



# **Maintenance and Service Guide**

HP Compaq nc6000 Business Notebook

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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 nc6000 Business Notebook  
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## Product Description

The HP Compaq nc6000 Business Notebook offers advanced modularity, a Mobile Intel® Pentium® 4 Processor-M with 64-bit architecture, an ATI MOBILITY RADEON 9600 graphics controller with 64 or 32 MB of discrete video memory, and extensive multimedia support.



*HP Compaq nc6000 Business Notebook*

# 1.1 Models

Notebook models are shown in Tables 1-1 and 1-2.

**Table 1-1  
HP Compaq nc6000 Model Naming Conventions**

| Key |  |  |    |    |   |  |    |   |              |
|-----|--|--|----|----|---|--|----|---|--------------|
| C   | P  | 180  | S4 | 60 | Y | Ci   | 10 | P | XXXXXXXX-XXX |
| 1   | 2  | 3  | 4  | 5  | 6 | 7  | 8  | 9 | 10           |
| Key | Description                              | Options  |    |    |   |  |    |   |              |
| 1   | Brand/Series designator                  | C = HP nc6000  |    |    |   |  |    |   |              |
| 2   | Processor type                           | P = Mobile Intel Pentium 4 Processor-M                 |    |    |   |  |    |   |              |
| 3   | Processor speed                          | 180 = 1.8-GHz<br>170 = 1.7-GHz<br>160 = 1.6-GHz        |    |    |   | 150 = 1.5-GHz<br>140 = 1.4-GHz                         |    |   |              |
| 4   | Display type/size/resolution             | S = SXGA+<br>X = XGA                                   |    |    |   | 4 = 14.x-in  |    |   |              |
| 5   | Hard drive size                          | 80 = 80-GB<br>60 = 60-GB                               |    |    |   | 40 = 40-GB<br>30 = 30-GB                               |    |   |              |
| 6   | Optical drive designator                 | C = CD-ROM drive<br>Y = DVD+RW/R and CD-RW combo drive |    |    |   | W = DVD/CD-RW combo drive                              |    |   |              |
| 7   | Integrated communication/wireless device | G = combination modem + GB NIC<br>N = no modem or NIC  |    |    |   | m = 802.11a/b/g + Bluetooth®<br>n = no wireless device |    |   |              |
| 8   | RAM                                      | 51 = 512-MB  |    |    |   | 25 = 25-MB   |    |   |              |
| 9   | Operating system                         | P = Microsoft® Windows® XP Pro                         |    |    |   | 2 = Windows 2000                                       |    |   |              |
| 10  | SKU#                                     |  |    |    |   |  |    |   |              |



**Table 1-2**  
**HP Compaq nc6000 Models**

All HP Compaq nc6000 models feature:

- Dual Stick (TouchPad and pointing stick) pointing device
- 8- or 6-cell lithium ion (Li-Ion) battery pack
- 3-year warranty on parts and labor

|                 |   |     |            |    |   |               |    |            |  |
|-----------------|---|-----|------------|----|---|---------------|----|------------|--|
| Cnc6000         | P | 170 | S4         | 60 | Y | Gm            | 51 | P          |  |
| United States   |   |     | DQ882A ABA |    |   |               |    |            |  |
| Cnc6000         | P | 170 | S4         | 60 | W | Gp            | 51 | P          |  |
| Australia       |   |     | DS804P ABG |    |   |               |    |            |  |
| Cnc6000         | P | 170 | S4         | 60 | W | Gp            | 51 | 2          |  |
| Australia       |   |     | DS803P ABG |    |   |               |    |            |  |
| Cnc6000         | P | 170 | X4         | 60 | D | Gn            | 51 | P          |  |
| Latin America   |   |     | DT486A ABM |    |   |               |    |            |  |
| Cnc6000         | P | 160 | S4         | 60 | W | Gj            | 51 | P          |  |
| Norway          |   |     | DJ299A ABN |    |   |               |    |            |  |
| Cnc6000         | P | 160 | X4         | 60 | Y | Gm            | 51 | P          |  |
| French Canada   |   |     | DQ880A ABC |    |   | United States |    | DQ880A ABA |  |
| Cnc6000         | P | 160 | X4         | 60 | W | Gm            | 51 | P          |  |
| French Canada   |   |     | DH915U ABC |    |   | United States |    | DH915U ABA |  |
| Cnc6000         | P | 160 | X4         | 60 | W | Gb            | 25 | P          |  |
| Korea           |   |     | DT645P AB1 |    |   |               |    |            |  |
| Cnc6000         | P | 160 | X4         | 60 | W | Gg            | 51 | P          |  |
| Brazil          |   |     | DT483A AC4 |    |   | United States |    | DT483A ABA |  |
| Latin America   |   |     | DT483A ABM |    |   |               |    |            |  |
| Cnc6000         | P | 160 | X4         | 40 | W | Gd            | 51 | P          |  |
| The Netherlands |   |     | DJ311S ABH |    |   |               |    |            |  |

**Table 1-2  
HP Compaq nc6000 Models (Continued)**

| Cnc6000 | P | 160 | X4 | 40 | W | Gj | 51 | P |                            |
|---------|---|-----|----|----|---|----|----|---|----------------------------|
| Belgium |   |     |    |    |   |    |    |   | DJ256A UUG                 |
| Denmark |   |     |    |    |   |    |    |   | DJ256A ABY                 |
| Europe  |   |     |    |    |   |    |    |   | DJ256A ABB                 |
| France  |   |     |    |    |   |    |    |   | DJ256A ABF                 |
| Germany |   |     |    |    |   |    |    |   | DJ256A ABD                 |
| Greece  |   |     |    |    |   |    |    |   | DJ256A AB7                 |
| Iceland |   |     |    |    |   |    |    |   | DJ256A A2M                 |
| Italy   |   |     |    |    |   |    |    |   | DJ256A ABZ                 |
|         |   |     |    |    |   |    |    |   | The Netherlands DJ256A ABH |
|         |   |     |    |    |   |    |    |   | Norway DJ256A ABN          |
|         |   |     |    |    |   |    |    |   | Portugal DJ256A AB9        |
|         |   |     |    |    |   |    |    |   | Spain DJ256A ABE           |
|         |   |     |    |    |   |    |    |   | Sweden DJ256A AK8          |
|         |   |     |    |    |   |    |    |   | Switzerland DJ256A UUZ     |
|         |   |     |    |    |   |    |    |   | United Kingdom DJ256A ABU  |
| Cnc6000 | P | 160 | X4 | 40 | W | Gj | 51 | 2 |                            |
| Belgium |   |     |    |    |   |    |    |   | DJ257A UUG                 |
| Denmark |   |     |    |    |   |    |    |   | DJ257A ABY                 |
| Europe  |   |     |    |    |   |    |    |   | DJ257A ABB                 |
| France  |   |     |    |    |   |    |    |   | DJ257A ABF                 |
| Germany |   |     |    |    |   |    |    |   | DJ257A ABD                 |
| Greece  |   |     |    |    |   |    |    |   | DJ257A AB7                 |
| Iceland |   |     |    |    |   |    |    |   | DJ257A A2M                 |
| Italy   |   |     |    |    |   |    |    |   | DJ257A ABZ                 |
|         |   |     |    |    |   |    |    |   | The Netherlands DJ257A ABH |
|         |   |     |    |    |   |    |    |   | Norway DJ257A ABN          |
|         |   |     |    |    |   |    |    |   | Portugal DJ257A AB9        |
|         |   |     |    |    |   |    |    |   | Spain DJ257A ABE           |
|         |   |     |    |    |   |    |    |   | Sweden DJ257A AK8          |
|         |   |     |    |    |   |    |    |   | Switzerland DJ257A UUZ     |
|         |   |     |    |    |   |    |    |   | United Kingdom DJ257A ABU  |

**Table 1-2**  
**HP Compaq nc6000 Models (Continued)**

| Cnc6000              | P | 160 | X4 | 40 | W | Gn              | 51 | P |             |
|----------------------|---|-----|----|----|---|-----------------|----|---|-------------|
| Asia Pacific         |   |     |    |    |   | Korea           |    |   | DP894A AB1  |
| Australia            |   |     |    |    |   | Latin America   |    |   | DP894A ABM  |
|                      |   |     |    |    |   | The Netherlands |    |   | DP894A ABH  |
|                      |   |     |    |    |   | Norway          |    |   | DP894A ABN  |
| Belgium              |   |     |    |    |   | People's        |    |   | DP894A AB2  |
| Brazil               |   |     |    |    |   | Republic        |    |   |             |
| Czech Republic       |   |     |    |    |   | of China        |    |   |             |
| Denmark              |   |     |    |    |   | Poland          |    |   | DP894A AKD  |
| Europe International |   |     |    |    |   | Portugal        |    |   | DP894A AB9  |
| France               |   |     |    |    |   | Russia          |    |   | DP894A ACB  |
| French Canada        |   |     |    |    |   | Saudi Arabia    |    |   | DP894A ABV  |
|                      |   |     |    |    |   | Slovenia        |    |   | DP894A AKN  |
|                      |   |     |    |    |   | Spain           |    |   | DP894A ABE  |
| Germany              |   |     |    |    |   | Sweden/Finland  |    |   | DP894A AK8  |
| Greece               |   |     |    |    |   | Switzerland     |    |   | DP894A UUZ  |
| Hong Kong            |   |     |    |    |   | Taiwan          |    |   | DP894A AB0  |
| Hungary              |   |     |    |    |   | Thailand        |    |   | DP894A AKL  |
| Iceland              |   |     |    |    |   | Turkey          |    |   | DP894A AB8  |
| India                |   |     |    |    |   | United Kingdom  |    |   | DP894A ABU  |
| Israel               |   |     |    |    |   | United States   |    |   | DP894A ABA, |
| Italy                |   |     |    |    |   |                 |    |   | DH915U ABA, |
| Japan                |   |     |    |    |   |                 |    |   | and         |
| Japan - English      |   |     |    |    |   |                 |    |   | DH916U ABA  |

**Table 1-2  
HP Compaq nc6000 Models (Continued)**

| Cnc6000              | P | 160 | X4                              | 40 | W | Gn                               | 51 | 2 |            |
|----------------------|---|-----|---------------------------------|----|---|----------------------------------|----|---|------------|
| Asia Pacific         |   |     | DP895A UUF                      |    |   | Korea                            |    |   | DP895A AB1 |
| Australia            |   |     | DP895A ABG<br>and<br>DS859P ABG |    |   | Latin America                    |    |   | DP895A ABM |
| Belgium              |   |     | DP895A UUG                      |    |   | The Netherlands                  |    |   | DP895A ABH |
| Brazil               |   |     | DP895A AC4                      |    |   | Norway                           |    |   | DP895A ABN |
| Czech Republic       |   |     | DP895A AKB                      |    |   | People's<br>Republic<br>of China |    |   | DP895A AB2 |
| Denmark              |   |     | DP895A ABY                      |    |   | Poland                           |    |   | DP895A AKD |
| Europe International |   |     | DP895A ABB                      |    |   | Portugal                         |    |   | DP895A AB9 |
| France               |   |     | DP895A ABF                      |    |   | Russia                           |    |   | DP895A ACB |
| French Canada        |   |     | DP895A ABC                      |    |   | Saudi Arabia                     |    |   | DP895A ABV |
| Germany              |   |     | DP895A ABD                      |    |   | Slovenia                         |    |   | DP895A AKN |
| Greece               |   |     | DP895A AB7                      |    |   | Spain                            |    |   | DP895A ABE |
| Hong Kong            |   |     | DP895A AB5                      |    |   | Sweden/Finland                   |    |   | DP895A AK8 |
| Hungary              |   |     | DP895A AKC                      |    |   | Switzerland                      |    |   | DP895A UUZ |
| Iceland              |   |     | DP895A A2M                      |    |   | Taiwan                           |    |   | DP895A AB0 |
| India                |   |     | DP895A ACJ                      |    |   | Thailand                         |    |   | DP895A AKL |
| Israel               |   |     | DP895A ABT                      |    |   | Turkey                           |    |   | DP895A AB8 |
| Italy                |   |     | DP895A ABZ                      |    |   | United Kingdom                   |    |   | DP895A ABU |
| Japan                |   |     | DP895A ABJ                      |    |   | United States                    |    |   | DP895A ABA |
| Japan - English      |   |     | DP895A ACF                      |    |   |                                  |    |   |            |
| Cnc6000              | P | 160 | X4                              | 40 | W | Gn                               | 25 | P |            |
| Hong Kong            |   |     | DS808P AB5                      |    |   |                                  |    |   |            |
| Cnc6000              | P | 160 | X4                              | 40 | D | Gd                               | 51 | P |            |
| Germany              |   |     | DJ330S ABD                      |    |   |                                  |    |   |            |
| Cnc6000              | P | 150 | X4                              | 60 | W | Gb                               | 25 | P |            |
| Korea                |   |     | DT644P AB1                      |    |   |                                  |    |   |            |
| Cnc6000              | P | 150 | X4                              | 60 | W | Gn                               | 51 | P |            |
| Asia Pacific         |   |     | DS805P UUF                      |    |   |                                  |    |   |            |
| Cnc6000              | P | 150 | X4                              | 60 | D | Gb                               | 25 | P |            |
| Taiwan               |   |     | DT812P AB0                      |    |   |                                  |    |   |            |

**Table 1-2  
HP Compaq nc6000 Models (Continued)**

|                               |   |     |                                 |    |   |               |    |            |  |
|-------------------------------|---|-----|---------------------------------|----|---|---------------|----|------------|--|
| Cnc6000                       | P | 150 | X4                              | 40 | W | Gn            | 25 | P          |  |
| Hong Kong                     |   |     | DS807P AB5                      |    |   |               |    |            |  |
| Cnc6000                       | P | 150 | X4                              | 30 | W | Gg            | 10 | H          |  |
| Germany                       |   |     | DJ324S ABD                      |    |   |               |    |            |  |
| Cnc6000                       | P | 150 | X4                              | 30 | D | Gm            | 25 | P          |  |
| Europe International          |   |     | DQ881A ABB                      |    |   | United States |    | DQ881A ABA |  |
| Cnc6000                       | P | 140 | X4                              | 40 | W | Gm            | 25 | P          |  |
| Japan                         |   |     | DT641P ABJ                      |    |   | Japan/English |    | DT641P ACF |  |
| Cnc6000                       | P | 140 | X4                              | 40 | W | Gp            | 25 | P          |  |
| Australia                     |   |     | DS802P ABG                      |    |   |               |    |            |  |
| Cnc6000                       | P | 140 | X4                              | 40 | W | Gp            | 25 | 2          |  |
| Australia                     |   |     | DS801P ABG                      |    |   |               |    |            |  |
| Cnc6000                       | P | 140 | X4                              | 40 | W | Gb            | 25 | P          |  |
| Asia Pacific<br>Korea         |   |     | DT636P UUF<br>DT643P AB1        |    |   | Taiwan        |    | DT811P AB0 |  |
| Cnc6000                       | P | 140 | X4                              | 40 | W | Gn            | 25 | H          |  |
| People's Republic<br>of China |   |     | DS796P AB2                      |    |   |               |    |            |  |
| Cnc6000                       | P | 140 | X4                              | 40 | D | Gb            | 76 | P          |  |
| United States                 |   |     | DT611C ABA<br>and<br>DT610C ABA |    |   |               |    |            |  |
| Cnc6000                       | P | 140 | X4                              | 40 | D | Gb            | 25 | P          |  |
| People's Republic<br>of China |   |     | DS795P AB2                      |    |   | Taiwan        |    | DT809P AB0 |  |

**Table 1-2  
HP Compaq nc6000 Models (Continued)**

|                            |   |     |            |    |   |                |    |            |  |
|----------------------------|---|-----|------------|----|---|----------------|----|------------|--|
| Cnc6000                    | P | 140 | X4         | 40 | D | Gn             | 25 | H          |  |
| People's Republic of China |   |     | DS794P AB2 |    |   |                |    |            |  |
| Cnc6000                    | P | 140 | X4         | 40 | D | Mn             | 51 | P          |  |
| United States              |   |     | DT868A ABA |    |   |                |    |            |  |
| Cnc6000                    | P | 140 | X4         | 40 | C | Gn             | 51 | P          |  |
| Asia Pacific               |   |     | DS652C UUF |    |   |                |    |            |  |
| Cnc6000                    | P | 140 | X4         | 30 | Y | Gn             | 25 | P          |  |
| United States              |   |     | DS825C ABA |    |   |                |    |            |  |
| Cnc6000                    | P | 140 | X4         | 30 | W | Gi             | 25 | P          |  |
| Belgium                    |   |     | DJ333A UUG |    |   | Norway         |    | DJ333A ABN |  |
| Denmark                    |   |     | DJ333A ABY |    |   | Poland         |    | DJ333A AKD |  |
| France                     |   |     | DJ333A ABF |    |   | Portugal       |    | DJ333A AB9 |  |
| Germany                    |   |     | DJ333A ABG |    |   | Spain          |    | DJ333A ABE |  |
| Greece                     |   |     | DJ333A AB7 |    |   | Sweden         |    | DJ333A AK8 |  |
| Iceland                    |   |     | DJ333A A2M |    |   | Switzerland    |    | DJ333A UUF |  |
| Italy                      |   |     | DJ333A ABZ |    |   | United Kingdom |    | DJ333A ABU |  |
| The Netherlands            |   |     | DJ333A ABH |    |   |                |    |            |  |
| Cnc6000                    | P | 140 | X4         | 30 | W | Gg             | 25 | P          |  |
| Europe                     |   |     | DJ323S ABB |    |   |                |    |            |  |
| Cnc6000                    | P | 140 | X4         | 30 | D | Gb             | 25 | P          |  |
| Asia Pacific               |   |     | DT640P UUF |    |   | Taiwan         |    | DT810P AB0 |  |
| Australia                  |   |     | DS800P ABG |    |   | United States  |    | DH930U ABA |  |
| French Canada              |   |     | DH930U ABC |    |   |                |    |            |  |
| Cnc6000                    | P | 140 | X4         | 30 | D | Gb             | 25 | 2          |  |
| Australia                  |   |     | DS799P ABG |    |   | Japan/English  |    | DT642P ACF |  |
| Japan                      |   |     | DT642P ABJ |    |   |                |    |            |  |

**Table 1-2**  
**HP Compaq nc6000 Models (Continued)**

| Cnc6000         | P | 140 | X4 | 30 | D | Gp              | 25 | P |            |
|-----------------|---|-----|----|----|---|-----------------|----|---|------------|
| Asia Pacific    |   |     |    |    |   | The Netherlands |    |   | DJ254A ABH |
| Belgium         |   |     |    |    |   |                 |    |   | and        |
| Czech Republic  |   |     |    |    |   |                 |    |   | DT412C ABH |
| Denmark         |   |     |    |    |   | Norway          |    |   | DJ254A ABN |
| Europe          |   |     |    |    |   | People's        |    |   | DT412C AB2 |
| France          |   |     |    |    |   | Republic        |    |   |            |
|                 |   |     |    |    |   | of China        |    |   |            |
|                 |   |     |    |    |   | Poland          |    |   | DJ254A AKD |
| French Canada   |   |     |    |    |   | Portugal        |    |   | DJ254A AB9 |
| Germany         |   |     |    |    |   | Russia          |    |   | DJ254A ACB |
|                 |   |     |    |    |   | Slovenia        |    |   | DJ254A AKN |
|                 |   |     |    |    |   | Spain           |    |   | DJ254A ABE |
|                 |   |     |    |    |   | Sweden          |    |   | DJ254A AK8 |
|                 |   |     |    |    |   |                 |    |   | and        |
| Greece          |   |     |    |    |   |                 |    |   | DT412C AK8 |
| Hungary         |   |     |    |    |   | Switzerland     |    |   | DJ254A UUZ |
| Iceland         |   |     |    |    |   | Taiwan          |    |   | DT412C AB0 |
| Israel          |   |     |    |    |   | Turkey          |    |   | DJ254A AB8 |
| Italy           |   |     |    |    |   | United Kingdom  |    |   | DJ254A ABU |
| Japan           |   |     |    |    |   |                 |    |   | and        |
| Japan/English   |   |     |    |    |   |                 |    |   | DT412C ABU |
| Korea           |   |     |    |    |   | United States   |    |   | DT412C ABA |
| Cnc6000         | P | 140 | X4 | 30 | D | Gp              | 25 | 2 |            |
| Belgium         |   |     |    |    |   | Norway          |    |   | DJ255A ABN |
| Czech Republic  |   |     |    |    |   | Poland          |    |   | DJ255A AKD |
| Denmark         |   |     |    |    |   | Portugal        |    |   | DJ255A AB9 |
| Europe          |   |     |    |    |   | Russia          |    |   | DJ255A ACB |
| France          |   |     |    |    |   | Slovenia        |    |   | DJ255A AKN |
| Germany         |   |     |    |    |   | Spain           |    |   | DJ255A ABE |
| Greece          |   |     |    |    |   | Sweden          |    |   | DJ255A AK8 |
| Hungary         |   |     |    |    |   | Switzerland     |    |   | DJ255A UUZ |
| Iceland         |   |     |    |    |   | Turkey          |    |   | DJ255A AB8 |
| Italy           |   |     |    |    |   | United Kingdom  |    |   | DJ255A ABU |
| The Netherlands |   |     |    |    |   |                 |    |   |            |

**Table 1-2  
HP Compaq nc6000 Models (Continued)**

|   |   |     |  |    |   |               |    |                                 |  |
|---|---|-----|--|----|---|---------------|----|---------------------------------|--|
| Cnc6000                                 | P | 140 | X4                                     | 30 | D | Gn            | 25 | P                               |  |
| Australia<br>French Canada<br>Hong Kong |   |     | DS798P ABG<br>DH913U ABC<br>DS806P AB5 |    |   | United States |    | DH913U ABA<br>and<br>DS847C ABA |  |
| Cnc6000                                 | P | 140 | X4                                     | 30 | D | Gn            | 25 | 2                               |  |
| Australia                               |   |     | DS797P ABG                             |    |   |               |    |                                 |  |



## 1.2 Features

- Mobile Intel Pentium 4 1.8-GHz Processor-M, with 2.0-MB L2 cache, varying by notebook model
- Mobile Intel Pentium M 1.7-, 1.6-, 1.5-, and 1.4-GHz processors, all with 1.0-MB L2 cache, varying by notebook model
- 14.1-inch SXGA+ (1400 × 1050) or XGA (1024 × 768) TFT displays with over 16.7 million colors, varying by notebook model
- ATI MOBILITY RADEON 9600 graphics controller with 64 or 32 MB of video memory, varying by notebook model
- 60-, 40-, or 30-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 Pro, varying by notebook model
- Full-size Windows 98 keyboard with integrated numeric keypad
- Dual pointing devices (TouchPad and pointing stick)
- Integrated Secure Digital (SD) Memory Card flash media slot
- Support for MultiBay device
- Integrated 10/100/1000BASE-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 two Type II or one Type III PC Card slots with support for both 32-bit (CardBus) and 16-bit PC Cards
- Integrated smart card slot
- External 65-watt AC adapter with power cord
- 8- or 6-cell Li-Ion battery pack

- Stereo speakers
- Support for the following devices in the MultiBay:
  - ❑ 24X Max CD-ROM drive
  - ❑ 24X Max DVD/CD-RW combo drive
  - ❑ 8X Max DVD-ROM drive
  - ❑ DVD+RW/R and CD-RW combo drive
  - ❑ 8-cell Prismatic battery pack
- Connectors for:
  - ❑ SD Card
  - ❑ Infrared
  - ❑ One Type III PC Card slot
  - ❑ Two Type II PC Card slots
  - ❑ RJ-11 (modem)
  - ❑ RJ-45 network interface card (NIC)
  - ❑ Universal Serial Bus (USB) v. 2.0
  - ❑ S-Video
  - ❑ Parallel
  - ❑ External monitor
  - ❑ DC power
  - ❑ Docking
  - ❑ 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 CMOS:

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 “5.20 RTC Battery”](#)).
3. Wait approximately five 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 have been cleared.

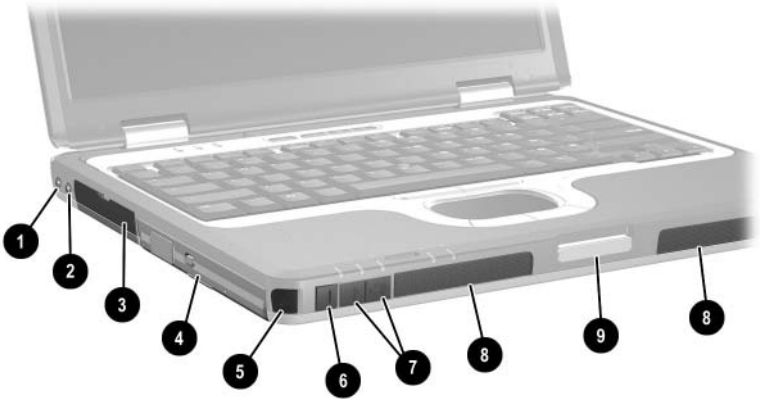
## 1.4 Power Management

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
- Customization of settings by the user
- Hotkeys for setting 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 left side of the notebook are shown below and described in Table 1-3.

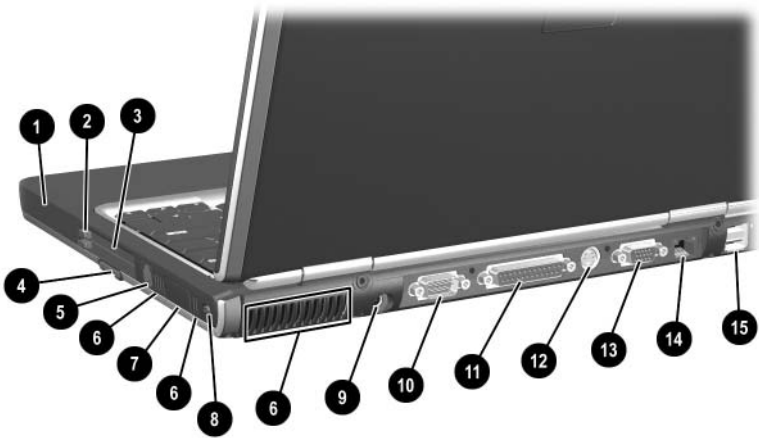


*Front and Left-Side Components*

**Table 1-3**  
**Front and Left-Side Components**

| <b>Item</b> | <b>Component</b>       | <b>Function</b>  |
|-------------|------------------------|--|
| 1           | Audio line-out jack    | Produces system sound when connected to optional powered stereo speakers, headphones, headset, or television audio.                |
| 2           | Microphone jack        | Connects an optional monaural microphone.  |
| 3           | Hard drive bay         | Holds the primary hard drive.  |
| 4           | MultiBay device slot   | Holds a MultiBay device.   |
| 5           | Infrared port          | Provides wireless communication between the notebook and an optional IrDA-compliant device.  |
| 6           | Mute button            | On: Mutes the system volume. A light comes on when the button is pushed in and the sound is muted.                                 |
| 7           | Volume control buttons | Increase and decrease system volume. Press the volume up button to increase sound. Press the volume down button to decrease sound. |
| 8           | Stereo speakers (2)    | Produce stereo sound.  |
| 9           | Display release latch  | Opens the notebook.  |

The notebook rear panel and right-side components are shown below and described in Table 1-4.





*Rear Panel and Right Side Components*

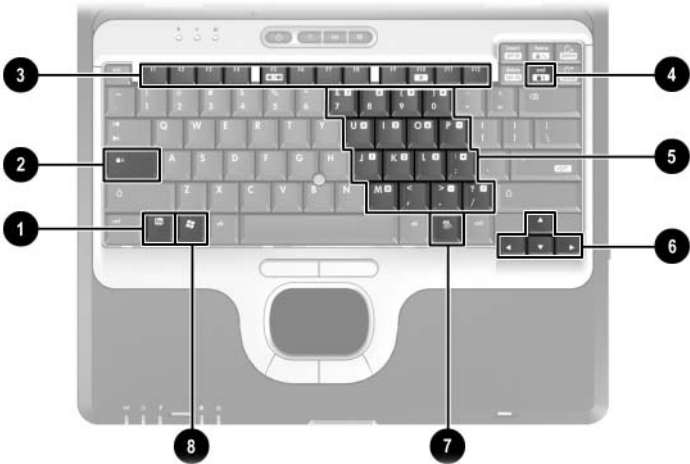
**Table 1-4  
Rear Panel and Right-Side Components**

| Item | Component                            | Function   |
|------|--------------------------------------|--|
| 1    | Battery slot                         | Holds the primary battery.   |
| 2    | PC Card eject buttons                | Release PC Card devices from the PC Card slots.                                    |
| 3    | PC Card slots (2)                    | Support optional Type I, Type II, or Type III 32-bit (CardBus) or 16-bit PC Cards. |
| 4    | Secure Digital (SD) Memory Card slot | Accepts SD Cards and MultiMedia Cards.   |
| 5    | RJ-11 telephone jack                 | Connects a modem cable.  |

**Table 1-4**  
**Rear Panel and Right-Side Components (Continued)**

| Item | Component                  | Function  |
|------|----------------------------|---|
| 6    | Vents (3)                  | <p>Allow 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, may block airflow.</p> |
| 7    | Bluetooth compartment      | Holds a Bluetooth wireless device.  |
| 8    | 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>          |
| 9    | AC power connector         | Connects an AC adapter or an optional Automobile Power Adapter/Charger, or Aircraft Power Adapter.  |
| 10   | Serial connector           | Connects an optional serial device.   |
| 11   | Parallel connector         | Connects an optional parallel device, such as an external diskette drive bay or a printer.  |
| 12   | S-Video connector          | Connects an optional S-Video device, such as a television, VCR, camcorder, overhead projector, or video capture card.   |
| 13   | External monitor connector | Connects an optional external monitor or overhead projector.  |
| 14   | RJ-45 network jack         | Connects a network cable.   |
| 15   | USB connectors (2)         | Connect USB 1.1- and 2.0-compliant devices to the notebook, using a standard USB cable.   |

The notebook keyboard components are shown below and described in Table 1-5.



