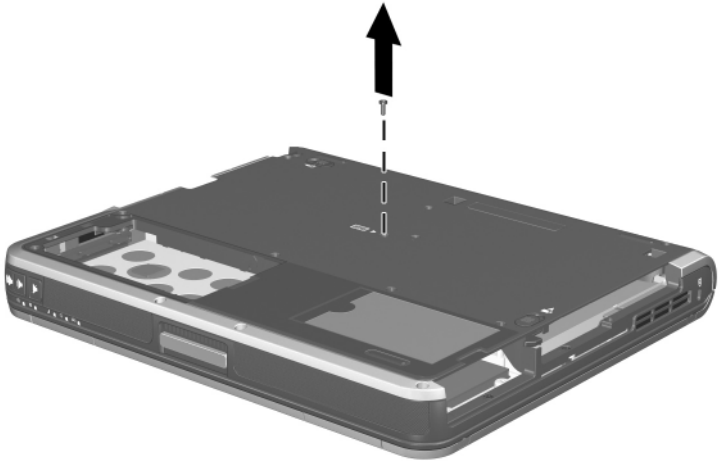
Spare Part Number Information

Keyboards (include pointing stick)

| | | | |
|----------------|------------|----------------|------------|
| Brazil | 341520-201 | Latin America | 341520-161 |
| Czech Republic | 341520-221 | Norway | 341520-091 |
| Denmark | 341520-081 | Portugal | 341520-131 |
| Europe | 341520-A41 | Russia | 341520-251 |
| France | 341520-051 | Saudi Arabia | 341520-171 |
| French Canada | 341520-121 | Slovenia | 341520-BA1 |
| Germany | 341520-041 | Spain | 341520-071 |
| Hungary | 341520-211 | Sweden/Finland | 341520-B71 |
| Iceland | 341520-DD1 | Switzerland | 341520-BG1 |
| International | 341520-B31 | Taiwan | 341520-AB1 |
| Israel | 341520-BB1 | Thailand | 341520-281 |
| Italy | 341520-061 | Turkey | 341520-141 |
| Japan | 341520-291 | United Kingdom | 341520-031 |
| Korea | 341520-AD1 | United States | 341520-001 |

1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Turn the notebook upside down with the front facing you.

3. Remove the T8M2.x6.0 screw that secures the keyboard to the notebook.



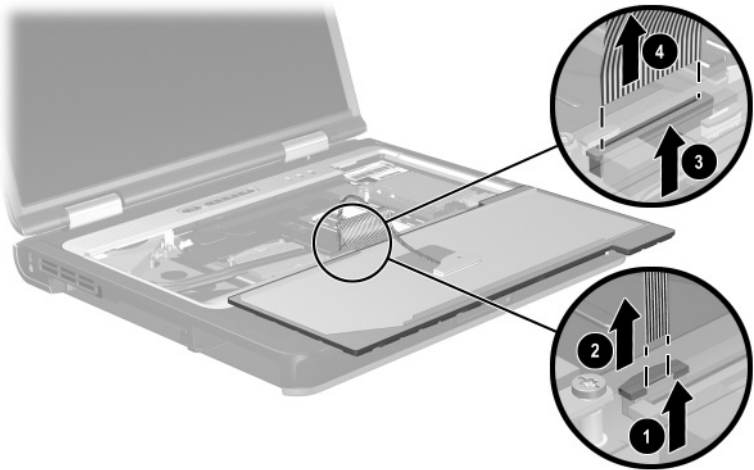
Removing the Keyboard Screw

4. Turn the notebook right-side up with the front facing you.
5. Open the notebook.
6. Slide the four tabs **1** on the top edge of the keyboard toward you.
7. Lift the rear edge of the keyboard up and swing it toward you **2** until it rests on the palm rest.



Releasing the Keyboard

8. Release the zero insertion force (ZIF) connector **1** to which the pointing stick cable is attached and disconnect the cable **2**.
9. Release the ZIF connector **3** to which the keyboard cable is attached and disconnect the cable **4**.



Disconnecting the Keyboard Cables

10. Remove the keyboard.

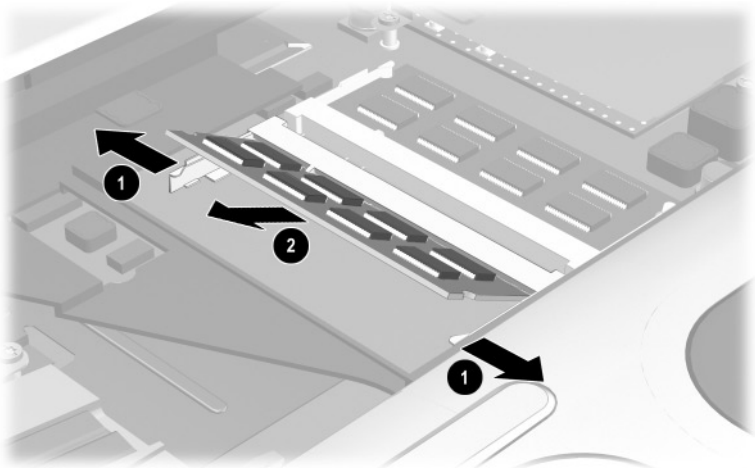
Reverse the above procedure to install the keyboard.

5.9 Memory Expansion Board

Spare Part Number Information

| | |
|---------------------------|------------|
| 1024 MB (1.0 GB), 333 MHz | 336579-001 |
| 512 MB, 333 MHz | 336578-001 |
| 256 MB, 333 MHz | 336577-001 |

1. Prepare the notebook for disassembly. Refer to Section 5.3.
2. Release the keyboard (Section 5.8).
3. Spread the retaining tabs ❶ that secure the memory expansion board to the socket. The free end of the board rises.
4. Pull the board away from the socket at a 45-degree angle ❷.



Removing a Memory Expansion Board

Reverse the above procedure to install a memory expansion board.

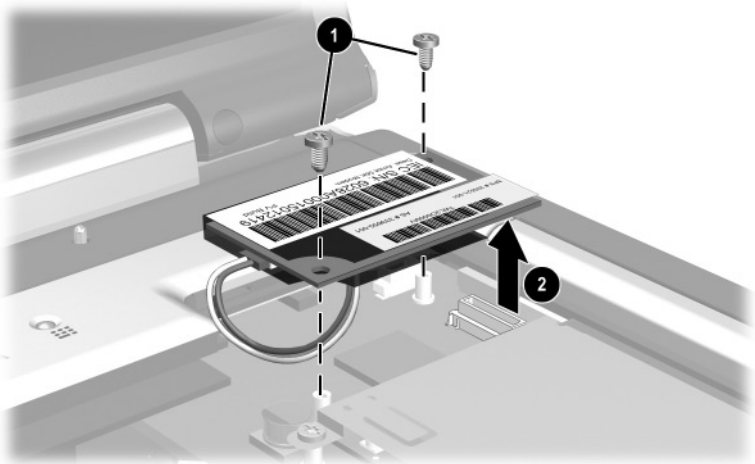
5.10 Modem Board

Spare Part Number Information

Modem board

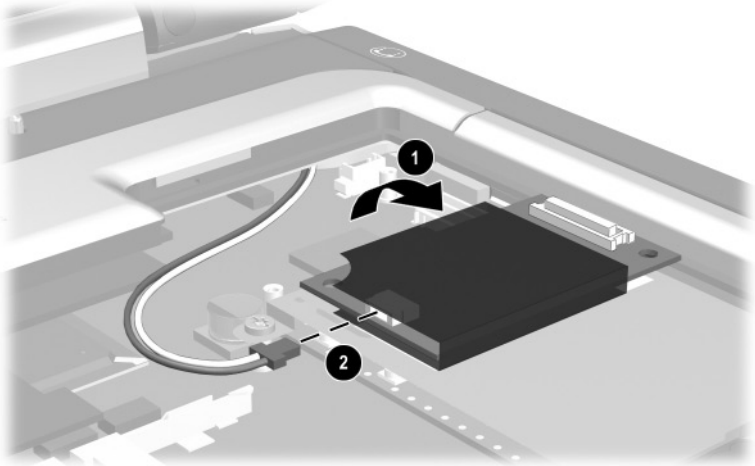
325521-001

1. Prepare the notebook for disassembly (Section 5.3).
2. Release the keyboard (Section 5.8).
3. Remove the two T8M2.0×4.0 screws ❶ that secure the modem board to the notebook.
4. Lift up on the right side of the modem board ❷ to disconnect the board from the system board.



Removing the Modem Board Screws

5. Turn the modem board upside down ❶.
6. Disconnect the modem cable ❷ from the modem.



Disconnecting the Modem Board Cable

7. Remove the modem board.

Reverse the above procedure to install the modem board.

