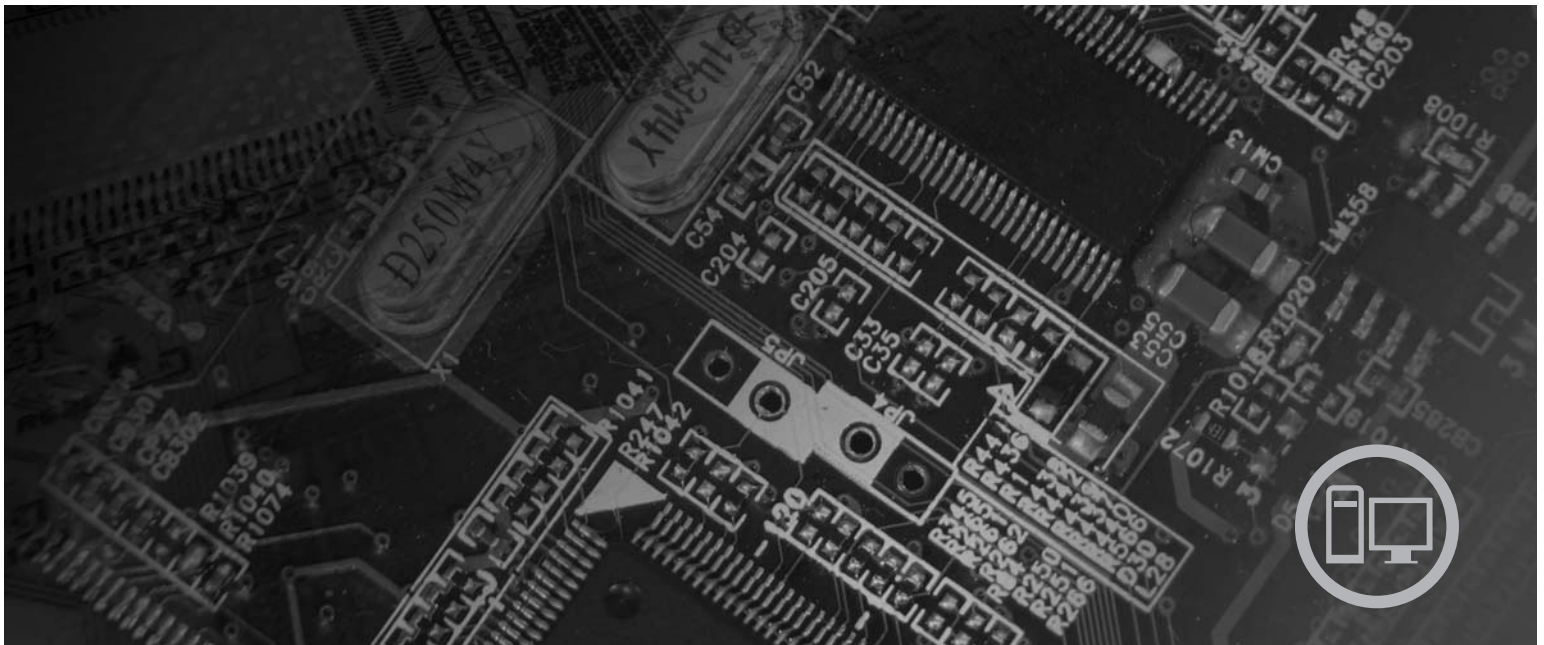




# ThinkStation Hardware Maintenance Manual



**Machine Types** 6423, 6427, 6483, 6493



***lenovo***

**ThinkStation  
Hardware Maintenance Manual**

**Note:** Before using this information and the product it supports, be sure to read the information under “Notices,” on page 217.

**Fourth Edition (December 2007)**

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# Contents

## Chapter 1. About this manual . . . . . 1

|   |   |
|---|---|
| Important Safety Information . . . . .                              | 1 |
| Important information about replacing RoHS compliant FRUs . . . . . | 2 |

## Chapter 2. Safety information . . . . . 3

|  |   |
|--|---|
| General safety . . . . .                                     | 3 |
| Electrical safety . . . . .                                  | 3 |
| Voltage-selection switch. . . . .                            | 5 |
| Safety inspection guide . . . . .                            | 5 |
| Handling electrostatic discharge-sensitive devices . . . . . | 6 |
| Grounding requirements . . . . .                             | 7 |
| Safety notices (multi-lingual translations). . . . .         | 7 |

## Chapter 3. General information . . . . . 39

|  |    |
|--|----|
| The ThinkVantage Productivity Center program . . . . . | 39 |
| Additional information resources . . . . .             | 39 |
| Specifications . . . . .                               | 40 |
| Types (6423, 6427, 6483, and 6493). . . . .            | 40 |

## Chapter 4. General Checkout . . . . . 41

|                                      |    |
|--------------------------------------|----|
| Problem determination tips . . . . . | 42 |
|--------------------------------------|----|

## Chapter 5. Diagnostics . . . . . 43

|  |    |
|--|----|
| PC-Doctor for Windows . . . . .                                      | 43 |
| PC-Doctor for Windows PE . . . . .                                   | 43 |
| Running diagnostics from the Rescue and Recovery workspace . . . . . | 43 |
| PC-Doctor for DOS . . . . .  | 44 |
| Creating a diagnostic CD image . . . . .                             | 44 |
| Creating diagnostic diskettes . . . . .                              | 44 |
| Running diagnostics from the CD or diskettes. . . . .                | 45 |
| Navigating through the diagnostics programs . . . . .                | 45 |
| Running tests. . . . .   | 45 |
| Viewing the test log . . . . .                                       | 47 |

## Chapter 6. Using the Setup Utility . . . . . 49

|   |    |
|---|----|
| Starting the Setup Utility program. . . . .                 | 49 |
| Viewing and changing settings . . . . .                     | 49 |
| Using passwords . . . . .                                   | 49 |
| Password considerations . . . . .                           | 49 |
| User Password . . . . .                                     | 50 |
| Administrator Password . . . . .                            | 50 |
| Setting, changing, and deleting a password. . . . .         | 50 |
| Selecting a startup device. . . . .                         | 50 |
| Selecting a temporary startup device . . . . .              | 50 |
| Selecting or changing the startup device sequence . . . . . | 51 |
| Advanced settings . . . . .                                 | 51 |
| Exiting from the Setup Utility program . . . . .            | 51 |

## Chapter 7. Installing and configuring RAID . . . . . 53

|   |    |
|---|----|
| Attaching SATA hard disk drives . . . . . | 53 |
|---|----|

|  |    |
|--|----|
| Configuring the system BIOS to enable embedded SATA RAID functionality . . . . .   | 53 |
| Creating RAID volumes . . . . .  | 53 |
| Deleting RAID volumes . . . . .  | 54 |
| SUPPORTED SAS RAID configurations . . . . .  | 54 |
| Configuring the system BIOS to enable SAS RAID functionality . . . . .   | 54 |
| Configuring the system BIOS to enable SAS RAID 0 functionality . . . . .   | 55 |
| Configuring the system BIOS to enable SAS RAID 1 functionality . . . . .   | 55 |
| Configuring mirrored volume disks for Integrated Mirrored Array (IM) two disk, with an optional hot spare disk or Integrated Mirrored Enhanced Array (IME) three to five disks, with an optional hot spare disk: . . . . . | 56 |
| Configuring the system BIOS to enable SAS RAID 1E functionality . . . . .  | 56 |

## Chapter 8. Symptom-to-FRU Index . . . . . 59

|  |    |
|--|----|
| Hard disk drive boot error . . . . .   | 59 |
| Power Supply Errors . . . . .          | 59 |
| Diagnostic error codes. . . . .        | 61 |
| Beep symptoms . . . . .                | 82 |
| POST error codes . . . . .             | 83 |
| Miscellaneous error messages . . . . . | 85 |
| Undetermined problems . . . . .        | 86 |

## Chapter 9. Replacing FRUs(types 6423 and 6483) . . . . . 89

|  |     |
|--|-----|
| Locations . . . . .  | 90  |
| Controls and connectors on the front of the computer . . . . . | 90  |
| Connectors on the rear of the computer . . . . .               | 91  |
| Internal components . . . . .                                  | 92  |
| System board connectors and components . . . . .               | 93  |
| Opening the cover . . . . .                                    | 94  |
| Removing the front bezel. . . . .                              | 95  |
| Accessing system board components and drives . . . . .         | 96  |
| Replacing the battery . . . . .                                | 98  |
| Replacing the power supply assembly . . . . .                  | 99  |
| Replacing an adapter card . . . . .                            | 103 |
| Replacing the heat sink . . . . .                              | 105 |
| Replacing the microprocessor . . . . .                         | 106 |
| Replacing the system board . . . . .                           | 109 |
| Replacing a hard disk drive . . . . .                          | 110 |
| Replacing an optical drive . . . . .                           | 112 |
| Replacing the diskette drive or optional card reader . . . . . | 113 |
| Replacing a memory module . . . . .                            | 115 |
| Replacing a fan assembly . . . . .                             | 117 |
| Replacing the internal speaker. . . . .                        | 118 |
| Replacing the front panel connector assembly . . . . .         | 119 |
| Completing the FRU replacement . . . . .                       | 121 |

**Chapter 10. Replacing FRUs (types 6427 and 6493). . . . . 123**

Locations. . . . . 124  
    Controls and connectors on the front of the computer. . . . . 124  
    Connectors on the rear of the computer . . . . . 125  
    Internal components . . . . . 126  
    System board connectors and components. . . . . 127  
Opening the cover. . . . . 128  
Removing the front bezel . . . . . 130  
Accessing system board components and drives 131  
Replacing the battery. . . . . 133  
Replacing the power supply assembly . . . . . 134  
Replacing an adapter card . . . . . 137  
Replacing the heat sink . . . . . 139  
Replacing the microprocessor . . . . . 141  
Replacing the system board . . . . . 143  
Replacing a hard disk drive . . . . . 144  
Replacing an optical drive . . . . . 146  
Replacing the diskette drive or optional card reader. . . . . 147  
Replacing a memory module . . . . . 149  
Replacing a fan assembly . . . . . 151  
Replacing the internal speaker. . . . . 152  
Completing the FRU replacement . . . . . 153

**Chapter 11. FRU lists . . . . . 155**

Machine Type 6423 . . . . . 155  
Machine Type 6427 . . . . . 169  
Machine Type 6483 . . . . . 183  
Machine Type 6493 . . . . . 198

**Chapter 12. Additional Service Information . . . . . 213**

Security features . . . . . 213  
    Hardware controlled Passwords . . . . . 213  
    Operating system password . . . . . 213  
    Vital product data . . . . . 213  
BIOS levels . . . . . 213  
Flash update procedures. . . . . 213  
    Updating (flashing) BIOS from a diskette or CD-ROM. . . . . 214  
Updating (flashing) BIOS from the operating system . . . . . 214  
Recovering from a POST/BIOS update failure . . . . . 214  
Power management . . . . . 216  
    Automatic configuration and power interface (ACPI) BIOS. . . . . 216  
    Automatic Power-On features . . . . . 216

**Appendix. Notices . . . . . 217**

Television output notice . . . . . 218  
Trademarks . . . . . 218

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## Chapter 1. About this manual

This manual contains service and reference information for ThinkStation computers listed on the cover. It is intended only for trained servicers who are familiar with Lenovo™ computer products.

Before servicing a Lenovo product, be sure to read the Safety Information. See Chapter 2, "Safety information," on page 3.

The Symptom-to-FRU Index and Additional Service Information chapters are not specific to any machine type and are applicable to all ThinkStation computers.

This manual includes a complete FRU part number listing for each machine type and model listed on the cover. If you have internet access, FRU part numbers are also available at:

<http://www.lenovo.com/support>

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### Important Safety Information

Be sure to read all caution and danger statements in this book before performing any of the instructions.

Veillez lire toutes les consignes de type DANGER et ATTENTION du présent document avant d'exécuter les instructions.

Lesen Sie unbedingt alle Hinweise vom Typ "ACHTUNG" oder "VORSICHT" in dieser Dokumentation, bevor Sie irgendwelche Vorgänge durchführen

Leggere le istruzioni introdotte da ATTENZIONE e PERICOLO presenti nel manuale prima di eseguire una qualsiasi delle istruzioni

Certifique-se de ler todas as instruções de cuidado e perigo neste manual antes de executar qualquer uma das instruções

Es importante que lea todas las declaraciones de precaución y de peligro de este manual antes de seguir las instrucciones.

تأكد من قراءة كل التحذيرات الموجودة في هذا الكتاب قبل اتباع هذه التعليمات .

执行任何说明之前，请确保已阅读本书中的所有警告和危险声明。

執行任何指示前，請確實閱讀本書中的所有警告及危險聲明。

ודאו שקראתם את כל הודעות האזהרה והסכנה במסמך זה לפני שתבצעו פעולה כלשהי.

본 사용 설명서에 기재된 내용을 실행하기 전에 모든 주의사항 및 위험사항을 숙지하십시오.

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## Important information about replacing RoHS compliant FRUs

RoHS, The Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive (2002/95/EC) is a European Union legal requirement affecting the global electronics industry. RoHS requirements must be implemented on Lenovo products placed on the market and sold in the European Union after June 2006. Products on the market before June 2006 are not required to have RoHS compliant parts. If the parts are not compliant originally, replacement parts can also be noncompliant, but in all cases, if the parts are compliant, the replacement parts must also be compliant.

**Note:** RoHS and non-RoHS FRU part numbers with the same fit and function are identified with unique FRU part numbers.

Lenovo plans to transition to RoHS compliance well before the implementation date and expects its suppliers to be ready to support Lenovo's requirements and schedule in the EU. Products sold in 2005, will contain some RoHS compliant FRUs. The following statement pertains to these products and any product Lenovo produces containing RoHS compliant parts.