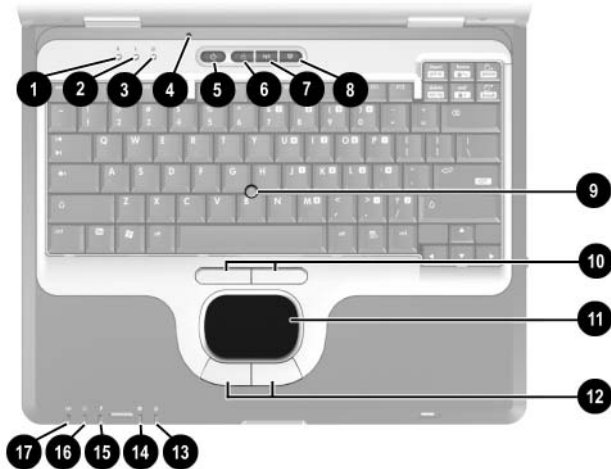
*Keyboard Components*



**Table 1-5**  
**Keyboard Components**

| <b>Item</b> | <b>Component</b>                           | <b>Function</b>   |
|-------------|--|---|
| 1           | <b>fn</b> key                              | Executes frequently used system functions when pressed in combination with another key.   |
| 2           | <b>caps lock</b> key                       | Enables caps lock and turns on the caps lock light.   |
| 3           | <b>f1</b> through <b>f12</b> function keys | Perform system and application tasks. When combined with the <b>fn</b> key, the function keys <b>f1</b> and <b>f3</b> through <b>f12</b> perform additional tasks as hotkeys. |
| 4           | <b>num lock</b> key                        | Enables numeric lock and the internal keypad.   |
| 5           | Embedded numeric keypad                    | Standard numeric keypad.  |
| 6           | Cursor control keys                        | Move the cursor around the screen.  |
| 7           | Applications key                           | Displays a shortcut menu for items beneath the pointer.   |
| 8           | Windows logo key                           | Display the Windows Start menu.   |

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



*Top Components*


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**Table 1-6  
Top Components**

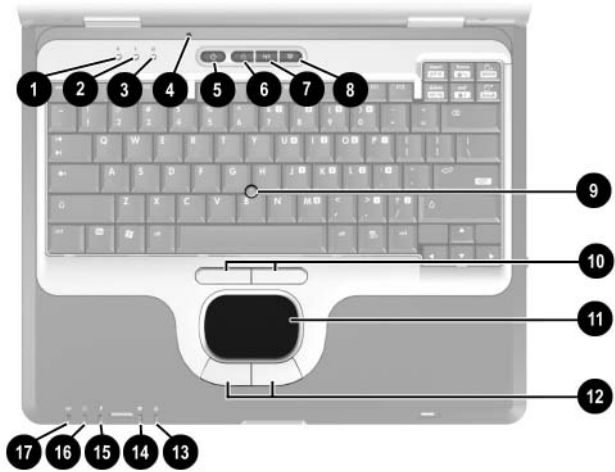
| <b>Item</b> | <b>Component</b>  | <b>Function</b>   |
|-------------|-------------------|---|
| 1           | Num lock light    | On: Num lock is on or the embedded numeric keypad is enabled. |
| 2           | Caps lock light   | On: Caps lock is on.  |
| 3           | Scroll lock light | On: Scroll lock is on.  |

---

**Table 1-6**  
**Top Components (*Continued*)**

| Item | Component              | Function  |
|------|------------------------|---|
| 4    | Display lid switch*    | <ul style="list-style-type: none"> <li>■ If the notebook is closed while on, turns off the display.</li> <li>■ If the notebook is opened while on, turns on the display.</li> </ul>   |
| 5    | Power button*          | <p>When the notebook is:</p> <ul style="list-style-type: none"> <li>■ Off, press and release to turn on the notebook.</li> <li>■ In Standby, press and release to exit Standby.</li> <li>■ In Hibernation, press and release to exit Hibernation.</li> </ul> <p>If the system has stopped responding and Windows shutdown procedures cannot be used, press and hold for 5 seconds to turn off the notebook.</p> |
| 6    | QuickLock button       | Disables the keyboard and pointing device and clears the display.   |
| 7    | Wireless On/Off button | <p>Enables and disables the integrated wireless device(s) on the notebook.</p> <p> When using the Wireless On/Off button to enable integrated WLAN or Bluetooth, first ensure that WLAN or Bluetooth has been enabled in the software and that the wireless on/off light is on before attempting to make a connection.</p>    |

\*This table describes default settings. For information about changing the functions of the display lid switch and power button and about using Standby and Hibernation, refer to the “Power” chapter in the *Software Guide* on the *Documentation Library CD*.

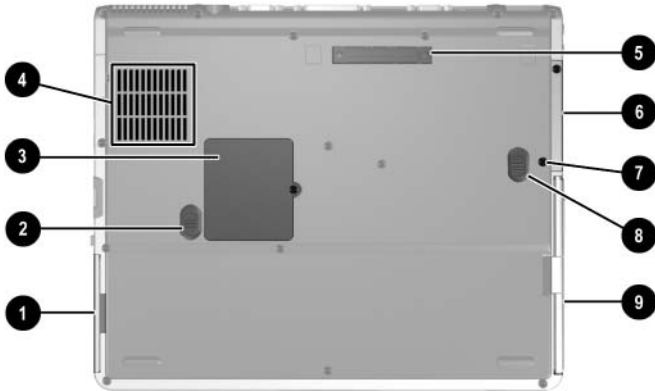


*Top Components (Continued)*

**Table 1-6  
Top Components (Continued)**

| <b>Item</b> | <b>Component</b>                      | <b>Function</b>   |
|-------------|---------------------------------------|---|
| 8           | Presentation Mode button              | Alternates between presentation modes.  |
| 9           | Pointing stick                        | Moves the pointer and selects or activates items on the screen.   |
| 10          | Left and right pointing stick buttons | Function like the left and right mouse buttons on an external mouse.  |
| 11          | TouchPad                              | Moves the pointer and selects or activates items on the screen.   |
| 12          | Left and right TouchPad buttons       | Function like the left and right buttons on an external mouse.  |
| 13          | MultiBay light                        | On: A device in the MultiBay is being accessed.   |
| 14          | Hard drive light                      | On: Hard drive in the hard drive bay is being accessed.   |
| 15          | Battery light                         | On: A battery pack is charging.<br>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.                         |
| 16          | Power/Standby light                   | On: Power is turned on.<br>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 goes off when the system enters Hibernation or shuts down. |
| 17          | Wireless on/off light                 | On: An integrated wireless device has been enabled.   |

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



*Bottom Components*



---

**Table 1-7**  
**Bottom Components**

| <b>Item</b> | <b>Component</b>      | <b>Function</b>                               |
|-------------|-----------------------|---|
| 1           | Battery bay           | Holds the primary battery pack.               |
| 2           | Battery release latch | Releases a battery pack from the battery bay. |

---

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

| <b>Item</b> | <b>Component</b>          | <b>Function</b>   |
|-------------|---------------------------|---|
| 3           | Mini PCI compartment      | <p>Holds an optional wireless LAN or ISDN device.</p> <p> The FCC does not allow unauthorized Mini PCI devices to be used in the notebook. Installing an unauthorized Mini PCI device can prevent the notebook from operating properly and might result in a warning message. To resume proper notebook operation, remove the unauthorized device. Contact the HP Customer Care Center if a warning message about the Mini PCI device displays in error.</p> |
| 4           | Intake vent               | <p>Allows 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, may block airflow.</p>  |
| 5           | Docking connector         | Connects the notebook to an optional HP Port Replicator.  |
| 6           | Hard drive bay            | Holds the internal hard drive.  |
| 7           | Hard drive security screw | Secures the hard drive.   |
| 8           | MultiBay release latch    | Releases the MultiBay device.   |
| 9           | MultiBay                  | Holds the MultiBay device.  |

## 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 device
- Hard drive
- Display
- Keyboard and TouchPad
- Audio
- Mobile Intel Pentium 4 Processor-M
- Fan
- PC Card



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

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The notebook uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to come on automatically when high temperature conditions exist. These conditions can be caused by high external temperatures, heavy system power consumption, certain power management/battery conservation configurations, battery fast charging, and some software applications. Exhaust air is displaced through the ventilation grill located on the notebook rear panel.



# 2

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## Troubleshooting



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**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.

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## 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 will 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"> <li>■ View identification information about the notebook, a Port Replicator, and any battery packs in the system.</li> <li>■ View specification information about the processor, memory and cache size, and system ROM.</li> </ul> |
| 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.<br><br> DriveLock Settings are accessible only when you enter Computer Setup by turning on (not restarting) the notebook.                                 |
| Password Options<br>(Password options can be selected only when a power-on password has been set.) | Enable/disable: <ul style="list-style-type: none"> <li>■ QuickLock</li> <li>■ QuickLock on Standby</li> <li>■ QuickBlank</li> </ul><br> To enable QuickLock on Standby or QuickBlank, you must first enable QuickLock.          |
| Device Security  | Enable/disable: <ul style="list-style-type: none"> <li>■ Ports or diskette drives*</li> <li>■ Diskette write*</li> <li>■ CD-ROM or diskette startup</li> </ul><br> 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"> <li>■ 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.)</li> <li>■ MultiBoot, which sets a startup sequence that can include most bootable devices and media in the system.</li> </ul>  |
| Device Options | <ul style="list-style-type: none"> <li>■ Enable/disable the embedded numeric keypad at startup.</li> <li>■ Enable/disable multiple standard pointing devices at startup. (To set the notebook to support only a single, usually nonstandard, pointing device at startup, select <b>Disable</b>.)</li> <li>■ 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.)</li> <li>■ 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.)</li> </ul> |

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

| Select                                 | To Do This  |
|--|---|
| Device Options<br>( <i>continued</i> ) | <ul style="list-style-type: none"> <li>■ Change the parallel port mode from Enhanced Parallel Port (EPP, the default setting) to standard, bi-directional EPP, or Enhanced Capabilities Port (ECP).</li> <li>■ Set video-out mode to NTSC (default), PAL, NTSC-J, or PAL-M.*</li> <li>■ Enable/disable all settings in the Intel SpeedStep window. (When Disable is selected, the notebook runs in Battery Optimized mode.)</li> <li>■ Specify how the notebook recognizes multiple identical Port Replicators that are identically equipped. Select <b>Disable</b> to recognize the Port Replicators as a single Port Replicator; select <b>Enable</b> to recognize the Port Replicators individually, by serial number.</li> <li>■ Enable/disable the reporting of the processor serial number by the processor to the software.</li> </ul> |
| 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 other 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, then print the file from your folder.

## 2.3 Troubleshooting Flowcharts

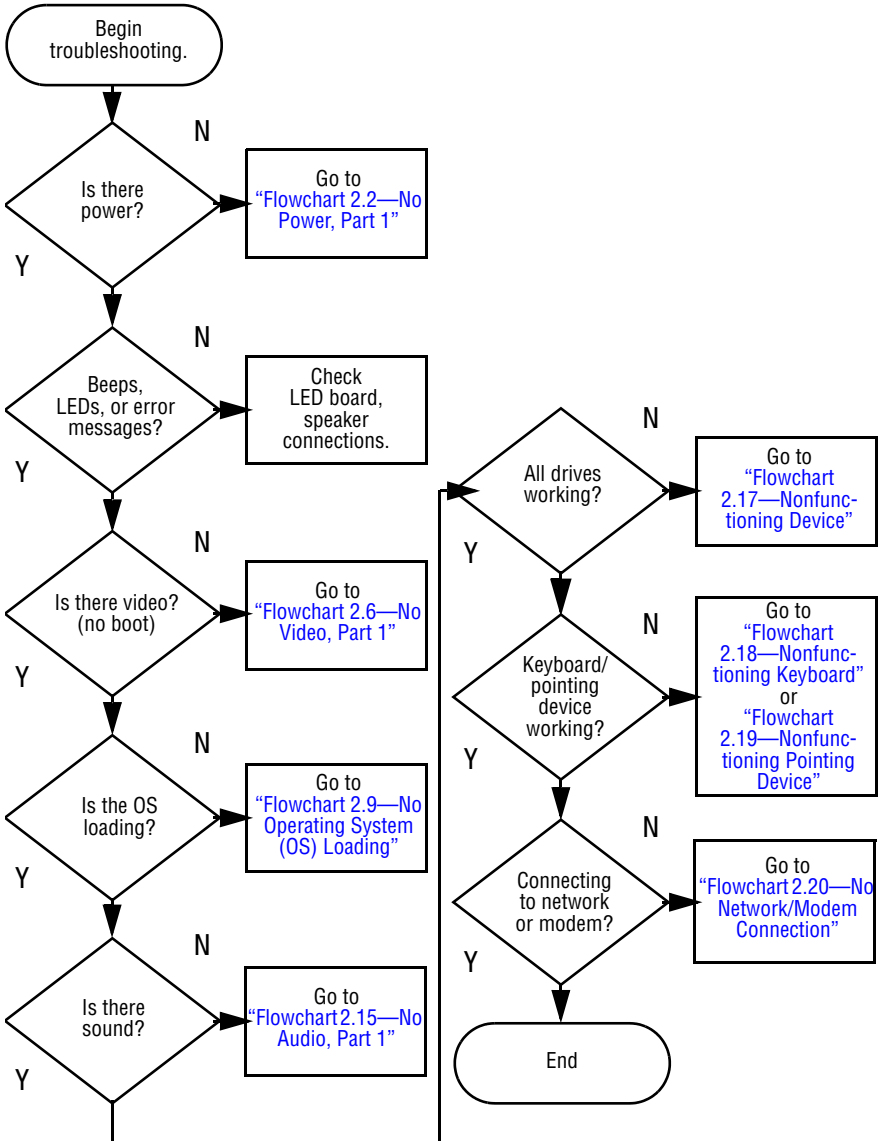
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**Table 2-4**  
**Troubleshooting Flowcharts Overview**

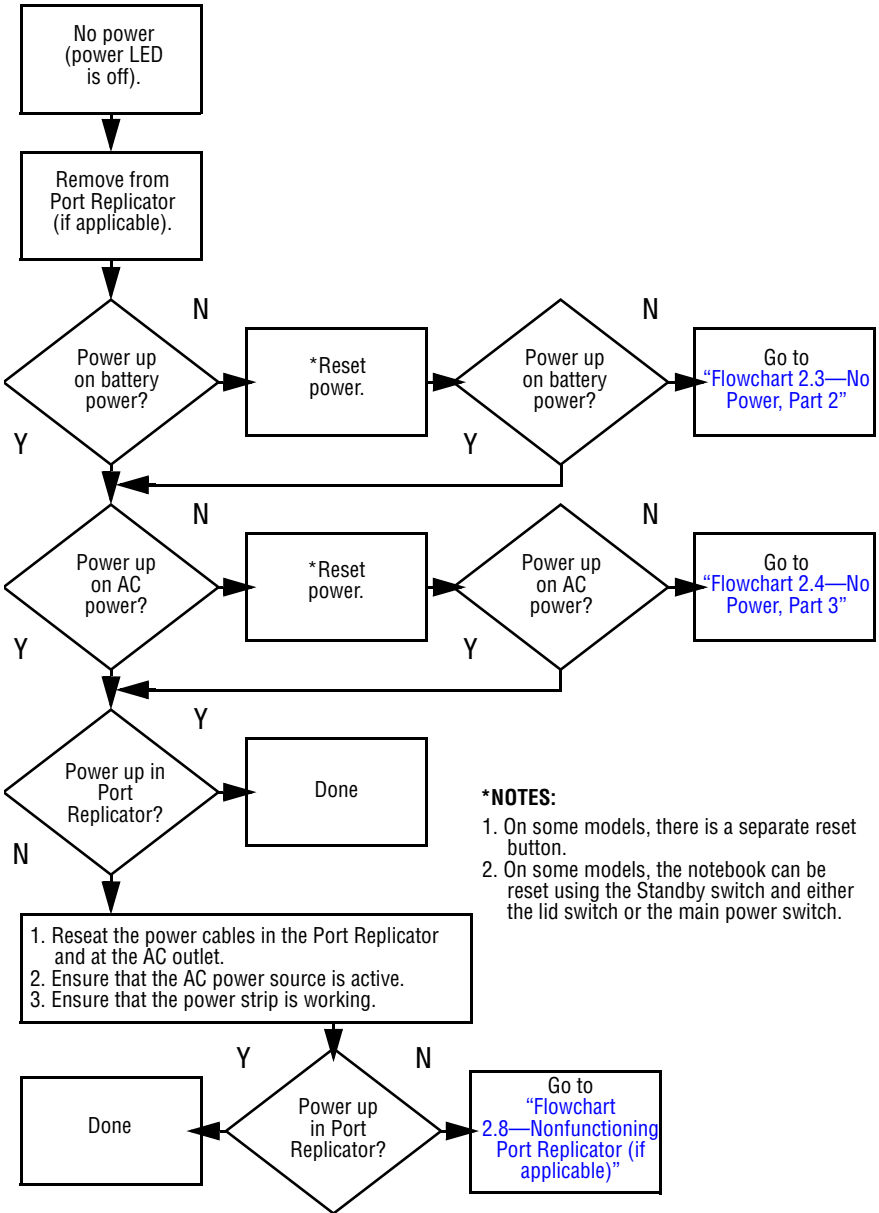
| <b>Flowchart</b> | <b>Description</b>   |
|------------------|--|
| 2.1              | “Flowchart 2.1—Initial Troubleshooting”                        |
| 2.2              | “Flowchart 2.2—No Power, Part 1”                               |
| 2.3              | “Flowchart 2.3—No Power, Part 2”       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

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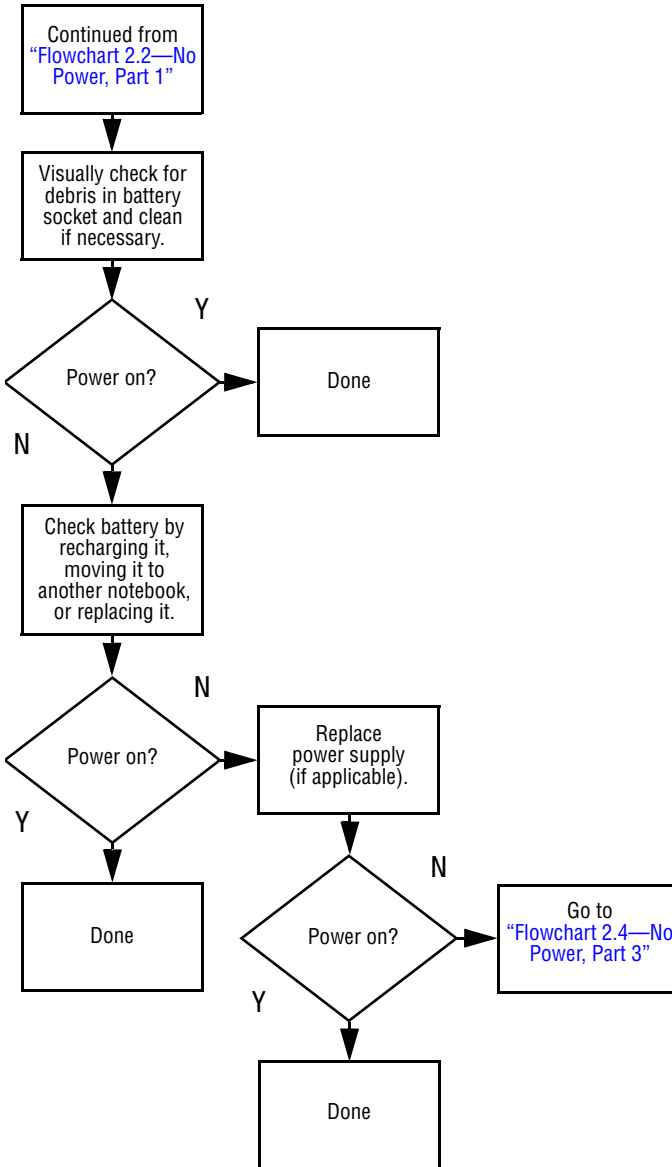
## Flowchart 2.1 – Initial Troubleshooting