5.11 Mini PCI Communications Board

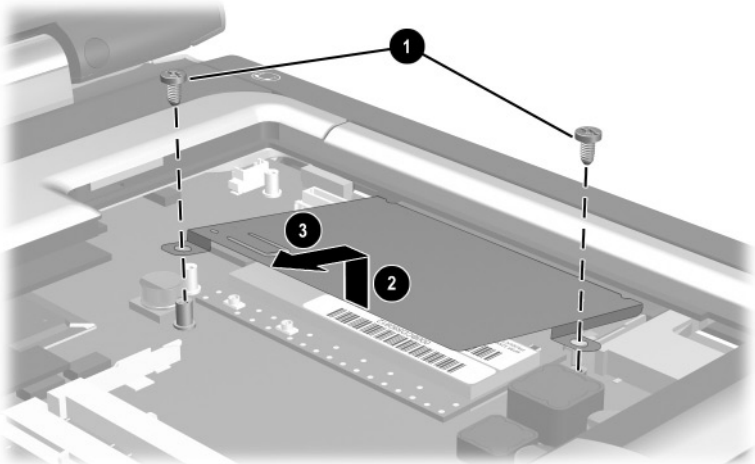
Spare Part Number Information

| | |
|---|------------|
| 802.11a/b/g LAN NIC | 325525-001 |
| 802.11b/g LAN NIC | 325526-001 |
| 802.11b W500 modem board (for use in Japan) | 339742-291 |
| 802.11b wireless LAN (MOW) | 345641-001 |
| 802.11b wireless LAN (ROW) | 345640-001 |

1. Prepare the notebook for disassembly (Section 5.3).
 2. Release the keyboard (Section 5.8).
 3. Remove the two T8M2.0×4.0 screws ❶ that secure the Mini PCI communications board shield to the notebook.
 4. Lift up on the left side of the shield ❷ and slide it to the left ❸ to remove it.
-

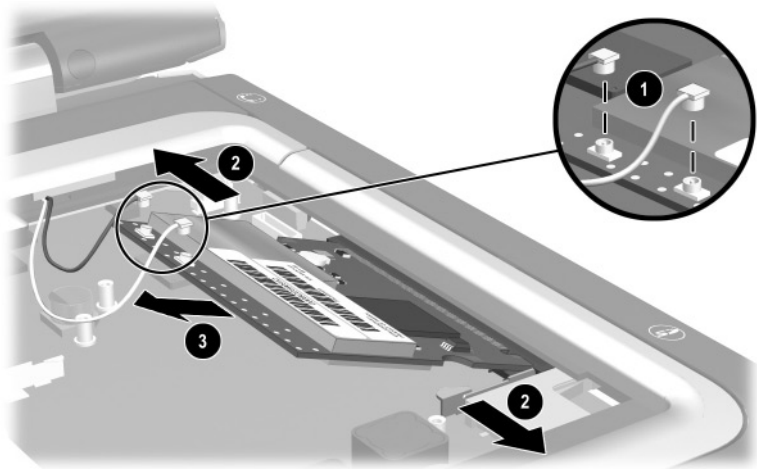


The Mini PCI communications board shield is included in the Miscellaneous Plastics Kit, spare part number 345066-001.



Removing the Mini PCI Communications Board Shield

5. Disconnect the two antenna cables ❶ from the board. Make note of which cable connects to which terminal.
6. Spread the retaining tabs ❷ that secure the Mini PCI communications board to the socket. The free end of the board rises.
7. Pull the board away from the socket at a 45-degree angle ❸.



Removing the Mini PCI Communications Board

8. Remove the Mini PCI communications board.

Reverse the above procedure to install the Mini PCI communications board.

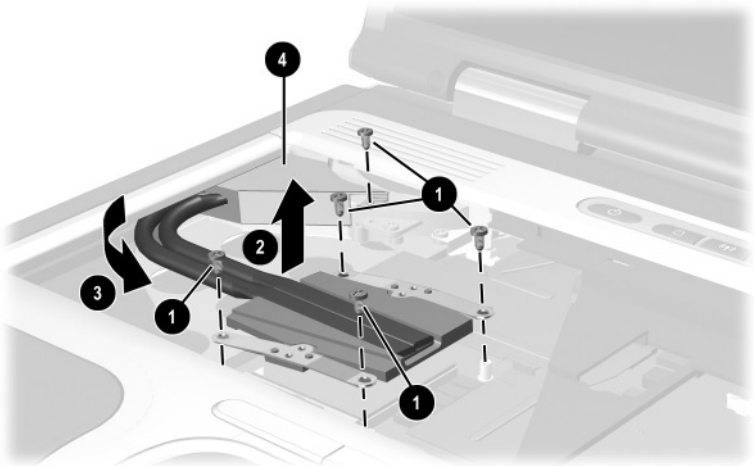
5.12 Heat Sink

Spare Part Number Information

Heat sink (includes grease)

345067-001

1. Prepare the notebook for disassembly (Section 5.3).
2. Release the keyboard (Section 5.8).
3. Remove the five T8M2.0×4.0 screws ❶ that secure the heat sink to the notebook.
4. Lift the front edge of the heat sink ❷ to unseat the adhesive grip of the thermal grease on the processor.
5. Swing the heat sink in a counterclockwise motion ❸ until the back of the heat sink ❹ clears the notebook.

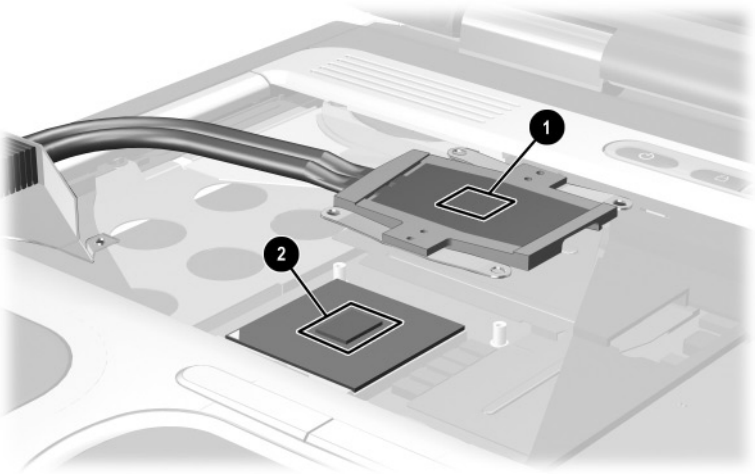


Removing the Heat Sink

6. Remove the heat sink.



Carefully clean any thermal grease residue from the heat sink **1** and processor surfaces **2** each time you remove the heat sink. Apply new thermal grease to both surfaces.



Removing the Thermal Grease From the Heat Sink and Processor

Reverse the above procedure to install the heat sink.

5.13 Processor

Spare Part Number Information

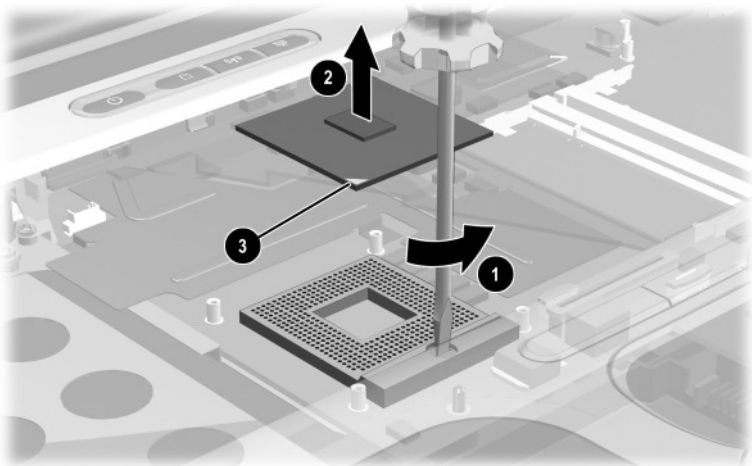
Processors (include grease)

| | |
|------------------------------------|------------|
| Intel Pentium M processor, 1.7 GHz | 340165-001 |
| Intel Pentium M processor, 1.6 GHz | 319777-001 |
| Intel Pentium M processor, 1.4 GHz | 319775-001 |

1. Prepare the notebook for disassembly (Section 5.3).
2. Release the keyboard (Section 5.8).
3. Remove the heat sink (Section 5.12).
4. Use a flat-bladed screwdriver to turn the processor locking screw one-quarter turn counterclockwise ❶.
5. Remove the processor from the system board socket ❷.



Note that the gold triangle ❸ on the processor should be aligned in the front left corner when you install the processor.



Removing the Processor

Reverse the above procedure to install the processor.

5.14 LED Switch Cover

Spare Part Number Information

LED switch cover

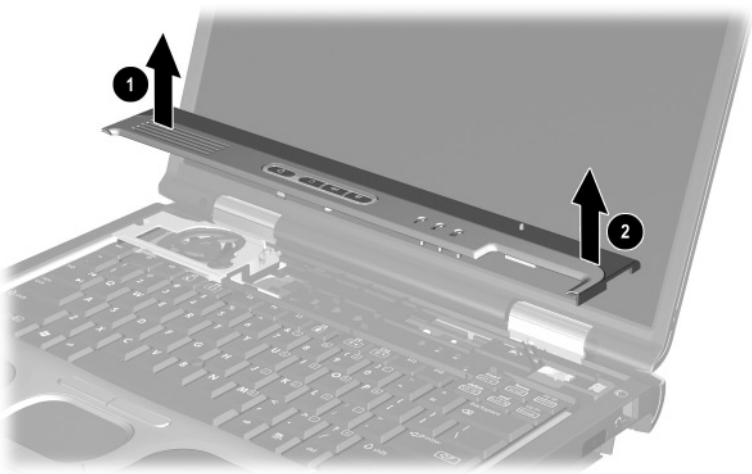
345063-001

1. Prepare the notebook for disassembly (Section 5.3).
2. Turn the notebook upside down with the rear facing you.
3. Remove the T8M2.0×6.0 screw that secures the LED switch cover to the notebook.



Removing the LED Switch Cover Screw

4. Turn the notebook right-side up with the front facing you.
5. Open the notebook.
6. Lift the left **1** and right **2** sides of the LED switch cover to disengage the cover from the notebook.
7. Remove the LED switch cover.