RoHS compliant ThinkStation parts have unique FRU part numbers. Before or after June, 2006, failed RoHS compliant parts must always be replaced using RoHS compliant FRUs, so only the FRUs identified as compliant in the system HMM or direct substitutions for those FRUs can be used.

| Products marketed before June 2006 |                 | Products marketed after June 2006 |                 |
|------------------------------------|-----------------|-----------------------------------|-----------------|
| Current or original part           | Replacement FRU | Current or original part          | Replacement FRU |
| Non-RoHS                           | Can be Non-RoHS | Must be RoHS                      | Must be RoHS    |
| Non-RoHS                           | Can be RoHS     |                                   |                 |
| Non-RoHS                           | Can sub to RoHS |                                   |                 |
| RoHS                               | Must be RoHS    |                                   |                 |

**Note:** A direct substitution is a part with a different FRU part number that is automatically shipped by the distribution center at the time of order.



---

## Chapter 2. Safety information

This chapter contains the safety information that you need to be familiar with before servicing a computer.

---

### General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
  1. Ensure you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
  4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.  
**Remember:** Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

---

### Electrical safety



**CAUTION:**

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the server/workstation covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

**Important:** Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing Field Replaceable Units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.  
**Remember:** Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.  
**Remember:** There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
  - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.

- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generatorsand similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
  - Use caution; do not become a victim yourself.
  - Switch off power.
  - Send another person to get medical aid.

---

## Voltage-selection switch

Some computers are equipped with a voltage-selection switch located near the power-cord connection point on the computer. If your computer has a voltage-selection switch, ensure that you set the switch to match the voltage available at your electrical outlet. Setting the voltage-selection switch incorrectly can cause permanent damage to the computer.

If your computer does not have a voltage-selection switch, your computer is designed to operate only at the voltage provided in the country or region where the computer was originally purchased.

If you relocate your computer to another country, be aware of the following:

- If your computer does not have a voltage-selection switch, do not connect the computer to an electrical outlet until you have verified that the voltage provided is the same as it was in the country or region where the computer was originally purchased.
- If your computer has a voltage selection switch, do not connect the computer to an electrical outlet until you have verified that the voltage-selection switch is set to match the voltage provided in that country or region.

If you are not sure of the voltage provided at your electrical outlet, contact your local electric company or refer to official Web sites or other literature for travelers to the country or region where you are located.

---

## Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
  - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
  - b. The power cord should be the appropriate type as specified in the parts listings.
  - c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious alterations. Use good judgment as to the safety of any alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

---

## Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

**Notes:**

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people while handling the part.
- Wear a grounded wrist strap against your skin to eliminate static on your body.

- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

**Note:** The use of a grounding system is desirable but not required to protect against ESD damage.

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
- Use the round ground-prong of the ac plug on ac-operated computers.

---

## Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

---

## Safety notices (multi-lingual translations)

The caution and danger safety notices in this section are provided in the following languages:

- English
- Arabic
- Brazilian/Portuguese
- Chinese (simplified)
- Chinese (traditional)
- French
- German
- Hebrew
- Italian
- Korean
- Spanish



### **DANGER**

Electrical current from power, telephone and communication cables is hazardous.

**To avoid a shock hazard:**

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**

- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following tables when installing, moving, or opening covers on this product or attached devices.**

| To Connect   | To Disconnect  |
|--|--|
| <ol style="list-style-type: none"> <li>1. Turn everything OFF.</li> <li>2. First, attach all cables to devices.</li> <li>3. Attach signal cables to connectors.</li> <li>4. Attach power cords to outlet.</li> <li>5. Turn device ON.</li> </ol> | <ol style="list-style-type: none"> <li>1. Turn everything OFF.</li> <li>2. First, remove power cords from outlet.</li> <li>3. Remove signal cables from connectors.</li> <li>4. Remove all cables from devices.</li> </ol> |



**CAUTION:**

When replacing the lithium battery, use only Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

*Do not:*

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.



**CAUTION:**

When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



**DANGER:** Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

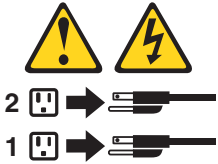
**CAUTION:**

Use safe practices when lifting.



**CAUTION:**

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.







## خطر

التيار الكهربى الموجود بمصدر الطاقة أو أجهزة التليفون أو أسلاك الإتصالات يشكل خطورة.

لتفادي مخاطر الصدمات الكهربائية:

لا تحاول توصيل أو فصل أي أسلاك أو القيام بعمليات تركيب أو صيانة أو إعادة توصيف لهذا المنتج أثناء وجود عاصفة كهربائية.

يجب توصيل كل أسلاك الكهرباء في مخارج كهرباء ذات توصيلات أسلاك وتوصيلات أرضية صحيحة  
يجب توصيل أي جهاز سيتم الحاقه بهذا المنتج في مخارج كهرباء ذات توصيلات أسلاك صحيحة.

وإن أمكن يجب استخدام يد واحدة فقط في توصيل أو فصل أسلاك الإشارة.

لا تحاول تشغيل أي جهاز إذا كان هناك أثر لحرق أو مياه أو تلف بالمكونات

يجب فصل أسلاك الكهرباء وأنظمة الاتصالات وشبكات الاتصال وأجهزة المودم الملحقة قبل فتح أغطية الجهاز، ما لم يتم طلب خلاف ذلك في التعليمات الخاصة بالتركيب والتوصيف.  
قم بتوصيل وفصل الأسلاك كما هو موضح في الجدول التالي وذلك عند القيام بعمليات التركيب أو النقل أو فتح أغطية هذا المنتج أو الأجهزة الملحقة.

### للفصل:

- قم بإيقاف كل شيء.
- أولاً، قم بفصل كل أسلاك الكهرباء من المخرج.
- قم بفصل أسلاك الإشارة من الموصلات.
- قم بفصل كل الأسلاك من الأجهزة.

### للتوصيل:

- قم بإيقاف كل شيء.
- أولاً، قم بتوصيل كل الأسلاك بالأجهزة.
- قم بتوصيل أسلاك الإشارة في لموصلات.
- قم بتوصيل أسلاك الكهرباء في المخارج.
- قم بتشغيل الجهاز.



تنبيه :

عند استبدال البطارية الليثيوم، استخدم فقط رقم الجزء الخاص **Part Number 33F8354** أو نوع آخر يكون على نفس مستوى الكفاءة يحدده لك المصنع. إذا كان النظام الخاص يستخدم معه بطارية ليثيوم قم باستبدالها بنفس النوع الذي تم صناعته من خلال نفس المصنع. تحتوي البطارية على مادة الليثيوم ويمكن أن تنفجر في حالة عدم استخدامها أو التعامل معها بطريقة صحيحة أو عند التخلص منها بطريقة خطأ.

لا تَقم بـ:

- الفاء البطارية أو غمرها في الماء
- تسخينها أعلى من ١٠٠ درجة مئوية و(٢١٢ ° فهرنهايت)
- بتصليحها أو فكها

تخلص من البطارية طبقاً للقانون أو النظام المحلي .



تنبيه :

أثناء تركيب منتجات ليزر (مثل CD-ROMs أو وحدة تشغيل DVD أو أجهزة Fiber Optic أو وحدات الإرسال) يجب مراعاة الآتي:

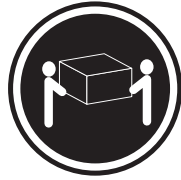
لا تنزع الأغطية. قد ينتج عن نزع أغطية منتج الليزر انفجار أشعة الليزر شديدة الخطورة. لا يوجد أجزاء يمكن تغييرها داخل الجهاز. قد ينتج عن استخدام تحكيمات أو تعديلات أو عمل أي تصرفات أخرى تخالف ما هو محدد هنا إلى انفجار أشعة شديدة الخطورة.



خطر

تحتوي بعض منتجات الليزر على الفئة دايود ليزر مدمج من الفئة **Class 3A** أو **Class 3B**. يجب مراعاة الآتي .

أشعة الليزر عند الفتح. لا تحدد إلى الإشعاع و لا تنظر إليه مباشرة بواسطة أي أجهزة مرئية وتجذب التعرض المباشر للإشعاع .



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)

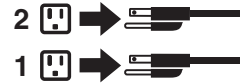


≥55 kg (121.2 lbs)

تنبيه :  
يجب استخدام ممارسات آمنة عند الرفع



تنبيهه :  
لا يرقم زر التحكم في التشغيل الموجود على الجهاز والمفتاح الكهربائي الموجود على لوحة التحكم بإيقاف التيار الكهربائي المار بالجهاز. قد يكون للجهاز أكثر من سلك كهربائي واحد. لايقاف التيار الكهربائي المار بالجهاز، تأكد من فصل جميع أسلاك الكهرباء من مصدر الكهرباء .





## PERIGO

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicações é perigosa.

Para evitar risco de choque elétrico:

- Não conecte nem desconecte nenhum cabo ou execute instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.
- Conecte todos os cabos de alimentação a tomadas elétricas corretamente instaladas e aterradas.
- Todo equipamento que for conectado a este produto deve ser conectado a tomadas corretamente instaladas.
- Quando possível, utilize apenas uma das mãos para conectar ou desconectar cabos de sinal.
- Nunca ligue nenhum equipamento quando houver evidência de fogo, água ou danos estruturais.
- Antes de abrir tampas de dispositivos, desconecte cabos de alimentação, sistemas de telecomunicação, redes e modems conectados, a menos que especificado de maneira diferente nos procedimentos de instalação e configuração.
- Conecte e desconecte os cabos conforme descrito na tabela apresentada a seguir ao instalar, mover ou abrir tampas deste produto ou de dispositivos conectados.

| Para Conectar:   | Para Desconectar:  |
|--|--|
| <ol style="list-style-type: none"><li>1. DESLIGUE Tudo.</li><li>2. Primeiramente, conecte todos os cabos aos dispositivos.</li><li>3. Conecte os cabos de sinal aos conectores.</li><li>4. Conecte os cabos de alimentação às tomadas.</li><li>5. LIGUE os dispositivos.</li></ol> | <ol style="list-style-type: none"><li>1. DESLIGUE Tudo.</li><li>2. Primeiramente, remova os cabos de alimentação das tomadas.</li><li>3. Remova os cabos de sinal dos conectores.</li><li>4. Remova todos os cabos dos dispositivos.</li></ol> |



### **CUIDADO:**

Ao substituir a bateria de lítio, utilize apenas uma bateria com Número de Peça 33F8354 ou um tipo de bateria equivalente recomendado pelo Se o seu sistema possui um módulo com uma bateria de lítio, substitua-o apenas por um módulo do mesmo tipo e do mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada ou descartada de maneira correta.

Não:

- Jogue ou coloque na água
- Aqueça a mais de 100°C (212°F)
- Conserte nem desmonte

Descarte a bateria conforme requerido pelas leis ou regulamentos locais.



### **PRECAUCIÓN:**

Quando produtos a laser (como unidades de CD-ROMs, unidades de DVD-ROM, dispositivos de fibra ótica ou transmissores) estiverem instalados, observe o seguinte:

- Não remova as tampas. A remoção das tampas de um produto a laser pode resultar em exposição prejudicial à radiação de laser. Não existem peças que podem ser consertadas no interior do dispositivo.
- A utilização de controles ou ajustes ou a execução de procedimentos diferentes dos especificados aqui pode resultar em exposição prejudicial à radiação.

### **PERIGO**

Alguns produtos a laser contêm diodo de laser integrado da Classe 3A ou da Classe 3B. Observe o seguinte:

Radiação a laser quando aberto. Não olhe diretamente para o feixe a olho nu ou com instrumentos ópticos e evite exposição direta ao feixe.



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

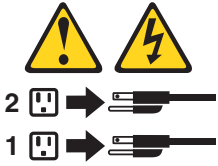
### **CUIDADO:**

Utilize procedimentos de segurança para levantar equipamentos.



**CUIDADO:**

O botão de controle de alimentação do dispositivo e o botão para ligar/desligar da fonte de alimentação não desligam a corrente elétrica fornecida ao dispositivo. O dispositivo também pode ter mais de um cabo de alimentação. Para remover toda a corrente elétrica do dispositivo, assegure que todos os cabos de alimentação estejam desconectados da fonte de alimentação.