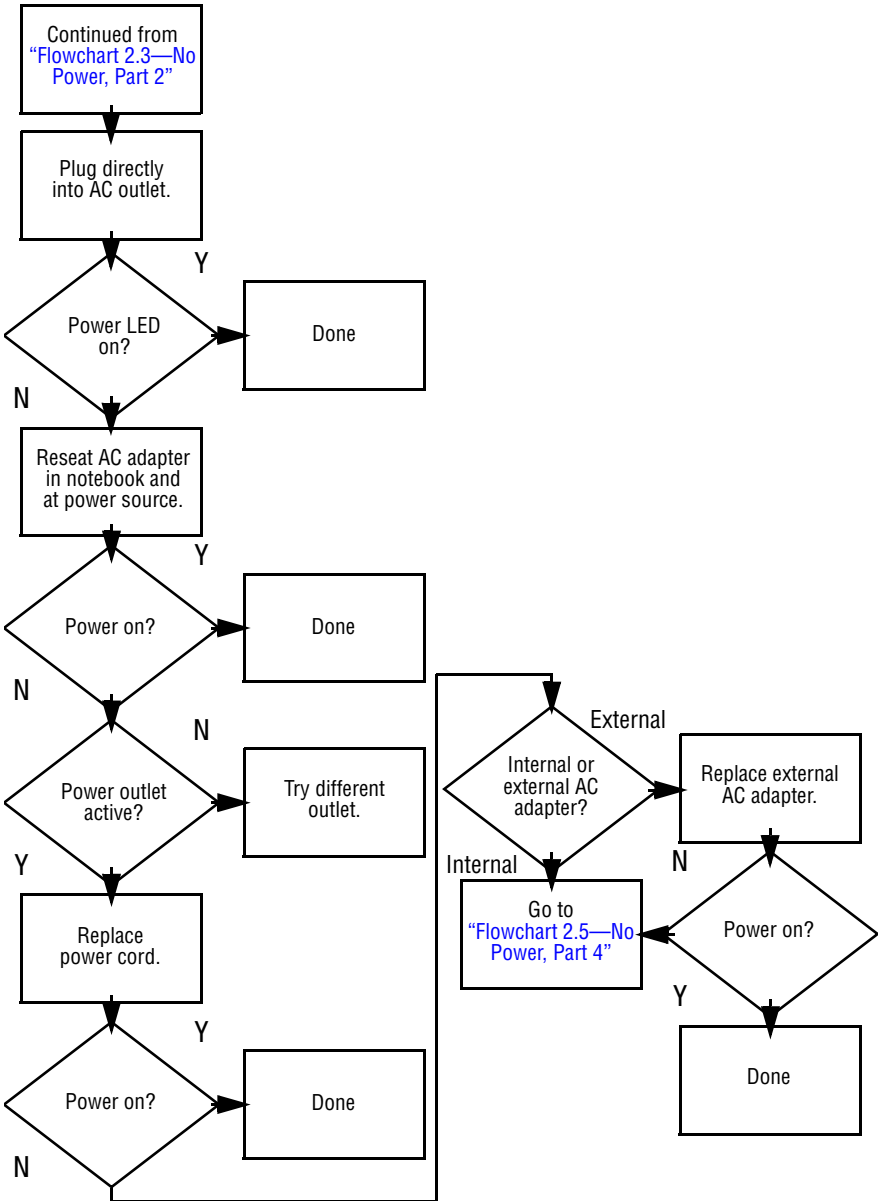
### Flowchart 2.2—No Power, Part 1



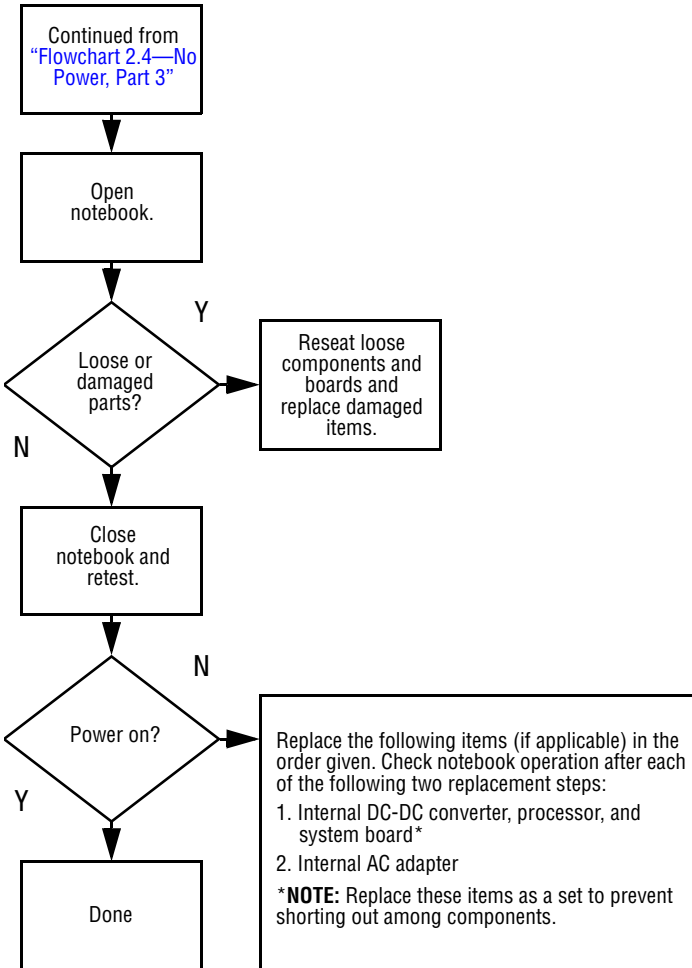
## Flowchart 2.3—No Power, Part 2



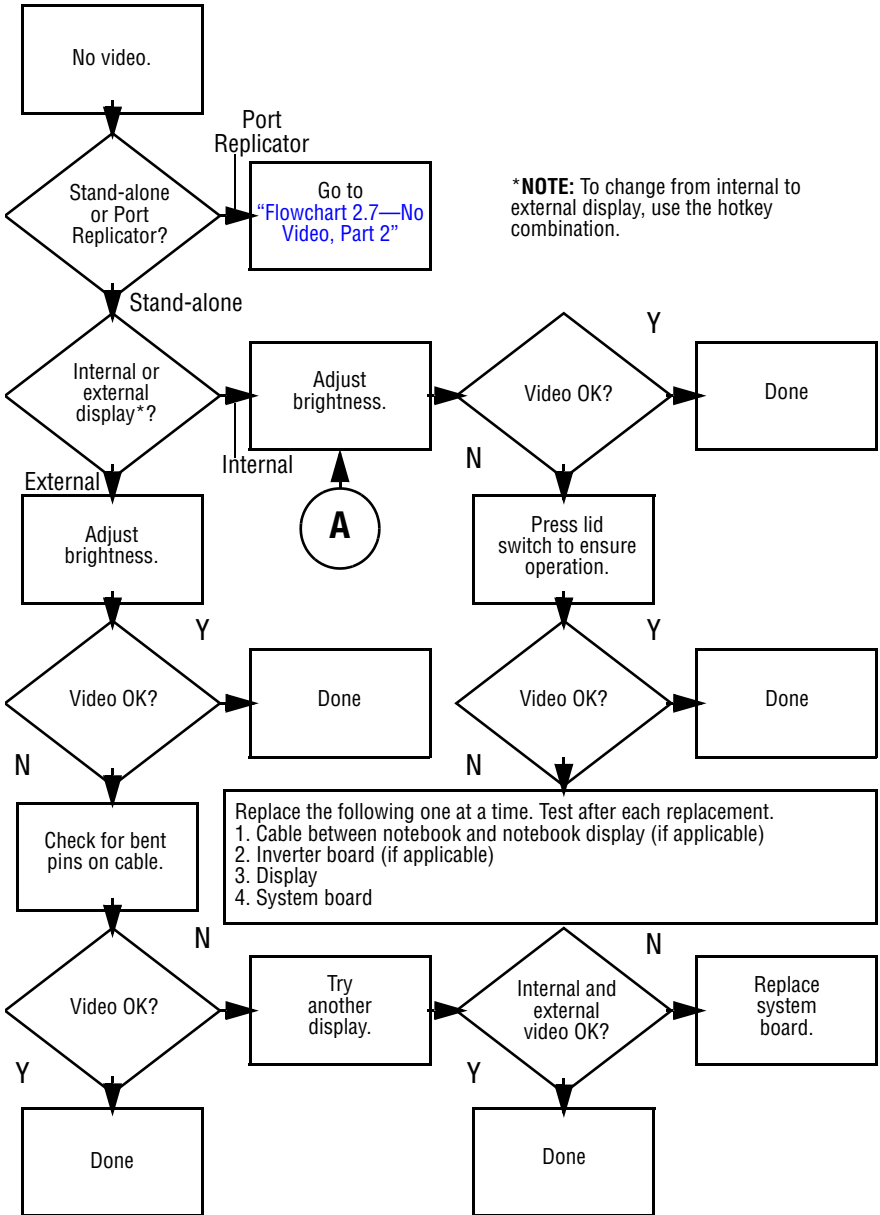
### Flowchart 2.4—No Power, Part 3



## Flowchart 2.5—No Power, Part 4

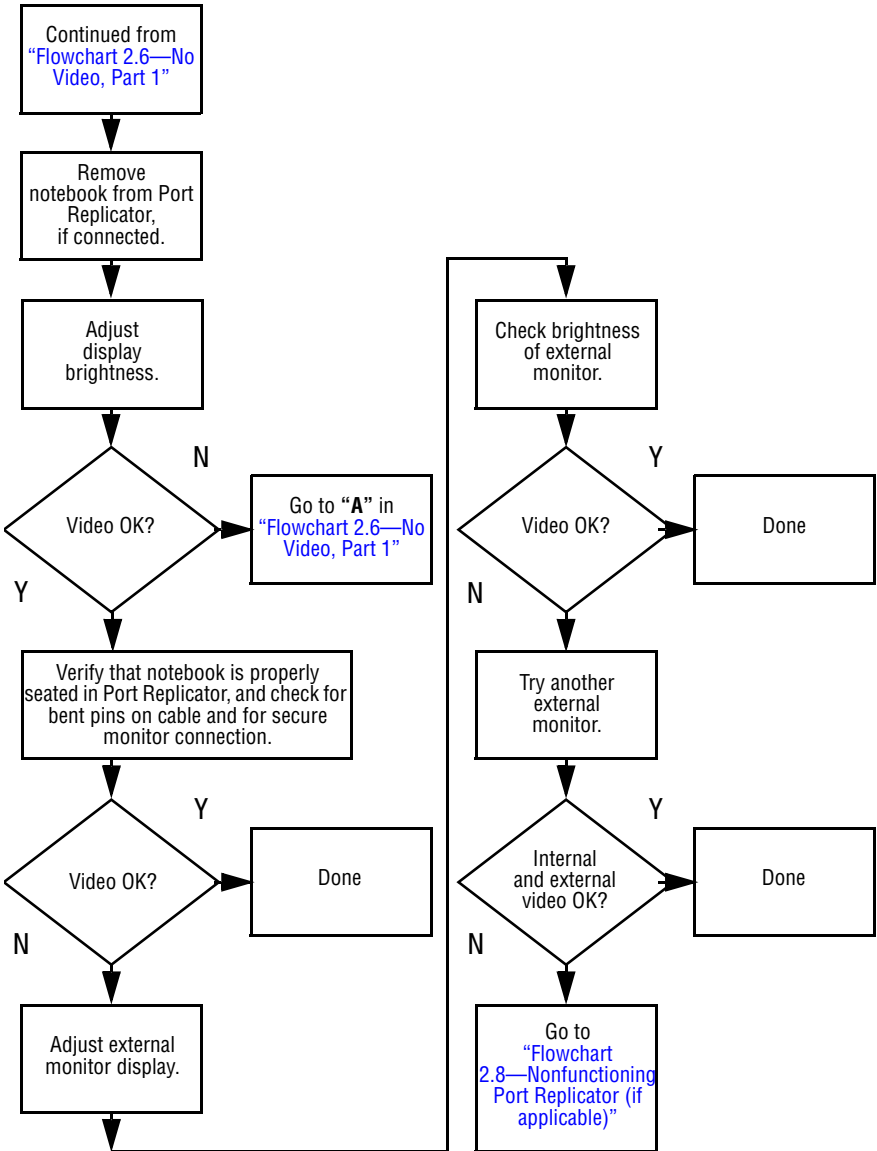


## Flowchart 2.6—No Video, Part 1

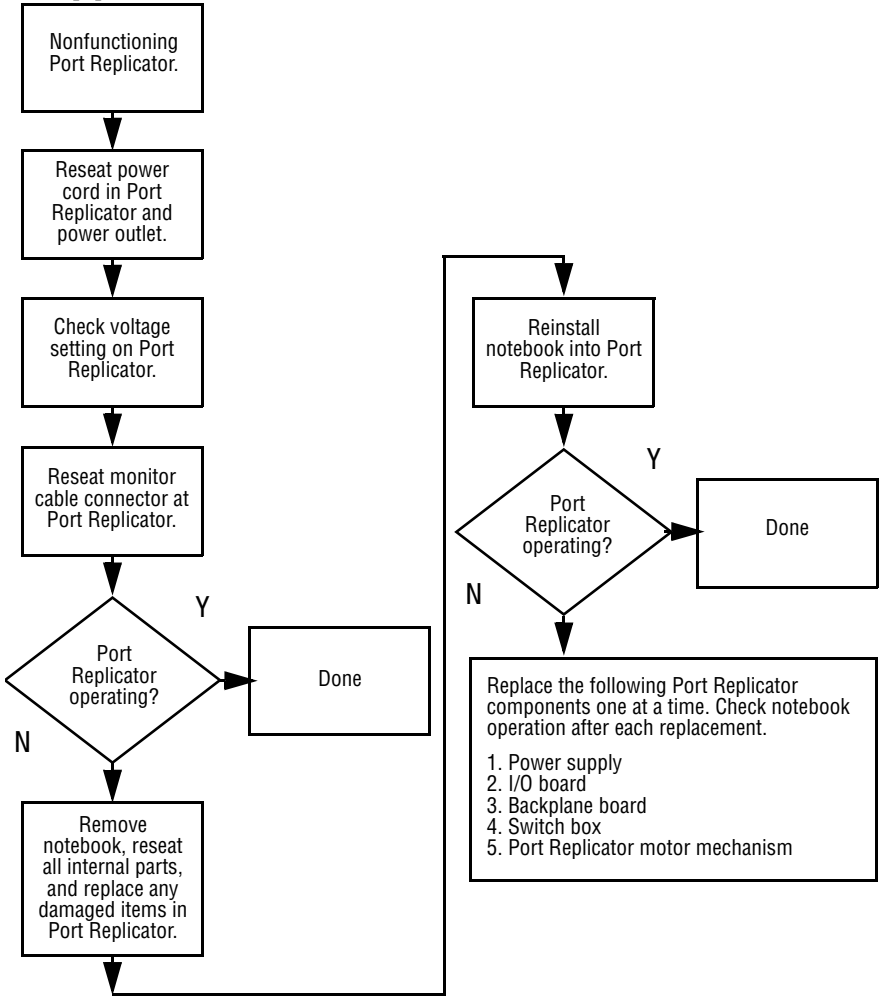




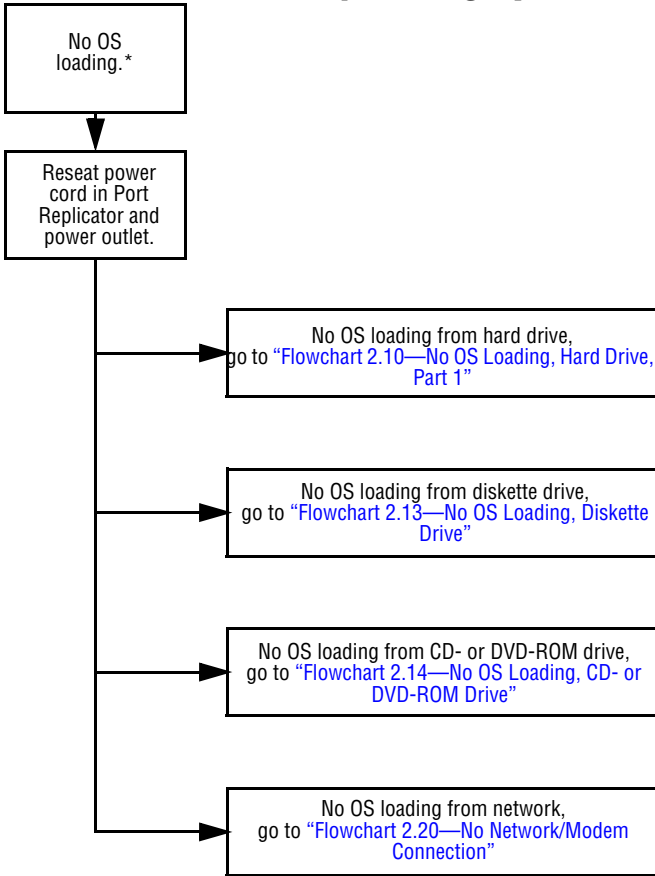
## Flowchart 2.7—No Video, Part 2



## Flowchart 2.8—Nonfunctioning Port Replicator (if applicable)

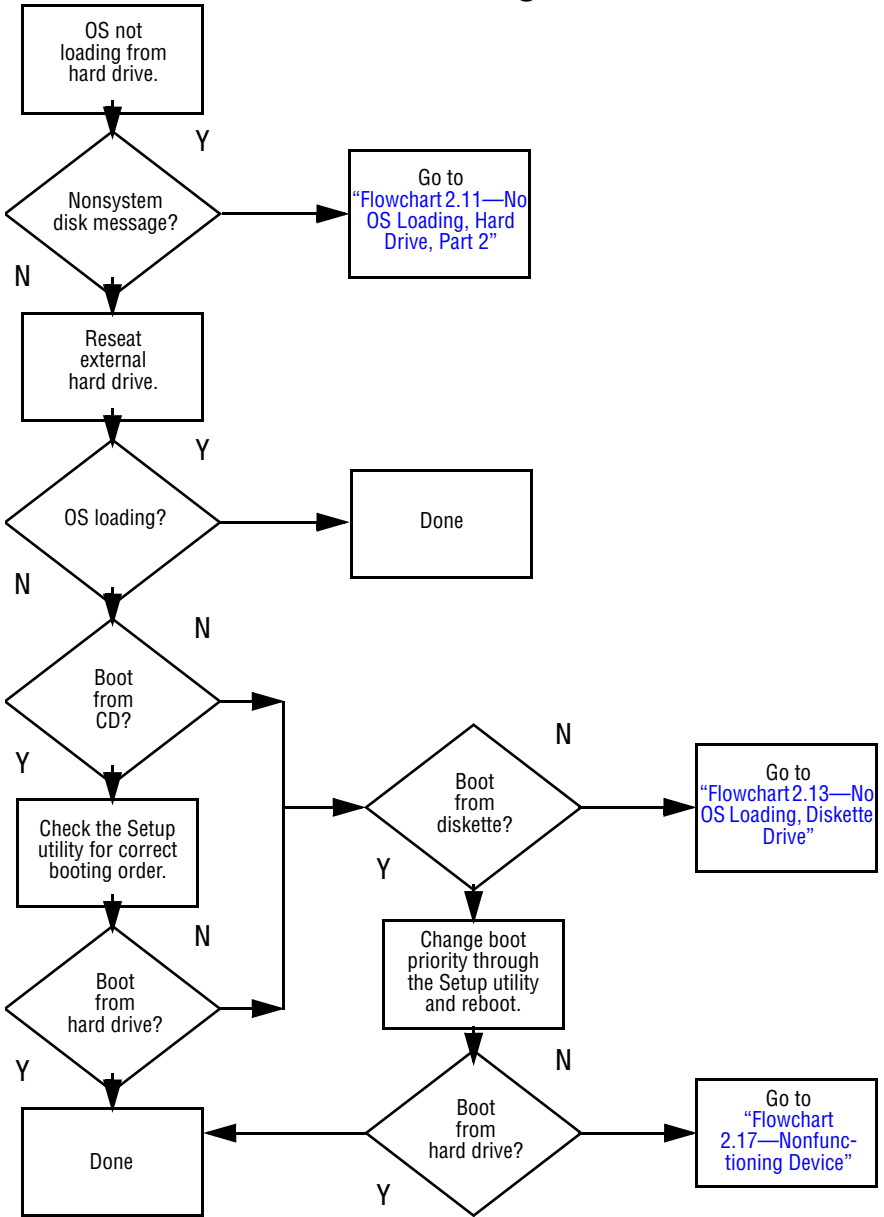


## Flowchart 2.9—No Operating System (OS) Loading

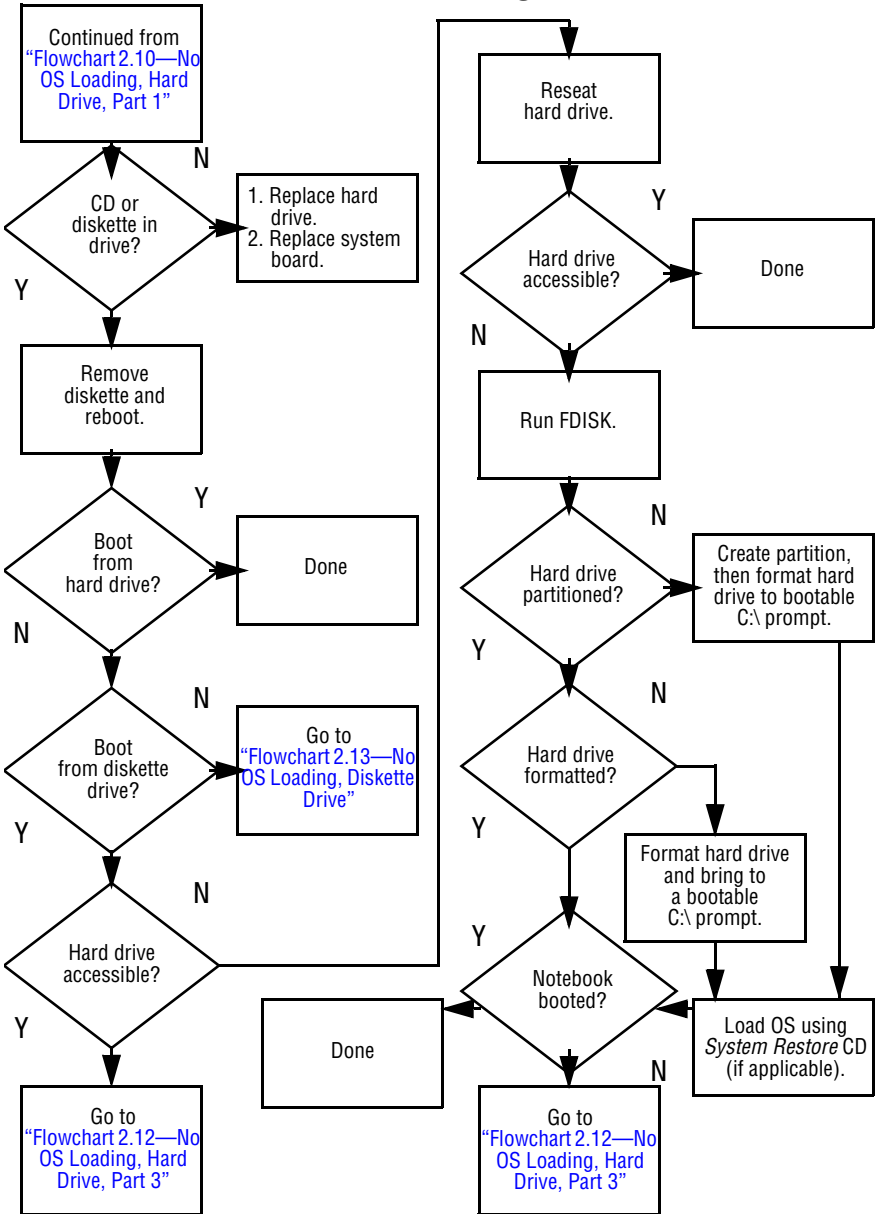


**\*NOTE:** Before beginning to troubleshoot, always check cable connections, cable ends, and drives for bent or damaged pins.

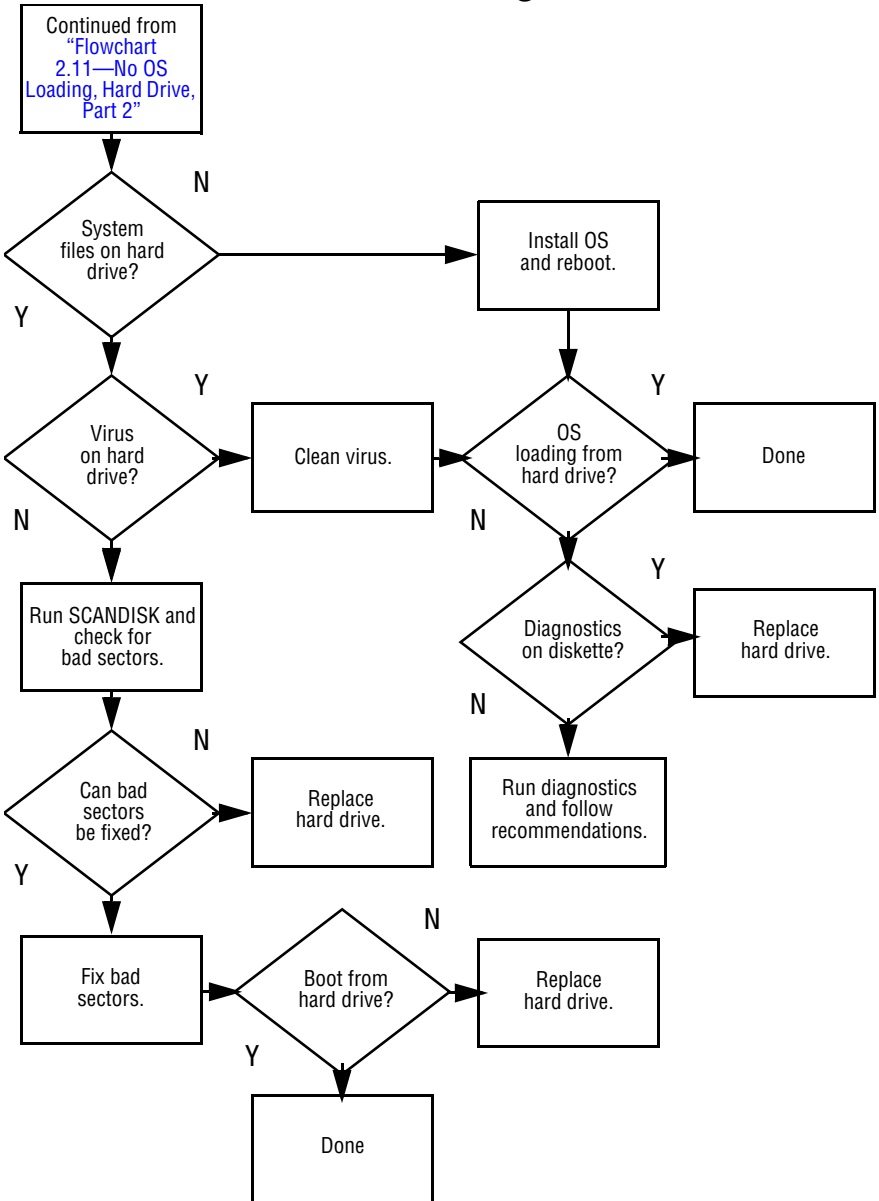
## Flowchart 2.10—No OS Loading, Hard Drive, Part 1



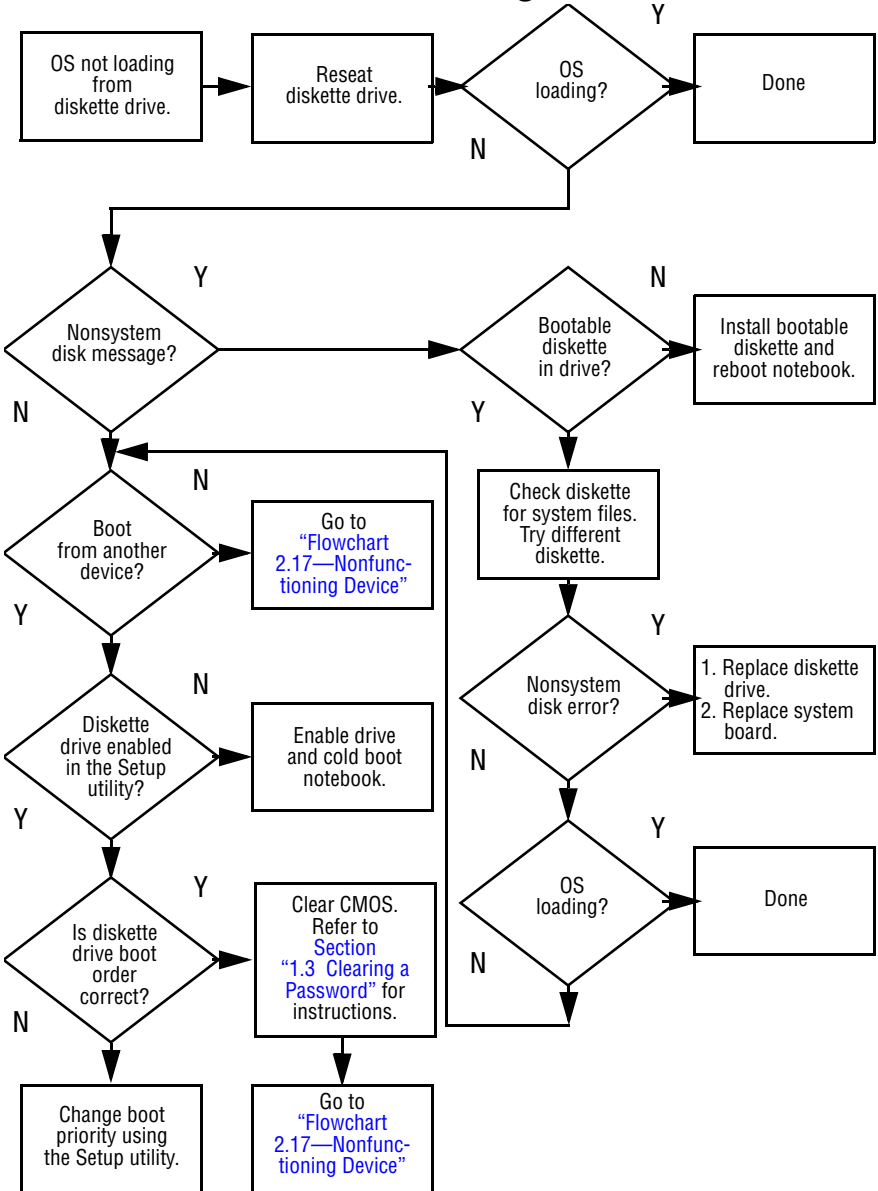
## Flowchart 2.11—No OS Loading, Hard Drive, Part 2



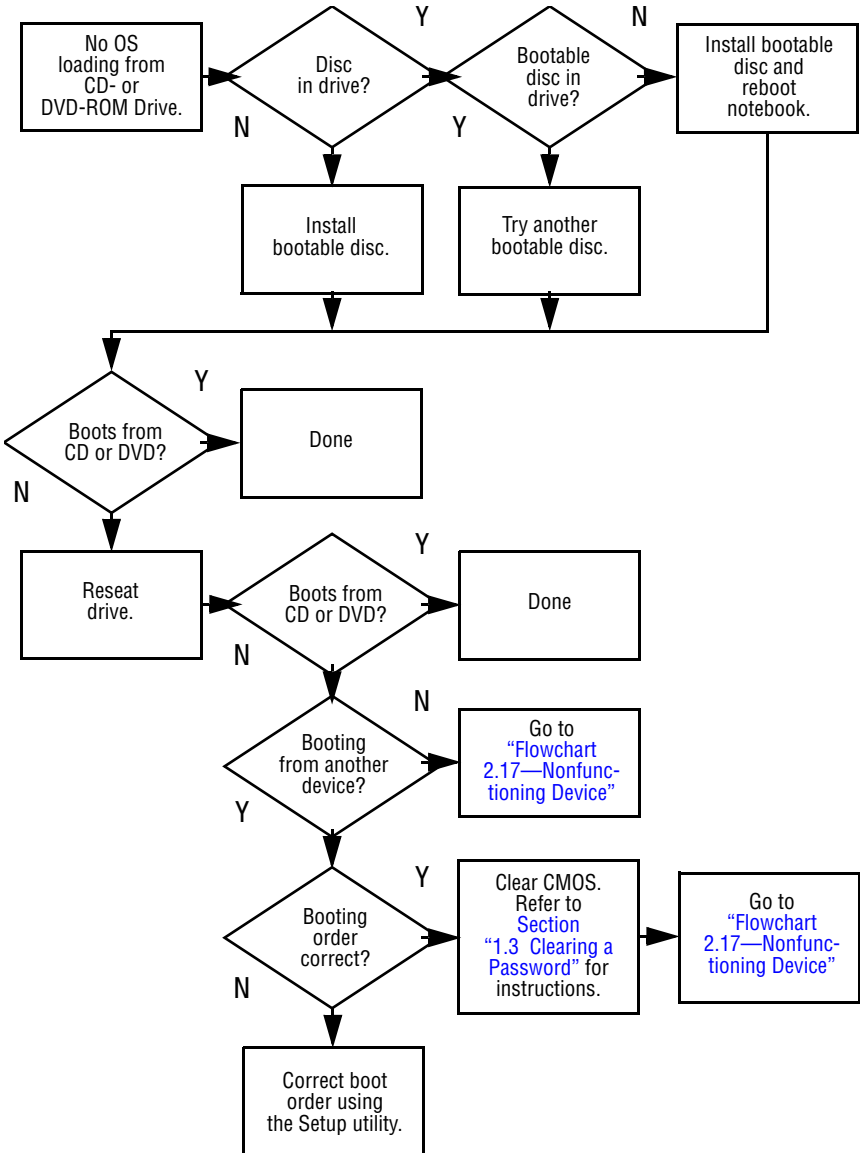
### Flowchart 2.12—No OS Loading, Hard Drive, Part 3