Removing the LED Switch Cover

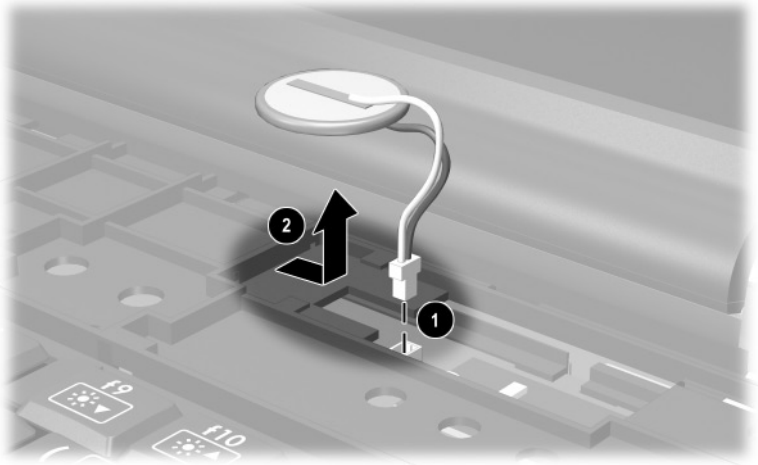
Reverse the above procedure to install the LED switch cover.

5.15 RTC Battery



The RTC battery is included in the Miscellaneous Plastics Kit, spare part number 345066-001.

1. Prepare the notebook for disassembly (Section 5.3).
2. Remove the LED switch cover (Section 5.14).
3. Disconnect the RTC battery cable ❶ from the system board.
4. Slide the RTC battery out of the clips in the top cover ❷ and remove the battery.



Removing the RTC Battery

Reverse the above procedure to install the RTC battery.

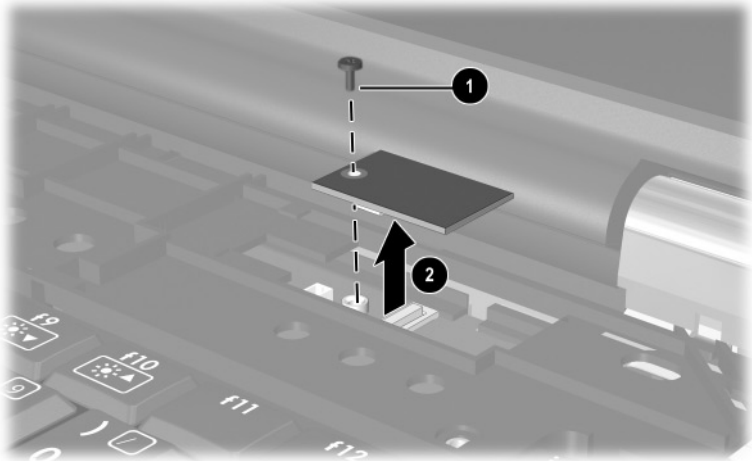
5.16 Security Card

Spare Part Number Information

Security card

345856-001

1. Prepare the notebook for disassembly (Section 5.3).
2. Remove the LED switch cover (Section 5.14).
3. Remove the PM1.5×3.0 screw **1** that secures the security card to the system board.
4. Lift the security card straight up **2** to disconnect it from the system board.



Removing the Security Card

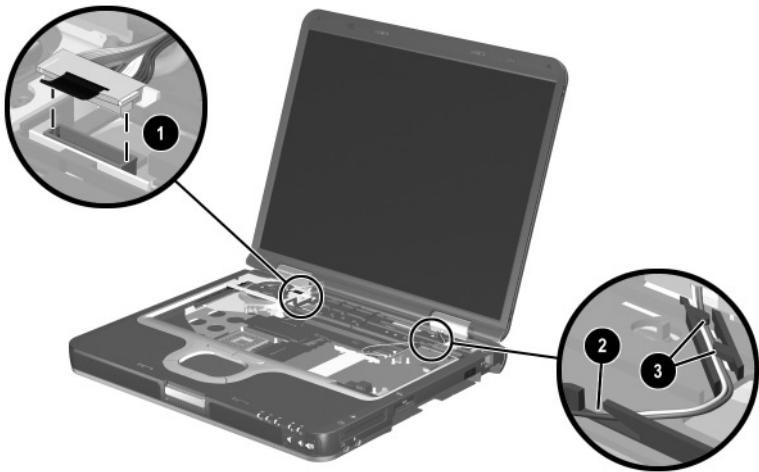
Reverse the above procedure to install the security card.

5.17 Display Assembly

Spare Part Number Information

| | |
|-----------------------|------------|
| 15.0-inch, UXGA, TFT | 345060-001 |
| 15.0-inch, SXGA+, TFT | 345059-001 |
| 15.0-inch, XGA, TFT | 345058-001 |

1. Prepare the notebook for disassembly (Section 5.3).
2. Remove the keyboard (Section 5.8).
3. Disconnect the wireless antenna cables from the Mini PCI wireless communications board (Section 5.11).
4. Remove the LED switch cover (Section 5.14).
5. Disconnect the display cable ❶ from the system board.
6. Remove the wireless antenna cables from the opening ❷ and the clips ❸ in the top cover.



Disconnecting the Display Cables

7. Position the notebook with the rear facing toward you.
8. Remove the two T8M2.0×6.0 screws ❶ that secure the display hinge covers to the notebook.
9. Remove the two T8M2.0×6.0 screws ❷ that secure the display assembly to the notebook.

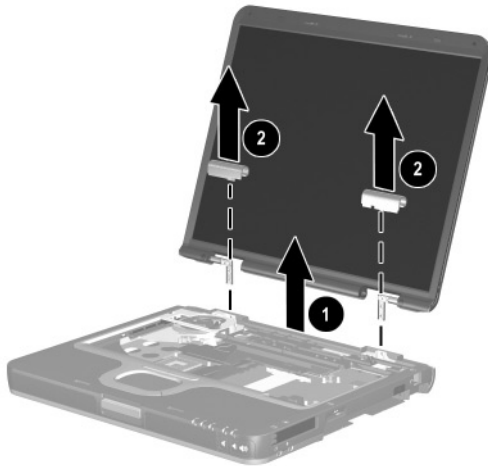


Removing the Display Screws

10. Lift the display assembly straight up **1** to remove it from the notebook.
11. If necessary, remove the display hinge covers **2** from the display assembly.



The display hinge covers are included in the Miscellaneous Plastics Kit, spare part number 345066-001.



Removing the Display Assembly

Reverse the above procedure to install the display assembly.

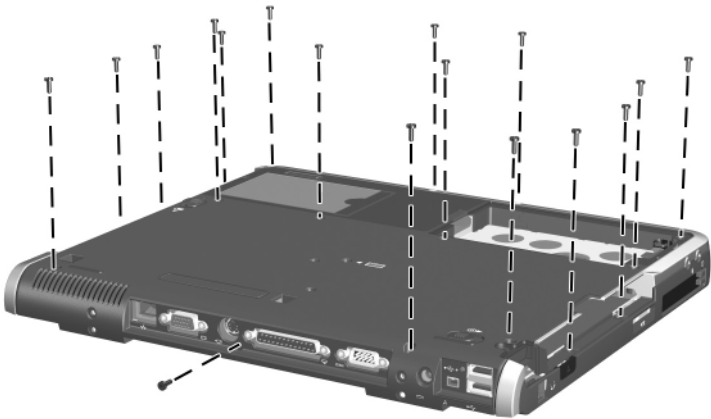
5.18 Top Cover

Spare Part Number Information

Top cover (includes TouchPad and speaker)

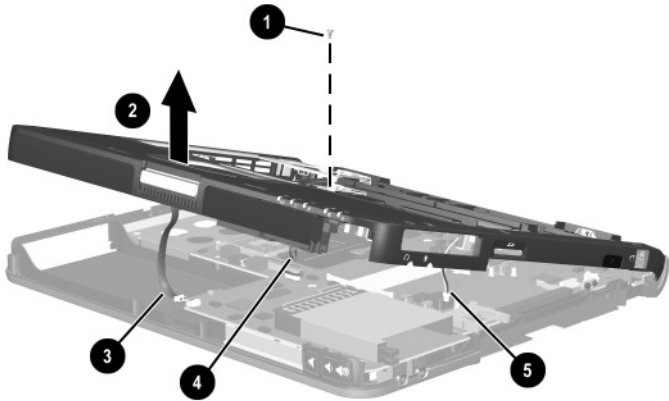
345061-001

1. Prepare the notebook for disassembly (Section 5.3).
2. Remove the keyboard (Section 5.8).
3. Remove the LED switch cover (Section 5.14).
4. Remove the display assembly (Section 5.17).
5. Turn the notebook upside down with the front facing you.
6. Remove the 17 T8M2.0×6.0 screws that secure the top cover to the notebook.



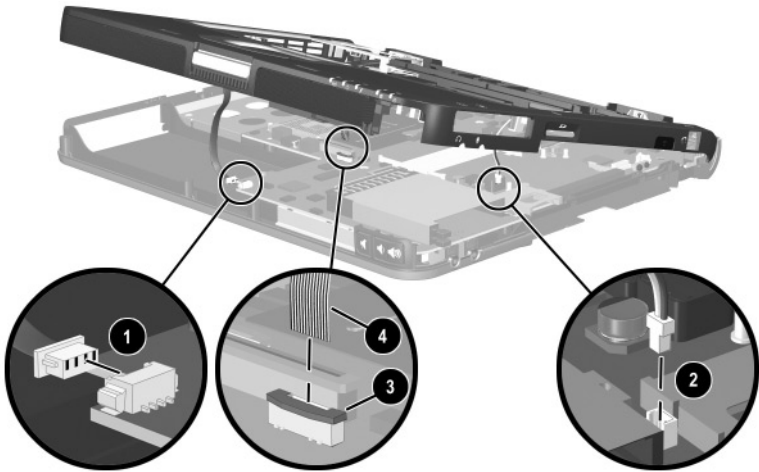
Removing the Top Cover Screws

7. Turn the notebook right-side up with the front facing you.
8. Remove the TM2.0x4.0 screw **1** near the fan that secures the top cover to the notebook.
9. Lift the front edge of the top cover **2** until the speaker cable **3**, TouchPad cable **4**, and microphone cable **5** are accessible.