#### 危险

电源、电话和通信电缆中的电流是危险的。

为避免电击危险：

- 请勿在雷电期间连接或断开任何电缆的连接，或者对本产品进行安装、维护或重新配置。
- 将所有电源线连接到正确连线和妥善接地的电源插座。
- 将所有要连接到该产品的设备连接到正确连线的插座。
- 如果可能，请仅使用一只手来连接或断开信号电缆的连接。
- 切勿在有火、水、结构损坏迹象的情况下开启任何设备。
- 在打开设备外盖之前请断开已连接的电源线、远程通信系统、网络和调制解调器，除非在安装和配置过程中另有说明。
- 当安装、移动或打开该产品或连接设备的外盖时，请按照下表所述来连接或断开电缆的连接。

| 要连接   | 要断开连接  |
|---|--|
| <ol style="list-style-type: none"><li>1. 切断所有电源。</li><li>2. 首先将所有电缆连接到设备。</li><li>3. 将信号电缆连接到接口。</li><li>4. 将电源线连接到插座。</li><li>5. 开启设备。</li></ol> | <ol style="list-style-type: none"><li>1. 切断所有电源。</li><li>2. 首先从插座上拔出电源线。</li><li>3. 从接口上拔出信号电缆。</li><li>4. 从设备上拔出所有电缆。</li></ol> |



#### 警告：

更换锂电池时，请仅使用部件号为 33F8354 的电池或制造商推荐的同类电池。如果您的系统有包含锂电池的模块，请仅使用同一制造商生产的相同模块类型来替换该模块。该电池中含有锂，如果使用、操作或处理不当，可能会发生爆炸。

切勿：

- 投入或浸入水中
- 加热到 100 °C (212 °F) 以上
- 维修或拆卸

请按照当地法令或条例的要求处理电池。



警告：  
安装激光产品（例如 CD-ROM、DVD-ROM 驱动器、光纤设备或发射设备）时，  
请注意以下声明：

- 请勿卸下外盖。卸下激光产品的外盖可能导致遭受激光辐射的危险。该设备内没有可维修的部件。
- 如果不按照此处指定的过程进行控制、调整或操作，则有可能导致遭受辐射的危险。



危险

某些激光产品包含嵌入式 3A 类或 3B 类激光二极管。请注意以下声明：

打开后有激光辐射。请勿注视光束，请勿直接用光学仪器查看，并请避免直接暴露在光束中。



≥18 千克 (37 磅)



≥32 千克 (70.5 磅)



≥55 千克 (121.2 磅)

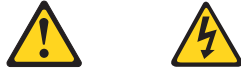
警告：  
抬起时请采取安全措施。



警告：  
设备上的电源控制按钮和电源上的电源开关不会切断供给该设备的电流。该设备还可能有多条电源线。要切断该设备的所有电流，请确保所有电源线都与电源断开连接。







#### 危險

電源、電話及通訊纜線上的電流都具有危險性。

若要避免觸電危險：

- 請勿在雷雨期間，連接或拔除纜線、執行安裝、維護或重新配置本產品。
- 將所有電源線連接到正確配線及接地的電源插座。
- 任何與本產品連接的設備都必須連接到配線妥當的電源插座。
- 請盡可能用單手連接或拔除信號線。
- 發生火災、水災或結構損害時，絕對不要開啟任何設備。
- 除非在安裝及配置程序中另有指示，否則在開啟裝置機蓋之前，請拔掉連接的電源線、電信系統、網路及數據機。
- 安裝、移動或開啟本產品或附屬裝置的機蓋時，請遵循下列說明連接及拔掉纜線。

| 連線   | 切斷連線   |
|--|--|
| <ol style="list-style-type: none"> <li>1. 關閉所有開關。</li> <li>2. 首先，連接所有接線到裝置。</li> <li>3. 連接信號線到接頭。</li> <li>4. 連接電源線到插座。</li> <li>5. 開啟裝置。</li> </ol> | <ol style="list-style-type: none"> <li>1. 關閉所有開關。</li> <li>2. 首先，拔掉插座上的電源線。</li> <li>3. 拔掉接頭上的信號線。</li> <li>4. 拔掉裝置上所有接線。</li> </ol> |



#### 警告：

更換鋰電池時，請僅使用產品編號 **33F8354** 或製造商所建議的同類型電池。  
 如果您的系統中含有鋰電池模組，請僅使用同一家製造商所生產的相同模組進行更換。  
 如果未以正確方式使用、處理或棄置含鋰的電池，會有爆炸的危險。

請勿：

- 沾溼或浸入水中
  - 置於 **100C (212F)** 以上的高溫環境
  - 修理或拆開
- 請按照各地區有關廢棄電池的法令和規定處理舊電池。



#### 警告：

- 請勿移除機蓋。移除雷射產品的機蓋，可能會導致暴露在危險的雷射輻射中。裝置內部並無可自行維修的零件。
- 利用或執行非本文中所指定的控制、調整及執行程序，可能會導致危險的輻射外洩。



#### 危險

部分雷射產品含有內嵌式 **Class 3A** 或 **Class 3B** 雷射二極體。請注意下列事項：  
 在開啟光碟機時，會發生雷射輻射。請勿直視光束或用光學儀器直接檢視，並避免直接暴露在光束中。



≥ 18 公斤 (37 磅)



≥ 32 公斤 (70.5 磅)



≥ 55 公斤 (121.2 磅)

警告：  
搬運時請注意安全。



警告：  
裝置上的電源控制按鈕及電源供應器上的電源開關，無法關閉裝置所產生的電流。  
該裝置可能有多條電源線。若要除去裝置流出的所有電流，請確認已切斷所有電源線的電源。





## DANGER

Le courant électrique provenant de l'alimentation, du téléphone et des câbles de transmission peut présenter un danger.

Pour éviter tout risque de choc électrique :

- Ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.
- Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.
- Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.
- Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.
- Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.
- Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relient aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).
- Lorsque vous installez, que vous déplacez, ou que vous manipulez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.

| Connexion  | Déconnexion   |
|--|---|
| 1. Mettez les unités HORS TENSION.                         | 1. Mettez les unités HORS TENSION.                    |
| 2. Commencez par brancher tous les cordons sur les unités. | 2. Débranchez les cordons d'alimentation des prises.  |
| 3. Branchez les câbles d'interface sur des connecteurs.    | 3. Débranchez les câbles d'interface des connecteurs. |
| 4. Branchez les cordons d'alimentation sur des prises.     | 4. Débranchez tous les câbles des unités.             |
| 5. Mettez les unités SOUS TENSION.                         |   |



**ATTENTION:**

Remplacer la pile au lithium usagée par une pile de référence identique exclusivement, (référence 33F8354), ou suivre les instructions du fabricant qui en définit les équivalences. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et peut exploser en cas de mauvaise utilisation, de mauvaise manipulation ou de mise au rebut inappropriée.

Ne pas :

- la jeter à l'eau,
- l'exposer à des températures supérieures à 100°C,
- chercher à la réparer ou à la démonter.

Ne pas mettre la pile à la poubelle. Pour la mise au rebut, se reporter à la réglementation en vigueur.



**ATTENTION:**

Si des produits à laser (tels que des unités de CD-ROM, de DVD-ROM, des unités à fibres optiques, ou des émetteurs) sont installés, prenez connaissance des informations suivantes :

- Ne retirez pas le carter. En ouvrant l'unité de CD-ROM ou de DVD-ROM, vous vous exposez au rayonnement dangereux du laser. Aucune pièce de l'unité n'est réparable.
- Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent manuel.



**DANGER**

Certains produits à laser contiennent une diode à laser intégrée de classe 3A ou 3B. Prenez connaissance des informations suivantes:

Rayonnement laser lorsque le carter est ouvert. Evitez toute exposition directe au rayon laser. Evitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques.



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



≥55 kg (121.2 lbs)

**ATTENTION:**

**Soulevez la machine avec précaution.**



**ATTENTION:**

L'interrupteur de contrôle d'alimentation de l'unité et l'interrupteur dubloc d'alimentation ne coupent pas le courant électrique alimentant l'unité. En outre, le système peut être équipé de plusieurs cordons d'alimentation. Pour mettre l'unité hors tension, vous devez déconnecter tous les cordons de la source d'alimentation.





## VORSICHT

An Netz-, Telefon- und Datenleitungen können gefährliche Spannungen anliegen.

### Aus Sicherheitsgründen:

- Bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.
- Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Die Signalkabel nach Möglichkeit einhändig anschließen oder lösen, um einen Stromschlag durch Berühren von Oberflächen mit unterschiedlichem elektrischem Potenzial zu vermeiden.
- Geräte niemals einschalten, wenn Hinweise auf Feuer, Wasser oder Gebäudeschäden vorliegen.
- Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem Öffnen des Gehäuses zu unterbrechen, sofern in den Installations- und Konfigurationsprozeduren keine anders lautenden Anweisungen enthalten sind.
- Zum Installieren, Transportieren und Öffnen der Abdeckungen des Computers oder der angeschlossenen Einheiten die Kabel gemäß der folgenden Tabelle anschließen und abziehen.

| Zum Anschließen der Kabel gehen Sie wie folgt vor  | Zum Abziehen der Kabel gehen Sie wie folgt vor  |
|--|---|
| <ol style="list-style-type: none"><li>1. Schalten Sie alle Einheiten AUS.</li><li>2. Schließen Sie erst alle Kabel an die Einheiten an.</li><li>3. Schließen Sie die Signalkabel an die Buchsen an.</li><li>4. Schließen Sie die Netzkabel an die Steckdose an.</li><li>5. Schalten Sie die Einheit EIN.</li></ol> | <ol style="list-style-type: none"><li>1. Schalten Sie alle Einheiten AUS.</li><li>2. Ziehen Sie zuerst alle Netzkabel aus den Netzsteckdosen.</li><li>3. Ziehen Sie die Signalkabel aus den Buchsen.</li><li>4. Ziehen Sie alle Kabel von den Einheiten ab.</li></ol> |



#### **CAUTION:**

Eine verbrauchte Lithiumbatterie nur durch eine Batterie mit der Teilenummer 33F8354 oder eine gleichwertige, vom Hersteller empfohlene Batterie ersetzen. Enthält das System ein Modul mit einer Lithiumbatterie, dieses nur durch ein Modul desselben Typs und von demselben Hersteller ersetzen. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

Die Batterie nicht:

- mit Wasser in Berührung bringen.
- über 100 C erhitzen.
- reparieren oder zerlegen.

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.



#### **ACHTUNG:**

**Bei der Installation von Lasergeräten (wie CD-ROM-Laufwerken, DVD-aufwerken, Einheiten mit Lichtwellenleitertechnik oder Sendern) Folgendes beachten:**

- Die Abdeckungen nicht entfernen. Durch Entfernen der Abdeckungen des Lasergeräts können gefährliche Laserstrahlungen freigesetzt werden. Das Gerät enthält keine zu wartenden Teile.
- Werden Steuerelemente, Einstellungen oder Durchführungen von Prozeduren anders als hier angegeben verwendet, kann gefährliche Laserstrahlung auftreten.



#### **VORSICHT**

**Einige Lasergeräte enthalten eine Laserdiode der Klasse 3A oder 3B. Beachten Sie Folgendes:**

**Laserstrahlung bei geöffneter Verkleidung. Nicht in den Strahl blicken. Keine Lupen oder Spiegel verwenden. Strahlungsbereich meiden.**



≥18 kg



≥32 kg



≥55 kg

**ACHTUNG:**

Arbeitsschutzrichtlinien beim Anheben der Maschine beachten.



**ACHTUNG:**

Mit dem Netzschalter an der Einheit und am Netzteil wird die Stromversorgung für die Einheit nicht unterbrochen. Die Einheit kann auch mit mehreren Netzkabeln ausgestattet sein. Um die Stromversorgung für die Einheit vollständig zu unterbrechen, müssen alle zum Gerät führenden Netzkabel vom Netz getrennt werden.







#### סכנה

זרם חשמלי המועבר בכבלי חשמל, טלפון ותקשורת הוא מסוכן.

כדי להימנע מסכנת התחשמלות:

- אל תחברו או תנתקו כבלים, ואל תבצעו פעולת התקנה, תחזוקה או שינוי תצורה במוצר זה במהלך סופת ברקים.
- חברו את כל כבלי החשמל לשקע חשמל מחווט ומוארק כהלכה.
- חברו כל ציוד שיחובר למוצר זה לשקעי חשמל מחוטים כהלכה.
- במידת האפשר, השתמשו ביד אחת בלבד לחיבור או לניתוק של כבלי אותות.
- לעולם אל תפעילו ציוד כלשהו כאשר יש עדות לנזק מבני או לנזק כתוצאה מאש או ממים.
- נתקו את כבלי החשמל, מערכות התקשורת, התקני הרשת והמודמים המחוברים לפני פתיחת כיסויי ההתקן, אלא אם הליכי ההתקנה וקביעת התצורה מורים אחרת.
- בעת התקנה, העברה או פתיחת כיסויים במוצר זה או בהתקנים המחוברים, חברו ונתקו את הכבלים כמתואר בטבלה שלהלן.

| כדי לחבר                             | כדי לנתק                              |
|--------------------------------------|---------------------------------------|
| 1. כבו הכל.                          | 1. כבו הכל.                           |
| 2. ראשית, חברו את כל הכבלים להתקנים. | 2. ראשית, נתקו את כבלי החשמל מהשקעים. |
| 3. חברו את כבלי האותות למחברים.      | 3. נתקו את כבלי האותות מהמחברים.      |
| 4. חברו את כבלי החשמל לשקעים.        | 4. הסירו את כל הכבלים מההתקנים.       |
| 5. הפעילו את ההתקן.                  |                                       |



זהירות:

בעת החלפת סוללת הליתיום, השתמשו רק בסוללה בעלת מק"ט 33F8354 או בסוג תואם שהומלץ על ידי היצרן. אם המערכת כוללת מודול המכיל סוללת ליתיום, החליפו אותו רק במודול מאותו סוג ומתוצרת אותו יצרן. הסוללה מכילה ליתיום, ועלולה להתפוצץ אם לא משתמשים ומטפלים בה או משליכים אותה כראוי.

לעולם:

- אל תטבלו במים

- אל תחממו לטמפרטורה הגבוהה מ-100°C (212°F)

- אל תתקנו או תפרקו

השליכו את הסוללה כנדרש לפי התקנות והחוקים המקומיים.



זהירות:

בעת התקנת מוצרי לייזר (כגון כונני תקליטורים ו-DVD, התקני סיב אופטי או משדרים), שימו לב לאזהרות הבאות:

- אל תסירו את הכיסויים. הסרת הכיסויים של מוצר הלייזר עלולה לגרום לחשיפה לקרינת לייזר מסוכנת. אין חלקים ברי טיפול בתוך ההתקן.

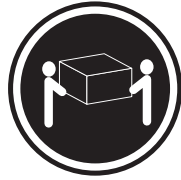
- שינויים, שימוש בבקרות או ביצוע הליכים אחרים מאלה המתוארים כאן, עלולים לגרום לחשיפה לקרינה מסוכנת.



סכנה

מוצרי לייזר מסוימים מכילים דיודת לייזר מסוג Class 3A או Class 3B. שימו לב לאזהרה הבאה:

כאשר הוא פתוח, המוצר פולט קרינת לייזר. אל תביטו ישירות בקרן, אל תביטו ישירות בעזרת ציוד אופטי, והימנעו מחשיפה לקרן.