## Flowchart 2.13—No OS Loading, Diskette Drive

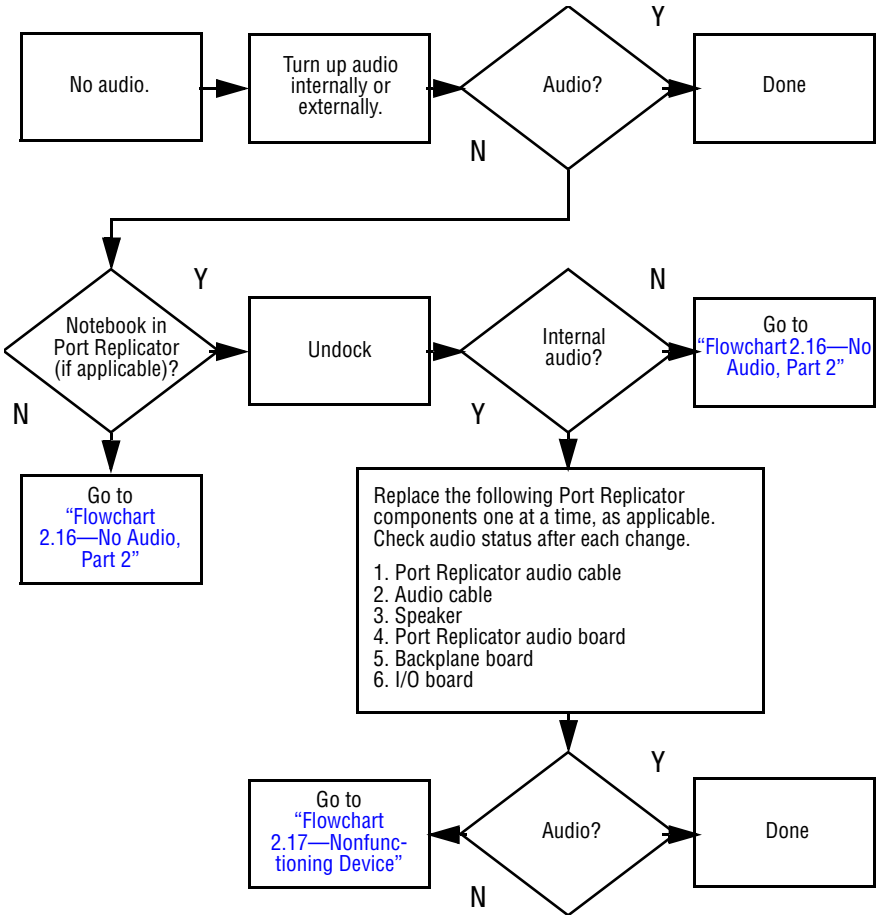


### Flowchart 2.14—No OS Loading, CD- or DVD-ROM Drive

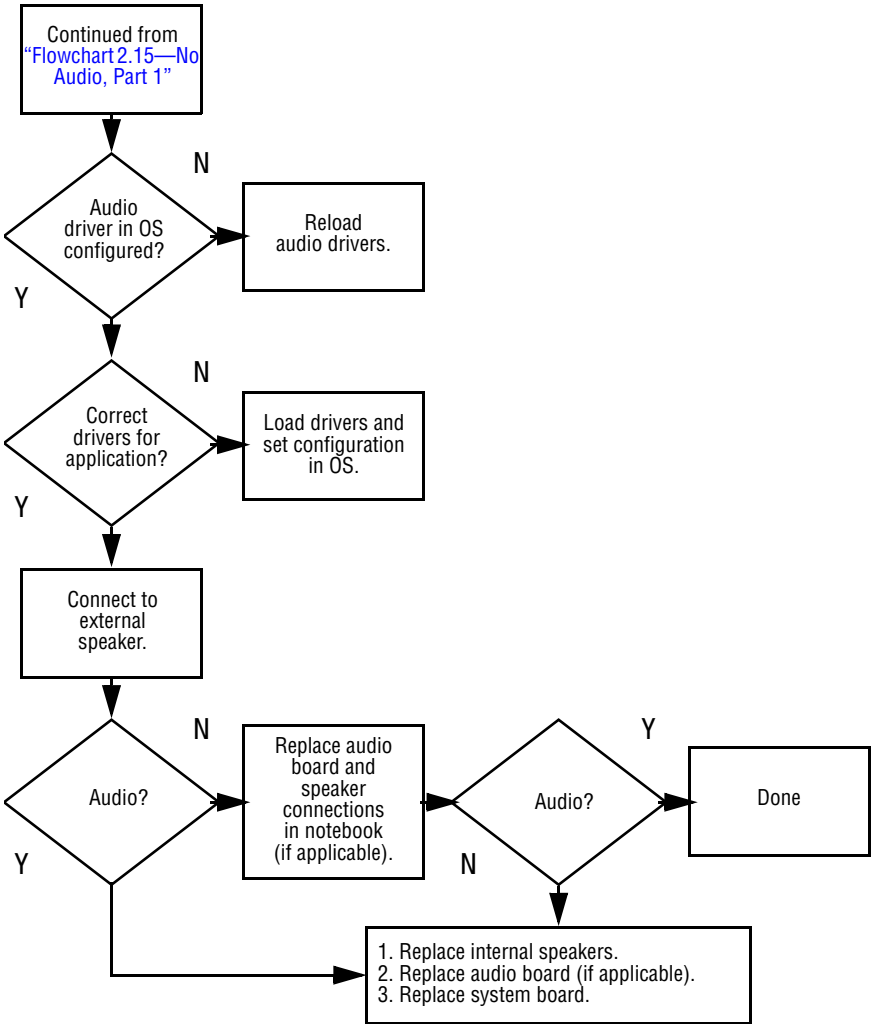




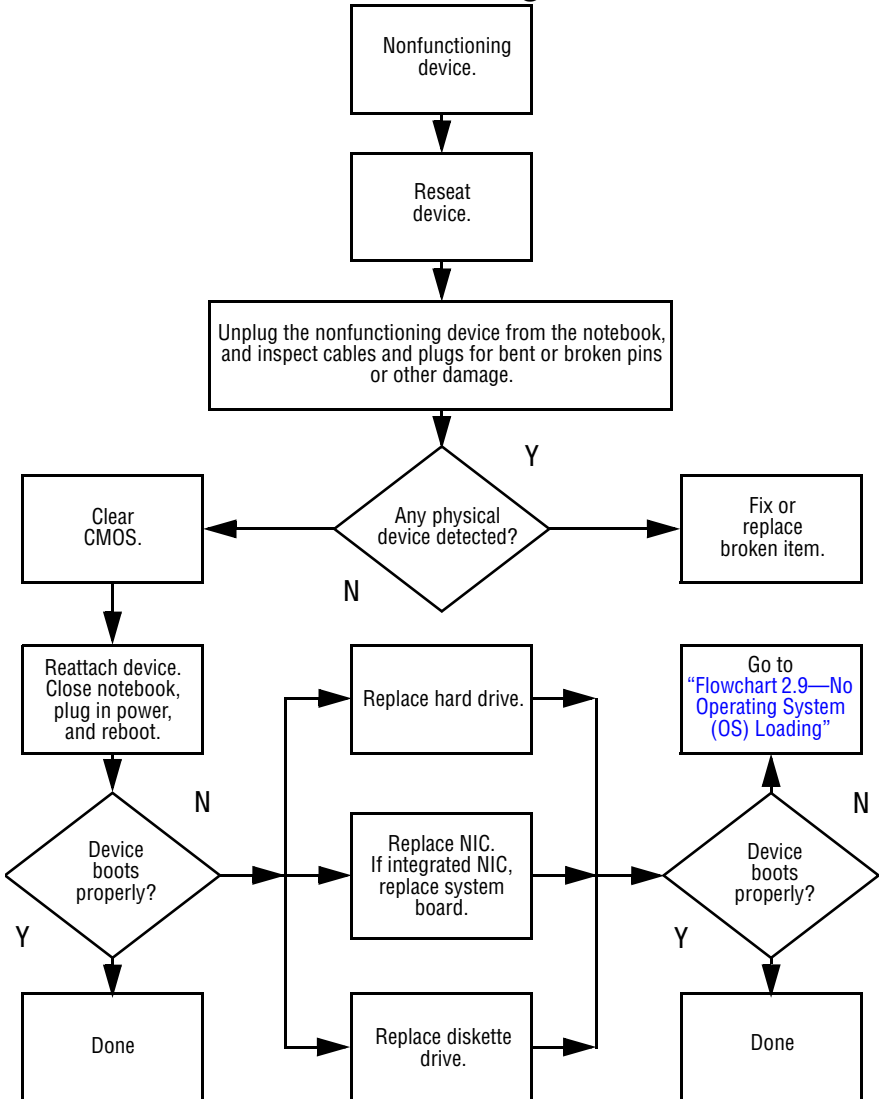
## Flowchart 2.15—No Audio, Part 1



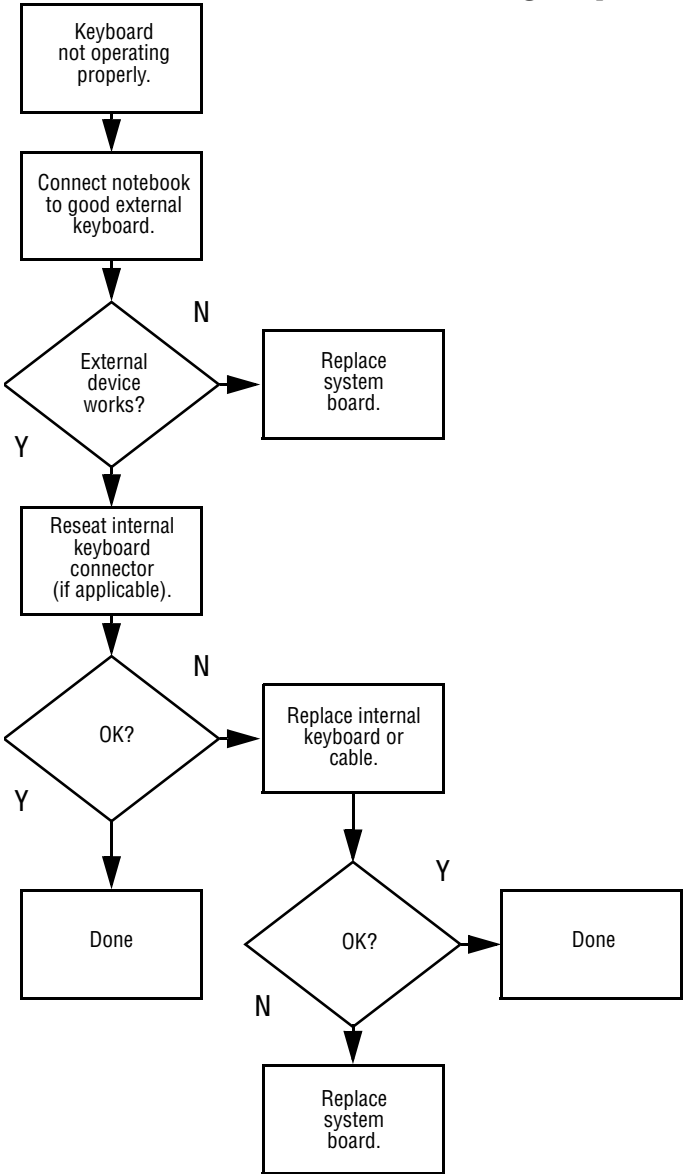
## Flowchart 2.16—No Audio, Part 2



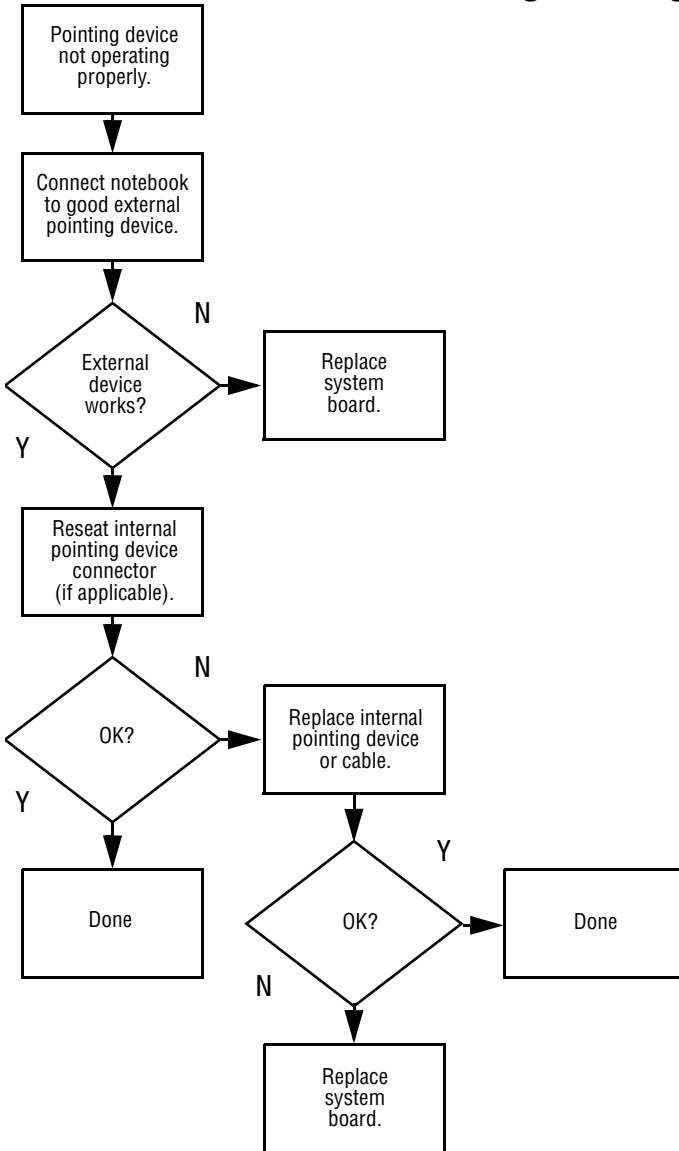
**Flowchart 2.17—Nonfunctioning Device**



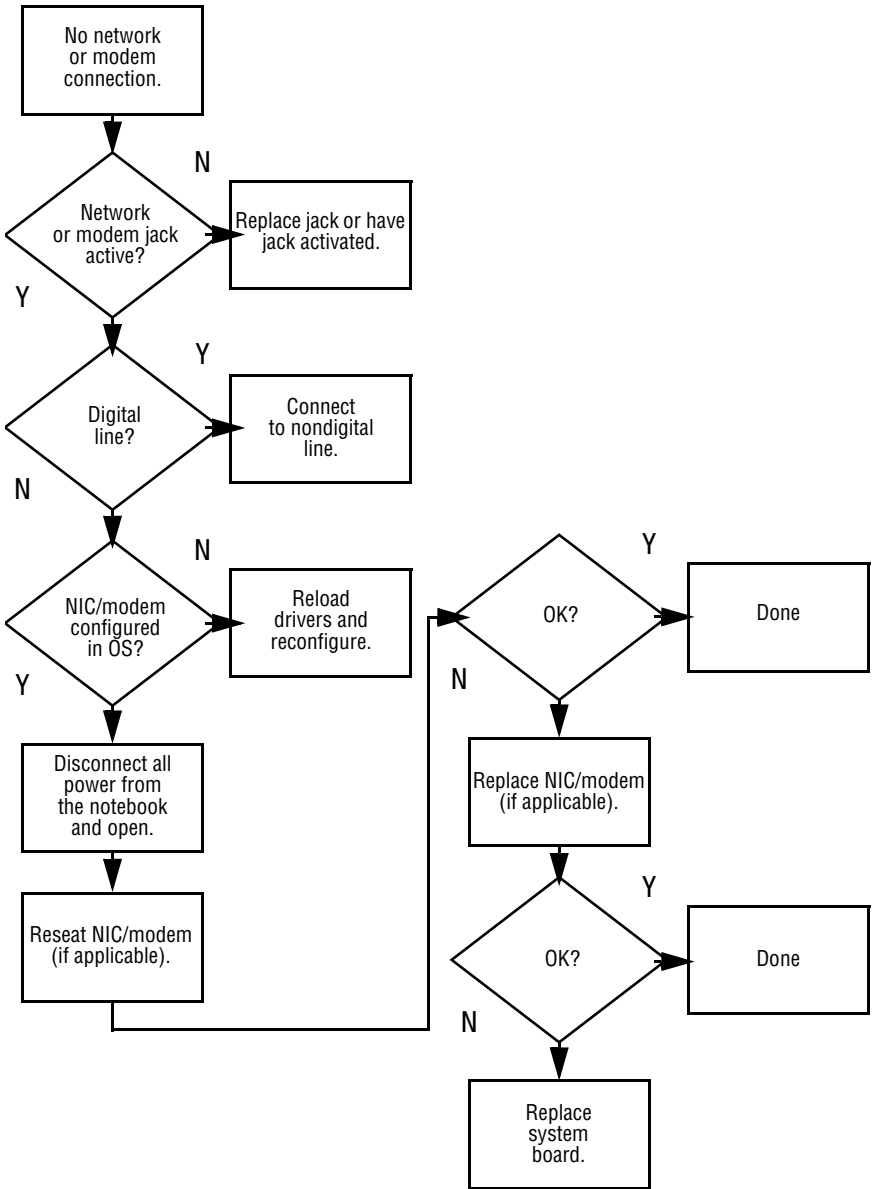
### Flowchart 2.18—Nonfunctioning Keyboard



**Flowchart 2.19—Nonfunctioning Pointing Device**



## Flowchart 2.20—No Network/Modem Connection



# 3

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## Illustrated Parts Catalog

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

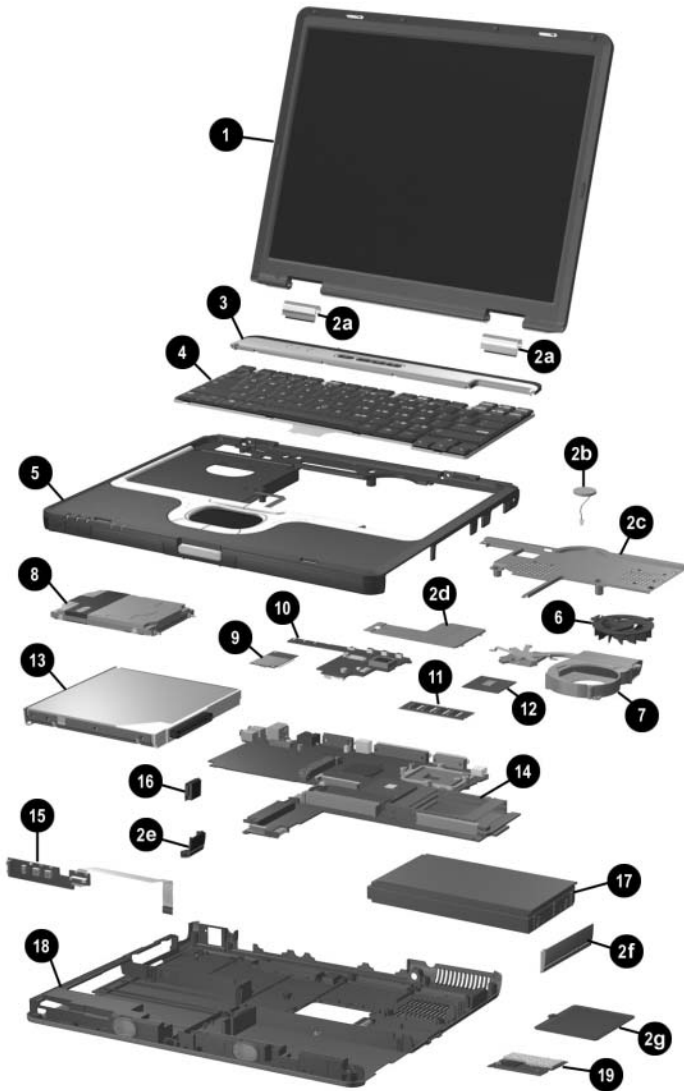
### 3.1 Serial Number Location

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

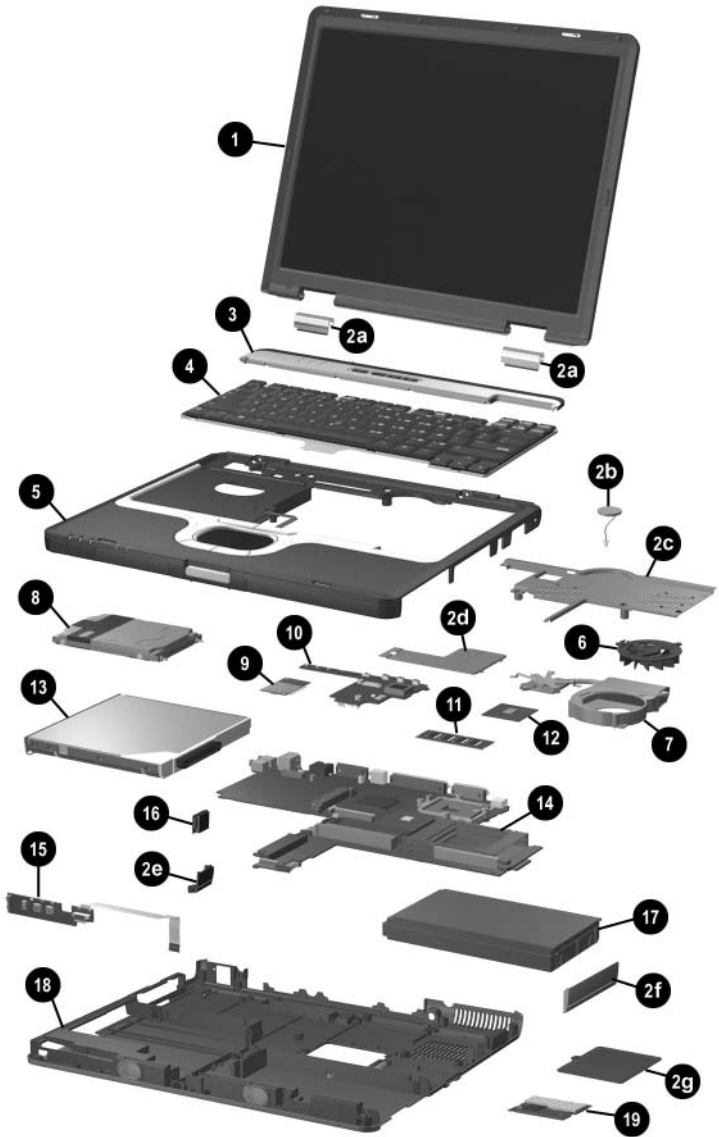


Notebook Major Components



**Table 3-1**  
**Spare Parts: Notebook Major Components**

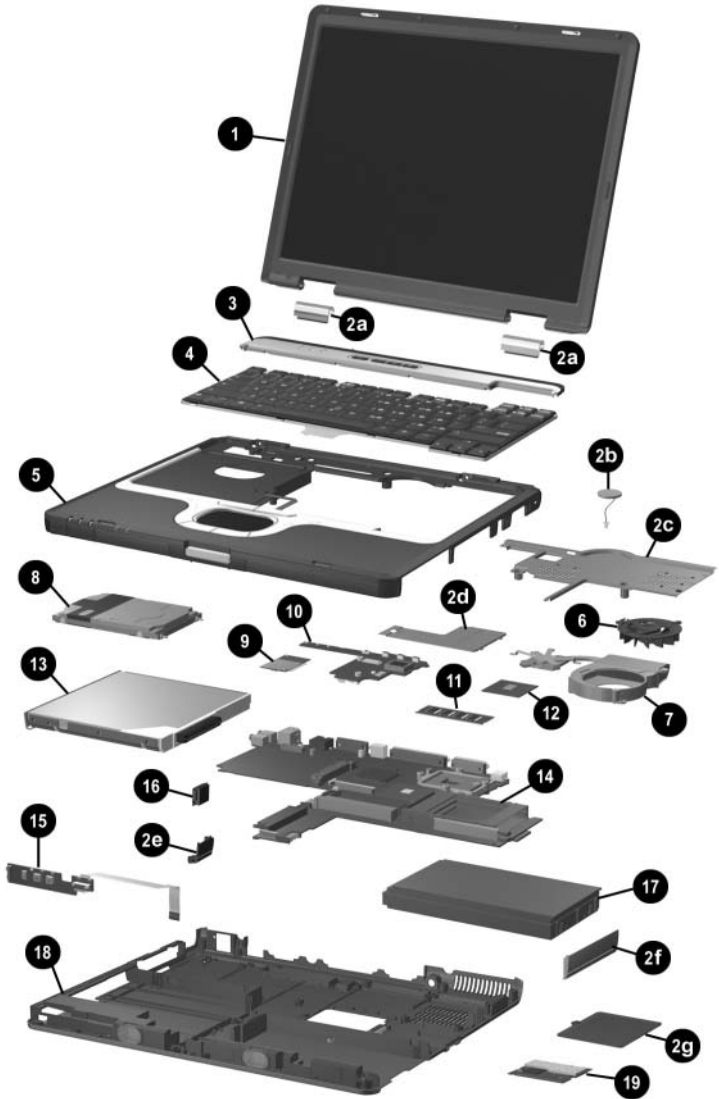
| <b>Item</b> | <b>Description</b>   | <b>Spare Part Number</b> |
|-------------|--|--------------------------|
| <b>1</b>    | <b>Display assemblies</b>  |                          |
|             | 14.1-inch, TFT, SXGA+  | 344397-001               |
|             | 14.1-inch, TFT, XGA  | 344396-001               |
|             | <b>Miscellaneous Plastics Kit</b> (includes the following components)                                | 344411-001               |
| 2a          | Left and right display hinge covers  |                          |
| 2b          | RTC battery  |                          |
| 2c          | Keyboard plate   |                          |
| 2d          | Memory shield  |                          |
| 2e          | Bluetooth cover  |                          |
| 2f          | Battery bezel  |                          |
| 2g          | Mini PCI compartment cover<br>not illustrated:<br>Notebook feet (4)<br>PC Card slot space savers (2) |                          |
| <b>3</b>    | <b>Switch cover</b>  | 344400-001               |
| <b>4</b>    | <b>Keyboards</b> (include pointing stick)  |                          |
|             | Brazil   | 344391-201               |
|             | Czech Republic   | 344391-221               |
|             | Denmark  | 344391-081               |
|             | European   | 344391-A41               |
|             | France   | 344391-051               |
|             | French   | 344391-121               |
|             | Canada   |                          |
|             | Germany  | 344391-041               |
|             | Greece   | 341520-151               |
|             | Greece - Bk  | 378538-151               |
|             | Hungary  | 344391-211               |
|             | Iceland  | 344391-DD1               |
|             | India  | 344391-D61               |
|             | International  | 344391-B31               |
|             | Israel   | 344391-BB1               |
|             | Italy  | 344391-061               |
|             | Japan  | 344391-291               |
|             | Korea  | 344391-AD1               |
|             | Latin America  | 344391-161               |
|             | Norway   | 344391-091               |
|             | Portugal   | 344391-131               |
|             | Russia   | 344391-251               |
|             | Saudi Arabia   | 344391-171               |
|             | Slovenia   | 344391-BA1               |
|             | Spain  | 344391-071               |
|             | Sweden/Finland   | 344391-B71               |
|             | Switzerland  | 344391-BG1               |
|             | Taiwan   | 344391-AB1               |
|             | Thailand   | 344391-281               |
|             | Turkey   | 344391-141               |
|             | United Kingdom   | 344391-031               |
|             | United States  | 344391-001               |



Notebook Major Components

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

| <b>Item</b> | <b>Description</b>                          | <b>Spare Part Number</b> |
|-------------|---|--------------------------|
| 5           | <b>Top cover</b> (includes TouchPad)        | 344398-001               |
| 6           | <b>Fan assembly</b>                         | 345065-001               |
| 7           | <b>Heat sink</b>                            | 344410-001               |
| 8           | <b>Hard drives</b>                          |                          |
|             | 80-GB (5400-rpm)                            | 344407-001               |
|             | 60-GB (7200-rpm)                            | 365438-001               |
|             | 60-GB (5400-rpm)                            | 344406-001               |
|             | 40-GB (5400-rpm)                            | 344405-001               |
|             | 30-GB (4200-rpm)                            | 344404-001               |
| 9           | <b>Modem board</b>                          | 325521-001               |
| 10          | <b>Button board</b>                         | 346883-001               |
| 11          | <b>Memory expansion boards, 333-MHz</b>     |                          |
|             | 1024-MB DDR                                 | 336579-001               |
|             | 512-MB DDR                                  | 336578-001               |
|             | 256-MB DDR                                  | 336577-001               |
| 12          | <b>Processors</b>                           |                          |
|             | Intel Pentium M (Banias) processor, 1.7-GHz | 340165-001               |
|             | Intel Pentium M (Banias) processor, 1.6-GHz | 319777-001               |
|             | Intel Pentium M (Banias) processor, 1.5-GHz | 347253-001               |
|             | Intel Pentium M (Banias) processor, 1.4-GHz | 319775-001               |
|             | Intel Pentium M (Dothan) processor, 1.5 GHz | 359636-001               |
|             | Intel Pentium M (Dothan) processor, 1.6 GHz | 356596-001               |
|             | Intel Pentium M (Dothan) processor, 1.7 GHz | 356597-001               |
|             | Intel Pentium M (Dothan) processor, 1.8 GHz | 345857-001               |
|             | Intel Pentium M (Dothan) processor, 2.0 GHz | 353395-001               |



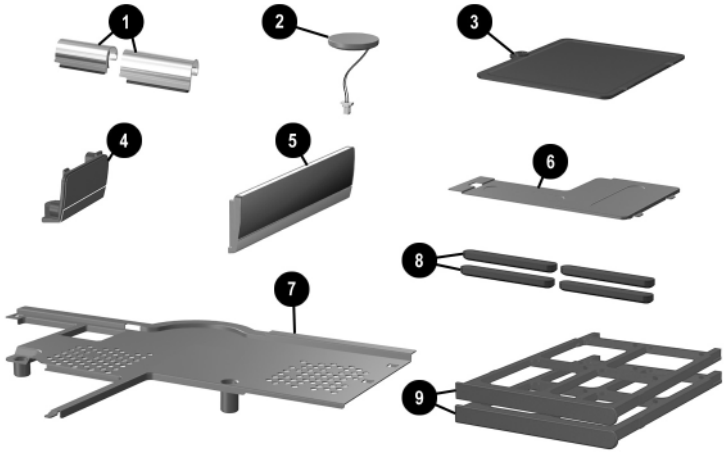
Notebook Major Components

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

| <b>Item</b> | <b>Description</b>                                  | <b>Spare Part Number</b> |
|-------------|---|--------------------------|
| 13          | <b>MultiBay devices</b>                             |                          |
|             | 24X Max CD-ROM drive                                | 100044-001               |
|             | 24X Max DVD/CD-RW combo drive                       | 346789-001               |
|             | 4X Max DVD+RW/R and CD-RW combo drive               | 344256-001               |
|             | 8X Max DVD-ROM drive                                | 173949-001               |
|             | Diskette drive                                      | 241995-001               |
|             | MultiBay battery pack                               | 267747-001               |
| 14          | <b>System boards</b>                                |                          |
|             | Includes 64-MB discrete video memory                | 346885-001               |
|             | Includes 32-MB discrete video memory                | 344401-001               |
| 15          | <b>LED board</b> (includes cable)                   | 346884-001               |
| 16          | <b>Bluetooth wireless communications board</b>      | 348276-001               |
| 17          | <b>Battery packs</b>                                |                          |
|             | Primary battery pack, Li-Ion, 8-cell, 3.6-Ah, 48-Wh | 338669-001               |
|             | Battery pack, 6-cell                                | 346886-001               |
| 18          | <b>Base enclosure</b> (includes speakers)           | 344399-001               |
| 19          | <b>Mini PCI communications boards</b>               |                          |
|             | 802.11a/b/g LAN board                               | 325525-001               |
|             | 802.11b/g LAN board                                 | 325526-001               |
|             | 802.11b/g, W400 modem board (for use in Japan)      | 325526-291               |
|             | 802.11b W500 modem board (for use in Japan)         | 339742-291               |
|             | 802.11b/g modem board (MOW)                         | 368247-001               |
|             | 802.11b/g modem board (ROW)                         | 368248-001               |
|             | <b>Wireless local area network (LAN) cards</b>      |                          |
|             | 802.11b wireless LAN (MOW)                          | 345641-001               |
|             | 802.11b wireless LAN (ROW)                          | 345640-001               |
| *           | <b>Integrated smart card</b>                        | 379336-001               |