Releasing the Top Cover

10. Disconnect the speaker **1** and microphone cables **2**.
11. Release the ZIF connector **3** to which the TouchPad cable **4** is attached and disconnect the TouchPad cable **4** from the system board.



Disconnecting the Top Cover Cables

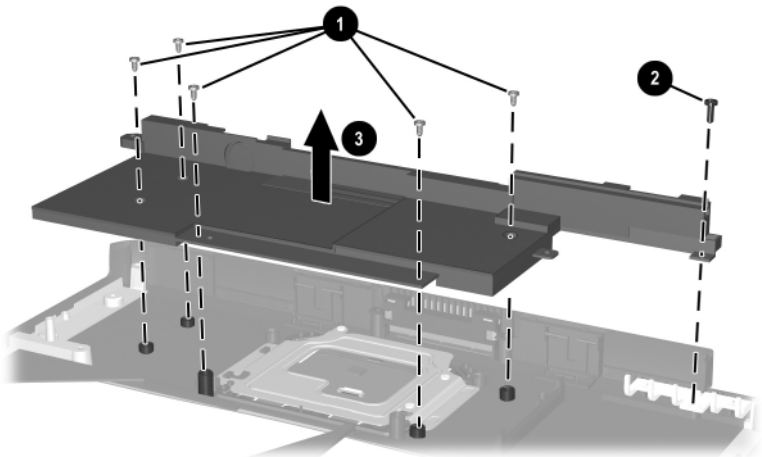
12. Remove the top cover.
- Reverse the above procedure to install the top cover.

5.19 Speaker



The speaker is included with the top cover, spare part number 345061-001.

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:
 - ❑ Keyboard (Section 5.8)
 - ❑ LED switch cover (Section 5.14)
 - ❑ Display assembly (Section 5.17)
 - ❑ Top cover (Section 5.18)
2. Turn the top cover upside down with the rear facing you.
3. Remove the five T8M2.0×4.0 screws **1** and one T8M2.0×6.0 screw **2** that secure the speaker to the top cover.
4. Remove the speaker **3** from the top cover.



Removing the Speaker

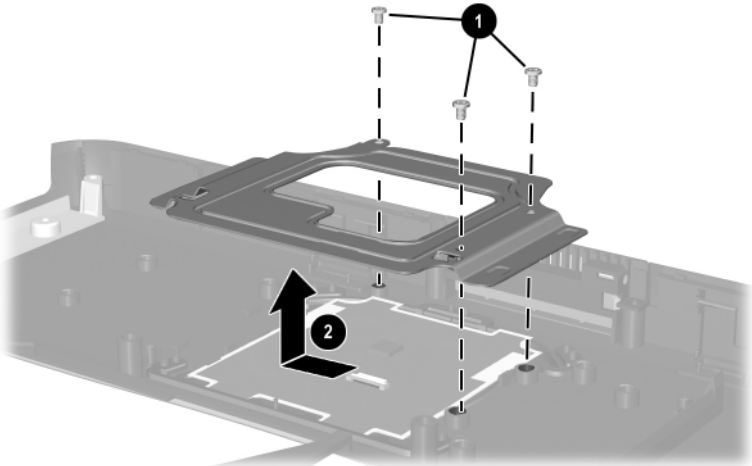
Reverse the above procedure to install the speaker.

5.20 TouchPad



The TouchPad and bracket are included with the top cover, spare part number 345061-001.

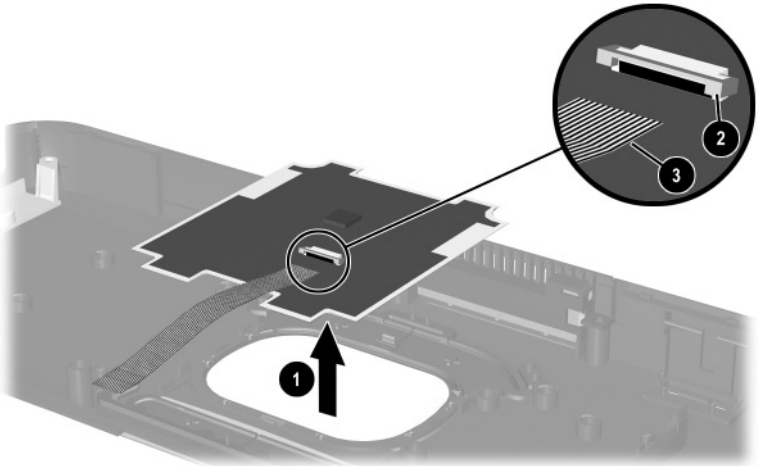
1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:
 - ❑ Keyboard (Section 5.8)
 - ❑ LED switch cover (Section 5.14)
 - ❑ Display assembly (Section 5.17)
 - ❑ Top cover (Section 5.18)
 - ❑ Speaker (Section 5.19)
2. Remove the three Torx T8M2.0×3.5 screws ❶ that secure the TouchPad and bracket to the top cover.
3. Lift the left side of the bracket ❷, then slide the bracket to the left.



Removing the TouchPad Bracket

4. Remove the bracket.

5. Remove the TouchPad **1** from the top cover.
6. Release the ZIF connector **2** to which the TouchPad cable is attached and disconnect the cable **3**.



Removing the TouchPad

Reverse the above procedure to install the TouchPad and bracket.

5.21 Fan Assembly

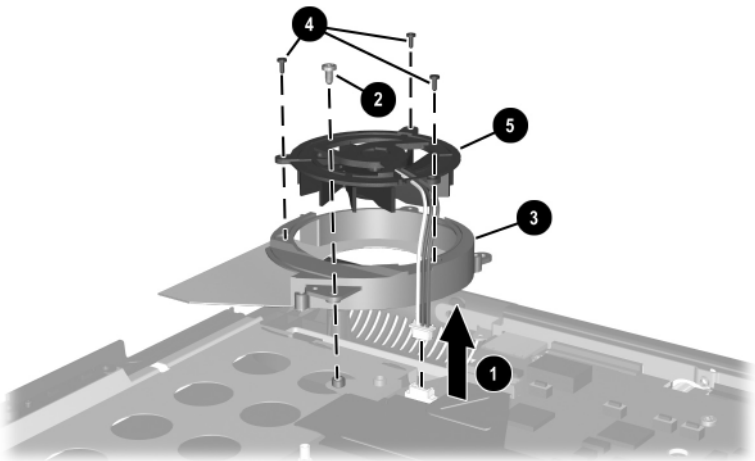
Spare Part Number Information

Fan assembly

345065-001

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:
 - ❑ Keyboard (Section 5.8)
 - ❑ Heat sink (Section 5.12)
 - ❑ LED switch cover (Section 5.14)
 - ❑ Display assembly (Section 5.17)
 - ❑ Top cover (Section 5.18)

2. Disconnect the fan cable ❶.
3. Remove the T8M2.0×4.0 screw ❷ that secures the fan assembly to the notebook.
4. Remove the fan assembly ❸ from the notebook.
5. Remove the three PM1.5×4.0 screws ❹ that secure the fan to the fan housing.
6. Remove the fan ❺.



Removing the Fan

Reverse the above procedure to install the fan.

5.22 System Board

Spare Part Number Information

| | |
|--|------------|
| System board with 128 MB of video memory | 349206-001 |
| System board with 64 MB of video memory | 345064-001 |



Both system boards include thermal grease.

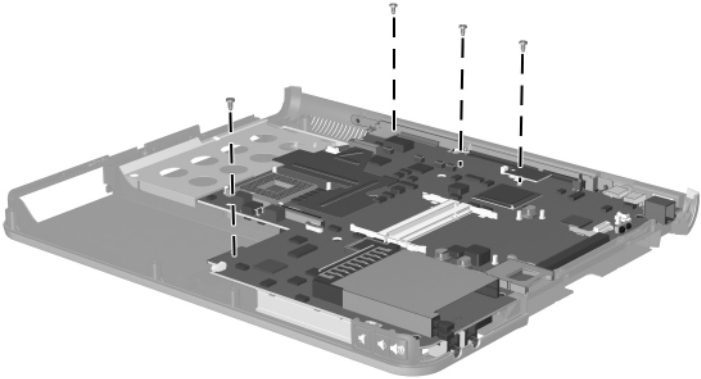


When replacing the system board, ensure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory expansion boards (Section 5.9)
 - Modem board (Section 5.10)
 - Mini PCI communications board (Section 5.11)
 - Heat sink (Section 5.12)
 - Processor (Section 5.13)
 - Real time clock battery (Section 5.15)
 - Security card (Section 5.16)
-

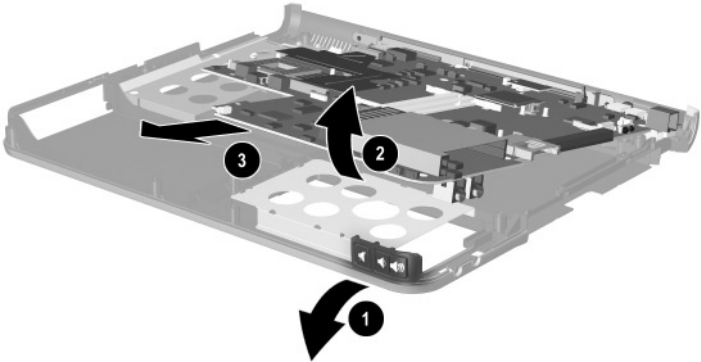
1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:
 - ❑ Keyboard (Section 5.8)
 - ❑ LED switch cover (Section 5.14)
 - ❑ Display assembly (Section 5.17)
 - ❑ Top cover (Section 5.18)
 - ❑ Fan (Section 5.21)

2. Remove the four T8M2.0×4.0 screws that secure the system board to the notebook.



Removing the System Board Screws

3. Flex and hold the front right corner of the base enclosure out **1** to allow the system board to clear the base enclosure.
4. Lift the front edge of the system board **2** until the board clears the base enclosure.
5. Slide the system board toward you **3** to remove it from the notebook.