$\leq 18$  ק"ג (37 ליב')



$\leq 32$  ק"ג (70.5 ליב')



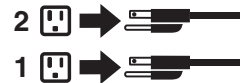
$\leq 55$  ק"ג (121.2 ליב')

זהירות:  
השתמשו בהליכים  
הנאותים בעת  
הרמת הציוד.



זהירות:

לחצן הפעלה של ההתקן ומתג הפעלה של ספק החשמל אינם מפסיקים את זרם החשמל המסופק להתקן. בנוסף, ההתקן עשוי לכלול יותר מכבל חשמל אחד. כדי לסלק את כל הזרם החשמלי מההתקן, ודאו שכל כבלי החשמל מנותקים ממקור החשמל.





## PERICOLO

La corrente elettrica proveniente dai cavi di alimentazione, del telefono e di comunicazione può essere pericolosa.

**Per evitare il rischio di scosse elettriche:**

- Non collegare o scollegare qualsiasi cavo oppure effettuare l'installazione, la manutenzione o la riconfigurazione del prodotto durante un temporale.
- Collegare tutti i fili elettrici a una presa di alimentazione correttamente cablata e dotata di messa a terra.
- Collegare alle prese elettriche appropriate tutte le apparecchiature che verranno utilizzate per questo prodotto.
- Se possibile, utilizzare solo una mano per collegare o scollegare i cavi di segnale.
- Non accendere assolutamente apparecchiature in presenza di incendi, perdite d'acqua o danno strutturale.
- Scollegare i cavi di alimentazione, i sistemi di telecomunicazione, le reti e il modem prima di aprire i coperchi del dispositivo, salvo istruzioni contrarie relative alle procedure di installazione e configurazione.
- Collegare e scollegare i cavi come descritto nella seguente tabella quando vengono effettuate operazioni di installazione, spostamento o apertura dei coperchi di questo prodotto o delle unità collegate.

| Per collegarsi                                      | Per scollegarsi   |
|---|---|
| 1. SPEGNERE le apparecchiature.                     | 1. SPEGNERE le apparecchiature.                                 |
| 2. Innanzitutto, collegare tutti i cavi alle unità. | 2. Innanzitutto, rimuovere i cavi di alimentazione dalla presa. |
| 3. Collegare i cavi di segnale ai connettori.       | 3. Rimuovere i cavi di segnale dai connettori.                  |
| 4. Collegare i cavi di alimentazione alla presa.    | 4. Rimuovere tutti i cavi dalle unità.                          |
| 5. Accendere l'unità.                               |   |



#### ATTENZIONE:

Quando si sostituisce la batteria al litio, utilizzare solo il Numero parte 33F8354 o un tipo di batteria equivalente consigliato dal produttore. Se sul sistema è presente un modulo che contiene una batteria al litio, sostituirlo solo con un tipo di modulo dello stesso tipo della stessa casa di produzione. La batteria contiene litio e può esplodere se usata, maneggiata o smaltita in modo non corretto.

*Non:*

- Gettare o immergere la batteria nell'acqua
- Riscaldarla ad una temperatura superiore ai 100 gradi C (212 gradi F)
- Smontarla, ricaricarla o tentare di ripararla

Le batterie usate vanno smaltite in accordo alla normativa in vigore (DPR 915/82 e successive disposizioni e disposizioni locali).



#### ATTENZIONE:

Quando vengono installati prodotti laser (quali CD-ROM, unità DVD-ROM, unità a fibre ottiche o trasmettenti), tener presente quanto segue:

- Non rimuovere gli sportelli. L'apertura di un'unità laser può determinare l'esposizione a radiazioni laser pericolose. All'interno dell'unità non vi sono parti su cui effettuare l'assistenza tecnica.
- L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.



#### PERICOLO

Alcune unità laser contengono un diodo laser di Classe 3A o Classe 3B. Tener presente quanto segue:

Aperto l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione al fascio.



≥18 kg



≥32 kg



≥55 kg

**ATTENZIONE:**

**Prestare attenzione nel sollevare l'apparecchiatura.**



**ATTENZIONE:**

**Il pulsante di controllo dell'alimentazione presente sull'unità e l'interruttore dell'alimentatore non disattivano l'alimentazione corrente fornita all'unità. E' possibile che l'unità disponga di più cavi di alimentazione. Per disattivare l'alimentazione dall'unità, accertarsi che tutti i cavi di alimentazione siano scollegati dalla fonte di alimentazione.**





**위험**

전원, 전화, 통신 케이블의 전류는 위험합니다.

**감전의 위험을 피하려면 다음과 같이 하십시오.**

- 번개가 치는 날에는 케이블을 연결 또는 분리하거나 본 제품을 설치, 보수, 재구성하지 마십시오.
- 모든 전원 코드는 올바르게 접지된 전기 콘센트에 연결하십시오.
- 본 제품에 연결될 장치는 올바르게 배선된 콘센트에 연결하십시오.
- 신호 케이블을 연결 또는 분리할 때 가능하면 한 손만을 사용하십시오.
- 불 또는 물로 인한 손상이나 구조적인 손상이 있을 경우 장치의 전원을 절대 켜지 마십시오.
- 설치 및 구성 과정에 별도의 지시 사항이 없는 경우, 장치의 덮개를 열기 전에 연결된 전원 코드, 원격 통신 시스템, 네트워크, 모뎀을 분리하십시오.
- 본 제품이나 연결된 장치를 설치, 이동하거나 덮개를 열 때 다음 표와 같은 순서로 케이블을 연결하거나 분리하십시오.

| 연결할 때:  | 분리할 때:   |
|---|--|
| <ol style="list-style-type: none"> <li>1. 모든 장치의 전원을 끄십시오.</li> <li>2. 먼저 모든 케이블을 장치에 연결하십시오.</li> <li>3. 커넥터에 신호 케이블을 연결하십시오.</li> <li>4. 콘센트에 전원 코드를 연결하십시오.</li> <li>5. 장치의 전원을 켜십시오.</li> </ol> | <ol style="list-style-type: none"> <li>1. 모든 장치의 전원을 끄십시오.</li> <li>2. 먼저 콘센트에서 전원 코드를 분리하십시오.</li> <li>3. 커넥터에서 신호 케이블을 분리하십시오.</li> <li>4. 장치에서 모든 케이블을 분리하십시오.</li> </ol> |



**주의:**

배터리를 교환할 때는 Part Number 33F8354 또는 제조업체에서 지정한 동일한 종류의 제품을 사용하십시오. 사용자의 시스템이 리튬 배터리를 포함하는 모듈일 경우, 동일한 제조업체에서 동일한 모듈 유형으로 생산된 제품으로 교체하십시오. 배터리에는 리튬이 함유되어 있어 잘못 사용, 취급 또는 폐기할 경우 폭발의 위험이 있습니다.

사고를 방지하려면 다음 사항을 준수하십시오.

- 배터리를 물 속에 던지거나 침수시키지 마십시오.
- 100℃(212°F) 이상 가열하지 마십시오.
- 수리하거나 분해하지 마십시오.

배터리를 폐기할 때는 법령 또는 회사의 안전 수칙에 따라 폐기하십시오.



**주의:**

CD-ROM, DVD-ROM 장치, 광섬유 장치 또는 송신 장치와 같은 레이저 제품을 설치할 때, 다음과 같은 취급 주의사항을 참고하십시오.

- 덮개를 열지 마십시오. 덮개를 열면 레이저 복사 에너지에 노출될 위험이 있습니다. 장치 내부에는 사용자가 조정하거나 수리할 수 있는 부품이 없습니다.
- 규정된 것 이외의 절차 수행, 제어 조정 등의 행위로 인해 해로운 레이저 복사에 노출될 수 있습니다.



**위험**

일부 장비에는 임베디드 클래스 3A 또는 클래스 3B 레이저 다이오드가 있습니다. 다음 주의사항에 유의하십시오.

드라이브가 열리면 레이저 복사 에너지가 방출됩니다. 광선이 눈에 직접 쏘이지 않도록 하십시오. 나안 또는 광학 기구를 착용한 상태에서 광선을 직접 바라보지 않도록 하십시오.



≥ 18 kg (37 lbs)



≥ 32 kg (70.5 lbs)



≥ 55 kg (121.2 lbs)

**주의:**

제품을 들어 올릴 때 안전 규제를 따르십시오.



**주의:**

장치의 전원 제어 버튼 및 전원 공급 장치의 전원 스위치를 사용하여 장치에 공급되는 전기를 차단하지 마십시오. 장치는 둘 이상의 코드를 가지고 있을 수 있습니다. 장치에서 모든 전원을 차단하려면 콘센트에서 코드가 모두 분리되어 있는지 확인하십시오.







## PELIGRO

La corriente eléctrica procedente de cables de alimentación, teléfonos y cables de comunicación puede ser peligrosa.

Para evitar el riesgo de descarga eléctrica:

- No conecte ni desconecte los cables ni realice ninguna tarea de instalación, mantenimiento o reconfiguración de este producto durante una tormenta eléctrica.
- Conecte todos los cables de alimentación a tomas de corriente debidamente cableadas y conectadas a tierra.
- Cualquier equipo que se conecte a este producto también debe conectarse a tomas de corriente debidamente cableadas.
- Siempre que sea posible, utilice una sola mano para conectar o desconectar los cables de señal.
- No encienda nunca un equipo cuando hay señales de fuego, agua o daños estructurales.
- Desconecte los cables de alimentación, los sistemas de telecomunicaciones, las redes y los módems conectados antes de abrir las cubiertas de los dispositivos, a menos que se indique lo contrario en los procedimientos de instalación y configuración.
- Conecte y desconecte los cables, como se describe en la tabla siguiente, cuando instale, mueva o abra las cubiertas de este producto o de los dispositivos conectados.

| Para conectar   | Para desconectar  |
|---|---|
| <ol style="list-style-type: none"><li>1. APÁGUELO todo.</li><li>2. En primer lugar, conecte todos los cables a los dispositivos.</li><li>3. Conecte los cables de señal a los conectores.</li><li>4. Enchufe los cables de alimentación a las tomas de corriente.</li><li>5. Encienda el dispositivo.</li></ol> | <ol style="list-style-type: none"><li>1. APÁGUELO todo.</li><li>2. En primer lugar, desenchufe los cables de alimentación de las tomas de corriente.</li><li>3. Desconecte los cables de señal de los conectores.</li><li>4. Desconecte todos los cables de los dispositivos.</li></ol> |



#### PRECAUCIÓN:

Cuando sustituya una batería de litio, utilice solamente una batería número de pieza 33F8354 u otra de tipo equivalente recomendada por el fabricante. Si su sistema dispone de un módulo que contiene una batería de litio, reemplácelo sólo con el mismo tipo de módulo, del mismo fabricante. La batería contiene litio y puede explotar si no se utiliza, manipula o desecha correctamente.

*No debe:*

- Arrojarla al agua o sumergirla en ella
- Exponerla a temperaturas superiores a 100°C (212°F)
- Repararla o desmontarla

Deshágase de la batería según especifiquen las leyes o normas locales.



#### PRECAUCIÓN:

Cuando haya productos láser (como unidades de CD-ROM, unidades de DVD, dispositivos de fibra óptica o transmisores) instalados, tenga en cuenta lo siguiente:

- No quite las cubiertas. Si quita las cubiertas del producto láser, podría quedar expuesto a radiación láser peligrosa. Dentro del dispositivo no existe ninguna pieza que requiera servicio técnico.
- Si usa controles o ajustes o realiza procedimientos que no sean los especificados aquí, podría exponerse a radiaciones peligrosas.



#### PELIGRO

Algunos productos láser tienen incorporado un diodo láser de clase 3A o clase 3B. Tenga en cuenta lo siguiente:

Cuando se abre, queda expuesto a radiación láser. No mire directamente al rayo láser, ni siquiera con instrumentos ópticos, y evite exponerse directamente al rayo láser.



≥18 kg



≥32 kg



≥55 kg

**PRECAUCIÓN:**

Adopte procedimientos seguros al levantar el equipo.



**PRECAUCIÓN:**

El botón de control de alimentación del dispositivo y el interruptor de alimentación de la fuente de alimentación no desconectan la corriente eléctrica suministrada al dispositivo. Además, el dispositivo podría tener más de un cable de alimentación. Para suprimir toda la corriente eléctrica del dispositivo, asegúrese de que todos los cables de alimentación estén desconectados de la toma de corriente.





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## Chapter 3. General information

This chapter provides general information that applies to all machine types supported by this publication.

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### The ThinkVantage™ Productivity Center program

The ThinkVantage Productivity Center program contains information sources and tools designed to make computing easier and secure.

The ThinkVantage Productivity Center program provides information about your computer and easy access to various technologies, such as:

- The Rescue and Recovery™ program
- Productivity Center
- Client Security Solutions
- Factory Recovery
- System Updates
- Service and support

**Note:** ThinkVantage Technologies are only available on select Lenovo computers.

To access the ThinkVantage Productivity Center program, open the **Start** menu from the Microsoft® Windows® desktop, select **All Programs**, select **ThinkVantage**, and click **Productivity Center**.

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### Additional information resources

If you have Internet access, the most up-to-date information for your computer is available from the World Wide Web.

You can find the following information:

- CRU removal and installation instructions
- Publications
- Troubleshooting information
- Parts information
- Downloads and drivers
- Links to other useful sources of information

To access this information, point your browser to <http://www.lenovo.com/support/>.

---

## Specifications

This section lists the physical specifications for your computer.

### Types (6423, 6427, 6483, and 6493)

This section lists the physical specifications.

**Dimensions machine types 6423 and 6483:**

Width: 175 mm (6.9 in.)

Height: 478 mm (18.8 in.) floor to top of handle

Depth: 460 mm (18.1 in.)