\*not illustrated

### 3.3 Miscellaneous Plastics Kit



*Miscellaneous Plastics Kit Components*

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**Table 3-2**  
**Miscellaneous Plastics Kit Components**  
**Spare Part Number 344411-001**

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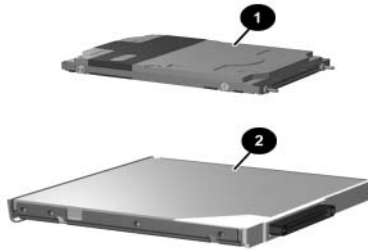
| <b>Item</b> | <b>Description</b>                  |
|-------------|-------------------------------------|
| 1           | Left and right display hinge covers |
| 2           | RTC battery                         |
| 3           | Mini PCI compartment cover          |
| 4           | Bluetooth cover                     |
| 5           | Battery bezel                       |
| 6           | Memory shield                       |
| 7           | Keyboard plate                      |
| 8           | Notebook feet (4)                   |
| 9           | PC Card slot space savers (2)       |
| *           | Integrated smart card bezel         |

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\*not illustrated

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### 3.4 Mass Storage Devices



**Table 3-3  
Mass Storage Devices  
Spare Part Number Information**

| Item | Description   | Spare Part Number |
|------|---|-------------------|
| 1    | <b>Hard drives</b> (include hard drive bezel and frame) |                   |
|      | 80-GB (5400-rpm)  | 344407-001        |
|      | 60-GB (7200-rpm)  | 365438-001        |
|      | 60-GB (5400-rpm)  | 344406-001        |
|      | 40-GB (5400-rpm)  | 344405-001        |
|      | 30-GB (4200-rpm)  | 344404-001        |
| 2    | <b>MultiBay devices</b>                                 |                   |
|      | 24X Max CD-ROM drive                                    | 100044-001        |
|      | 24X Max DVD/CD-RW combo drive                           | 346789-001        |
|      | 4X Max DVD+RW/R and CD-RW combo drive                   | 344256-001        |
|      | 8X Max DVD-ROM Drive                                    | 173949-001        |
|      | Diskette drive  | 241995-001        |
|      | MultiBay battery pack                                   | 267747-001        |



## 3.5 Miscellaneous

**Table 3-4  
Misc**

|   |   |
|---|---|
| <b>Carrying cases</b>   |   |
| Leather, top load, Samsung  | 325817-001  |
| Leather, top load, SG   | 325817-002  |
| Nylon, top load, Samsung  | 325815-001  |
| Nylon, top load, SG   | 325815-002  |
| Nylon, entry level  | 325814-001  |
| <b>Port Replicators</b>   |   |
| Advanced Port Replicator  | 339096-001  |
| Simple Port Replicator  | 339097-001  |
| <b>Trusted Platform Module (TPM)</b>  | 345856-001  |
| <b>Screw Kit</b> (includes the following screws; refer to <a href="#">Appendix C, "Screw Listing"</a> for more information on screw specifications and usage.)  | 344412-001  |
| <ul style="list-style-type: none"> <li>■ Phillips PM3.0×4.0 screw</li> <li>■ Phillips PM3.0×3.5 screw</li> <li>■ Phillips PM2.5×11.0 screw</li> <li>■ Phillips PM2.5×9.0 screw</li> <li>■ Phillips PM2.5×7.0 screw</li> <li>■ Phillips PM2.5×3.5 screw</li> <li>■ Phillips PM2.0×5.0 screw</li> <li>■ Phillips PM2.0×3.0 screw</li> </ul> | <ul style="list-style-type: none"> <li>■ Phillips PM1.5×3.0 screw</li> <li>■ Torx T8M2.5×5.5 screw</li> <li>■ Torx T8M2.5×5.0 screw</li> <li>■ Torx T8M2.5×3.5 flat-head screw</li> <li>■ Torx T5M3.0×4.0 screw</li> <li>■ Hex M2.5×9.0 screw</li> <li>■ Hex M2.0×10.0 alignment pin</li> </ul> |
| <b>Screw Kit</b> (hard drive, retaining)  | 360670-001  |
| <b>USB mouse, carbon</b>  | 164999-001  |

## 3.6 Sequential Part Number Listing

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**Table 3-5**  
**Spare Parts: Sequential Part Number Listing**

---

| <b>Spare Part Number</b> | <b>Description</b>                                  |
|--------------------------|---|
| 100044-001               | 24X Max CD-ROM drive                                |
| 164999-001               | USB mouse, carbon                                   |
| 173949-001               | 8X Max DVD-ROM Drive                                |
| 239704-001               | 65-watt AC adapter                                  |
| 241995-001               | Diskette drive                                      |
| 246959-001               | 3-wire power cord - United States                   |
| 246959-011               | 3-wire power cord - Australia                       |
| 246959-021               | 3-wire power cord - Europe, Middle East, Africa     |
| 246959-031               | 3-wire power cord - United Kingdom                  |
| 246959-061               | 3-wire power cord - Italy                           |
| 246959-081               | 3-wire power cord - Denmark                         |
| 246959-201               | 3-wire power cord - Brazil                          |
| 246959-291               | 3-wire power cord - Japan                           |
| 246959-AD1               | 3-wire power cord - Korea                           |
| 246959-AG1               | 3-wire power cord - Switzerland                     |
| 246959-BB1               | 3-wire power cord - Israel                          |
| 267747-001               | MultiBay battery pack                               |
| 319775-001               | Intel Pentium M (Banias) processor, 1.4-GHz         |
| 319777-001               | Intel Pentium M (Banias) processor, 1.6-GHz         |
| 325521-001               | Modem board   |
| 325525-001               | 802.11a/b/g LAN board mini PCI communications board |

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**Table 3-5**  
**Spare Parts: Sequential Part Number Listing (*Continued*)**

| <b>Spare Part Number</b> | <b>Description</b>   |
|--------------------------|--|
| 325526-001               | 802.11b/g LAN board mini PCI communications board                            |
| 325526-291               | 802.11b/g, W400 modem board (for use in Japan) mini PCI communications board |
| 325814-001               | Nylon, entry level   |
| 325815-001               | Nylon, top load, Samsung   |
| 325815-002               | Nylon, top load, SG  |
| 325817-001               | Leather, top load, Samsung   |
| 325817-002               | Leather, top load, SG  |
| 336577-001               | Memory expansion board, 333 MHz, 256-MB DDR                                  |
| 336578-001               | Memory expansion board, 333 MHz, 512-MB DDR                                  |
| 336579-001               | Memory expansion board, 333 MHz, 1024-MB DDR                                 |
| 338669-001               | Primary battery pack, Li-Ion, 8-cell, 3.6-Ah, 48-Wh                          |
| 339096-001               | Advanced Port Replicator   |
| 339097-001               | Simple Port Replicator   |
| 339742-291               | 802.11b W500 modem board (for use in Japan) mini PCI communications board    |
| 340165-001               | Intel Pentium M (Banias) processor, 1.7-GHz                                  |
| 341520-151               | Keyboard (including pointing stick) - Greece                                 |
| 344256-001               | 4X Max DVD+RW/R and CD-RW combo drive  |
| 344391-001               | Keyboard (including pointing stick) - United States                          |
| 344391-031               | Keyboard (including pointing stick) - United Kingdom                         |
| 344391-041               | Keyboard (including pointing stick) - Germany                                |
| 344391-051               | Keyboard (including pointing stick) - France                                 |

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**Table 3-5**  
**Spare Parts: Sequential Part Number Listing (*Continued*)**

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| <b>Spare Part Number</b> | <b>Description</b>                                   |
|--------------------------|--|
| 344391-061               | Keyboard (including pointing stick) - Italy          |
| 344391-071               | Keyboard (including pointing stick) - Spain          |
| 344391-081               | Keyboard (including pointing stick) - Denmark        |
| 344391-091               | Keyboard (including pointing stick) - Norway         |
| 344391-121               | Keyboard (including pointing stick) - French Canada  |
| 344391-131               | Keyboard (including pointing stick) - Portugal       |
| 344391-141               | Keyboard (including pointing stick) - Turkey         |
| 344391-161               | Keyboard (including pointing stick) - Latin America  |
| 344391-171               | Keyboard (including pointing stick) - Saudi Arabia   |
| 344391-201               | Keyboard (including pointing stick) - Brazil         |
| 344391-211               | Keyboard (including pointing stick) - Hungary        |
| 344391-221               | Keyboard (including pointing stick) - Czech Republic |
| 344391-251               | Keyboard (including pointing stick) - Russia         |
| 344391-281               | Keyboard (including pointing stick) - Thailand       |
| 344391-291               | Keyboard (including pointing stick) - Japan          |
| 344391-A41               | Keyboard (including pointing stick) - European       |
| 344391-AB1               | Keyboard (including pointing stick) - Taiwan         |
| 344391-AD1               | Keyboard (including pointing stick) - Korea          |
| 344391-B31               | Keyboard (including pointing stick) - International  |
| 344391-B71               | Keyboard (including pointing stick) - Sweden/Finland |
| 344391-BA1               | Keyboard (including pointing stick) - Slovenia       |
| 344391-BB1               | Keyboard (including pointing stick) - Israel         |
| 344391-BG1               | Keyboard (including pointing stick) - Switzerland    |

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**Table 3-5**  
**Spare Parts: Sequential Part Number Listing (*Continued*)**

| <b>Spare Part Number</b> | <b>Description</b>                                     |
|--------------------------|--|
| 344391-D61               | Keyboard (including pointing stick) - India            |
| 344391-DD1               | Keyboard (including pointing stick) - Iceland          |
| 344396-001               | Display assembly - 14.1-inch, TFT, XGA                 |
| 344397-001               | Display assembly - 14.1-inch, TFT, SXGA+               |
| 344398-001               | Top cover (includes TouchPad)                          |
| 344399-001               | Base enclosure (includes speakers)                     |
| 344400-001               | Switch cover   |
| 344401-001               | System board (includes 64-MB discrete video memory)    |
| 344404-001               | 30-GB (4200-rpm) hard drive (includes bezel and frame) |
| 344405-001               | 40-GB (5400-rpm) hard drive (includes bezel and frame) |
| 344406-001               | 60-GB (5400-rpm) hard drive (includes bezel and frame) |
| 344407-001               | 80-GB (5400-rpm) hard drive (includes bezel and frame) |
| 344410-001               | Heat sink  |
| 344411-001               | Misc Plastics Kit                                      |
| 344412-001               | Misc Screw Kit   |
| 345065-001               | Fan assembly   |
| 345640-001               | 802.11b wireless LAN (ROW) Wireless LAN card           |
| 345641-001               | 802.11b wireless LAN (MOW) Wireless LAN card           |
| 345856-001               | Trusted Platform Module (TPM)                          |
| 345857-001               | Intel Pentium M (Dothan) processor, 1.8 GHz            |
| 346789-001               | 24X Max DVD/CD-RW combo drive                          |
| 346883-001               | Button board   |
| 346884-001               | LED board (includes cable)                             |

---

**Table 3-5**  
**Spare Parts: Sequential Part Number Listing (*Continued*)**

---

| <b>Spare Part Number</b> | <b>Description</b>  |
|--------------------------|---|
| 346885-001               | System board (includes 32-MB discrete video memory)       |
| 346886-001               | Battery pack, 6-cell                                      |
| 347253-001               | Intel Pentium M (Banias) processor, 1.5-GHz               |
| 348276-001               | Bluetooth wireless communications board                   |
| 353395-001               | Intel Pentium M (Dothan) processor, 2.0 GHz               |
| 356596-001               | Intel Pentium M (Dothan) processor, 1.6 GHz               |
| 356597-001               | Intel Pentium M (Dothan) processor, 1.7 GHz               |
| 359636-001               | Intel Pentium M (Dothan) processor, 1.5 GHz               |
| 360670-001               | Screw Kit (hard drive, retaining)                         |
| 365438-001               | 60-GB (7200-rpm) hard drive (includes bezel and frame)    |
| 368247-001               | 802.11b/g modem board (MOW) mini PCI communications board |
| 368248-001               | 802.11b/g modem board (ROW) mini PCI communications board |
| 378538-151               | Keyboard (including pointing stick) - Greece Bk           |
| 379336-001               | Integrated smart card                                     |

---

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## Removal and Replacement Preliminaries

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

### 4.1 Tools Required

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

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

## 4.2 Service Considerations

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



---

As you remove each subassembly from the 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, a CD-ROM 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 volts.

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 fifty-seven screws and standoffs, in fifteen different sizes, that must be removed, replaced, and/or loosened when servicing the notebook. Make special 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**

| <b>Section</b> | <b>Description</b>                      | <b># of Screws Removed</b>       |
|----------------|---|----------------------------------|
| 5.3            | Preparing the notebook for disassembly  |                                  |
|                | Battery pack                            | 0                                |
|                | Hard drive                              | 2 to remove,<br>6 to disassemble |
| 5.4            | Notebook feet                           | 0                                |
| 5.5            | Mini PCI communications board           | 1                                |
| 5.6            | MultiBay device                         | 0                                |
| 5.7            | Bluetooth wireless communications board | 3                                |
| 5.8            | Integrated smart card                   | 0                                |
| 5.9            | Keyboard                                | 2                                |
| 5.10           | Modem board                             | 2                                |
| 5.11           | Memory expansion board                  | 0                                |
| 5.12           | Switch cover                            | 2                                |
| 5.13           | Keyboard plate                          | 0                                |
| 5.14           | Security Module (TPM)                   | 1                                |
| 5.15           | Fan assembly                            | 5                                |
| 5.16           | Heat sink                               | 4                                |
| 5.17           | Processor                               | 0                                |
| 5.18           | Display assembly                        | 4                                |
| 5.19           | Top cover                               | 16                               |
| 5.20           | RTC battery                             | 0                                |

---

**Disassembly Sequence Chart (*Continued*)**

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| <b>Section</b> | <b>Description</b> | <b># of Screws<br/>Removed</b> |
|----------------|--------------------|--------------------------------|
| 5.21           | LED board          | 0                              |
| 5.22           | Button board       | 2                              |
| 5.23           | System board       | 5 screws,<br>2 standoffs       |

---

## 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.
4. Remove the battery pack by following these steps:

---

### Spare Part Number Information

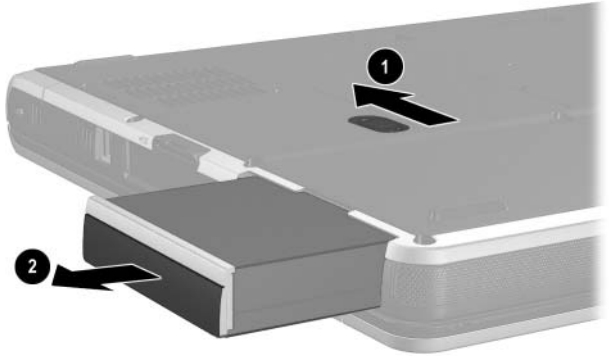
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#### Battery packs

|   |            |
|---|------------|
| Primary battery pack, Li-Ion, 6-cell, 3.6-Ah, 48-Wh | 338669-001 |
| Battery pack, 6-cell                                | 346886-001 |

---

- a. Turn the notebook upside down, with the front panel 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 left **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.



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The battery bezel is included in the Miscellaneous Plastics Kit, spare part number 344411-001.

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#### *Removing the Battery Bezel*

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

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## Spare Part Number Information

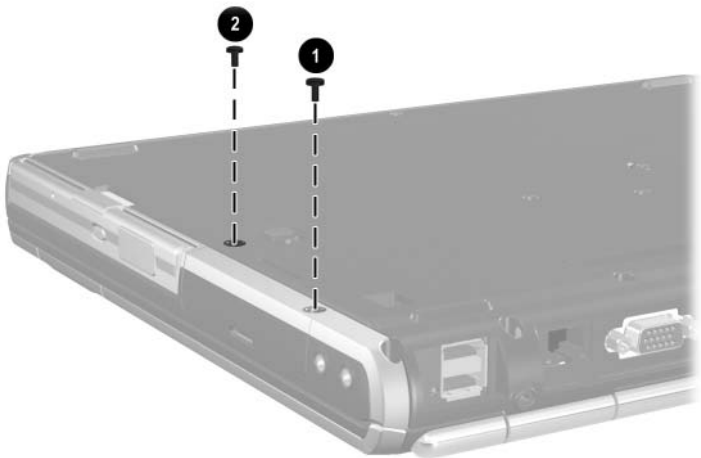
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### Hard drives (include hard drive frame and connector)

|                  |            |
|------------------|------------|
| 80-GB (5400-rpm) | 344407-001 |
| 60-GB (7200-rpm) | 365438-001 |
| 60-GB (5400-rpm) | 344406-001 |
| 40-GB (5400-rpm) | 344405-001 |
| 30-GB (4200-rpm) | 344404-001 |

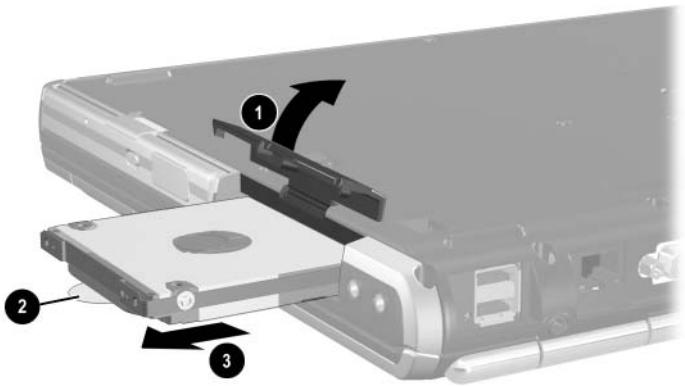
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6. Remove the hard drive by following these steps:
  - a. Turn the notebook upside down, with the rear panel facing you.
  - b. Remove the T8M2.5×5.0 screw ❶ that secures the hard drive door to the notebook.
  - c. Remove the PM3.0×4.0 hard drive security screw ❷ that secures the hard drive to the notebook.



*Removing the Hard Drive Screws*

- d. Lift the hard drive cover up and swing it back ❶.
- e. Use the Mylar tab ❷ to slide the hard drive to the left ❸ to disconnect it from the system board.
- f. Remove the hard drive.



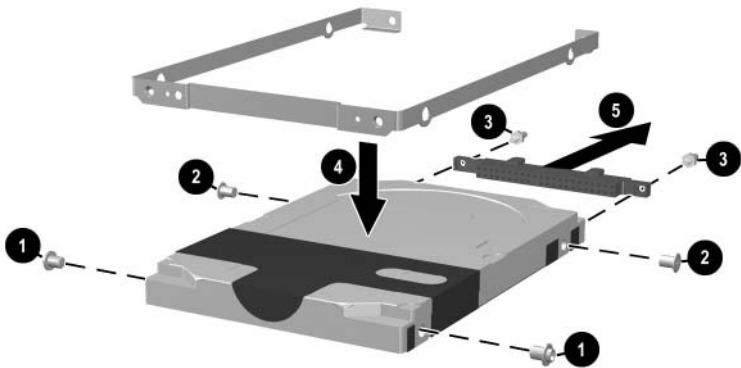
### *Removing the Hard Drive*



**CAUTION:** The hard drive should be disassembled only if it is damaged and must be repaired. Unnecessary disassembly of the hard drive can result in damage to the hard drive and loss of information.

---

- g. Remove the two T5M3.0×4.0 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 from the hard drive frame ❹.
- j. Remove the hard drive connector from the hard drive ❺.



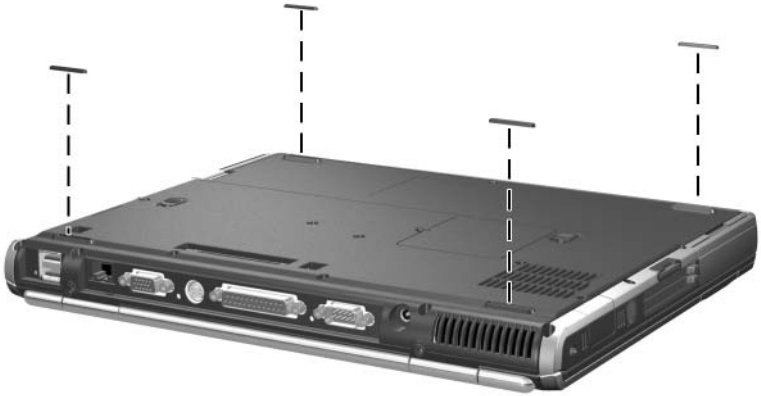
### *Removing the Hard Drive Bracket and Connector*

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



## 5.4 Notebook Feet

The notebook feet are adhesive-backed rubber pads. The notebook feet are included in the Miscellaneous Plastics Kit, spare part number 344411-001. The notebook feet attach to the base enclosure as illustrated below.



*Replacing the Notebook Feet*

## 5.5 Mini PCI Communications Board

---

### Spare Part Number Information

---

#### Mini PCI communications boards

|  |            |
|--|------------|
| 802.11a/b/g LAN board                          | 325525-001 |
| 802.11b/g LAN board                            | 325526-001 |
| 802.11b/g, W400 modem board (for use in Japan) | 325526-291 |
| 802.11b W500 modem board (for use in Japan)    | 339742-291 |
| 802.11b/g modem board (MOW)                    | 368247-001 |
| 802.11b/g modem board (ROW)                    | 368248-001 |

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#### Wireless LAN cards

|               |            |
|---------------|------------|
| 802.11b (MOW) | 345641-001 |
| 802.11b (ROW) | 345640-001 |

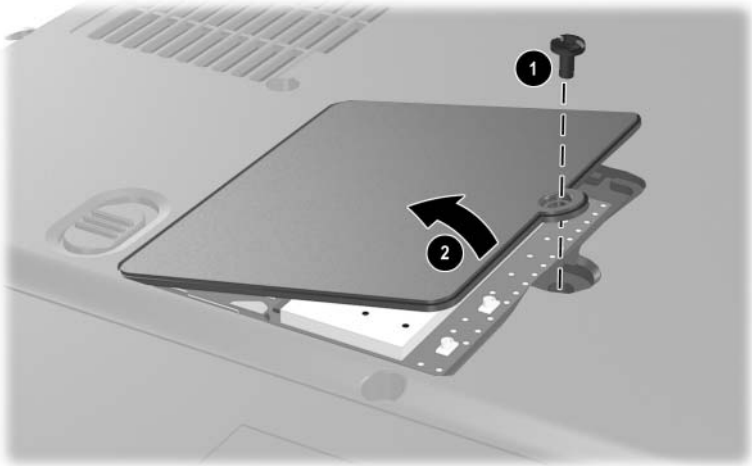
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1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Turn the notebook upside down, with the front facing you.
3. Remove the PM2.5×3.5 screw ❶ that secures the Mini PCI compartment cover to the notebook.
4. Lift the right side of the cover up and swing it to the left ❷.
5. Remove the cover.



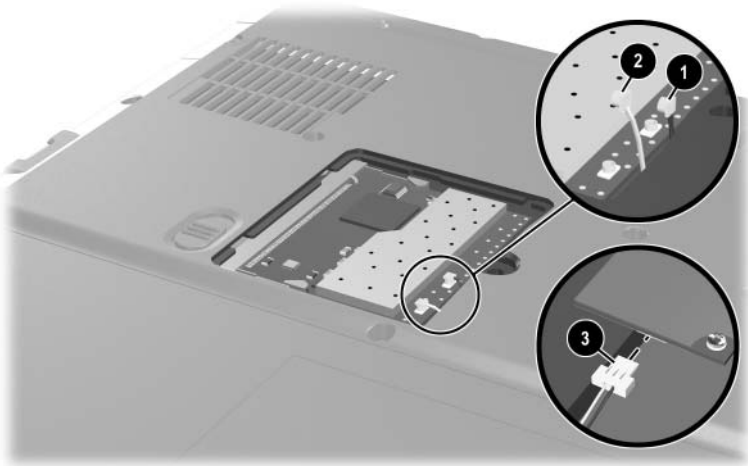
The Mini PCI compartment cover is included in the Miscellaneous Plastics Kit, spare part number 344411-001.

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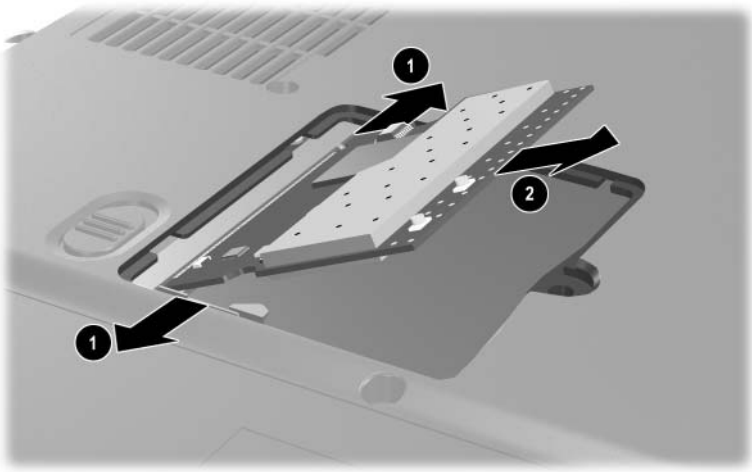
*Removing the Mini PCI Compartment Cover*

6. If a wireless communications device is installed in this compartment, disconnect the two antenna cables from the Mini PCI communications board. Note that the longer cable ❶ connects to the rear antenna terminal and the shorter antenna cable ❷ connects to the front antenna terminal.
7. If a modem is installed in this compartment, disconnect the modem cable from the modem ❸.



*Disconnecting the Cables from the Mini PCI Communications Board*

8. Spread the retaining tabs ❶ that secure the Mini PCI communications board to the socket. The board rises up.
9. Pull the board away from the socket at a 45-degree angle ❷.



#### *Removing the Mini PCI Communications Board*

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

## 5.6 MultiBay Device

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### Spare Part Number Information

---

#### MultiBay devices

|                                       |            |
|---------------------------------------|------------|
| 24X Max CD-ROM drive                  | 100044-001 |
| 24X Max DVD/CD-RW combo drive         | 346789-001 |
| 4X Max DVD+RW/R and CD-RW combo drive | 344256-001 |
| 8X Max DVD-ROM Drive                  | 173949-001 |
| Diskette drive                        | 241995-001 |
| MultiBay battery pack                 | 267747-001 |

---

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Turn the notebook upside down, with the right side facing you.
3. Slide and hold the MultiBay release latch to the right **1**.
4. Remove the MultiBay device **2**.



#### *Removing a MultiBay Device*

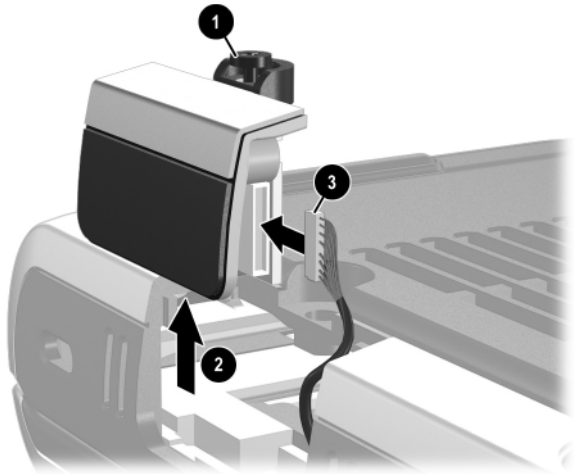
Reverse the above procedure to install a MultiBay device.

## 5.7 Bluetooth Wireless Communications Board

### Spare Part Number Information

|   |            |
|---|------------|
| Bluetooth wireless communications board | 348276-001 |
|---|------------|

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Turn the notebook upside down, with the right side facing you.
3. Loosen the PM2.0x5.0 screw **1** that secures the Bluetooth cover to the notebook.
4. Remove the cover from the notebook as far as the cable will allow **2**.
5. Disconnect the cable **3** from the Bluetooth board.



*Removing the Bluetooth Cover*

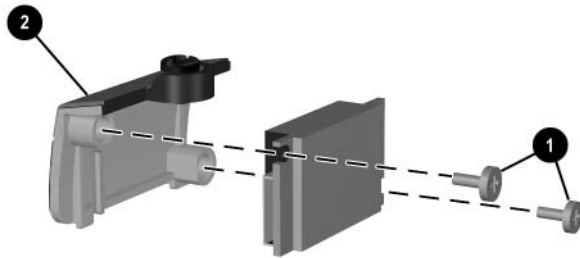
6. Remove the two PM1.5×3.0 screws ❶ that secure the Bluetooth board to the Bluetooth cover ❷.
7. Remove the cover from the board.



---

The Bluetooth cover is included in the Miscellaneous Plastics Kit, spare part number 344411-001.

---



### *Removing the Bluetooth Board*

Reverse the above procedure to install a Bluetooth board.