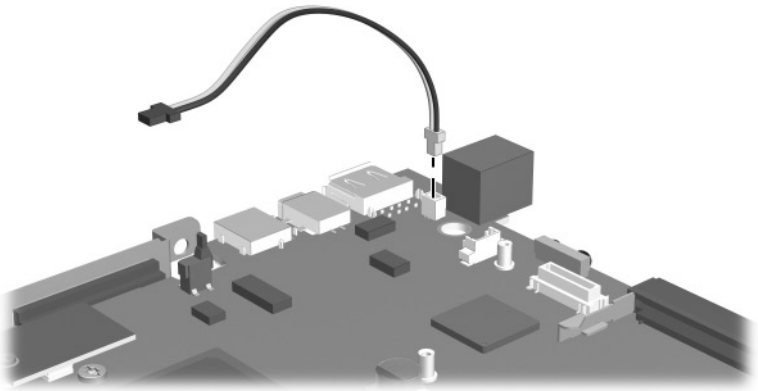


Removing the System Board

6. If necessary, disconnect the modem cable from the system board and remove the cable.



The modem cable is included in the Miscellaneous Cables Kit, spare part number 345056-001.



Removing the Modem Cable

Reverse the above procedure to install the modem cable and system board.

6

Specifications

This chapter provides physical and performance specifications.

Table 6-1
Notebook

| Dimensions | | |
|--|---|---------------|
| Height | 4.1 cm | 1.61 in |
| Width | 32.6 cm | 12.83 in |
| Depth | 27.5 cm | 10.83 in |
| Weight (with main battery pack and MultiBay weight saver) | | |
| | 2.95 kg | 6.50 lb |
| Stand-alone power requirements | | |
| Nominal operating voltage (Li-Ion) | 14.4 VDC | |
| Maximum operating power | 60.0 W | |
| Peak operating power | 65.0 W | |
| Temperature | | |
| Operating (not writing optical drive) | 0°C to 35°C | 32°F to 95°F |
| (writing optical drive) | 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% | |
| Nonoperating | 5% to 95%, 38.7°C (101.6°F) maximum wet bulb temperature | |

Table 6-1
Notebook (Continued)

Altitude (unpressurized)

| | | |
|------------------------------------|-----------------|------------------|
| Operating (14.7 to 10.1 psia) | -15 to 3048 m | -50 to 10,000 ft |
| Nonoperating (14.7 to 4.4 psia) | -15 to 12,192 m | -50 to 40,000 ft |

Shock

| | |
|--------------|------------------------|
| Operating | 10 g, 11 ms, half-sine |
| Nonoperating | 60 g, 11 ms, half-sine |



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

Table 6-2
15.0-inch, UXGA, TFT Display

| | | |
|--------------------------------|---|---------|
| Dimensions | | |
| Height | 29.9 cm | 11.8 in |
| Width | 22.8 cm | 9.0 in |
| Diagonal | 38.1 cm | 15.0 in |
| Number of colors | Up to 16.8 million | |
| Contrast ratio | 250:1 | |
| Brightness | 140 nits typical | |
| Pixel resolution | | |
| Pitch | 0.191 × 0.191 mm | |
| Format | 1680 × 1200 | |
| Configuration | RGB vertical stripe | |
| Backlight | Edge lit | |
| Character display | 80 × 25 | |
| Total power consumption | 6.5 W | |
| Viewing angle | +/- 85° horizontal, +15/-35° vertical typical | |

Table 6-3
15.1-inch, SXGA+, TFT Display

| | | |
|--------------------------------|---|---------|
| Dimensions | | |
| Height | 29.9 cm | 11.8 in |
| Width | 22.8 cm | 9.0 in |
| Diagonal | 38.1 cm | 15.0 in |
| Number of colors | Up to 16.8 million | |
| Contrast ratio | 150:1 | |
| Brightness | 150 nits typical | |
| Pixel resolution | | |
| Pitch | 0.218 × 0.218 mm | |
| Format | 1400 × 1050 | |
| Configuration | RGB vertical stripe | |
| Backlight | Edge lit | |
| Character display | 80 × 25 | |
| Total power consumption | 5.75 W | |
| Viewing angle | +/- 35° horizontal, +15/-35° vertical typical | |

Table 6-4
15.0-inch, XGA, TFT Display

| | | |
|--------------------------------|---|---------|
| Dimensions | | |
| Height | 29.9 cm | 11.8 in |
| Width | 22.8 cm | 9.0 in |
| Diagonal | 38.1 cm | 15.0 in |
| Number of colors | Up to 16.8 million | |
| Contrast ratio | 150:1 | |
| Brightness | 150 nits typical | |
| Pixel resolution | | |
| Pitch | 0.264 × 0.264 mm | |
| Format | 1280 × 800 | |
| Configuration | RGB vertical stripe | |
| Backlight | Edge lit | |
| Character display | 80 × 25 | |
| Total power consumption | 5.75 W | |
| Viewing angle | +/- 35° horizontal, +15/-35° vertical typical | |

**Table 6-5
Hard Drives**

| | 80-GB | 60-GB | 40-GB |
|---|-----------------------------------|-----------------------------------|-----------------------------------|
| User capacity per drive¹ | 80 GB | 60 GB | 40 GB |
| Dimensions | | | |
| Height | 9.5 mm | 9.5 mm | 9.5 mm |
| Width | 70 mm | 70 mm | 70 mm |
| Weight | 99 g | 99 g | 99 g |
| Interface type | ATA-5 | ATA-5 | ATA-5 |
| Transfer rate | | | |
| Synchronous (maximum) | 100 MB/s | 100 MB/s | 100 MB/s |
| Security | ATA security | ATA security | ATA security |
| Seek times (typical read, including setting) | | | |
| Single track | 3 ms | 3 ms | 3 ms |
| Average | 13 ms | 13 ms | 13 ms |
| Maximum | 24 ms | 24 ms | 24 ms |
| Logical blocks² | 156,280,320 | 117,210,240 | 78,140,160 |
| Disk rotational speed | 5400 rpm | 5400 rpm | 5400 rpm |
| Operating temperature | 5°C to 55°C (41°F to 131°F) | 5°C to 55°C (41°F to 131°F) | 5°C to 55°C (41°F to 131°F) |

¹1 GB = 1,073,741,824 bytes.

²Actual drive specifications may differ slightly.

Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details.

Table 6-6
External AC Adapter

| Weight | | |
|---------------------------|-------------------|---------|
| AC adapter | 0.29 kg | 0.65 lb |
| Power cord | 0.13 kg | 0.29 lb |
| Power supply | | |
| Operating voltage | 90 to 264 VAC RMS | |
| Operating current | 1.6 A RMS | |
| Operating frequency range | 47 to 63 Hz AC | |
| Maximum transient | 4/50 kV | |

Table 6-7
6-cell, Li-Ion Battery Pack

| Dimensions | | |
|---|---------------|---------------|
| Height | 2.3 cm | 0.90 in |
| Width | 6.3 cm | 2.48 in |
| Depth | 20.7 cm | 8.15 in |
| Weight | 0.39 kg | 0.86 lb |
| Energy | | |
| Voltage | 11.1 V | |
| Amp-hour capacity | 3.96 Ah | |
| Watt-hour capacity | 40 Wh | |
| Temperature | | |
| Operating | 5°C to 45°C | 41°F to 113°F |
| Nonoperating | -20°C to 60°C | -4°F to 140°F |
| Recharge time | | |
| System in Standby mode | 2 to 3 hours | |
| System on (depending on system power consumption) | 2 to 5 hours | |

Table 6-8
24X Max DVD+RW/R and CD-RW Combo Drive

| | | |
|-----------------------------|--|----------|
| Applicable disc | DVD-5, DVD-9, DVD-10 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 (read only) CD Plus Photo CD (single/multisession) CD-Bridge | |
| Center hole diameter | 1.5 cm | 0.59 in |
| Disc diameter | | |
| Standard disc | 12 cm | 4.72 in |
| Mini disc | 8 cm | 3.15 in |
| Disc thickness | 1.2 mm | 0.047 in |
| Track pitch | 0.74 μ m | |
| Access time | | |
| Random | < 150 ms | |
| Full stroke | < 225 ms | |
| Audio output level | Line-out, 0.7 Vrms | |
| Cache buffer | 128 KB/s | |
| Data transfer rate | | |
| CD-R (24X) | 3,600 KB/s (150 KB/s at 1X CD rate) | |
| CD-RW (10X) | 1,500 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) | |
| Multiword DMA mode 2 | 16.6 MB/s | |
| Startup time | < 15 seconds | |
| Stop time | < 6 seconds | |