**Weight machine types 6423 and 6483:**

Maximum configuration: 16.33 kg (36 lbs)

**Dimensions machine types 6427 and 6493:**

Width: 210 mm (8 in.)

Height: 485 mm (19.1 in.)

Depth: 579 mm (22.8 in.)

**Dimensions machine types 6427 and 6493 when rack mounted:**

Width: 427 mm (16.8 in.)

Height: 210 mm (8 in.)

Depth: 579 mm (22.8 in.)

**Weight machine type 6427 and 6493:**

Maximum configuration: 26.00 kg (57 lbs)

**Environment**

Air temperature:

Operating at 0 - 3000 ft (914.4 m): 10° to 35°C (50° to 95°F)

Operating at 3000 ft - 7000 ft (2134 m): 10° to 32°C (50° to 89.6°F)

Non-operating: 10° to 43°C (50° to 110°F)

Humidity:

Operating: 10% to 80%

Non-operating: 10% to 90%

Transit: 10% to 90%

Maximum altitude: 7000 ft (2133.6 m)

**Electrical input machine types 6423 and 6483**

Input voltage:

Range 100 V - 240 V

Input kilovolt-amperes (kVA) (approximate)

Minimum configuration as shipped: 0.17 kVA

Maximum configuration: 0.8 kVA

**Electrical input machine types 6427 and 6493**

Input voltage:

Range 100 V - 240 V

Input kilovolt-amperes (kVA) (approximate)

Minimum configuration as shipped: 0.17 kVA

Maximum configuration: 1.2 kVA

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## Chapter 4. General Checkout

### Attention

The drives in the computer you are servicing might have been rearranged or the drive startup sequence changed. Be extremely careful during write operations such as copying, saving, or formatting. Data or programs can be overwritten if you select an incorrect drive.

### Attention

When replacing a hard disk drive in a RAID configured array, depending on which type of array is used, rebuilding the RAID array might be required. If the array is redundant, make sure to connect the new drive to the same port from which the replaced drive was removed.

General error messages appear if a problem or conflict is found by an application program, the operating system, or both. For an explanation of these messages, refer to the information supplied with that software package.

Before replacing any FRUs, ensure that the latest level of BIOS is installed on the system. A down-level BIOS might cause false errors and unnecessary replacement of the system board. For more information on how to determine and obtain the latest level BIOS, see "BIOS levels" on page 213.

Use the following procedure to help determine the cause of the problem:

1. Power-off the computer and all external devices.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Power-on all external devices.
5. Power-on the computer.
  - Look for displayed error codes
  - Listen for beep codes
  - Look for readable instructions or a main menu on the display.If you **did not** receive the correct response, proceed to step 6.  
If you **do** receive the correct response, proceed to step 7.
6. Look at the following conditions and follow the instructions:
  - If you hear beep codes during POST, go to "Beep symptoms" on page 82.
  - If the computer displays a POST error, go to "POST error codes" on page 83.
  - If the computer hangs and no error is displayed, continue at step 7.
7. Run the Diagnostic programs. See Chapter 5, "Diagnostics," on page 43.
  - If you receive an error, replace the part that the diagnostic program calls out or go to "Diagnostic error codes" on page 61.
  - If the test stops and you cannot continue, replace the last device tested.

---

## Problem determination tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Processor or hard disk upgrades
- Failure symptom
  - Do diagnostics indicate a failure?
  - What, when, where, single, or multiple systems?
  - Is the failure repeatable?
  - Has this configuration ever worked?
  - If it has been working, what changes were made prior to it failing?
  - Is this the original reported failure?
- Diagnostics version
  - Type and version level
- Hardware configuration
  - Print (print screen) configuration currently in use
  - BIOS level
- Operating system software
  - Type and version level

**Note:** To eliminate confusion, identical systems are considered identical only if they:

1. Are the exact machine type and models
2. Have the same BIOS level
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same Diagnostic Diskettes (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operating system control files

Comparing the configuration and software set-up between “working and non-working” systems will often lead to problem resolution.



---

## Chapter 5. Diagnostics

Diagnostic programs are used to test hardware components of your computer and report operating-system-controlled settings that can cause hardware failures. There are two diagnostic programs preinstalled on your computer to help you diagnose problems:

- PC-Doctor for Windows (used when diagnosing problems while running the Windows operating system)
- PC-Doctor for Windows PE (used when your Windows operating system will not start)

### Notes:

1. You can also download the latest version of the PC-Doctor for Windows and PC-Doctor for DOS diagnostic programs from <http://www.lenovo.com/support/>.
2. If you are unable to isolate and repair the problem yourself by running the applicable version of PC-Doctor, click the Save Button in the PC-Doctor-log-file display. You will need to have all problem-related log files available when you speak to a Lenovo technical support representative.

---

### PC-Doctor for Windows

PC-Doctor for Windows is a diagnostic program that works through the Windows operating system. The PC-Doctor for Windows diagnostic program enables you to view symptoms and solutions for computer problems, access the Lenovo troubleshooting center, update system drivers, and review system information.

To run PC-Doctor for Windows, open the Start menu from the Windows desktop, select **All Programs**, select **PC-Doctor for Windows**, and click **PC-Doctor for Windows**. Follow the instructions on the screen. For additional information about running the diagnostic program, refer to the PC-Doctor for Windows help system.

If you still suspect a problem after PC-Doctor for Windows runs successfully, run PC-Doctor for DOS or PC-Doctor for Windows PE to help you diagnose the computer problem.

PC Doctor for Windows also has problem determination aids that determine software and usage problems.

---

### PC-Doctor for Windows PE

The PC-Doctor for Windows PE diagnostic program is part of the Rescue and Recovery workspace on each Lenovo computer. Use PC-Doctor for Windows PE, if you are unable to start the Windows operating system or if PC-Doctor for Windows has not been successful in isolating a possible problem.

### Running diagnostics from the Rescue and Recovery workspace

You can run the PC-Doctor for Windows PE diagnostic program from the Rescue and Recovery workspace. To run diagnostics from the Rescue and Recovery workspace, use the following procedure:

1. Shut down the operating system and turn off the computer.
2. Repeatedly press and release the F11 key as you turn on the computer.
3. When you hear beeps or see a logo screen, stop pressing the F11 key. The Rescue and Recovery workspace opens.
4. From the Rescue and Recovery workspace, select **Diagnose hardware**.
5. The diagnostic program opens automatically. Select the diagnostic test you want to run. Press the F1 key for additional help.
6. Follow the instructions on the screen.

**Note:** Rescue media includes PC-Doctor for Windows PE. For more information about rescue media, see the *User Guide* for the computer.

---

## PC-Doctor for DOS

Use PC-Doctor for DOS, if you are unable to start the Windows operating system or if PC-Doctor for Windows has not been successful in isolating a possible problem. You can run PC-Doctor for DOS from a diagnostic CD image or diagnostic diskettes that have been created.

**Note:** It is important to create a diagnostic CD image or diagnostic diskettes in case PC-Doctor for Windows PE cannot be run from the Rescue and Recovery workspace.

### Creating a diagnostic CD image

To create a diagnostic CD image, download a self-starting bootable CD image (known as an .iso image) of the diagnostic program from <http://www.lenovo.com/support/>. After you download the image, you can create the CD using any CD burning software.

If the computer does not have a CD burner or you do not have Internet access, see "Creating diagnostic diskettes."

### Creating diagnostic diskettes

To create diagnostic diskettes, download the PC-Doctor for DOS diagnostic program from <http://www.lenovo.com/support/> onto two blank, formatted diskettes.

If you do not have Internet access, create the diagnostic diskettes using the following procedure:

**Note:** You will need a diskette drive on the computer or a USB diskette drive to complete this procedure.

1. Shut down the operating system and turn off the computer.
2. If you are using a USB diskette drive, plug it into the computer.
3. Repeatedly press and release the F11 key as you turn on the computer.
4. When you hear beeps or see a logo screen, stop pressing the F11 key. The Rescue and Recovery workspace opens.

**Note:** For some models, press the Esc key to enter Rescue and Recovery.

5. From the Rescue and Recovery workspace, select **Create diagnostic disks**.
6. Follow the instructions on the screen.

7. When prompted, insert a blank, formatted diskette into the diskette drive and continue to follow the instructions on the screen.
8. When the operation is complete, remove the diskette and click **Quit**.
9. Insert another blank, formatted diskette into the diskette drive and continue to follow the instructions on the screen.
10. When the operation is complete, remove the diskette and click **Quit**.

## Running diagnostics from the CD or diskettes

To run diagnostics from the diagnostic CD image or diagnostic diskettes that you created, use the following procedure:

1. Make sure the computer is turned off.
2. If you are running diagnostics from diskettes using a USB diskette drive, plug in the USB device.
3. Insert the CD into the optical drive or the first diagnostic diskette into the diskette drive.
4. Restart the computer.

**Note:** If the diagnostic program does not start, you might not have your optical drive or diskette drive set as a startable device. See “Selecting a startup device” on page 50 for instructions on how to change the startup device.

5. When the diagnostics program opens, follow the instructions on the screen.

**Note:** If you are running diagnostics from a diskette, when prompted, remove the first diskette and insert the second diskette.

6. When the program finishes, be sure to remove the CD or diskette from the drive.
7. Select the diagnostic test you want to run. Press the F1 key for additional help.

## Navigating through the diagnostics programs

Use the cursor movement keys to navigate within the menus.

- The **Enter** key is used to select a menu item.
- The **Esc** key is used to back up to the previous menu.
- For online help select **F1**.

## Running tests

There are four ways to run the diagnostic tests.

- Using the cursor movement keys, highlight **Run Normal Test** or **Run Quick Test** from the Diagnostics menu and then press **Enter**.

This automatically runs a pre-defined group of tests from each test category.

**Run Normal Test** runs a more extensive set of tests than does **Run Quick Test** and takes longer to complete.

- Press **F5** to automatically run all selected tests in all categories.
- From within a test category, press **Ctrl-Enter** to automatically run only the selected tests in that category.
- Using the cursor movement keys, highlight a single test within a test category, and then press **Enter**. This runs only that test.

Press **Esc** at any time to stop the testing process.

Test results (N/A, PASSED, FAILED, ABORTED) are displayed in the field beside the test description and in the test log. See “Viewing the test log” on page 47.

To select one or more tests, use the following procedure.

1. Open the corresponding test category.
2. Using the cursor movement keys, highlight the desired test.
3. Press the space bar.  
A selected test is marked by >>. Pressing the space bar again de-selects a test and removes the >>.
4. Repeat steps 2 and 3 above to select all desired tests.

## Test results

Diagnostics test results produce the following error code format:

| Function Code | Failure Type | DeviceID | Date | ChkDigits | Text |
|---------------|--------------|----------|------|-----------|------|
|---------------|--------------|----------|------|-----------|------|

- **Function Code:**  
Represents the feature or function within the PC.
- **Failure Type:**  
Represents the type of error encountered.
- **DeviceID:**  
Contains the component’s unit-ID which corresponds to either a fixed disk drive, removable media drive, serial or parallel port, processor, specific RIMM, or a device on the PCI bus.
- **Date:**  
Contains the date when the diagnostic test was run. The date is retrieved from CMOS and displayed using the YYYYMMDD format.
- **ChkDigits:**  
Contains a 2-digit check-digit value to ensure the following:
  - Diagnostics were run on the specified date.
  - Diagnostics were run on the specified computer.
  - The diagnostic error code is recorded correctly.
- **Text:**  
Description of the error.

**Note:** See “Diagnostic error codes” on page 61 for error code listings.

## Quick and Full erase - hard drive

The diagnostics program offers two hard drive format utilities:

- Quick Erase Hard Drive
- Full Erase Hard Drive

The Quick Erase Hard Drive provides a DOS utility that performs the following:

- Destroys the Master Boot Record (MBR) on the hard drive.
- Destroys all copies of the FAT Table on all partitions (both the master and backup).
- Destroys the partition table.
- Provides messages that warn the user that this is a non-recoverable process.

The Full Erase Hard Drive provides a DOS utility that performs the following:

- Performs all the steps in Quick Erase.
- Provides a DOS utility that writes random data to all sectors of the hard drive.
- Provides an estimate of time to completion along with a visual representation of completion status.
- Provides messages that warn the user about non-recoverable process.

|   |
|---|
| <p><b>Important:</b> Make sure that all data is backed up before using the Quick or Full Erase functions.</p> |
|---|

To select the Quick Erase or Full Erase Hard Drive utility, use the following procedure:

1. Select the UTILITY option on the toolbar and press **Enter**.
2. Select either the QUICK ERASE or FULL ERASE HARD DISK option and follow the instructions.

## Viewing the test log

Errors reported by the diagnostic test will be displayed by the program as a failed test.

To view details of a failure or to view a list of test results, use the following procedure from any test category screen:

1. Press **F3** to activate the log file.
2. Press **F3** again to save the file to diskette or press **F2** to print the file.



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## Chapter 6. Using the Setup Utility

The Setup Utility program is used to view and change the configuration settings of your computer, regardless of which operating system you are using. However, the operating-system settings might override any similar settings in the Setup Utility program.

---

### Starting the Setup Utility program

To start the Setup Utility program, do the following:

1. If your computer is turned on when you start this procedure, shut down the operating system and turn off the computer.
2. Press and hold the F1 key then turn on the computer. When you hear multiple beeps, release the F1 key.

**Notes:**

- a. If you are using a USB keyboard and the Setup Utility program does not display using this method, repeatedly press and release the F1 key rather than leaving it pressed when turning on the computer.
- b. If a user password or an administrator password has been set, the Setup Utility program menu is not displayed until you type your password. For more information, see "Using passwords."

The Setup Utility might start automatically when POST detects that hardware has been removed or new hardware has been installed in your computer.