## 5.8 Integrated Smart Card

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### Spare Part Number Information

---

Integrated smart card

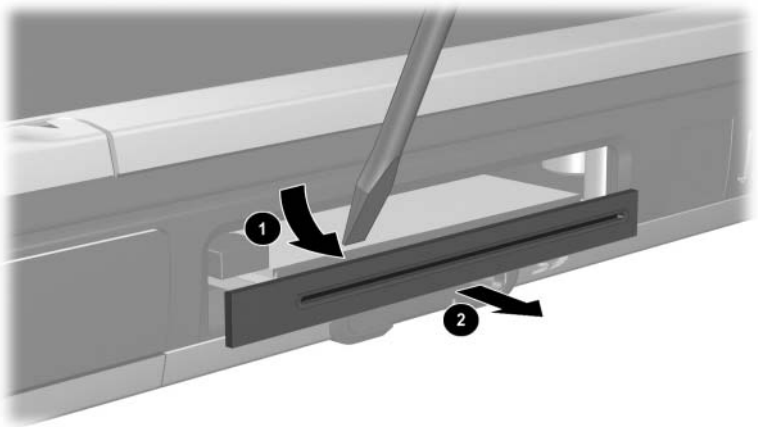
379336-001

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The integrated smart card is located in the bottom PC Card slot.

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Remove any PC Card or spacer from the top PC Card slot.
3. Using a flat-bladed tool, pry the smart card bezel off of the notebook ❶. The bezel releases with a small amount of force.
4. Remove the bezel from the notebook ❷.



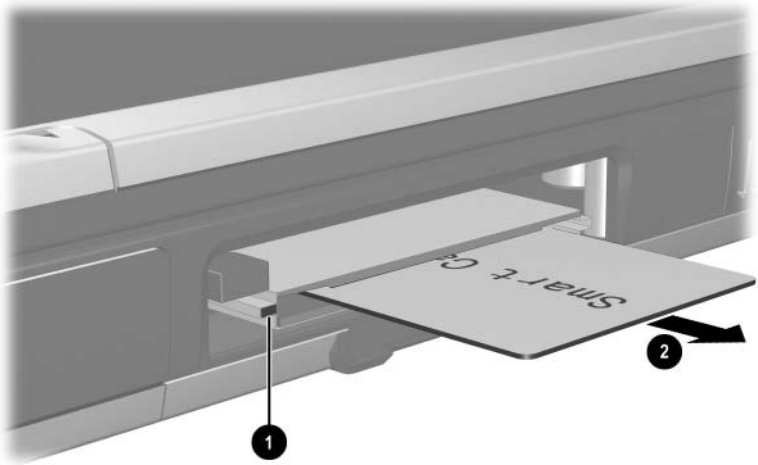
#### *Removing the Smart Card Bezel*



The integrated smart card bezel is included in the Miscellaneous Plastics Kit, spare part number 344411-001.

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5. Eject the smart card from the notebook using a flat-bladed tool to press the small metal eject tab **1** to the left of the smart card.
6. Remove the card from the slot **2**.



#### *Removing the Smart Card*

Reverse the above procedure to install the integrated smart card.

## 5.9 Keyboard

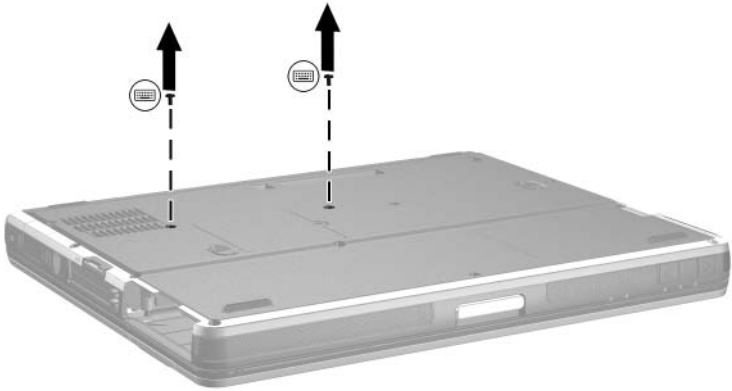
### Spare Part Number Information

#### Keyboards (include pointing stick)

|                |            |                |            |
|----------------|------------|----------------|------------|
| Brazil         | 344391-201 | Korea          | 344391-AD1 |
| Czech Republic | 344391-221 | Latin America  | 344391-161 |
| Denmark        | 344391-081 | Norway         | 344391-091 |
| European       | 344391-A41 | Portugal       | 344391-131 |
| France         | 344391-051 | Russia         | 344391-251 |
| French Canada  | 344391-121 | Saudi Arabia   | 344391-171 |
| Germany        | 344391-041 | Slovenia       | 344391-BA1 |
| Greece         | 341520-151 | Spain          | 344391-071 |
| Greece - Bk    | 378538-151 | Sweden/Finland | 344391-B71 |
| Hungary        | 344391-211 | Switzerland    | 344391-BG1 |
| Iceland        | 344391-DD1 | Taiwan         | 344391-AB1 |
| India          | 344391-D61 | Thailand       | 344391-281 |
| International  | 344391-B31 | Turkey         | 344391-141 |
| Israel         | 344391-BB1 | United Kingdom | 344391-031 |
| Italy          | 344391-061 | United States  | 344391-001 |
| Japan          | 344391-291 |                |            |

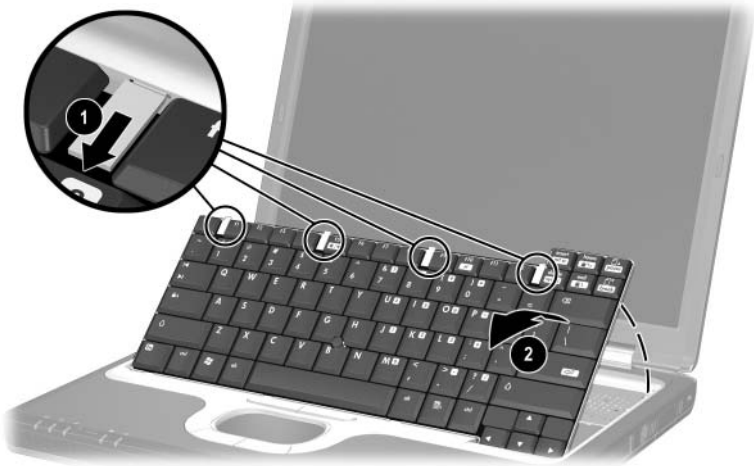
1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Turn the notebook upside down, with the front facing you.

3. Remove the two T8M2.5×11.0 screws that secure the keyboard to the notebook.



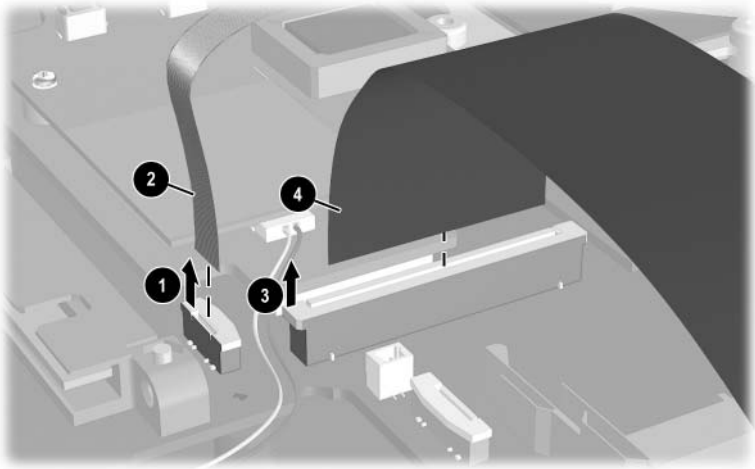
*Removing the Keyboard Screws*

4. Turn the notebook right-side up, with the front facing you.
5. Open the notebook.
6. Slide the four tabs on the top edge of the keyboard toward you **1**.
7. Lift the rear edge of the keyboard up and swing it forward **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 TouchPad and Keyboard Cables*

Reverse the above procedure to install the keyboard.

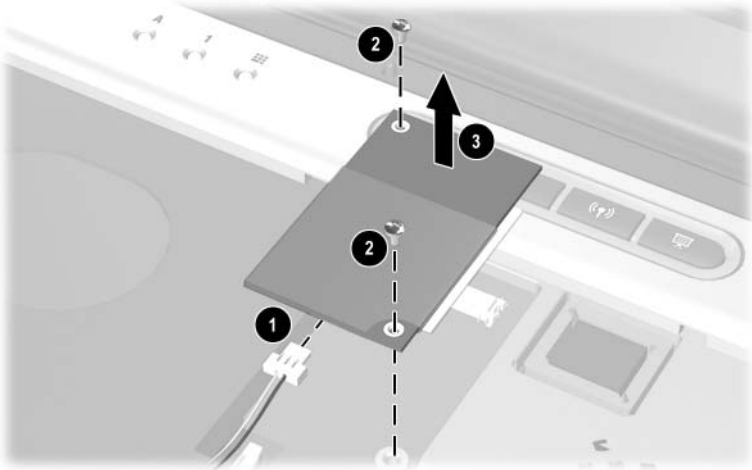
## 5.10 Modem Board

### Spare Part Number Information

Modem board

325521-001

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Release the keyboard (refer to [Section 5.9](#)).
3. Disconnect the modem cable ❶ from the modem board.
4. Remove the two PM2.5×3.5 screws ❷ that secure the modem board to the notebook.
5. Lift the rear edge of the modem board ❸ to disconnect it from the system board.
6. Remove the modem board.



#### *Removing the Modem Board*

Reverse the above procedure to install the modem board.

## 5.11 Memory Expansion Board

---

### Spare Part Number Information

---

#### Memory expansion boards, 333-MHz

|             |            |
|-------------|------------|
| 1024-MB DDR | 336579-001 |
| 512-MB DDR  | 336578-001 |
| 256-MB DDR  | 336577-001 |

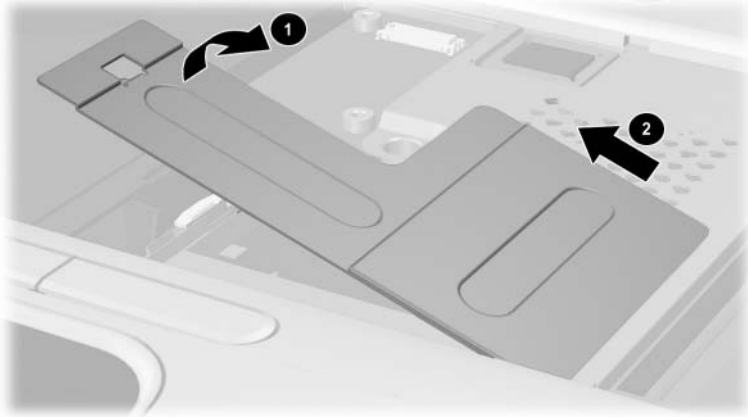
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1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Remove the keyboard (refer to [Section 5.9](#)).
3. Lift the left side of the memory shield and swing it up and to the right **1** until it rests at a 45-degree angle.
4. Slide the shield to the left **2** to remove it.



The memory shield is included in the Miscellaneous Plastics Kit, spare part number 344411-001.

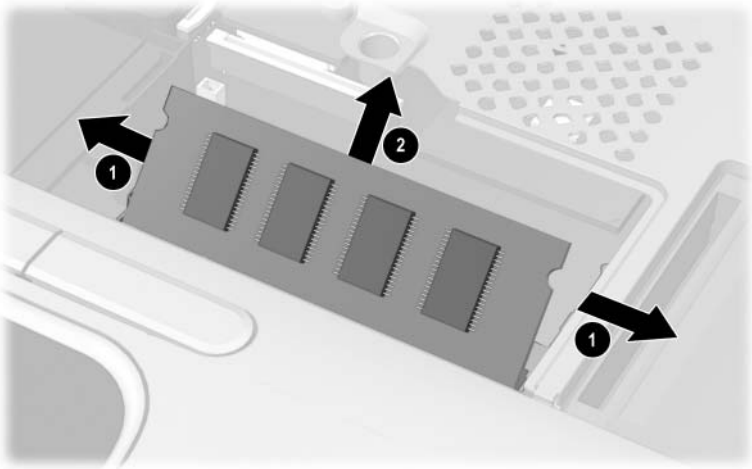
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*Removing the Memory Shield*



5. Spread the retaining tabs ❶ that secure the memory expansion board to the socket. The board rises up.
6. 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.

## 5.12 Switch Cover

---

### Spare Part Number Information

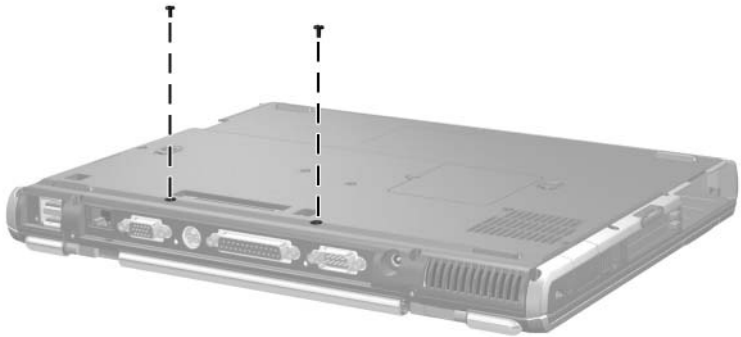
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Switch cover

344400-001

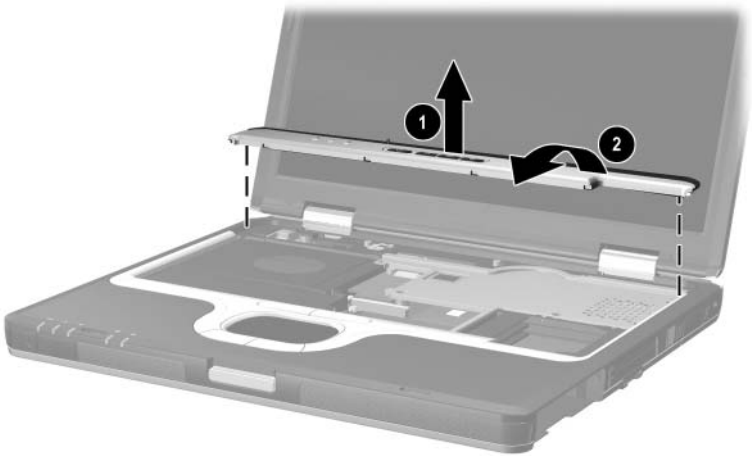
---

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Remove the keyboard (refer to [Section 5.9](#)).
3. Close the notebook.
4. Turn the notebook upside down, with the rear panel facing you.
5. Remove the two TM2.5×9.0 screws that secure the switch cover to the notebook.



*Removing the Switch Cover Screws*

6. Turn the notebook right-side up, with the front facing you.
7. Open the notebook.
8. Lift up on the middle of the switch cover ❶ to disengage it from the notebook.
9. Swing the rear edge of the switch cover up and forward ❷.
10. Remove the switch cover.



### *Removing the Switch Cover*

Reverse the above procedure to install the switch cover.

## 5.13 Keyboard Plate

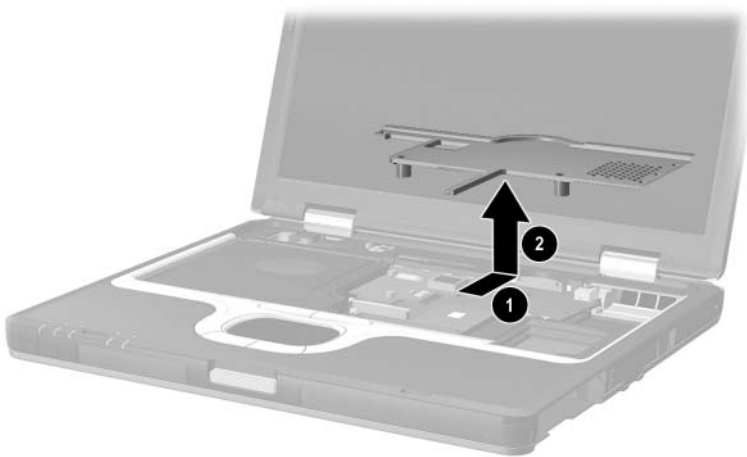
---



The keyboard plate is included in the Miscellaneous Plastics Kit, spare part number 344411-001.

---

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Remove the keyboard (refer to [Section 5.9](#)).
3. Remove the switch cover (refer to [Section 5.12](#)).
4. Slide the keyboard plate toward the back of the notebook ❶ to disengage the plate tabs from the slots in the top cover, and then lift the plate straight up ❷ to remove it.



### *Removing the Keyboard Plate*

Reverse the above procedure to install the keyboard plate.

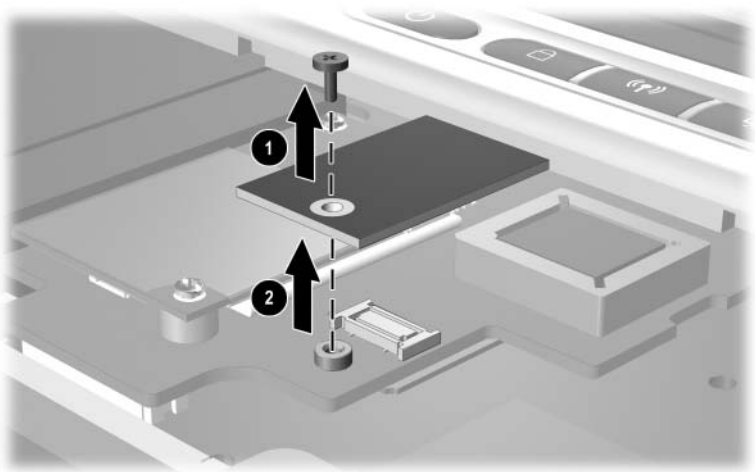
## 5.14 Security Module (TPM)

### Spare Part Number Information

Security Module (TPM)

345856-001

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Remove the keyboard (refer to [Section 5.9](#)).
3. Remove the switch cover (refer to [Section 5.12](#)).
4. Remove the keyboard plate (refer to [Section 5.13](#)).
5. Remove the PM3.5×3.0 screw ❶ that secures the security card to the system board.
6. Lift the security module straight up ❷ to disconnect it from the system board.



*Removing the Security Module*

Reverse the above procedure to install the security card.

## 5.15 Fan Assembly

---

### Spare Part Number Information

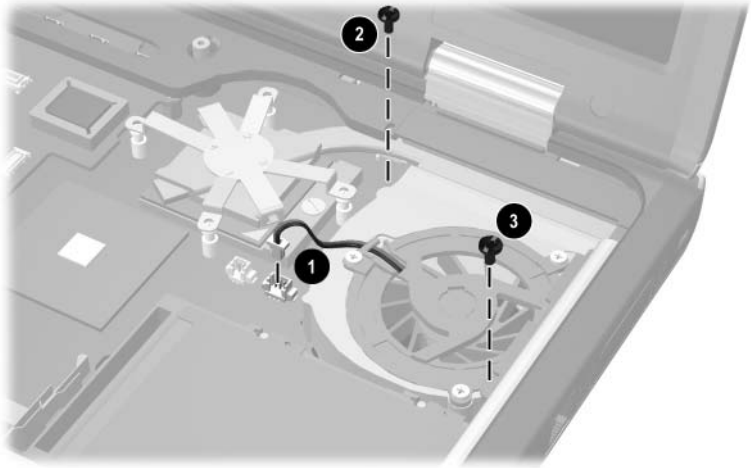
---

Fan assembly

345065-001

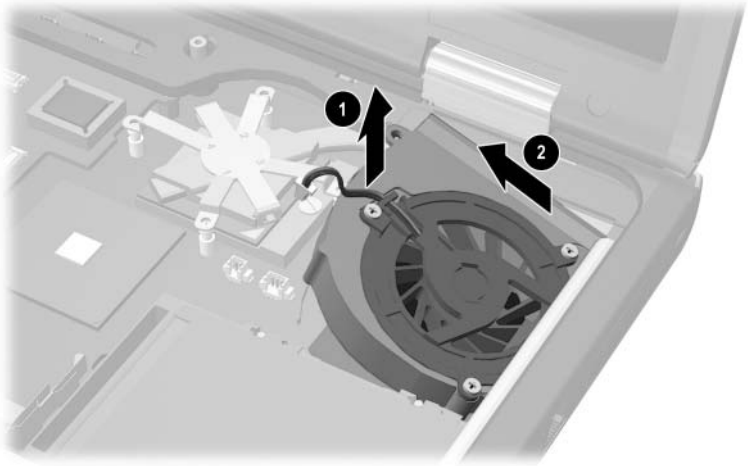
---

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Remove the keyboard (refer to [Section 5.9](#)).
3. Remove the switch cover (refer to [Section 5.12](#)).
4. Remove the keyboard plate (refer to [Section 5.13](#)).
5. Disconnect the fan cable ❶ from the system board.
6. Remove the T8M2.5×7.0 ❷ and T8M2.5×5.0 screws ❸ that secure the fan assembly to the notebook.



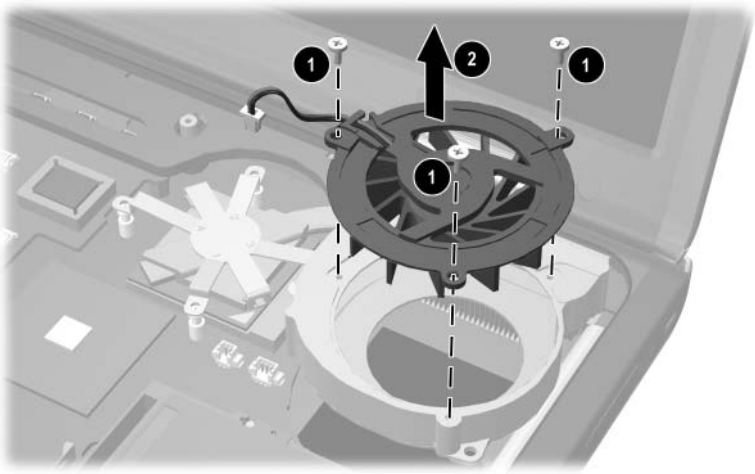
*Removing the Fan Assembly Screws*

7. Lift the left side of the fan assembly **1** until it rests at an angle.
8. Slide the fan assembly up and to the left **2** to remove it from the notebook.



*Removing the Fan Assembly*

9. Remove the three PM2.0×3.0 screws ❶ that secure the fan to the fan housing.
10. Remove the fan ❷.



*Removing the Fan from the Fan Assembly*

Reverse the above procedure to install the fan assembly.



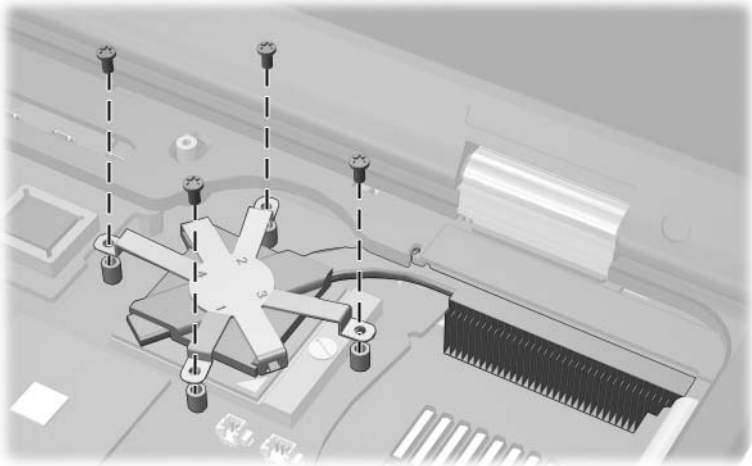
## 5.16 Heat Sink

### Spare Part Number Information

Heat sink

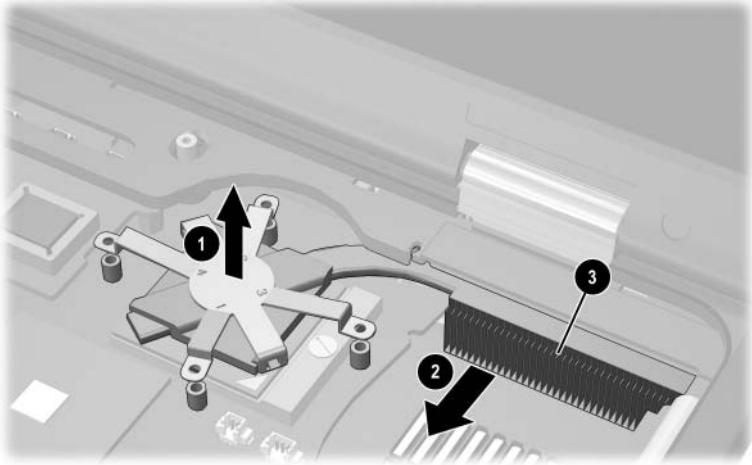
344410-001

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
  - ❑ Keyboard (refer to [Section 5.9](#))
  - ❑ Switch cover (refer to [Section 5.12](#))
  - ❑ Keyboard plate (refer to [Section 5.13](#))
  - ❑ Fan assembly (refer to [Section 5.15](#))
2. Remove the four T8M2.5×5.0 screws that secure the heat sink bracket to the system board.



*Removing the Heat Sink*

3. Lift the left side of the heat sink up **1** until the thermal grease bond between the heat sink and the processor disengages.
4. Slide the heat sink forward **2** until the cooling fins **3** clear the top cover.
5. Lift the heat sink straight up to remove it.

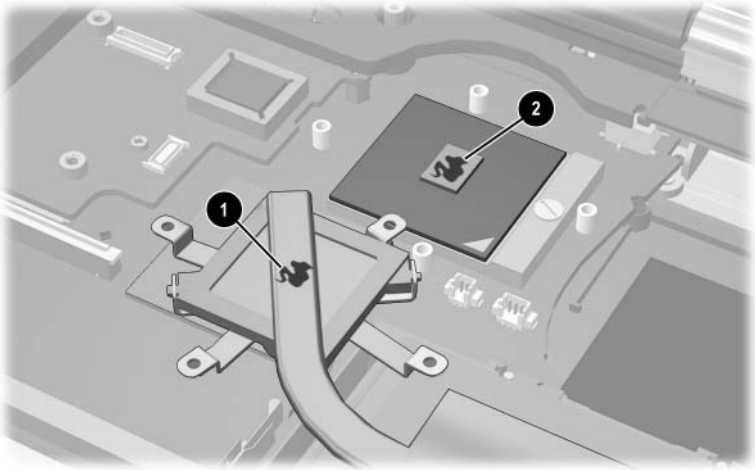


*Removing the Heat Sink*



Carefully clean any thermal grease residue from the underside of the heat sink **1** and processor surfaces **2** each time you remove the heat sink. Then 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.

## 5.17 Processor

---

### Spare Part Number Information

---

**Processors** (include thermal grease)

|   |            |
|---|------------|
| Intel Pentium M (Banias) processor, 1.7-GHz | 340165-001 |
| Intel Pentium M (Banias) processor, 1.6-GHz | 319777-001 |
| Intel Pentium M (Banias) processor, 1.5-GHz | 347253-001 |
| Intel Pentium M (Banias) processor, 1.4-GHz | 319775-001 |
| Intel Pentium M (Dothan) processor, 1.5 GHz | 359636-001 |
| Intel Pentium M (Dothan) processor, 1.6 GHz | 356596-001 |
| Intel Pentium M (Dothan) processor, 1.7 GHz | 356597-001 |
| Intel Pentium M (Dothan) processor, 1.8 GHz | 345857-001 |
| Intel Pentium M (Dothan) processor, 2.0 GHz | 353395-001 |

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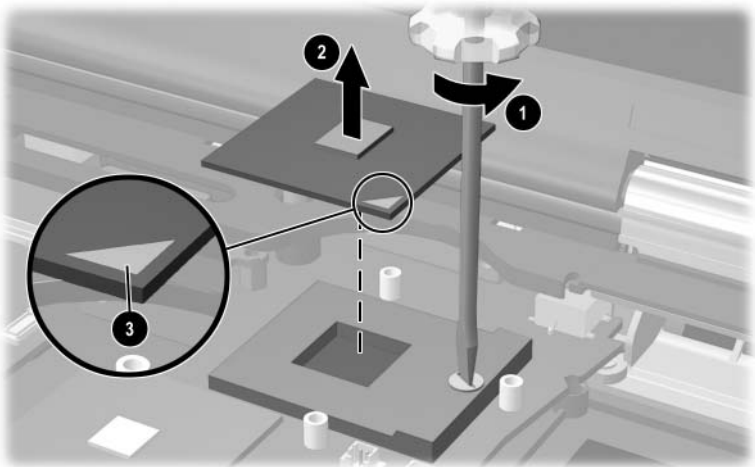
1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
  - Keyboard (refer to [Section 5.9](#))
  - Switch cover (refer to [Section 5.12](#))
  - Keyboard plate (refer to [Section 5.13](#))
  - Fan assembly (refer to [Section 5.15](#))
  - Heat sink (refer to [Section 5.16](#))

2. Use a flat-bladed screwdriver to turn the processor lock screw one-quarter turn counterclockwise ❶ to release the processor from the socket.
3. Lift the processor straight up ❷ to remove it.



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

---



### Removing the Processor

Reverse the above procedure to install the processor.