Table 6-9
24X Max DVD/CD-RW Combo Drive

| | | |
|-----------------------------|--|----------|
| Applicable disc | DVD-5, DVD-9, DVD-10 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 (read only) CD Plus Photo CD (single/multisession) CD-Bridge | |
| Center hole diameter | 1.5 cm | 0.59 in |
| Disc diameter | | |
| Standard disc | 12 cm | 4.72 in |
| Mini disc | 8 cm | 3.15 in |
| Disc thickness | 1.2 mm | 0.047 in |
| Track pitch | 0.74 μ m | |
| Access time | | |
| Random | < 150 ms | |
| Full stroke | < 225 ms | |
| Audio output level | Line-out, 0.7 Vrms | |
| Cache buffer | 128 KB/s | |
| Data transfer rate | | |
| CD-R (24X) | 3,600 KB/s (150 KB/s at 1X CD rate) | |
| CD-RW (10X) | 1,500 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) | |
| Multiword DMA mode 2 | 16.6 MB/s | |
| Startup time | < 15 seconds | |
| Stop time | < 6 seconds | |

Table 6-10
8X DVD-ROM Drive

| | | |
|-----------------------------|--|----------|
| Applicable disc | DVD-5, DVD-9, DVD-10 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 (read only) CD Plus Photo CD (single/multisession) CD-Bridge | |
| Center hole diameter | 1.5 cm | 0.59 in |
| Disc diameter | | |
| Standard disc | 12 cm | 4.72 in |
| Mini disc | 8 cm | 3.15 in |
| Disc thickness | 1.2 mm | 0.047 in |
| Track pitch | 0.74 μ m | |
| Access time | | |
| Random DVD media | < 150 ms | |
| Full stroke DVD media | < 225 ms | |
| Random CD media | < 110 ms | |
| Full stroke CD media | < 200 ms | |
| Audio output level | Line-out, 0.7 Vrms | |
| Cache buffer | 512 KB/s | |
| Data transfer rate | | |
| Max 24X CD | 3,600 KB/s (150 KB/s at 1X CD rate) | |
| Max 8X DVD | 10,800 KB/s (1,352 KB/s at 1X DVD rate) | |
| Multiword DMA mode 2 | 16.6 MB/s | |
| Startup time | < 10 seconds | |
| Stop time | < 3 seconds | |

Table 6-11
24X CD-ROM Drive

| | | |
|-----------------------------|--|----------|
| Applicable disc | DVD-5, DVD-9, DVD-10 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 (read only) CD Plus Photo CD (single/multisession) CD-Bridge | |
| Center hole diameter | 1.5 cm | 0.59 in |
| Disc diameter | | |
| Standard disc | 12 cm | 4.72 in |
| Mini disc | 8 cm | 3.15 in |
| Disc thickness | 1.2 mm | 0.047 in |
| Track pitch | 1.6 μ m | |
| Access time | | |
| Random | < 150 ms | |
| Full stroke | < 300 ms | |
| Audio output level | Line-out, 0.7 Vrms | |
| Cache buffer | 128 KB/s | |
| Data transfer rate | | |
| Sustained (16X) | 2,400 KB/s | |
| Variable | 1,500 to 3,600 KB/s (10X to 24X) | |
| Multiword DMA mode 2 | 16.6 MB/s | |
| Startup time | < 8 seconds | |
| Stop time | < 4 seconds | |

**Table 6-12
System DMA**

| Hardware DMA | System Function |
|---------------------|--|
| DMA0 | Available for audio |
| DMA1* | Entertainment audio (default; alternate = DMA0, DMA3, none) |
| DMA2* | Diskette drive |
| DMA3 | ECP parallel port LPT1 (default; alternate = DMA0, none) |
| DMA4 | DMA controller cascading (not available) |
| DMA5* | Available for PC Card |
| DMA6 | Not assigned |
| DMA7 | Not assigned |

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

**Table 6-13
System Interrupts**


| Hardware IRQ | System Function |
|---|---|
| IRQ0 | System timer |
| IRQ1 | Keyboard controller |
| IRQ2 | Cascaded |
| IRQ3 | COM2 |
| IRQ4 | COM1 |
| IRQ5 | Audio (default)* |
| IRQ6 | Diskette drive |
| IRQ7 | Parallel port |
| IRQ8 | RTC |
| IRQ9 | Assigned by operating system |
| IRQ10 | Assigned by operating system |
| IRQ11 | Assigned by operating system |
| IRQ12 | Internal point stick or external mouse |
| IRQ13 | Infrared |
| IRQ14 | Primary IDE interface |
| IRQ15 | Secondary IDE interface |
|  | 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. |
| *Default configuration; audio possible configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none. | |

Table 6-14
System I/O Addresses

| I/O Address (hex) | System Function (shipping configuration) |
|------------------------------|---|
| 000 - 00F | DMA controller 1 |
| 010 - 01F | Unused |
| 020 - 021 | Interrupt controller 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 2 |

Table 6-14
System I/O Addresses (Continued)

| I/O Address (hex) | System Function (shipping configuration) |
|------------------------------|---|
| 0A2 - 0BF | Unused |
| 0C0 - 0DF | DMA controller 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 |

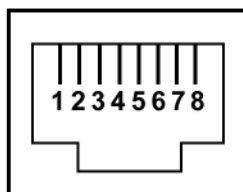
Table 6-14
System I/O Addresses (*Continued*)

| 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) |

A

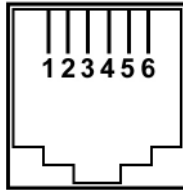
Connector Pin Assignments

Table A-1
RJ-45 Network Interface



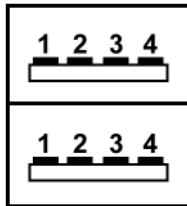
| Pin | Signal | Pin | Signal |
|------------|---------------|------------|---------------|
| 1 | Transmit + | 5 | Unused |
| 2 | Transmit - | 6 | Receive - |
| 3 | Receive + | 7 | Unused |
| 4 | Unused | 8 | Unused |

Table A-2
RJ-11 Modem



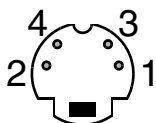
| Pin | Signal | Pin | Signal |
|-----|------------------|-----|------------------|
| 1 | TX+ (ISDN modem) | 4 | Ring (modem) |
| 2 | TX- (ISDN modem) | 5 | RX+ (ISDN modem) |
| 3 | Tip (modem) | 6 | RX- (ISDN modem) |

Table A-3
Universal Serial Bus



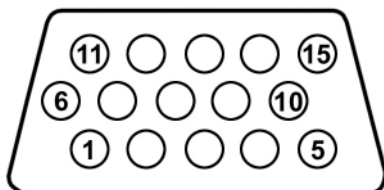
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | +5 VDC | 3 | Data + |
| 2 | Data - | 4 | Ground |

**Table A-4
S-Video**



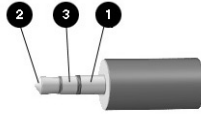
| Pin | Signal | Pin | Signal |
|-----|------------|-----|-------------------------|
| 1 | Ground (Y) | 3 | Y-Luminance (Intensity) |
| 2 | Ground (C) | 4 | C-Chrominance (Color) |

**Table A-5
External Monitor**



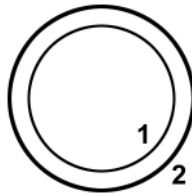
| Pin | Signal | Pin | Signal |
|-----|---------------|-----|-----------------|
| 1 | Red analog | 9 | +5 VDC |
| 2 | Green analog | 10 | Ground |
| 3 | Blue analog | 11 | Monitor detect |
| 4 | Not connected | 12 | DDC 2B data |
| 5 | Ground | 13 | Horizontal sync |
| 6 | Ground analog | 14 | Vertical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

**Table A-6
Audio Line-Out**



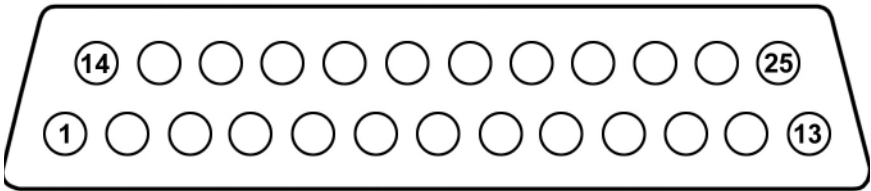
| Pin | Signal |
|-----|-----------------|
| 1 | Ground |
| 2 | Left audio out |
| 3 | Right audio out |

**Table A-7
Microphone**



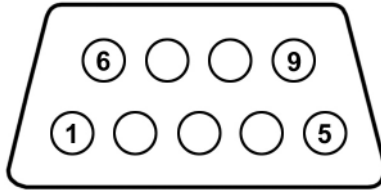
| Pin | Signal | Pin | Signal |
|-----|----------|-----|--------|
| 1 | Audio in | 2 | Ground |

Table A-8
Parallel



| Pin | Signal | Pin | Signal |
|-----|-------------|-----|------------------|
| 1 | Strobe | 14 | Auto linefeed |
| 2 | Data bit 0 | 15 | Error |
| 3 | Data bit 1 | 16 | Initialize paper |
| 4 | Data bit 2 | 17 | Select in |
| 5 | Data bit 3 | 18 | Ground |
| 6 | Data bit 4 | 19 | Ground |
| 7 | Data bit 5 | 20 | Ground |
| 8 | Data bit 6 | 21 | +5VS |
| 9 | Data bit 7 | 22 | PTF |
| 10 | Acknowledge | 23 | EXTFDD_VCC (+5V) |
| 11 | Busy | 24 | Ground |
| 12 | Paper end | 25 | Ground |
| 13 | Select | | |

Table A-9
Serial



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

Power Cord Requirements

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

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

Power cords for use in other countries must meet the requirements of the country where the notebook is used. For more information on power cord requirements, contact an HP authorized reseller or service provider.

General Requirements

The requirements listed below are applicable to all countries:

- The length of the power cord must be at least 1.5 m (5.00 ft) and a maximum of 2.0 m (6.50 ft).
- All power cords must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord will be used.
- The power cord 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 notebook.