---

### Viewing and changing settings

The Setup Utility program menu lists items that identify system configuration topics. To view or change settings, see "Starting the Setup Utility program."

When working with the Setup Utility program menu, you must use the keyboard. The keys used to perform various tasks are displayed at the bottom of each screen.

---

### Using passwords

By using the Setup Utility program, you can set passwords to prevent unauthorized persons from gaining access to your computer and data. See "Starting the Setup Utility program." The following types of passwords are available:

- User Password
- Administrator Password

You do not have to set any passwords to use your computer. However, if you decide to set any passwords, read the following sections.

#### Password considerations

A password can be any combination of up to twelve characters (a-z and 0-9) and symbols. For security reasons, it is a good idea to use a strong password that cannot be easily compromised. Passwords should adhere to the following rules:

- Have at least eight characters in length

- Contain at least one alphabetic character, one numeric character, and one symbol
- Contain at least one of the following symbols: , . / ` ; ' []
- You can also use the space bar
- Setup Utility program and hard disk drive passwords are not case sensitive
- Not be your name or your user name
- Not be a common word or a common name
- Be significantly different from your previous password

## User Password

When a User Password is set, the computer cannot be used until a valid password is typed from the keyboard.

## Administrator Password

When an Administrator Password is set, it deters unauthorized persons from changing configuration settings. If you are responsible for maintaining the settings of several computers, you might want to set an Administrator Password.

After you set an Administrator Password, a password prompt is displayed each time you try to access the Setup Utility program.

If both the user and administrator passwords are set, you can type either password. However, to change any configuration settings, you must use your administrator password.

## Setting, changing, and deleting a password

To set, change, or delete a password, do the following:

**Note:** A password can be any combination of up to twelve characters (A- Z, a-z, and 0-9). For more information, see "Password considerations" on page 49.

1. Start the Setup Utility program (see "Starting the Setup Utility program" on page 49).
2. From the Setup Utility program menu, select **Security**.
3. Select **Set Passwords**. Read the information displayed on the right side of the screen.

---

## Selecting a startup device

If your computer does not start up (boot) from a device such as the CD-ROM, diskette, or hard disk as expected, use one of the following procedures to select a startup device.

### Selecting a temporary startup device

Use this procedure to startup from any boot device.

**Note:** Not all CDs, hard disks, and diskettes are bootable.

1. Turn off your computer.
2. Press and hold the F12 key then turn on the computer. When the Startup Device Menu appears, release the F12 key.



**Note:** If you are using a USB keyboard and the Startup Device Menu does not display using this method, repeatedly press and release the F12 key rather than leaving it pressed when turning on the computer.

3. Select the desired startup device from the Startup Device Menu and press Enter to begin.

**Note:** Selecting a startup device from the Startup Device menu does not permanently change the startup sequence.

## Selecting or changing the startup device sequence

To view or permanently change the configured startup device sequence, do the following:

1. Start the Setup Utility program (see “Starting the Setup Utility program” on page 49).
2. Select **Startup**.
3. Select **Startup Sequence**. See the information displayed on the right side of the screen.
4. Select the devices for the Primary Startup Sequence, the Automatic Startup Sequence, and the Error Startup Sequence.
5. Select **Exit** from the Setup Utility menu and then **Save Settings** or **Save and exit the Setup Utility**.

If you have changed these settings and want to return to the default settings, select **Load Default Settings** on the Exit menu.

---

## Advanced settings

It might be necessary to change some of the advanced settings.

- **Set max Ext CPUID=3** - An option added specifically for Windows NT®. Newer microprocessors return a value > 3 when queried by the CPUID instruction maximum value supported with its extensions. Windows NT will hang during install when it makes the CPUID query if it gets a value > 3. Enabling this option will cause the value returned to be '3' so NT will work.
- **Processor Power Management** - Controls Power Management Features supported by the microprocessor/chipset combination. When enabled, it allows the processor to enter lower power states when deemed appropriate by microprocessor.
- **Fan Acoustics** - Three choices (High, Normal, Quiet) so user can select whether fan acoustics or system performance is more important. High will allow fans to run faster (louder) to reduce chance to processor throttling. Quiet will run fans at a slower speed (quieter) but may result in processor throttling if temperatures get high.

---

## Exiting from the Setup Utility program

After you finish viewing or changing settings, press Esc to return to the Setup Utility program menu (you might have to press Esc several times). If you want to save the new settings, select **Save Settings** or **Save and exit the Setup Utility**. Otherwise, your changes will not be saved.



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## Chapter 7. Installing and configuring RAID

This section contains information about attaching SATA devices and configuring RAID for this product.

---

### Attaching SATA hard disk drives

You must attach the minimum number of SATA drives for the level of RAID.

- RAID Level 0: Two drives minimum
- RAID Level 1: Two drives
- RAID Level 5: Three drives minimum
- RAID Level 10: Four drives (Available for two-processor system only)

### Configuring the system BIOS to enable embedded SATA RAID functionality

This section describes how to configure the BIOS for RAID.

1. Press F1 to enter the system BIOS setup.
2. Use the arrow key on the keyboard to select **Devices**, and press Enter.
3. Use the arrow keys to select **IDE Drive Setup**, and press Enter.
4. Use the arrow keys to select **SATA RAID**, and press Enter.
5. Use the up and down arrow to select **Enabled**.
6. Press F10 to save the new settings.

### Creating RAID volumes

This section describes how to use the Intel® Matrix Storage Manager option ROM Configuration Utility to create RAID volumes.

1. Press Ctrl+I when prompted to enter the Intel Matrix Storage Manager option ROM configuration Utility.

**Note:** To make enough physical drives available to create a RAID volume, see “Deleting RAID volumes” on page 54.

2. Use the arrow keys to select **Create RAID Volume**, and press Enter.
3. Type a RAID Volume name in the **Name** field, and press Tab.
4. Use the arrow keys to select a RAID level in the **RAID Level** field, and press Tab.
5. If appropriate, use the arrow keys to select the Stripe Size in the **Stripe Size** field, and press Tab.
6. Type a volume size in the **Capacity** field, and press Tab.
7. To initiate volume creation, press Enter.
8. When prompted, press Y to accept the warning message and create the volume.
9. To create additional RAID volumes, return to step 3 or select **Exit** and press Enter.
10. Press Y when prompted to confirm the exit.

## Deleting RAID volumes

This section describes how to use the Intel Matrix Storage Manager option ROM Configuration Utility to delete RAID volumes.

1. Press Ctrl+I when prompted to enter the Intel Matrix Storage Manager option ROM Configuration Utility.
2. Use the arrow keys to select the RAID volume to be deleted, and press Delete.
3. When prompted, press Y to confirm the deletion of the selected RAID volume.
4. After deleting a RAID volume, you can:
  - Return to step 1 to delete additional RAID volumes.
  - See “Creating RAID volumes” on page 53 for RAID volume creation.
  - Use the arrow keys to select **Exit** and press Enter.
  - Use the arrow keys to select **Reset Disks to Non-RAID**, and press Enter.
    - a. Use the arrow keys and space to mark individual physical disks to be reset.
    - b. Use the space key to select, and then press Enter to complete the selection.
    - c. When prompted, press Y to confirm the reset action.
    - d. After completing the Reset Disks to Non-RAID function, you can:
      - Return to step 1 to delete additional RAID volumes.
      - See “Creating RAID volumes” on page 53 for RAID volume creation.
      - Use the arrow keys to select **Exit** and press Enter.

## SUPPORTED SAS RAID configurations

This section provides information that is applicable only for a Windows environment. For information about configuring RAID in a Linux<sup>®</sup> environment, contact your Linux software provider.

The following RAID configurations are supported on the Lenovo ThinkStation:

- RAID Level 0 – Striped disk array
  - Two drives minimum.
  - Better performance and no fault tolerance.
- RAID Level 1 – Mirrored disk array
  - Two drives.
  - Improved read performance and 100% redundancy.
- RAID Level 1E (1 Enhanced)
  - Three drives minimum
  - Can always recover from a single drive failure and, in some cases, can recover from two drives.
  - High Performance.

## Configuring the system BIOS to enable SAS RAID functionality

This section describes how to configure the system BIOS to enable SAS RAID functionality.

1. Press F1 to enter the system BIOS setup.
2. Use the arrow keys on the keyboard to select **Advanced**, and press Enter.
3. Use the arrow keys to select the **LSI SAS Interface**, and press Enter.

4. Use the up and down arrow to select **Enabled**, and press F10 to save the new settings.

## Configuring the system BIOS to enable SAS RAID 0 functionality

To configure the system BIOS to enable SAS RAID 0 functionality, use the LSI Logic Config Utility as the SAS Configuration Utility. This utility assumes that the system has the required number of disks.

1. Press Ctrl +C when prompted to start the LSI Logic Config Utility.
2. On the Adapter Properties screen, use the arrow key to select **RAID Properties**, and press Enter. The RAID Properties screen is displayed.
3. Use the arrow key to select the first disk for the **IS (Stripe) volume**.
4. Use the arrow keys to move the Array Disk column for this disk, and press +, -, or the space key to select **Yes**.

**Note:** If a partition is defined on the disk, a message warns you that the data will be lost when the striped volume is created.

5. Press M to Migrate, or D to delete the data on the drive.
6. Repeat the previous steps to select up to three more disks for the stripe volume.
7. Press C to create the array after all drives have been chosen, and select **Save Changes**. Exit this menu, press Enter, and select **Save**.
8. Repeat Step 4 and select **View Existing Array** to view the new Array.
9. To delete the new array, select **Manage Array**, and press Y.

## Configuring the system BIOS to enable SAS RAID 1 functionality

To configure the system BIOS to enable SAS RAID 1 functionality, use the LSI Logic Config Utility as the SAS Configuration Utility. This utility assumes that the system has the required number of disks.

1. Press Ctrl +C when prompted to start the LSI Logic Config Utility.
2. On the Adapter Properties screen, use the arrow key to select **RAID Properties**.
3. Press Enter to go to the RAID Properties screen.
4. On the RAID Properties screen, use the arrow keys to select the first disk (primary disk) for the IM (Mirror) volume, the disk with the data that you want to mirror.
5. Then use the arrow keys to move the Array Disk column for this disk, and press the Space key to select **Yes**.

**Note:** If a partitions is defined on the disk, a message warns you that the data will be lost when the striped volume is created.

6. Press M to Migrate, or D to delete the data on the drive.
7. When the Keep Data/Erase Disk message is displayed, press F3 to keep the data currently on this disk. The value in the Array Disk column changes to Primary.
8. Use the arrow keys to select the secondary (mirrored) disk for the IM volume. Select **Yes** as the value for the Array Disk column.

**Note:** If a partition is defined on the disk, a message warns you that the data will be lost when the mirrored volume is created.

9. Press Delete to confirm erasing data from the disk.

## **Configuring mirrored volume disks for Integrated Mirrored Array (IM) two disk, with an optional hot spare disk or Integrated Mirrored Enhanced Array (IME) three to five disks, with an optional hot spare disk:**

To configure mirrored volume disks, with an optional hot spare disk:

1. On the RAID Properties screen, use the arrow key to select the first disk for the volume.
2. Use the arrow keys to move to the Array Disk column for this disk, and use the + and – keys to select **Yes** as the value.
3. When the Keep Data/Erase Disk message appears, press Delete to erase the disk.
4. Use the arrow keys to select the next disk for the IM volume. Select **Yes** as the value for the Array Disk column.

**Note:** If a partition is defined on the disk, a message warns you that the data will be lost when the mirrored volume is created.

5. Press Delete to confirm erasing data from the disk.
6. Repeat the previous steps to select up to four more disks for the IM volume. If you want to configure a hot spare disk for the volume, you can select up to three more disks.
7. (Optional) Use the arrow keys to select a hot spare disk for the IM volume. Select **Yes** as the value for the Hot Spare column.
8. When you have selected all disks for the IM volume, Press C to create the array after all drives have been chosen, and then select **Save Changes** to exit this menu. Press Enter and select **Save**.
9. Repeat Step 1 above and select **View Existing Array** to view the New Array.
10. To Delete the New Array, select **Manage Array**.
11. Then press Y to delete the New Array and exit the Adapter properties screen.

## **Configuring the system BIOS to enable SAS RAID 1E functionality**

To configure the system BIOS to enable SAS RAID 1E functionality, use the LSI Logic Config Utility as the SAS Configuration Utility. This utility assumes that the system has the required number of disks.

1. Press Ctrl+C when prompted to start the LSI Logic Config Utility.
2. On the Adapter Properties screen, use the arrow key to select **RAID Properties**.
3. Press Enter to go to the RAID Properties screen. Continue with step 4 through 9 to configure a two-disk mirrored volume.
4. On the RAID Properties screen, use the arrow key to select the first disk for the IME (Mirror) volume, the disk with the data that you want to mirror.
5. Use the arrow keys to move the Array Disk column for this disk, and press Space, + or - key to select **Yes**.

**Note:** If a partition is defined on the disk, a message warns you that the data will be lost when the striped volume is created.

6. Press M to Migrate, or D to delete the data on the drive.

7. When the Keep Data/Erase Disk message is displayed, press F3 to keep the data currently on this disk. The value in the Array Disk column changes to Primary.
8. Use the arrow keys to select the secondary (mirrored) disk for the IM volume. Select **Yes** as the value for the Array Disk column.

**Notes:**

- a. If a partition is defined on the disk, a message warns you that the data will be lost when the mirrored volume is created. Press **Delete** to confirm erasing data from the disk.
  - b. To configure mirrored volume disks, with an optional hot spare disk, see “Configuring mirrored volume disks for Integrated Mirrored Array (IM) two disk, with an optional hot spare disk or Integrated Mirrored Enhanced Array (IME) three to five disks, with an optional hot spare disk:” on page 56.
9. On the RAID Properties screen, use the arrow key to select the first disk for the IME volume.
  10. Use the arrow keys to move to the Array Disk column for this disk, and use the + and – keys to select **Yes** as the value.
  11. When the Keep Data/Erase Disk message is displayed, press Delete to erase the disk.
  12. Use the arrow keys to select the next disk for the IME volume. Select **Yes** as the value for the Array Disk column.