## 5.18 Display Assembly

---

### Spare Part Number Information

---

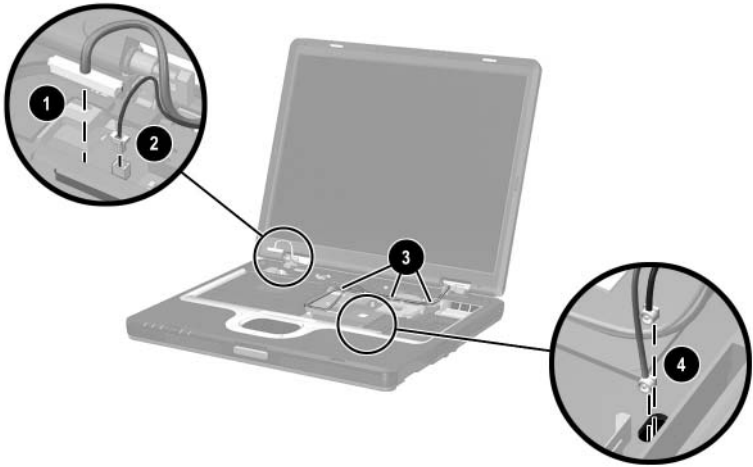
#### Display assemblies

|                       |            |
|-----------------------|------------|
| 14.1-inch, TFT, SXGA+ | 344397-001 |
| 14.1-inch, TFT, XGA   | 344396-001 |

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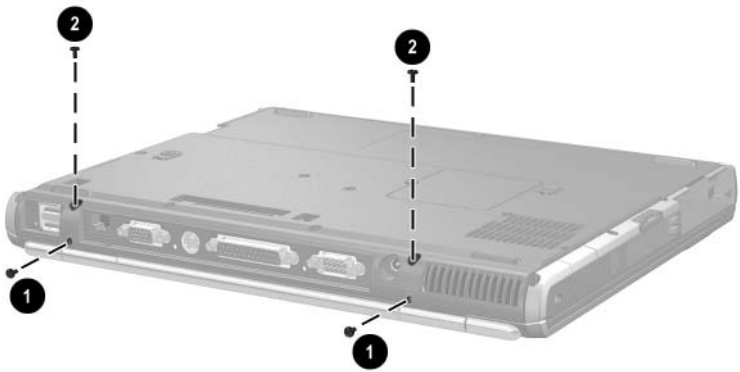
1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Disconnect the wireless antenna cables from the Mini PCI communications board (refer to [Section 5.5](#)).
3. Remove the following components:
  - Keyboard (refer to [Section 5.9](#))
  - Memory shield (refer to [Section 5.11](#))
  - Switch cover (refer to [Section 5.12](#))
  - Keyboard plate (refer to [Section 5.13](#))
  - Fan assembly (refer to [Section 5.15](#))
  - Heat sink (refer to [Section 5.16](#))

4. Disconnect the display cable ❶ and microphone cable ❷ from the system board.
5. Remove the left and right wireless antenna cables ❸ from the three clips in the top cover.
6. Remove the left and right wireless antenna cables from the hole ❹ in the system board.



*Disconnecting the Display Cables*

7. Close the notebook.
8. Turn the notebook upside down, with the rear panel facing you.
9. Remove the following screws:
  - ❶ Two T8M2.5×9.0 screws from the rear panel
  - ❷ Two T8M2.5×9.0 screws from the bottom of the notebook



### *Removing the Display Screws*



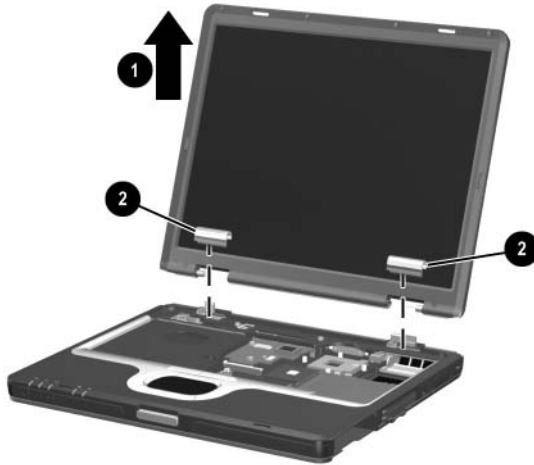
10. Turn the notebook right-side up, with the front facing you.
11. Open the notebook until the display assembly is in an upright position.
12. Lift the display assembly straight up ❶ to remove it.
13. If necessary, remove the left ❷ and right ❷ display hinge covers from the display assembly.



---

The display hinge covers are included in the Miscellaneous Plastics Kit, spare part number 344411-001.

---



### *Removing the Display Assembly*

Reverse the above procedure to install the display assembly.

## 5.19 Top Cover

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### Spare Part Number Information

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Top cover (includes TouchPad)

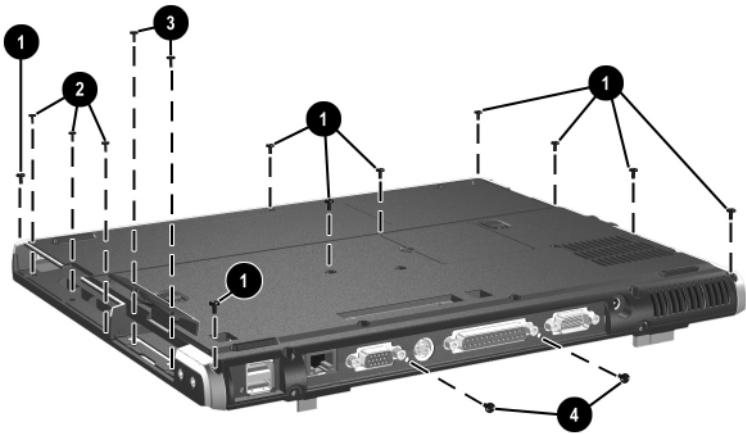
344398-001

---

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
  - Keyboard (refer to [Section 5.9](#))
  - Memory shield (refer to [Section 5.11](#))
  - Switch cover (refer to [Section 5.12](#))
  - Keyboard plate (refer to [Section 5.13](#))
  - Fan assembly (refer to [Section 5.15](#))
  - Heat sink (refer to [Section 5.16](#))
  - Display assembly (refer to [Section 5.18](#))
2. Turn the notebook upside down, with the rear panel facing you.

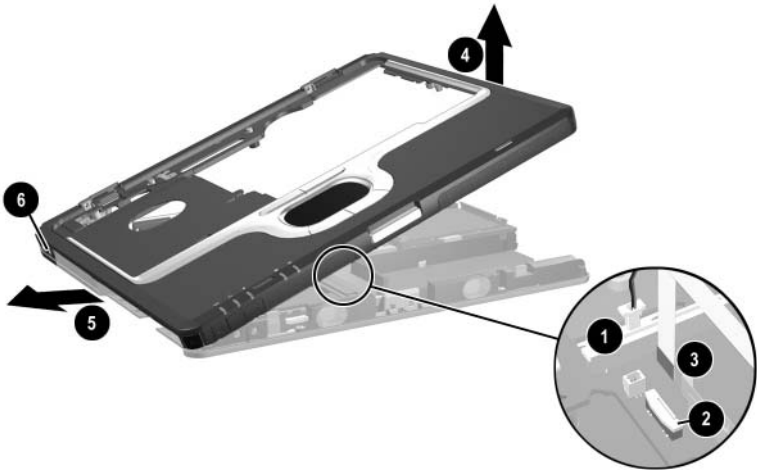
3. Remove the following screws:

- ❶ Nine T8M2.5×9.0 screws from the bottom of the notebook
- ❷ Three PM2.5×3.5 screws from the MultiBay
- ❸ Two PM2.5×3.5 screws from the hard drive bay
- ❹ Two T8M2.5×5.5 screws from the rear panel



*Removing the Top Cover Screws*

4. Turn the notebook right-side up, with the front facing you.
5. Disconnect the RTC battery cable **1** from the system board.
6. Release the ZIF connector **2** to which the TouchPad cable is attached and disconnect the TouchPad cable **3**.
7. Lift the right side of the top cover **4** until it rests at a 45-degree angle.
8. Slide the top cover to the left **5** to disengage the audio connectors **6** from the top cover.
9. Remove the top cover.



### Removing the Top Cover

Reverse the above procedure to install the top cover.

## 5.20 RTC Battery

---

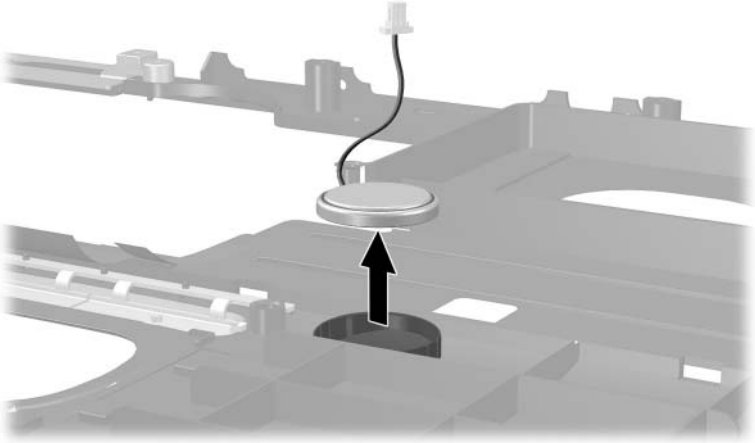


The RTC battery is included in the Miscellaneous Plastics Kit, spare part number 344411-001.

---

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
  - Keyboard (refer to [Section 5.9](#))
  - Memory shield (refer to [Section 5.11](#))
  - Switch cover (refer to [Section 5.12](#))
  - Keyboard plate (refer to [Section 5.13](#))
  - Fan assembly (refer to [Section 5.15](#))
  - Heat sink (refer to [Section 5.16](#))
  - Display assembly (refer to [Section 5.18](#))
  - Top cover (refer to [Section 5.19](#))
2. Turn the top cover upside down, with the front facing you.

3. Lift the RTC battery out of the top cover clip.



*Removing the RTC Battery*

Reverse the above procedure to install the RTC battery.

## 5.21 LED Board

---

### Spare Part Number Information

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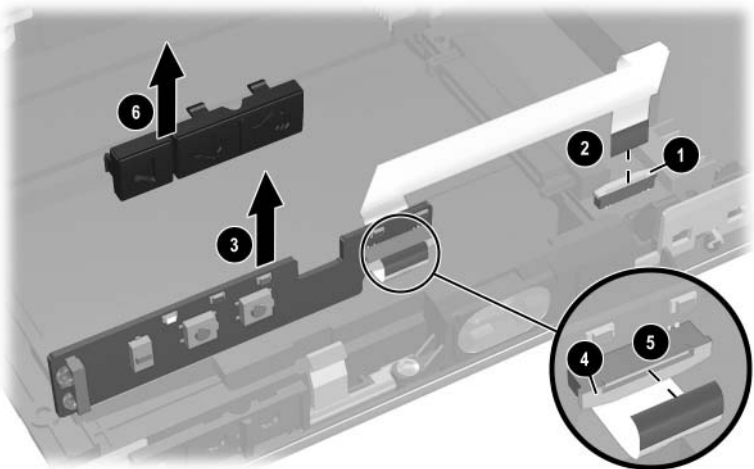
LED board (includes cable)

346884-001

---

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
  - Keyboard (refer to [Section 5.9](#))
  - Memory shield (refer to [Section 5.11](#))
  - Switch cover (refer to [Section 5.12](#))
  - Keyboard plate (refer to [Section 5.13](#))
  - Fan assembly (refer to [Section 5.15](#))
  - Heat sink (refer to [Section 5.16](#))
  - Display assembly (refer to [Section 5.18](#))
  - Top cover (refer to [Section 5.19](#))
2. Turn the top cover upside down, with the front facing you.

3. Release the ZIF connector **1** on the system board to which the LED board cable is attached, and then disconnect the cable **2**.
4. Lift the board straight up to remove it **3**.
5. Release the ZIF connector **4** on the LED board to which the LED board cable is attached and disconnect the cable **5**.
6. Remove the LED board actuator **6** from the notebook.



### *Removing the LED Board*

Reverse the above procedure to install the LED board.



## 5.22 Button Board

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### Spare Part Number Information

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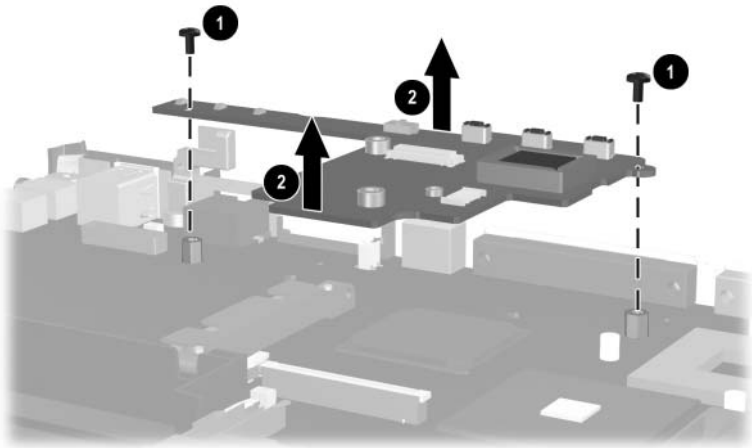
Button board

346883-001

---

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
  - Keyboard (refer to [Section 5.9](#))
  - Memory shield (refer to [Section 5.11](#))
  - Switch cover (refer to [Section 5.12](#))
  - Keyboard plate (refer to [Section 5.13](#))
  - Fan assembly (refer to [Section 5.15](#))
  - Heat sink (refer to [Section 5.16](#))
  - Display assembly (refer to [Section 5.18](#))
  - Top cover (refer to [Section 5.19](#))
2. Turn the top cover upside down, with the front facing you.

3. Remove the two PM2.5×5.0 screws ❶ that secure the button board to the notebook.
4. Lift the front and rear edges of the button board to disconnect it from the system board ❷.
5. Remove the button board.



### *Removing the Button Board*

Reverse the above procedure to install the button board.

---

## 5.23 System Board

---

### Spare Part Number Information

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#### System boards

|                                      |            |
|--------------------------------------|------------|
| Includes 64-MB discrete video memory | 346885-001 |
| Includes 32-MB discrete video memory | 344401-001 |

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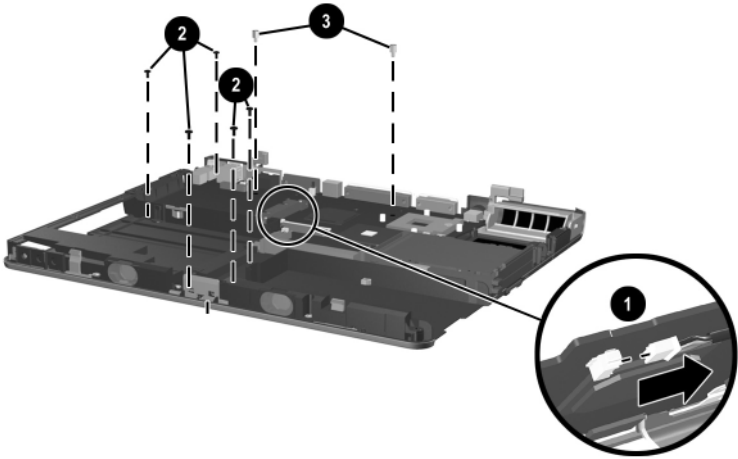


When replacing the system board, ensure that the following components are removed from the defective system board and installed on the replacement system board:

- Mini PCI communications board (refer to [Section 5.5](#))
  - Bluetooth wireless communications board (refer to [Section 5.7](#))
  - Modem board (refer to [Section 5.10](#))
  - Memory expansion boards (refer to [Section 5.11](#))
  - Processor (refer to [Section 5.17](#))
  - RTC battery (refer to [Section 5.20](#))
  - Button board (refer to [Section 5.22](#))
-

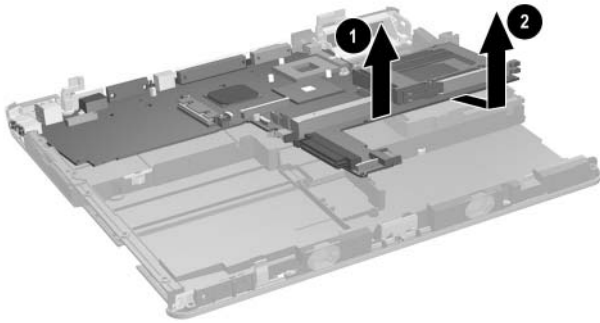
1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
  - ❑ MultiBay device (refer to [Section 5.6](#))
  - ❑ Keyboard (refer to [Section 5.9](#))
  - ❑ Memory shield (refer to [Section 5.11](#))
  - ❑ Switch cover (refer to [Section 5.12](#))
  - ❑ Keyboard plate (refer to [Section 5.13](#))
  - ❑ Fan assembly (refer to [Section 5.15](#))
  - ❑ Heat sink (refer to [Section 5.16](#))
  - ❑ Display assembly (refer to [Section 5.18](#))
  - ❑ Top cover (refer to [Section 5.19](#))
  - ❑ LED board (refer to [Section 5.21](#))
  - ❑ Button board (refer to [Section 5.22](#))

2. Disconnect the speaker cable ❶.
3. Remove the five T8M2.5×5.0 screws ❷ that secure the system board to the notebook.
4. Use a 5.0-mm socket to remove the two HM2.5×9.0 standoffs ❸ that secure the system board to the notebook.



### Removing the System Board Screws and Standoffs

5. Lift the front edge of the system board ❶ until it rests at an angle.
6. Slide the system board forward at an angle, and then lift it straight up to remove it ❷.



### *Removing the System Board*

Reverse the above procedure to install the system board.

# 6

## Specifications

This chapter provides physical and performance specifications.

**Table 6-1**  
**Notebook**

| <b>Dimensions</b>                                   |               |               |
|---|---------------|---------------|
| Height  | 3.40 cm       | 1.34 in       |
| Width   | 31.78 cm      | 12.51 in      |
| Depth   | 26.19 cm      | 10.31 in      |
| <b>Weight</b>                                       |               |               |
| With 6-cell battery pack and MultiBay weight saver  | 2.25 kg       | 4.96 lb       |
| With 6-cell battery pack and MultiBay DVD-ROM drive | 2.46 kg       | 5.42 lb       |
| <b>Stand-alone power requirements</b>               |               |               |
| Nominal operating voltage                           | 14.4 VDC      |               |
| Maximum operating power                             | 60 W          |               |
| Peak operating power                                | 65 W          |               |
| <b>Temperature</b>                                  |               |               |
| Operating (not writing optical)                     | 10°C to 35°C  | 50°F to 95°F  |
| Operating (writing optical)                         | 5°C to 35°C   | 41°F to 95°F  |
| Nonoperating  | -20°C to 60°C | -4°F to 140°F |

---

**Table 6-1**  
**Notebook (Continued)**

---

**Relative humidity** (noncondensing)

|              |  |
|--------------|--|
| Operating    | 10% to 90%   |
| Nonoperating | 5% to 95%, 38.7°C (101.6°F) maximum wet bulb temperature |

---

**Altitude** (unpressurized)

|                                 |                 |                  |
|---------------------------------|-----------------|------------------|
| Operating (14.7 to 10.1 psia)   | -15 to 3,048 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    | 50 g, 2 ms, half-sine  |
| Nonoperating | 175 g, 2 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**  
**14.1-inch, SXGA+, TFT Display**

|                                |  |         |
|--------------------------------|--|---------|
| <b>Dimensions</b>              |  |         |
| Height                         | 28.6 cm                                      | 11.2 in |
| Width                          | 21.4 cm                                      | 8.4 in  |
| Diagonal                       | 35.7 cm                                      | 14.1 in |
| <b>Number of colors</b>        | up to 16.8 million                           |         |
| <b>Contrast ratio</b>          | 250:1  |         |
| <b>Refresh rate</b>            | 60 Hz  |         |
| <b>Brightness</b>              | 180 nits typical                             |         |
| <b>Pixel resolution</b>        |  |         |
| Pitch                          | 0.204 × 0.204 mm                             |         |
| Format                         | 1400 × 1050                                  |         |
| Configuration                  | RGB stripe                                   |         |
| <b>Backlight</b>               | CCFT   |         |
| <b>Character display</b>       | 80 × 25                                      |         |
| <b>Total power consumption</b> | 4 W  |         |
| <b>Viewing angle</b>           | +/-40° horizontal, +20/-40° vertical typical |         |

**Table 6-3**  
**14.1-inch, XGA, TFT Display**

|                                |  |         |
|--------------------------------|--|---------|
| <b>Dimensions</b>              |  |         |
| Height                         | 28.6 cm                                      | 11.2 in |
| Width                          | 21.4 cm                                      | 8.4 in  |
| Diagonal                       | 35.7 cm                                      | 14.1 in |
| <b>Number of colors</b>        | up to 16.8 million                           |         |
| <b>Contrast ratio</b>          | 250:1  |         |
| <b>Refresh rate</b>            | 60 Hz  |         |
| <b>Brightness</b>              | 180 nits typical                             |         |
| <b>Pixel resolution</b>        |  |         |
| Pitch                          | 0.279 × 0.279 mm                             |         |
| Format                         | 1024 × 768                                   |         |
| Configuration                  | RGB stripe                                   |         |
| <b>Backlight</b>               | CCFT   |         |
| <b>Character display</b>       | 80 × 25                                      |         |
| <b>Total power consumption</b> | 4 W  |         |
| <b>Viewing angle</b>           | +/-40° horizontal, +20/-40° vertical typical |         |

**Table 6-4  
Hard Drives**

|   | <b>60-GB</b>                      | <b>40-GB</b>                      | <b>30-GB</b>                      |
|---|-----------------------------------|-----------------------------------|-----------------------------------|
| <b>User capacity per drive<sup>1</sup></b>          | 60 GB                             | 40 GB                             | 30 GB                             |
| <b>Dimensions</b>                                   |                                   |                                   |                                   |
| Height  | 9.5 mm                            | 9.5 mm                            | 9.5 mm                            |
| Width   | 70 mm                             | 70 mm                             | 70 mm                             |
| Weight  | 99 g                              | 99 g                              | 99 g                              |
| <b>Interface type</b>                               | ATA-5                             | ATA-5                             | ATA-5                             |
| <b>Transfer rate</b>                                |                                   |                                   |                                   |
| Synchronous (maximum)                               | 100 MB/<br>sec                    | 100 MB/<br>sec                    | 100 MB/<br>sec                    |
| Security  | ATA security                      | ATA security                      | ATA security                      |
| <b>Seek times</b> (typical read, including setting) |                                   |                                   |                                   |
| Single track  | 3 ms                              | 3 ms                              | 2.5 ms                            |
| Average   | 13 ms                             | 13 ms                             | 12 ms                             |
| Maximum   | 24 ms                             | 24 ms                             | 23 ms                             |
| <b>Logical blocks<sup>2</sup></b>                   | 117,210,240                       | 78,140,160                        | 58,605,120                        |
| <b>Disk rotational speed</b>                        | 5400 rpm                          | 5400 rpm                          | 4200 rpm                          |
| <b>Operating temperature</b>                        | 5° to 55° C<br>(41° to<br>131° F) | 5° to 55° C<br>(41° to<br>131° F) | 5° to 55° C<br>(41° to<br>131° F) |

<sup>1</sup>1 GB = 1,073,741,824 bytes.

<sup>2</sup>Actual drive specifications may differ slightly.

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

**Table 6-5  
External AC Adapter**

|                           |                   |         |
|---------------------------|-------------------|---------|
| <b>Weight</b>             | 0.29 kg           | 0.65 lb |
| <b>Power supply</b>       |                   |         |
| 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 6-6  
Primary 6-Cell, Li-Ion Battery Pack**

|   |              |               |
|---|--------------|---------------|
| <b>Dimensions</b>                                 |              |               |
| Height  | 1.90 cm      | 0.75 in       |
| Width   | 7.60 cm      | 3.00 in       |
| Depth   | 14.70 cm     | 5.80 in       |
| Weight  | 0.34 kg      | 0.75 lb       |
| <b>Energy</b>                                     |              |               |
| Voltage   | 11.1 V       |               |
| Amp-hour capacity                                 | 3.6 Ah       |               |
| Watt-hour capacity                                | 48 Wh        |               |
| <b>Temperature</b>                                |              |               |
| Operating   | 5°C to 45°C  | 41°F to 113°F |
| Nonoperating                                      | 0°C to 60°C  | 32°F to 140°F |
| <b>Recharge time</b>                              |              |               |
| System in off mode or Standby                     | 2 to 3 hours |               |
| System on (depending on system power consumption) | 3 to 5 hours |               |

---

**Table 6-7**  
**Optional High-Capacity 8-Cell, Li-Ion Battery Pack**

---

**Dimensions**

|        |          |         |
|--------|----------|---------|
| Height | 1.90 cm  | 0.75 in |
| Width  | 7.60 cm  | 3.00 in |
| Depth  | 14.70 cm | 5.80 in |
| Weight | 0.43 kg  | 0.94 lb |

---

**Energy**

|                    |        |
|--------------------|--------|
| Voltage            | 14.1 V |
| Amp-hour capacity  | 4.4 Ah |
| Watt-hour capacity | 63 Wh  |

---

**Temperature**

|              |             |               |
|--------------|-------------|---------------|
| Operating    | 5°C to 45°C | 41°F to 113°F |
| Nonoperating | 0°C to 60°C | 32°F to 140°F |

---

**Recharge time**

|   |              |
|---|--------------|
| System in off mode or Standby                     | 2 to 3 hours |
| System on (depending on system power consumption) | 3 to 5 hours |

---

---

**Table 6-8**  
**Optional MultiBay 8-Cell, Li-Ion Battery Pack**

---

**Dimensions**

|        |          |         |
|--------|----------|---------|
| Height | 1.30 cm  | 0.50 in |
| Width  | 13.20 cm | 5.20 in |
| Depth  | 13.90 cm | 5.45 in |
| Weight | 0.39 kg  | 0.86 lb |

---

**Energy**

|                    |        |
|--------------------|--------|
| Voltage            | 14.8 V |
| Amp-hour capacity  | 3.6 Ah |
| Watt-hour capacity | 52 Wh  |

---

**Temperature**

|              |             |               |
|--------------|-------------|---------------|
| Operating    | 5°C to 45°C | 41°F to 113°F |
| Nonoperating | 0°C to 60°C | 32°F to 140°F |

---

**Recharge time**

|   |              |
|---|--------------|
| System in off mode or Standby                     | 2 to 3 hours |
| System on (depending on system power consumption) | 3 to 5 hours |

---

**Table 6-9**  
**24X DVD/CD-RW Combo Drive and**  
**24X CD-ROM Drive**

|                             |  |          |
|-----------------------------|--|----------|
| <b>Applicable disc</b>      | DVD-5, DVD-9, DVD-10<br>CD-ROM (Mode 1 and 2)<br>CD Digital Audio<br>CD-XA ready (Mode 2, Form 1 and 2)<br>CD-I ready (Mode 2, Form 1 and 2)<br>CD-R (read only)<br>CD Plus<br>Photo CD (single/multisession)<br>CD-Bridge |          |
| <b>Center hole diameter</b> | 1.5 cm   | 0.59 in  |
| <b>Disc diameter</b>        |  |          |
| Standard disc               | 12 cm  | 4.72 in  |
| Mini disc                   | 8 cm   | 3.15 in  |
| <b>Disc thickness</b>       | 1.2 mm   | 0.047 in |
| <b>Track pitch</b>          | 0.74 $\mu$ m   |          |
| <b>Access time</b>          |  |          |
| Random                      | < 150 ms   |          |
| Full stroke                 | < 225 ms   |          |

**Table 6-9**  
**24X DVD/CD-RW Combo Drive and**  
**24X CD-ROM Drive (Continued)**

|                           |  |
|---------------------------|--|
| <b>Audio output level</b> | Line-out, 0.7 Vrms                     |
| <b>Cache buffer</b>       | 128 KB/s                               |
| <b>Data transfer rate</b> |  |
| CD-R (24X)                | 3600 KB/s (150 KB/s at 1X CD rate)     |
| CD-RW (10X)               | 1500 KB/s (150 KB/s at 1X CD rate)     |
| CD-ROM (24X)              | 3600 KB/s (150 KB/s at 1X CD rate)     |
| DVD (8X)                  | 10,800 KB/s (1352 KB/s at 1X DVD rate) |
| Multiword DMA mode 2      | 16.6 MB/s                              |
| <b>Startup time</b>       | < 15 seconds                           |
| <b>Stop time</b>          | < 6 seconds                            |



**Table 6-10**  
**8X DVD-ROM Drive and**  
**DVD+RW/R and CD-RW Combo Drive**

|                             |  |          |
|-----------------------------|--|----------|
| <b>Applicable disc</b>      | DVD-5, DVD-9, DVD-10<br>CD-ROM (Mode 1 and 2)<br>CD Digital Audio<br>CD-XA ready (Mode 2, Form 1 and 2)<br>CD-I ready (Mode 2, Form 1 and 2)<br>CD-R (read only)<br>CD Plus<br>Photo CD (single/multisession)<br>CD-Bridge |          |
| <b>Center hole diameter</b> | 1.5 cm   | 0.59 in  |
| <b>Disc diameter</b>        |  |          |
| Standard disc               | 12 cm  | 4.72 in  |
| Mini disc                   | 8 cm   | 3.15 in  |
| <b>Disc thickness</b>       | 1.2 mm   | 0.047 in |
| <b>Track pitch</b>          | 0.74 $\mu$ m   |          |
| <b>Access time</b>          |  |          |
| Random DVD media            | < 150 ms   |          |
| Full stroke DVD media       | < 225 ms   |          |
| Random CD media             | < 110 ms   |          |
| Full stroke CD media        | < 200 ms   |          |
| <b>Audio output level</b>   | Line-out, 0.7 Vrms   |          |
| <b>Cache buffer</b>         | 512 KB/s   |          |
| <b>Data transfer rate</b>   |  |          |
| Max 24X CD                  | 3600 KB/s (150 KB/s at 1X CD rate)   |          |
| Max 8X DVD                  | 10,800 KB/s (1352 KB/s at 1X DVD rate)   |          |
| Multiword DMA mode 2        | 16.6 MB/s  |          |
| <b>Startup time</b>         | < 10 seconds   |          |
| <b>Stop time</b>            | < 3 seconds  |          |