Country-Specific Requirements

3-Conductor Power Cord Requirements

| Country | Accredited Agency | Applicable Note Number |
|-----------------|--------------------------|-------------------------------|
| Australia | EANSW | 1 |
| Austria | OVE | 1 |
| Belgium | CEBC | 1 |
| Canada | CSA | 2 |
| Denmark | DEMKO | 1 |
| Finland | FIMKO | 1 |
| France | UTE | 1 |
| Germany | VDE | 1 |
| Italy | IMQ | 1 |
| Japan | METI | 3 |
| The Netherlands | KEMA | 1 |
| Norway | NEMKO | 1 |
| Sweden | SEMKO | 1 |
| Switzerland | SEV | 1 |

3-Conductor Power Cord Requirements (Continued)

| Country | Accredited Agency | Applicable Note Number |
|----------------|--------------------------|-------------------------------|
| United Kingdom | BSI | 1 |
| United States | UL | 2 |

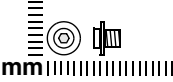
Notes

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord 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.
-

Screw Listing

This appendix provides specification and reference information for the screws used in the notebook. All screws listed in this appendix are available in the Miscellaneous Screw Kit, spare part number 345057-001.

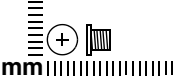
**Table C-1
Torx T5M2.5×4.0 Screw**

|  mm | Color | Qty. | Length | Thread | Head Width |
|--|--------|------|--------|--------|------------|
| | Silver | 2 | 4.0 mm | 2.5 mm | 5.0 mm |

Where used:

- ❶ Two screws that secure the hard drive to the hard drive frame (documented in Section 5.3)

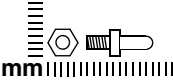
**Table C-2
Phillips PM3.0×3.5 Screw**

|  mm | Color | Qty. | Length | Thread | Head Width |
|--|--------|------|--------|--------|------------|
| | Silver | 2 | 3.5 mm | 3.0 mm | 4.5 mm |

Where used:

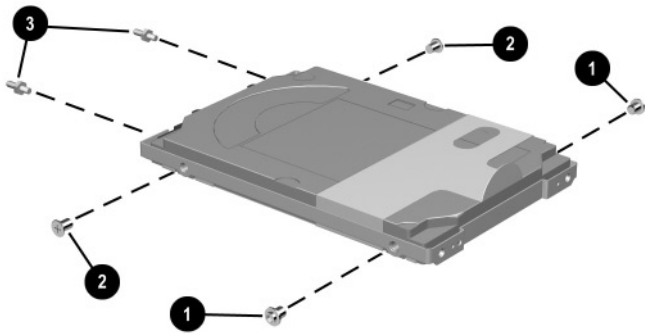
- ❷ Two screws that secure the hard drive to the hard drive frame (documented in Section 5.3)

**Table C-3
M2.0×10.0 Alignment Pin**

|  mm | Color | Qty. | Length | Thread | Head Width |
|---|--------|------|---------|--------|------------|
| | Silver | 2 | 10.0 mm | 2.0 mm | 4.0 mm |

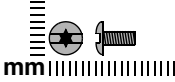

Where used:

- ❸ Two alignment pins that secure the hard drive to the hard drive frame (documented in Section 5.3)



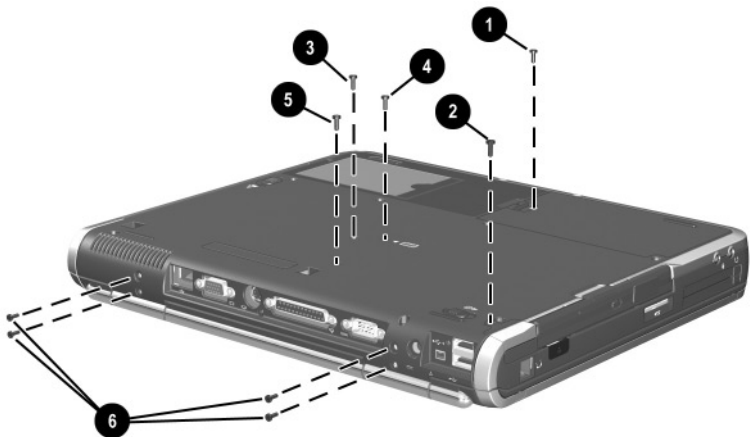
Torx T5M2.5×4.0 Screw, Phillips PM3.0×3.5 Screw, and M2.0×10.0 Alignment Pin Locations

Table C-4
Torx T8M2.0×6.0 Screw

|  | Color | Qty. | Length | Thread | Head Width |
|--|-------|------|--------|--------|------------|
| mm  | Black | 27 | 6.0 mm | 2.0 mm | 5.0 mm |

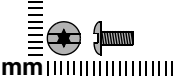
Where used:

- ❶ One screw that secures the hard drive cover to the notebook (documented in Section 5.3)
- ❷ One screw that secures the Bluetooth cover to the notebook (documented in Section 5.6)
- ❸ One screw that secures the optical drive to the notebook (documented in Section 5.7)
- ❹ One screw that secures the keyboard to the notebook (documented in Section 5.8)
- ❺ One screw that secures the LED switch cover to the notebook (documented in Section 5.14)
- ❻ Four screws that secure the display assembly and hinge covers to the notebook (documented in Section 5.17)



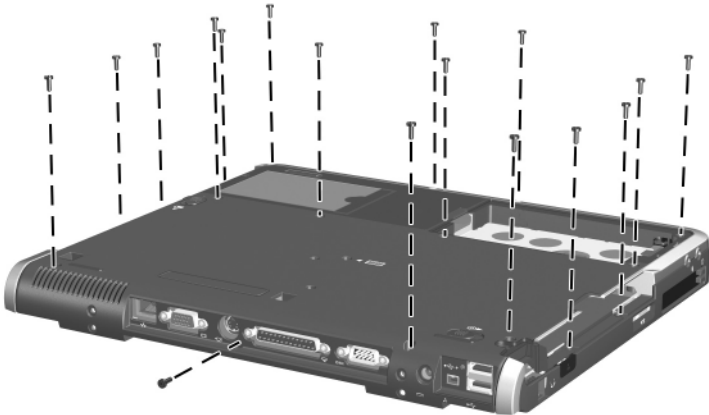
Torx T8M2.0×6.0 Screw Locations

Table C-4
Torx T8M2.0x6.0 Screw (Continued)

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| | Black | 27 | 6.0 mm | 2.0 mm | 5.0 mm |

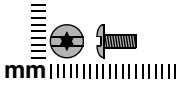
Where used:

Seventeen screws that secure the top cover to the notebook
 (documented in Section 5.18)



Torx T8M2.0x6.0 Screw Locations

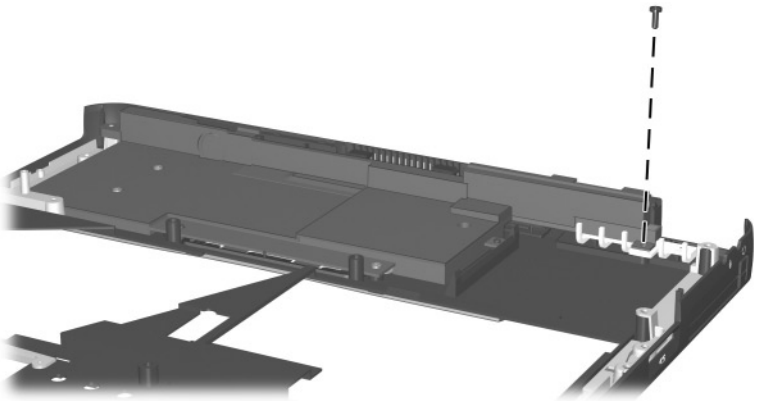
Table C-4
Torx T8M2.0x6.0 Screw (Continued)



| Color | Qty. | Length | Thread | Head Width |
|-------|------|--------|--------|------------|
| Black | 27 | 6.0 mm | 2.0 mm | 5.0 mm |



Where used:

One screw that secures the speaker to the top cover
 (documented in Section 5.19)



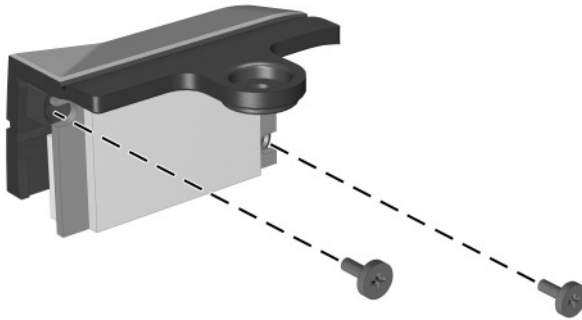
Torx T8M2.0x6.0 Screw Location

Table C-5
Phillips PM1.5x3.0 Screw

|  mm  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| | Black | 3 | 3.0 mm | 1.5 mm | 3.0 mm |



Where used:

Two screws that secure the Bluetooth board to the Bluetooth cover (documented in Section 5.6)



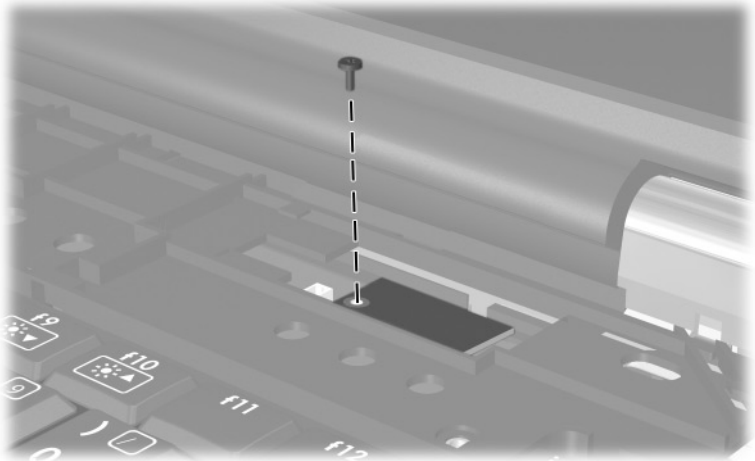
Phillips PM1.5x3.0 Screw Locations

Table C-5
Phillips PM1.5x3.0 Screw (Continued)

|  mm  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| | Black | 3 | 3.0 mm | 1.5 mm | 5.0 mm |