**Note:** If a partition is defined on the disk, a message warns you that the data will be lost when the mirrored volume is created. Press Delete to confirm erasing data from the disk.

13. Repeat the previous steps to select up to four more disks for the IME volume. If you want to configure a hot spare disk for the volume, you can select up to three more disks.
14. (Optional) Use the arrow keys to select a hot spare disk for the IME volume. Select **Yes** as the value for the Hot Spare column.
15. When you have selected all disks for the IM volume, Press C to create the array after all drives have been chosen, and then select **Save Changes** to exit this menu. Press Enter and select **Save**.
16. Repeat Step 1 above and select **View Existing Array** to view the New Array.
17. To delete the New Array, select **Manage Array**.
18. Press Y to delete the New Array and exit the Adapter properties screen.





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## Chapter 8. Symptom-to-FRU Index

The Symptom-to-FRU index lists error symptoms and possible causes. The most likely cause is listed first. Always begin with Chapter 4, "General Checkout," on page 41. This index can also be used to help you decide which FRUs to have available when servicing a computer. If you are unable to correct the problem using this index, go to "Undetermined problems" on page 86.

**Notes:**

- If you have both an error message and an incorrect audio response, diagnose the error message first.
- If you cannot run the diagnostic tests or you get a diagnostic error code when running a test, but did receive a POST error message, diagnose the POST error message first.
- If you did not receive any error message, look for a description of your error symptoms in the first part of this index.

---

### Hard disk drive boot error

A hard disk drive boot error (error codes 1962 and I999030X) can have the following causes.

| Error  | FRU/Action   |
|--|--|
| The start-up drive is not in the boot sequence in configuration. | Check the configuration and ensure the start-up drive is in the boot sequence.   |
| No operating system installed on the boot drive.                 | Install an operating system on the boot drive.   |
| The boot sector on the start-up drive is corrupted.              | The drive must be formatted, do the following: <ol style="list-style-type: none"><li>1. Attempt to back-up the data on the failing hard disk drive.</li><li>2. Using the operating systems programs, format the hard disk drive.</li></ol> |
| The drive is defective.  | Replace the hard disk drive.   |

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### Power Supply Errors

If you suspect a power problem, use the following procedures.

| Check/Verify   | FRU/Action        |
|--|-------------------|
| Check the following for proper installation. <ul style="list-style-type: none"><li>• Power Cord</li><li>• On/Off Switch connector</li><li>• On/Off Switch Power Supply connector</li><li>• System Board Power Supply connectors</li><li>• Microprocessor(s) connection</li></ul> | Reseat connectors |
| Check the power cord for continuity.   | Power Cord        |
| Check the power-on switch for continuity.  | Power-on Switch   |

1. Turn off the computer and disconnect all external devices.
2. Power-on the computer.
3. There are three LEDs to help you determine if the power supply and system board are working correctly. The power button LED is located on the front of the computer and the two diagnostic LEDs are located on the power supply at the rear of the computer. After pressing the power button, observe the LEDs and refer to the following table:

| Power LED                                     | Green diagnostic LED | Yellow diagnostic LED | Action   |
|---|----------------------|-----------------------|--|
| ON  | ON                   | OFF                   | This is the normal condition of the LEDs when the power is OK.   |
| OFF   | OFF                  | OFF                   | <ul style="list-style-type: none"> <li>• Make sure the power cord is attached to a working electrical outlet.</li> <li>• Check the power cord for continuity.</li> <li>• If the problem persists, replace the power supply.</li> </ul> |
| OFF (after the power button has been pressed) | ON                   | OFF                   | Replace the system board   |
| ON  | ON                   | ON                    | Replace the power supply   |

If the Diagnostic LEDs are in the normal condition and the problem persists, replace the system board and the microprocessor, one at a time, until the computer works correctly.

## Diagnostic error codes

Refer to the following diagnostic error codes when using the diagnostic tests. See “Running tests” on page 45 for the specific type for information about the Diagnostic programs.

In the following index, X can represent any number.

| Diagnostic Error Code                                | FRU/Action  |
|--|---|
| <b>000-000-XXX</b><br>BIOS Test Passed               | <b>No action</b>  |
| <b>000-002-XXX</b><br>BIOS Timeout                   | <ol style="list-style-type: none"><li>1. <b>Flash the system.</b> See “Flash update procedures” on page 213</li><li>2. System board</li></ol>   |
| <b>000-024-XXX</b><br>BIOS Addressing test failure   | <ol style="list-style-type: none"><li>1. <b>Flash the system.</b> See “Flash update procedures” on page 213</li><li>2. System board</li></ol>   |
| <b>000-025-XXX</b><br>BIOS Checksum Value error      | <ol style="list-style-type: none"><li>1. <b>Flash the system.</b> See “Flash update procedures” on page 213</li><li>2. System board</li></ol>   |
| <b>000-026-XXX</b><br>FLASH data error               | <ol style="list-style-type: none"><li>1. <b>Flash the system.</b> See “Flash update procedures” on page 213</li><li>2. System board</li></ol>   |
| <b>000-027-XXX</b><br>BIOS Configuration/Setup error | <ol style="list-style-type: none"><li>1. <b>Run Setup</b></li><li>2. Flash the system. See “Flash update procedures” on page 213</li><li>3. System board</li></ol>                                    |
| <b>000-034-XXX</b><br>BIOS Buffer Allocation failure | <ol style="list-style-type: none"><li>1. <b>Reboot the system</b></li><li>2. Flash the system. See “Flash update procedures” on page 213</li><li>3. Run memory test</li><li>4. System board</li></ol> |
| <b>000-035-XXX</b><br>BIOS Reset Condition detected  | <ol style="list-style-type: none"><li>1. <b>Flash the system.</b> See “Flash update procedures” on page 213</li><li>2. System board</li></ol>   |
| <b>000-036-XXX</b><br>BIOS Register error            | <ol style="list-style-type: none"><li>1. <b>Flash the system.</b> See “Flash update procedures” on page 213</li><li>2. System board</li></ol>   |
| <b>000-038-XXX</b><br>BIOS Extension failure         | <ol style="list-style-type: none"><li>1. <b>Flash the system.</b> See “Flash update procedures” on page 213</li><li>2. Adapter card</li><li>3. System board</li></ol>                                 |
| <b>000-039-XXX</b><br>BIOS DMI data error            | <ol style="list-style-type: none"><li>1. <b>Flash the system.</b> See “Flash update procedures” on page 213</li><li>2. System board</li></ol>   |
| <b>000-195-XXX</b><br>BIOS Test aborted by user      | <b>Information only</b><br>Re-start the test, if necessary  |

| Diagnostic Error Code  | FRU/Action   |
|--|--|
| <b>000-196-XXX</b><br>BIOS test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. Press F3 to review the log file</li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| <b>000-197-XXX</b><br>BIOS test warning                        | <ol style="list-style-type: none"> <li>1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| <b>000-198-XXX</b><br>BIOS test aborted                        | <ol style="list-style-type: none"> <li>1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</li> <li>2. Flash the system and retest. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>        |
| <b>000-199-XXX</b><br>BIOS test failed, cause unknown          | <ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test</li> </ol>   |
| <b>000-250-XXX</b><br>BIOS APM failure                         | <ol style="list-style-type: none"> <li>1. Flash the system. See "Flash update procedures" on page 213</li> <li>2. System board</li> </ol>  |
| <b>000-270-XXX</b><br>BIOS ACPI failure                        | <ol style="list-style-type: none"> <li>1. Flash the system. See "Flash update procedures" on page 213</li> <li>2. System board</li> </ol>  |
| <b>001-000-XXX</b><br>System Test Passed                       | No action  |
| <b>001-00X-XXX</b><br>System Error                             | System board   |
| <b>001-01X-XXX</b><br>System Error                             | System board   |
| <b>001-024-XXX</b><br>System Addressing test failure           | System board   |
| <b>001-025-XXX</b><br>System Checksum Value error              | <ol style="list-style-type: none"> <li>1. Flash the system. See "Flash update procedures" on page 213</li> <li>2. System board</li> </ol>  |
| <b>001-026-XXX</b><br>System FLASH data error                  | <ol style="list-style-type: none"> <li>1. Flash the system. See "Flash update procedures" on page 213</li> <li>2. System board</li> </ol>  |
| <b>001-027-XXX</b><br>System Configuration/Setup error         | <ol style="list-style-type: none"> <li>1. Run Setup</li> <li>2. Flash the system. See "Flash update procedures" on page 213</li> <li>3. System board</li> </ol>  |

| Diagnostic Error Code  | FRU/Action  |
|--|---|
| <b>001-032-XXX</b><br>System Device Controller failure           | <b>System board</b>   |
| <b>001-034-XXX</b><br>System Device Buffer Allocation failure    | <ol style="list-style-type: none"> <li>1. <b>Reboot the system</b></li> <li>2. Flash the system. See "Flash update procedures" on page 213</li> <li>3. Run memory test</li> <li>4. System board</li> </ol>  |
| <b>001-035-XXX</b><br>System Device Reset condition detected     | <b>System board</b>   |
| <b>001-036-XXX</b><br>System Register error                      | <b>System board</b>   |
| <b>001-038-XXX</b><br>System Extension failure                   | <ol style="list-style-type: none"> <li>1. <b>Adapter card</b></li> <li>2. System board</li> </ol>   |
| <b>001-039-XXX</b><br>System DMI data structure error            | <ol style="list-style-type: none"> <li>1. <b>Flash the system. See "Flash update procedures" on page 213</b></li> <li>2. System board</li> </ol>  |
| <b>001-040-XXX</b><br>System IRQ failure                         | <ol style="list-style-type: none"> <li>1. <b>Power-off/on system and re-test</b></li> <li>2. System board</li> </ol>  |
| <b>001-041-XXX</b><br>System DMA failure                         | <ol style="list-style-type: none"> <li>1. <b>Power-off/on system and re-test</b></li> <li>2. System board</li> </ol>  |
| <b>001-195-XXX</b><br>System Test aborted by user                | <b>Information only</b><br>Re-start the test, if necessary  |
| <b>001-196-XXX</b><br>System test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| <b>001-197-XXX</b><br>System test warning                        | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| <b>001-198-XXX</b><br>System test aborted                        | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and retest. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>        |
| <b>001-199-XXX</b><br>System test failed, cause unknown          | <ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test</li> </ol>  |
| <b>001-250-XXX</b><br>System ECC error                           | <b>System board</b>   |

| <b>Diagnostic Error Code</b>   | <b>FRU/Action</b>  |
|--|--|
| 001-254-XXX<br>001-255-XXX<br>001-256-XXX<br>001-257-XXX<br>System DMA error | <b>System board</b>  |
| 001-260-XXX<br>001-264-XXX<br>System IRQ error                               | <b>System board</b>  |
| 001-268-XXX<br>System IRQ1 failure   | 1. <b>Device on IRQ1</b><br>2. System board                              |
| 001-269-XXX<br>System IRQ2 failure   | 1. <b>Device on IRQ2</b><br>2. System board                              |
| 001-270-XXX<br>System IRQ3 failure   | 1. <b>Device on IRQ3</b><br>2. System board                              |
| 001-271-XXX<br>System IRQ4 failure   | 1. <b>Device on IRQ4</b><br>2. System board                              |
| 001-272-XXX<br>System IRQ5 failure   | 1. <b>Device on IRQ5</b><br>2. System board                              |
| 001-273-XXX<br>System IRQ6<br>(diskette drive) failure                       | 1. <b>Diskette Cable</b><br>2. Diskette drive<br>3. System board         |
| 001-274-XXX<br>System IRQ7 failure   | 1. <b>Device on IRQ7</b><br>2. System board                              |
| 001-275-XXX<br>System IRQ8 failure   | 1. <b>Device on IRQ8</b><br>2. System board                              |
| 001-276-XXX<br>System IRQ9 failure   | 1. <b>Device on IRQ9</b><br>2. System board                              |
| 001-277-XXX<br>System IRQ10 failure  | 1. <b>Device on IRQ10</b><br>2. System board                             |
| 001-278-XXX<br>System IRQ11 failure  | 1. <b>Device on IRQ11</b><br>2. System board                             |
| 001-279-XXX<br>System IRQ12 failure  | 1. <b>Device on IRQ12</b><br>2. System board                             |
| 001-280-XXX<br>System IRQ13 failure  | 1. <b>Device on IRQ13</b><br>2. System board                             |
| 001-281-XXX<br>System IRQ14<br>(hard disk drive) failure                     | 1. <b>Hard disk drive cable</b><br>2. Hard disk drive<br>3. System board |
| 001-282-XXX<br>System IRQ15 failure  | 1. <b>Device on IRQ15</b><br>2. System board                             |