---

**Table 6-11  
System DMA**


| <b>Hardware DMA</b> | <b>System Function</b>   |
|---------------------|--|
| DMA0                | Available for audio  |
| DMA1*               | Entertainment audio<br>(default; alternate = DMA0, DMA3, none) |
| DMA2*               | Diskette drive   |
| DMA3                | ECP parallel port LPT1<br>(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 6-12  
System Interrupts**

| <b>Hardware IRQ</b>   | <b>System Function</b>  |
|---|---|
| IRQ0  | System timer  |
| IRQ1  | Keyboard controller   |
| IRQ2  | Cascaded  |
| IRQ3  | COM2  |
| IRQ4  | COM1  |
| IRQ5  | Audio (default)*  |
| IRQ6  | Diskette drive  |
| IRQ7  | Parallel port   |
| IRQ8  | Real time clock (RTC)   |
| IRQ9  | Infrared  |
| IRQ10   | System use  |
| IRQ11   | System use  |
| IRQ12   | Internal point stick or external mouse  |
| IRQ13   | Coprocessor (not available to any peripheral)   |
| IRQ14   | IDE interface (hard drive and optical drive)  |
| IRQ15   | System use  |
|  | 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 6-13  
System I/O Addresses**

| <b>I/O Address<br/>(hex)</b> | <b>System Function<br/>(shipping configuration)</b> |
|------------------------------|---|
| 000 - 00F                    | DMA controller no. 1                                |
| 010 - 01F                    | Unused  |
| 020 - 021                    | Interrupt controller no. 1                          |
| 022 - 024                    | Opti chipset configuration registers                |
| 025 - 03F                    | Unused  |
| 02E - 02F                    | 87334 "Super I/O" configuration for CPU             |
| 040 - 05F                    | Counter/timer registers                             |
| 044 - 05F                    | Unused  |
| 060                          | Keyboard controller                                 |
| 061                          | Port B  |
| 062 - 063                    | Unused  |
| 064                          | Keyboard controller                                 |
| 065 - 06F                    | Unused  |
| 070 - 071                    | NMI enable/real time clock (RTC)                    |
| 072 - 07F                    | Unused  |
| 080 - 08F                    | DMA page registers                                  |
| 090 - 091                    | Unused  |
| 092                          | Port A  |
| 093 - 09F                    | Unused  |
| 0A0 - 0A1                    | Interrupt controller no. 2                          |

**Table 6-13**  
**System I/O Addresses (*Continued*)**

| <b>I/O Address<br/>(hex)</b> | <b>System Function<br/>(shipping configuration)</b> |
|------------------------------|---|
| 0A2 - 0BF                    | Unused  |
| 0C0 - 0DF                    | DMA controller no. 2                                |
| 0E0 - 0EF                    | Unused  |
| 0F0 - 0F1                    | Coprocessor busy clear/reset                        |
| 0F2 - 0FF                    | Unused  |
| 100 - 16F                    | Unused  |
| 170 - 177                    | Secondary fixed disk controller                     |
| 178 - 1EF                    | Unused  |
| 1F0 - 1F7                    | Primary fixed disk controller                       |
| 1F8 - 200                    | Unused  |
| 201                          | Joystick (decoded in ESS1688)                       |
| 202 - 21F                    | Unused  |
| 220 - 22F                    | Entertainment audio                                 |
| 230 - 26D                    | Unused  |
| 26E - 26                     | Unused  |
| 278 - 27F                    | Unused  |
| 280 - 2AB                    | Unused  |
| 2A0 - 2A7                    | Unused  |
| 2A8 - 2E7                    | Unused  |
| 2E8 - 2EF                    | Reserved serial port                                |

---

**Table 6-13**  
**System I/O Addresses (*Continued*)**

| <b>I/O Address<br/>(hex)</b> | <b>System Function<br/>(shipping configuration)</b> |
|------------------------------|---|
| 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)         |

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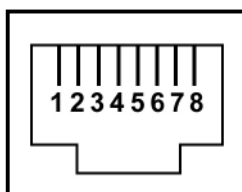
# A

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## Connector Pin Assignments

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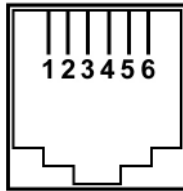
**Table A-1**  
**RJ-45 Network Interface**



| <b>Pin</b> | <b>Signal</b> | <b>Pin</b> | <b>Signal</b> |
|------------|---------------|------------|---------------|
| 1          | Transmit +    | 5          | Unused        |
| 2          | Transmit –    | 6          | Receive –     |
| 3          | Receive +     | 7          | Unused        |
| 4          | Unused        | 8          | Unused        |

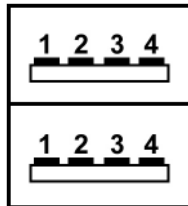
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**Table A-2  
RJ-11 Modem**



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

**Table A-3  
Universal Serial Bus**



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

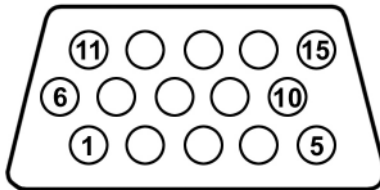


**Table A-4  
S-Video**



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

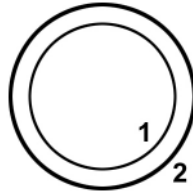
**Table A-5  
External Monitor**



| 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 |     |                 |

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



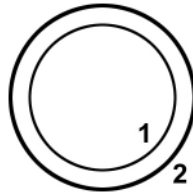
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| Pin | Signal    | Pin | Signal |
|-----|-----------|-----|--------|
| 1   | Audio out | 2   | Ground |

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**Table A-7  
Microphone**

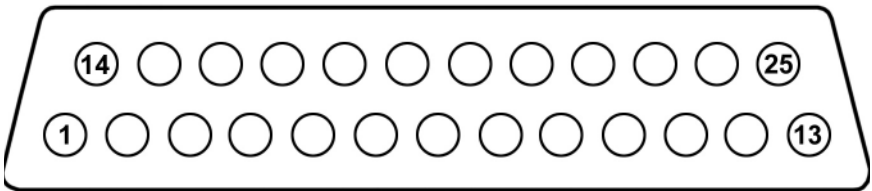


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| Pin | Signal   | Pin | Signal |
|-----|----------|-----|--------|
| 1   | Audio in | 2   | Ground |

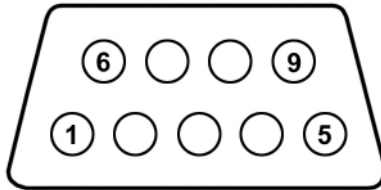
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**Table A-8**  
**Parallel**



| 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**



| <b>Pin</b> | <b>Signal</b>       | <b>Pin</b> | <b>Signal</b>  |
|------------|---------------------|------------|----------------|
| 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              |            |                |

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## Power Cord Requirements

### 3-Conductor Power Cord

The wide range input feature of the notebook permits it to operate from any line voltage from 100 to 120 or 220 to 240 volts 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 meters (5.00 feet) and a maximum of 2.0 meters (6.50 feet).
- 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 volts 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                      |

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

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

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#### Notes

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm<sup>2</sup> 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 mm<sup>2</sup> conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
-




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## 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 344412-001.

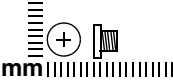
**Table C-1**  
**Torx T5M3.0×4.0 Screw**

|  mm | Color  | Qty. | Length | Thread | Head Width |
|--|--------|------|--------|--------|------------|
|  | Silver | 2    | 4.0 mm | 3.0 mm | 5.0 mm     |

**Where used:**

- ① Two screws that secure the hard drive frame to the hard drive (documented in [Section 5.3](#))

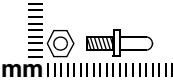
**Table C-2**  
**Phillips PM3.0×3.5 Screw**

|  mm | Color  | Qty. | Length | Thread | Head Width |
|--|--------|------|--------|--------|------------|
|  | Silver | 2    | 3.5 mm | 3.0 mm | 5.0 mm     |

**Where used:**

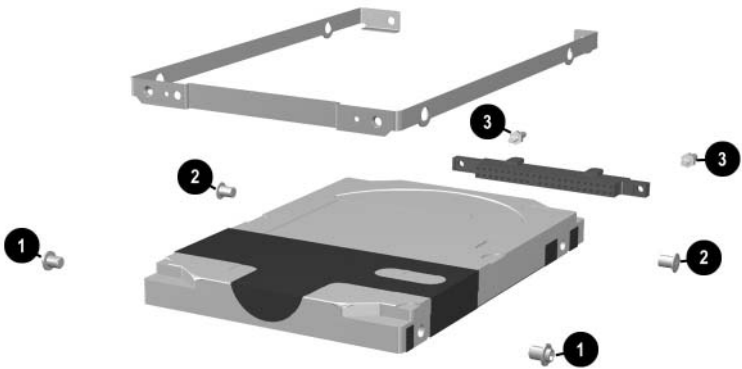
- ② Two screws that secure the hard drive frame to the hard drive (documented in [Section 5.3](#))

**Table C-3**  
**Hex M2.0×10.0 Alignment Pin**

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

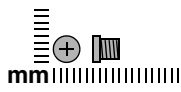
**Where used:**

- ③ Two alignment pins that secure the hard drive frame and connector to the hard drive (documented in [Section 5.3](#))



*Torx T5M3.0×4.0 Screw, Phillips PM3.0×3.5 Screw, and Hex M2.0×10.0 Alignment Pin Locations*

**Table C-4**  
**Phillips PM3.0x4.0 Screw**

|  mm | Color | Qty. | Length | Thread | Head Width |
|--|-------|------|--------|--------|------------|
|  | Black | 1    | 4.0 mm | 3.0 mm | 4.0 mm     |



**Where used:**

One screw that secures the hard drive to the notebook  
(documented in [Section 5.3](#))



*Phillips PM3.0x4.0 Screw Location*

**Table C-5**  
**Torx T8M2.5×5.0 Screw**

| <br>mm | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|        | Black | 13   | 5.0 mm | 2.5 mm | 4.0 mm     |

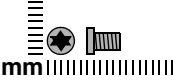
**Where used:**

One screw that secures the hard drive cover to the notebook  
 (documented in [Section 5.3](#))



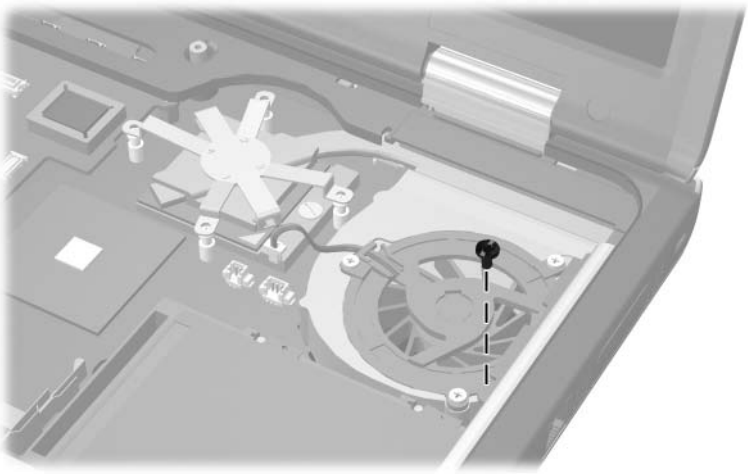
*Torx T8M2.5×5.0 Screw Location*

**Table C-5**  
**Torx T8M2.5x5.0 Screw (Continued)**

| <br>mm | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|   | Black | 13   | 5.0 mm | 2.5 mm | 4.0 mm     |


**Where used:**

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



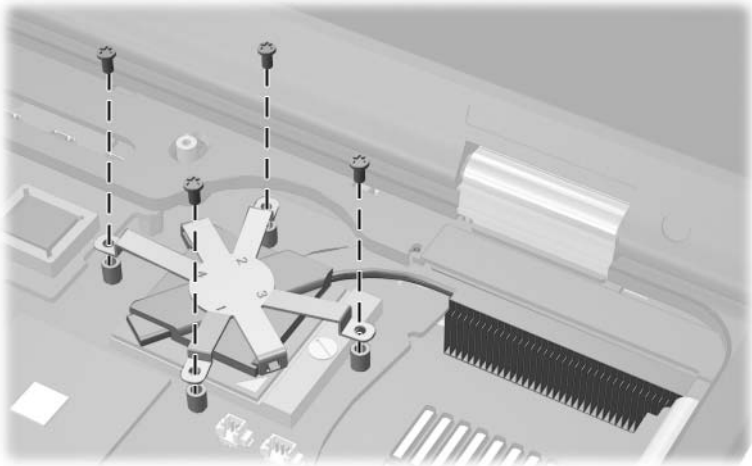
*Torx T8M2.5x5.0 Screw Location*

**Table C-5**  
**Torx T8M2.5x5.0 Screw (Continued)**

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|   | Black | 13   | 5.0 mm | 2.5 mm | 4.0 mm     |

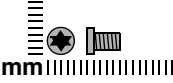
**Where used:**

Four screws that secure the heat sink to the notebook  
 (documented in [Section 5.16](#))



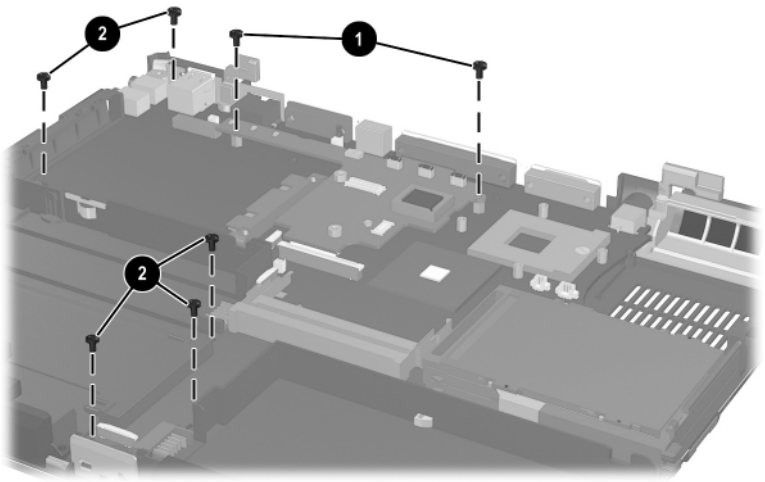
*Torx T8M2.5x5.0 Screw Locations*

**Table C-5**  
**Torx T8M2.5x5.0 Screw (Continued)**

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|   | Black | 13   | 5.0 mm | 2.5 mm | 4.0 mm     |

**Where used:**

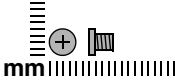
- ❶ Two screws that secure the button board to the notebook (documented in [Section 5.22](#))
- ❷ Five screws that secure the system board to the notebook (documented in [Section 5.23](#))



*Torx T8M2.5x5.0 Screw Locations*



**Table C-6**  
**Phillips PM2.5×3.5 Screw**

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| mm  | Black | 3    | 3.5 mm | 2.5 mm | 4.0 mm     |

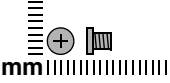
**Where used:**

One screw that secures the Mini PCI compartment cover to the notebook (documented in [Section 5.5](#))



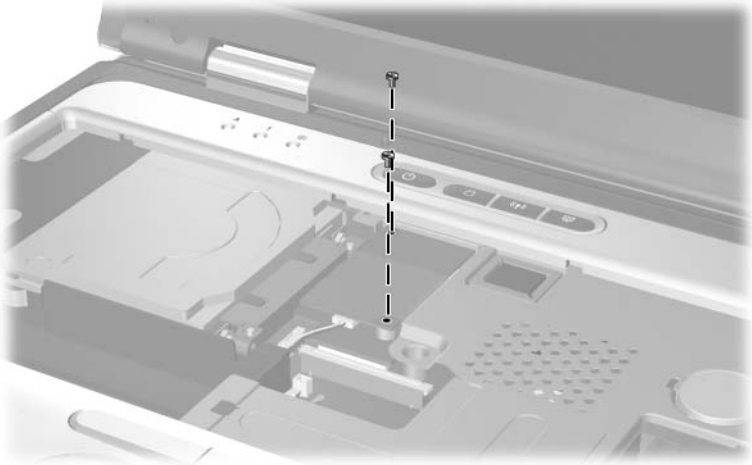
*Phillips M2.5×3.5 Screw Location*

**Table C-6**  
**Phillips PM2.5x3.5 Screw (Continued)**

|  mm | Color | Qty. | Length | Thread | Head Width |
|--|-------|------|--------|--------|------------|
|  | Black | 3    | 3.5 mm | 2.5 mm | 4.0 mm     |

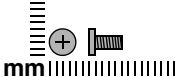
**Where used:**

Two screws that secure the modem board to the notebook (documented in [Section 5.10](#))



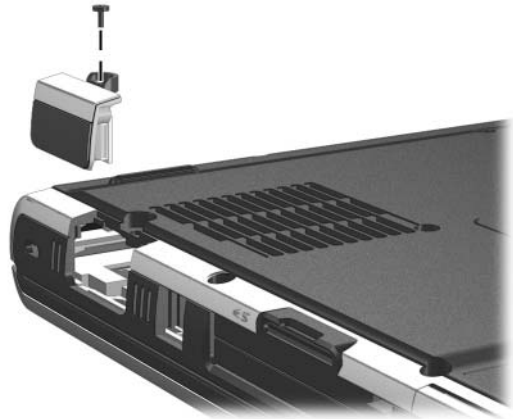
*Phillips PM2.5x3.5 Screw Locations*

**Table C-7**  
**Phillips PM2.0x5.0 Screw**

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| mm  | Black | 1    | 5.0 mm | 2.0 mm | 4.0 mm     |

**Where used:**



One screw that secures the Bluetooth cover to the notebook (documented in [Section 5.7](#))



*Phillips PM2.0x5.0 Screw Locations*

**Table C-8**  
**Phillips PM1.5x3.0 Screw**

---

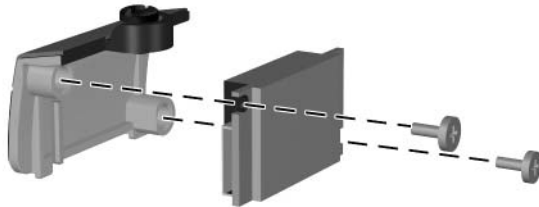
| <br>mm  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|   | Black | 5    | 3.0 mm | 1.5 mm | 3.5 mm     |

---

**Where used:**


Two screws that secure the Bluetooth board to the Bluetooth cover (documented in [Section 5.7](#))

---



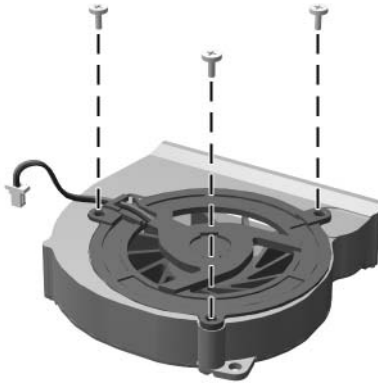
*Phillips PM1.5x3.0 Screw Locations*

**Table C-8**  
**Phillips PM1.5×3.0 Screw (Continued)**

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|   | Black | 5    | 3.0 mm | 1.5 mm | 3.5 mm     |

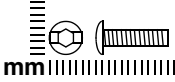
**Where used:**

Three screws that secure the fan to the fan housing  
 (documented in [Section 5.15](#))



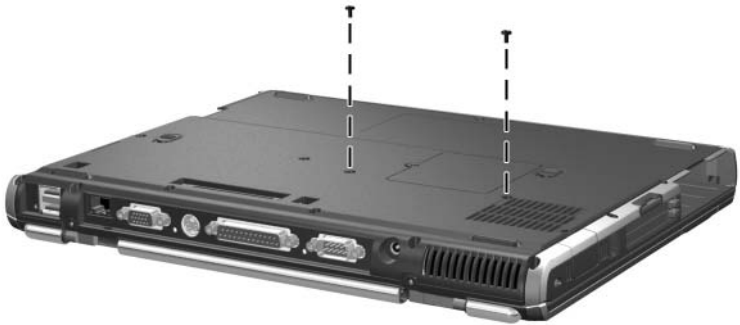
*Phillips PM1.5×3.0 Screw Locations*

**Table C-9**  
**Torx T8M2.5x11.0 Screw**

|  | Color  | Qty. | Length  | Thread | Head Width |
|---|--------|------|---------|--------|------------|
|   | Silver | 2    | 11.0 mm | 2.5 mm | 5.0 mm     |

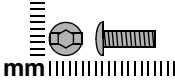
**Where used:**

Two screws that secure the keyboard to the notebook  
(documented in [Section 5.9](#))



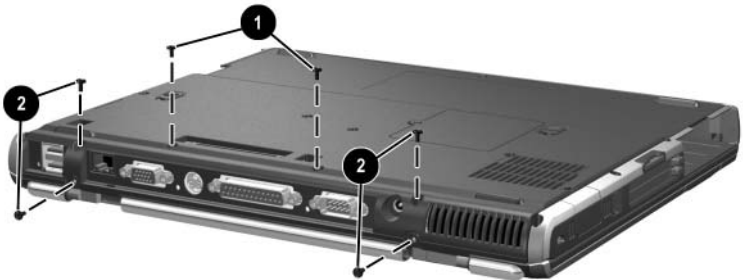
*Torx T8M2.5x11.0 Screw Locations*

**Table C-10**  
**Torx T8M2.5×9.0 Screw**

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|   | Black | 15   | 9.0 mm | 2.5 mm | 5.0 mm     |

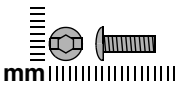
**Where used:**

- ❶ Two screws that secure the switch cover to the notebook (documented in [Section 5.12](#))
- ❷ Four screws that secure the display assembly to the notebook (documented in [Section 5.18](#))



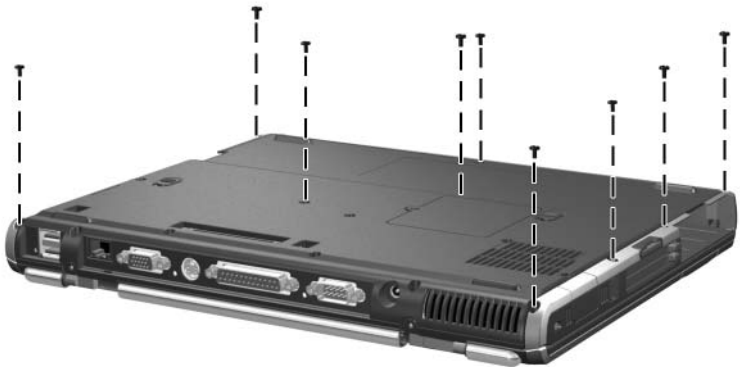
*Torx T8M2.5×9.0 Screw Locations*

**Table C-10**  
**Torx T8M2.5x9.0 Screw (Continued)**

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|   | Black | 15   | 9.0 mm | 2.5 mm | 5.0 mm     |

**Where used:**

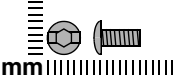
Nine screws that secure the top cover to the notebook  
 (documented in [Section 5.19](#))



*Torx T8M2.5x9.0 Screw Locations*

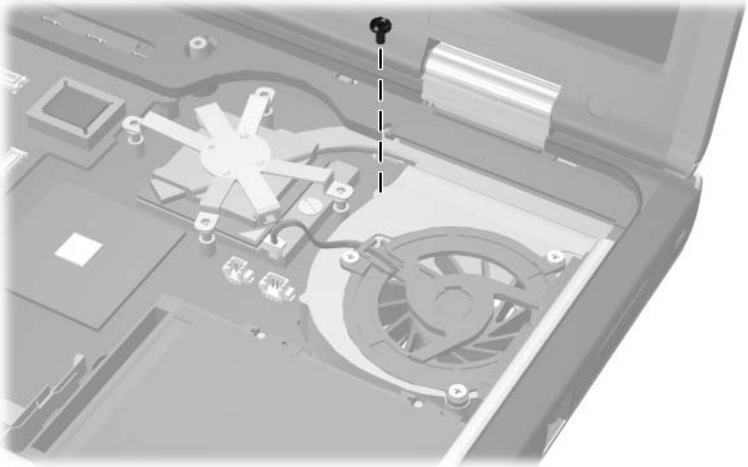


**Table C-11**  
**Torx T8M2.5×7.0 Screw**

| <br>mm | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|   | Black | 1    | 7.0 mm | 2.5 mm | 5.0 mm     |

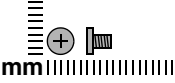
**Where used:**

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



*Torx T8M2.5×7.0 Screw Locations*

**Table C-12**  
**Phillips M2.0×3.5 Screw**

|  mm | Color | Qty. | Length | Thread | Head Width |
|--|-------|------|--------|--------|------------|
|  | Black | 5    | 3.5 mm | 2.5 mm | 4.0 mm     |

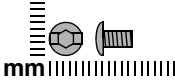
**Where used:**

Five screws that secure the top cover to the notebook (three in the MultiBay, two in the hard drive bay; documented in [Section 5.6](#))



*Phillips M2.0×3.5 Screw Locations*

**Table C-13**  
**Torx T8M2.5×5.5 Screw**

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|   | Black | 2    | 5.5 mm | 2.5 mm | 5.0 mm     |

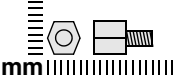
**Where used:**

Two screws that secure the top cover to the notebook  
 (documented in [Section 5.19](#))



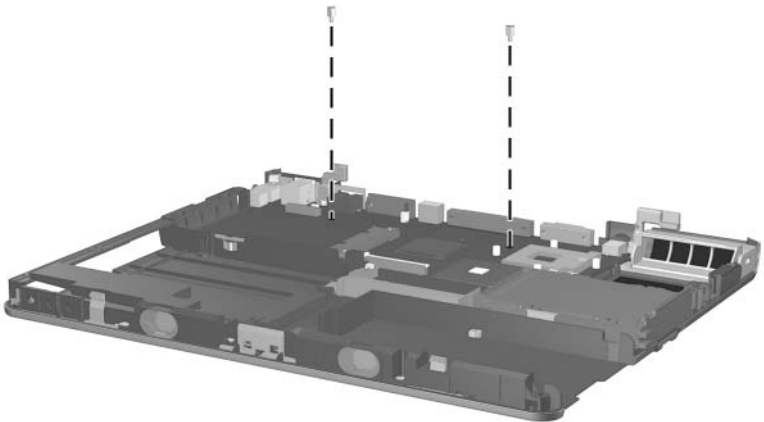
*Torx T8M2.5×5.5 Screw Locations*

**Table C-14**  
**Hex M2.5×9.0 Standoffs**

|  | Color  | Qty. | Length | Thread | Head Width |
|---|--------|------|--------|--------|------------|
|   | Silver | 2    | 9.0 mm | 2.5 mm |            |

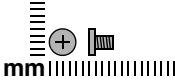
**Where used:**

Two standoffs that secure the system board to the notebook (documented in [Section 5.23](#))



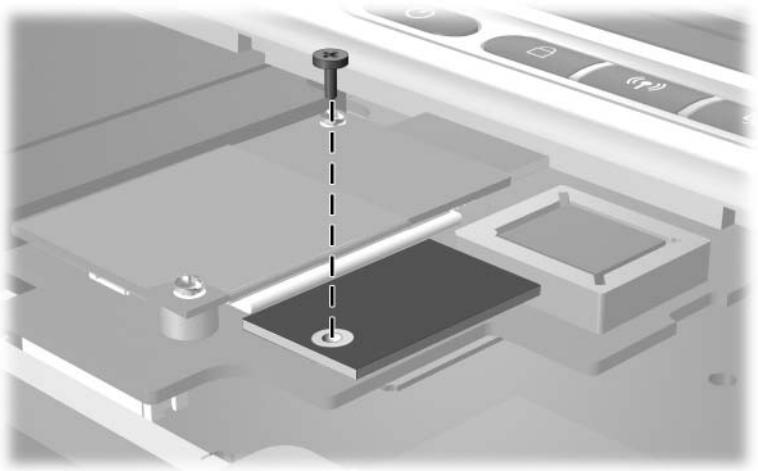
*Hex M2.5×9.0 Standoff Locations*

**Table C-15**  
**Phillips M3.5×3.0 Screw**

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|   | Black | 1    | 3.0 mm | 2.0 mm | 3.5 mm     |

**Where used:**

One screw that secures the security card to the system board  
 (documented in [Section 5.14](#))



*Phillips M3.5×3.0 Screw Location*

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