Where used:

One screw that secures the security card to the system board
(documented in Section 5.16)



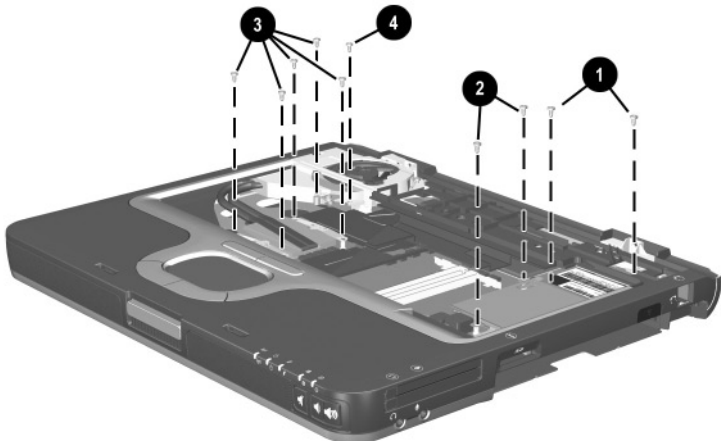
Phillips PM1.5x3.0 Screw Location

Table C-6
Torx T8M2.0×4.0 Screw

|  mm  | Color | Qty. | Length | Thread | Head Width |
|---|--------|------|--------|--------|------------|
| | Pewter | 20 | 4.0 mm | 2.0 mm | 5.0 mm |

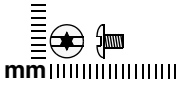
Where used:

- ❶ Two screws that secure the modem board to the system board (documented in Section 5.10)
- ❷ Two screws that secure the Mini PCI communications board and shield to the system board (documented in Section 5.11)
- ❸ Five screws that secure the heat sink to the system board (documented in Section 5.12)
- ❹ One screw that secures the top cover to the notebook (documented in Section 5.18)



Torx T8M2.0×4.0 Screw Locations

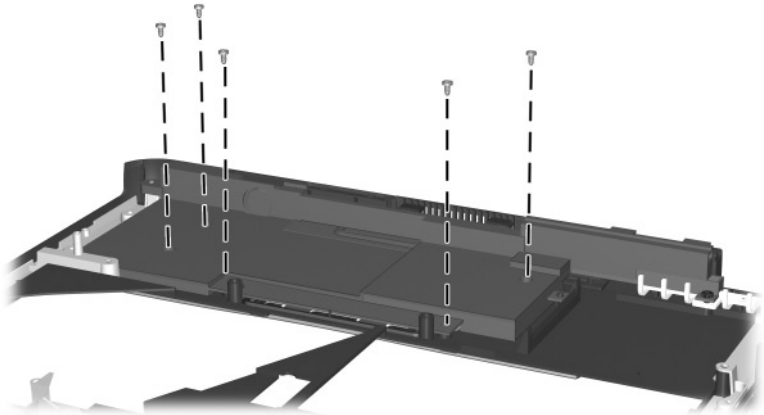
Table C-6
Torx T8M2.0x4.0 Screw (Continued)



| Color | Qty. | Length | Thread | Head Width |
|--------|------|--------|--------|------------|
| Pewter | 20 | 4.0 mm | 2.0 mm | 5.0 mm |

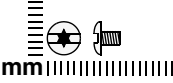
Where used:

Five screws that secure the speaker to the top cover (documented in Section 5.19)



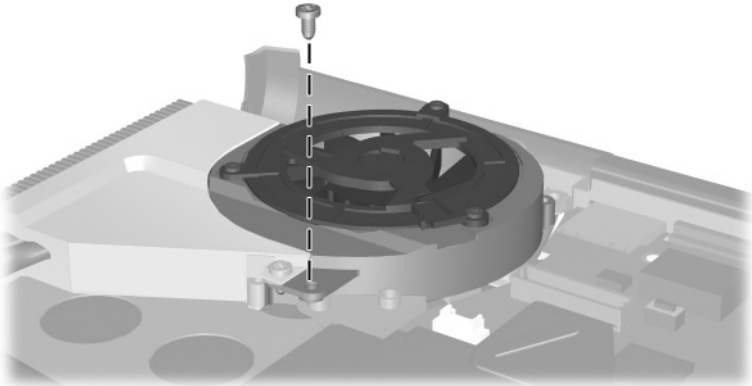
Torx T8M2.0x4.0 Screw Locations

Table C-6
Torx T8M2.0x4.0 Screw (Continued)

|  | Color | Qty. | Length | Thread | Head Width |
|---|--------------|-------------|---------------|---------------|-------------------|
| | Pewter | 20 | 4.0 mm | 2.0 mm | 5.0 mm |

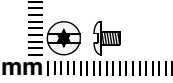
Where used:

One screw that secures the fan assembly to the notebook
(documented in Section 5.21)



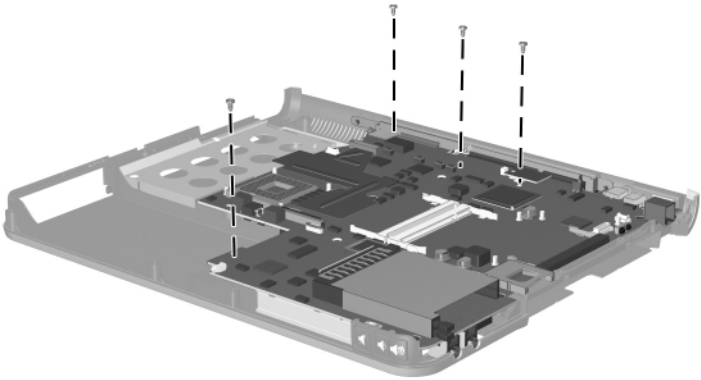
Torx T8M2.0x4.0 Screw Location

Table C-6
Torx T8M2.0x4.0 Screw (Continued)

|  | Color | Qty. | Length | Thread | Head Width |
|---|--------------|-------------|---------------|---------------|-------------------|
| | Pewter | 20 | 4.0 mm | 2.0 mm | 5.0 mm |



Where used:

Four screws that secure the system board to the notebook (documented in Section 5.22)



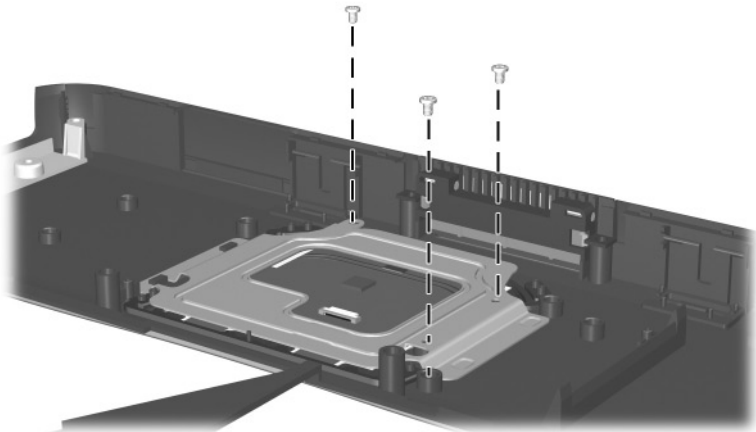
Torx T8M2.0x4.0 Screw Locations

Table C-7
Torx T8M2.0×3.5 Screw

|  mm  | Color | Qty. | Length | Thread | Head Width |
|---|--------|------|--------|--------|------------|
| | Silver | 3 | 3.5 mm | 2.0 mm | 5.0 mm |

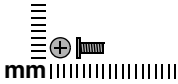
Where used:

Three screws that secure the TouchPad and bracket to the top cover (documented in Section 5.20)



Torx T8M2.0×3.5 Screw Locations

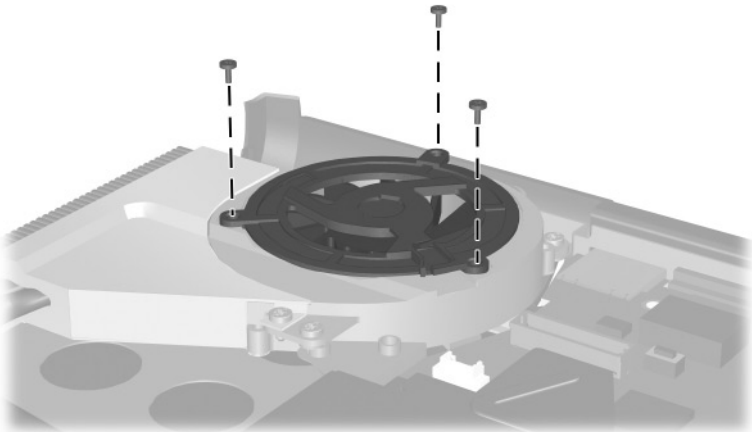
Table C-8
Phillips PM1.5x4.0 Screw



| Color | Qty. | Length | Thread | Head Width |
|-------|------|--------|--------|------------|
| Black | 3 | 4.0 mm | 1.5 mm | 3.0 mm |

Where used:

Three screws that secure the fan to the fan housing
(documented in Section 5.21)



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