| <b>Diagnostic Error Code</b>   | <b>FRU/Action</b>  |
|--|--|
| 001-286-XXX<br>001-287-XXX<br>001-288-XXX<br>System Timer failure                | <b>System board</b>  |
| 001-292-XXX<br>System CMOS<br>RAM error  | 1. <b>Run Setup and re-test</b><br>2. System board   |
| 001-293-XXX<br>System CMOS Battery   | 1. <b>CMOS Battery</b><br>2. System board  |
| 001-298-XXX<br>System RTC date/time update failure                               | 1. <b>Flash the system. See “Flash update procedures” on page 213</b><br>2. System board         |
| 001-299-XXX<br>System RTC periodic interrupt failure                             | <b>System board</b>  |
| 001-300-XXX<br>System RTC Alarm failure  | <b>System board</b>  |
| 001-301-XXX<br>System RTC Century byte error                                     | 1. <b>Flash the system. See “Flash update procedures” on page 213</b><br>2. System board         |
| 005-000-XXX<br>Video Test Passed   | <b>No action</b>   |
| 005-00X-XXX<br>Video error   | 1. <b>Video card, if installed</b><br>2. System board  |
| 005-010-XXX<br>005-011-XXX<br>005-012-XXX<br>005-013-XXX<br>Video Signal failure | 1. <b>Video card, if installed</b><br>2. System board  |
| 005-016-XXX<br>Video Simple Pattern<br>test failure                              | 1. <b>Video Ram</b><br>2. Video card, if installed<br>3. System board                            |
| 005-024-XXX<br>Video Addressing test failure                                     | 1. <b>Video card, if installed</b><br>2. System board  |
| 005-025-XXX<br>Video Checksum Value error  | 1. <b>Video card, if installed</b><br>2. System board  |
| 005-027-XXX<br>Video Configuration/Setup error                                   | 1. <b>Run Setup</b><br>2. Video drivers update<br>3. Video card, if installed<br>4. System board |
| 005-031-XXX<br>Video Device Cable failure  | 1. <b>Video cable</b><br>2. Monitor<br>3. Video card, if installed<br>4. System board            |
| 005-032-XXX<br>Video Device Controller failure                                   | 1. <b>Video card, if installed</b><br>2. System board  |

| Diagnostic Error Code  | FRU/Action  |
|--|---|
| <b>005-036-XXX</b><br>Video Register error                                   | <ol style="list-style-type: none"> <li>1. <b>Video card, if installed</b></li> <li>2. System board</li> </ol>   |
| <b>005-038-XXX</b><br>System BIOS extension failure                          | <ol style="list-style-type: none"> <li>1. <b>Video card, if installed</b></li> <li>2. System board</li> </ol>   |
| <b>005-040-XXX</b><br>Video IRQ failure                                      | <ol style="list-style-type: none"> <li>1. <b>Video card, if installed</b></li> <li>2. System board</li> </ol>   |
| <b>005-195-XXX</b><br>Video Test aborted by user                             | <b>Information only</b><br>Re-start the test, if necessary  |
| <b>005-196-XXX</b><br>Video test halt, error threshold exceeded              | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| <b>005-197-XXX</b><br>Video test warning                                     | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component called out in warning statement</li> <li>4. Replace the component under test</li> </ol>   |
| <b>005-198-XXX</b><br>Video test aborted                                     | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol> |
| <b>005-199-XXX</b><br>Video test failed, cause unknown                       | <ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| <b>005-2XX-XXX</b><br><b>005-3XX-XXX</b><br>Video subsystem error            | <ol style="list-style-type: none"> <li>1. <b>Video card, if installed</b></li> <li>2. System board</li> </ol>   |
| <b>006-000-XXX</b><br>Diskette interface Test Passed                         | <b>No action</b>  |
| <b>006-0XX-XXX</b><br>Diskette interface error                               | <ol style="list-style-type: none"> <li>1. <b>Diskette drive Cable</b></li> <li>2. Diskette drive</li> <li>3. System board</li> </ol>  |
| <b>006-195-XXX</b><br>Diskette interface Test aborted by user                | <b>Information only</b><br>Re-start the test, if necessary  |
| <b>006-196-XXX</b><br>Diskette interface test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |



| Diagnostic Error Code  | FRU/Action  |
|--|---|
| 006-197-XXX<br>Diskette interface test warning                                 | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| 006-198-XXX<br>Diskette interface test aborted                                 | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| 006-199-XXX<br>Diskette interface test failed, cause unknown                   | <ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test</li> </ol>  |
| 006-25X-XXX<br>Diskette interface Error  | <ol style="list-style-type: none"> <li>1. <b>Diskette drive cable</b></li> <li>2. Diskette drive</li> <li>3. System board</li> </ol>  |
| 011-000-XXX<br>Serial port Interface Test Passed                               | <b>No action</b>  |
| 011-001-XXX<br>Serial port Presence  | <ol style="list-style-type: none"> <li>1. <b>Remove external serial device, if present</b></li> <li>2. Run setup, enable port</li> <li>3. System board</li> </ol>   |
| 011-002-XXX<br>011-003-XXX<br>Serial port Timeout/Parity error                 | <b>System board</b>   |
| 011-013-XXX<br>011-014-XXX<br>Serial port Control Signal/Loopback test failure | <b>System board</b>   |
| 011-015-XXX<br>Serial port External Loopback failure                           | <ol style="list-style-type: none"> <li>1. <b>Wrap plug</b></li> <li>2. System board</li> </ol>  |
| 011-027-XXX<br>Serial port Configuration/Setup error                           | <ol style="list-style-type: none"> <li>1. <b>Run Setup, enable port</b></li> <li>2. Flash the system. See "Flash update procedures" on page 213</li> <li>3. System board</li> </ol>   |
| 011-03X-XXX<br>011-04X-XXX<br>Serial port failure                              | <b>System board</b>   |
| 011-195-XXX<br>Serial port Test aborted by user                                | <b>Information only</b><br>Re-start the test, if necessary  |
| 011-196-XXX<br>Serial port test halt, error threshold exceeded                 | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |

| Diagnostic Error Code  | FRU/Action  |
|--|---|
| 011-197-XXX<br>Serial port test warning  | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| 011-198-XXX<br>Serial port test aborted  | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| 011-199-XXX<br>Serial port test failed, cause unknown                            | <ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| 011-2XX-XXX<br>Serial port signal failure  | <ol style="list-style-type: none"> <li>1. <b>External serial device</b></li> <li>2. System board</li> </ol>   |
| 014-000-XXX<br>Parallel port Interface Test Passed                               | <b>No action</b>  |
| 014-001-XXX<br>Parallel port Presence  | <ol style="list-style-type: none"> <li>1. <b>Remove external parallel device, if present</b></li> <li>2. Run setup, enable port</li> <li>3. System board</li> </ol>   |
| 014-002-XXX<br>014-003-XXX<br>Parallel port Timeout/Parity error                 | <b>System board</b>   |
| 014-013-XXX<br>014-014-XXX<br>Parallel port Control Signal/Loopback test failure | <b>System board</b>   |
| 014-015-XXX<br>Parallel port External Loopback failure                           | <ol style="list-style-type: none"> <li>1. <b>Wrap plug</b></li> <li>2. System board</li> </ol>  |
| 014-027-XXX<br>Parallel port Configuration/Setup error                           | <ol style="list-style-type: none"> <li>1. <b>Run Setup, enable port</b></li> <li>2. Flash the system. See "Flash update procedures" on page 213</li> <li>3. System board</li> </ol>   |
| 014-03X-XXX<br>014-04X-XXX<br>Parallel port failure                              | <b>System board</b>   |
| 014-195-XXX<br>Parallel port Test aborted by user                                | <b>Information only</b><br>Re-start the test, if necessary  |

| Diagnostic Error Code   | FRU/Action   |
|---|--|
| <b>014-196-XXX</b><br>Parallel port test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. Press F3 to review the log file</li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| <b>014-197-XXX</b><br>Parallel port test warning                        | <ol style="list-style-type: none"> <li>1. Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| <b>014-198-XXX</b><br>Parallel port test aborted                        | <ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>   |
| <b>014-199-XXX</b><br>Parallel port test failed, cause unknown          | <ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>  |
| <b>014-2XX-XXX</b><br><b>014-3XX-XXX</b><br>Parallel port failure       | <ol style="list-style-type: none"> <li>1. External parallel device</li> <li>2. System board</li> </ol>   |
| <b>015-000-XXX</b><br>USB port Interface Test Passed                    | No action  |
| <b>015-001-XXX</b><br>USB port Presence                                 | <ol style="list-style-type: none"> <li>1. Remove USB device(s) and re-test</li> <li>2. System board</li> </ol>   |
| <b>015-002-XXX</b><br>USB port Timeout                                  | <ol style="list-style-type: none"> <li>1. Remove USB device(s) and re-test</li> <li>2. System board</li> </ol>   |
| <b>015-015-XXX</b><br>USB port External Loopback failure                | <ol style="list-style-type: none"> <li>1. Remove USB device(s) and re-test</li> <li>2. System board</li> </ol>   |
| <b>015-027-XXX</b><br>USB port Configuration/Setup error                | <ol style="list-style-type: none"> <li>1. Flash the system. See "Flash update procedures" on page 213</li> <li>2. System board</li> </ol>  |
| <b>015-032-XXX</b><br>USB port Device Controller failure                | System board   |
| <b>015-034-XXX</b><br>USB port buffer allocation failure                | <ol style="list-style-type: none"> <li>1. Reboot the system</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Run memory test</li> <li>4. System board</li> </ol>  |
| <b>015-035-XXX</b><br>USB port Reset condition detected                 | <ol style="list-style-type: none"> <li>1. Remove USB device(s) and re-test</li> <li>2. System board</li> </ol>   |

| Diagnostic Error Code  | FRU/Action  |
|--|---|
| <b>015-036-XXX</b><br>USB port Register error                      | <b>System board</b>   |
| <b>015-040-XXX</b><br>USB port IRQ failure                         | <ol style="list-style-type: none"> <li>1. <b>Run setup and check for conflicts</b></li> <li>2. Flash the system. See "Flash update procedures" on page 213</li> <li>3. System board</li> </ol>  |
| <b>015-195-XXX</b><br>USB port Test aborted by user                | <b>Information only</b><br>Re-start the test, if necessary  |
| <b>015-196-XXX</b><br>USB port test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| <b>015-197-XXX</b><br>USB port test warning                        | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| <b>015-198-XXX</b><br>USB port test aborted                        | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| <b>015-199-XXX</b><br>USB port test failed, cause unknown          | <ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| <b>018-000-XXX</b><br>PCI Card Test Passed                         | <b>No action</b>  |
| <b>018-0XX-XXX</b><br>PCI Card Failure                             | <ol style="list-style-type: none"> <li>1. <b>Riser card, if installed</b></li> <li>2. System board</li> </ol>   |
| <b>018-195-XXX</b><br>PCI Card Test aborted by user                | <ol style="list-style-type: none"> <li>1. <b>PCI card</b></li> <li>2. <b>Information only</b><br/>Re-start the test, if necessary</li> </ol>  |
| <b>018-196-XXX</b><br>PCI Card test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |

| Diagnostic Error Code   | FRU/Action  |
|---|---|
| <b>018-197-XXX</b><br>PCI Card test warning                   | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| <b>018-198-XXX</b><br>PCI Card test aborted                   | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| <b>018-199-XXX</b><br>PCI Card test failed, cause unknown     | <ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| <b>018-250-XXX</b><br>PCI Card Services error                 | <ol style="list-style-type: none"> <li>1. <b>PCI card</b></li> <li>2. Riser card, if installed</li> <li>3. System board</li> </ol>  |
| <b>020-000-XXX</b><br>PCI Interface Test Passed               | <b>No action</b>  |
| <b>020-0XX-XXX</b><br>PCI Interface error                     | <ol style="list-style-type: none"> <li>1. <b>PCI card</b></li> <li>2. Riser card, if installed</li> <li>3. System board</li> </ol>  |
| <b>020-195-XXX</b><br>PCI Test aborted by user                | <b>Information only</b><br>Re-start the test, if necessary  |
| <b>020-196-XXX</b><br>PCI test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| <b>020-197-XXX</b><br>PCI test warning                        | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |

| Diagnostic Error Code  | FRU/Action  |
|--|---|
| 020-198-XXX<br>PCI test aborted                                    | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| 020-199-XXX<br>PCI test failed, cause unknown                      | <ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| 020-262-XXX<br>PCI system error                                    | <ol style="list-style-type: none"> <li>1. PCI card</li> <li>2. Riser card, if installed</li> <li>3. System board</li> </ol>   |
| 025-000-XXX<br>IDE interface Test Passed                           | <b>No action</b>  |
| 025-00X-XXX<br>025-01X-XXX<br>IDE interface failure                | <ol style="list-style-type: none"> <li>1. <b>IDE signal cable</b></li> <li>2. Check power supply voltages</li> <li>3. Reseat IDE signal cable</li> <li>4. IDE device</li> <li>5. System board</li> </ol>  |
| 025-027-XXX<br>IDE interface Configuration/Setup error             | <ol style="list-style-type: none"> <li>1. <b>IDE signal cable</b></li> <li>2. Flash the system. See "Flash update procedures" on page 213</li> <li>3. Reseat IDE signal cable</li> <li>4. IDE device</li> <li>5. System board</li> </ol>  |
| 025-02X-XXX<br>025-03X-XXX<br>025-04X-XXX<br>IDE Interface failure | <ol style="list-style-type: none"> <li>1. <b>IDE signal cable</b></li> <li>2. Check power supply</li> <li>3. Reseat IDE signal cable</li> <li>4. IDE device</li> <li>5. System board</li> </ol>   |
| 025-195-XXX<br>IDE interface Test aborted by user                  | <b>Information only</b><br>Re-start the test, if necessary  |
| 025-196-XXX<br>IDE interface test halt, error threshold exceeded   | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| 025-197-XXX<br>IDE interface test warning                          | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |

| Diagnostic Error Code  | FRU/Action  |
|--|---|
| <b>025-198-XXX</b><br>IDE interface test aborted                         | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| <b>025-199-XXX</b><br>IDE interface test failed, cause unknown           | <ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| <b>030-000-XXX</b><br>SCSI interface Test Passed                         | <b>No action</b>  |
| <b>030-00X-XXX</b><br><b>030-01X-XXX</b><br>SCSI interface failure       | <ol style="list-style-type: none"> <li>1. <b>SCSI signal cable</b></li> <li>2. Check power supply</li> <li>3. SCSI device</li> <li>4. SCSI adapter card, if installed</li> <li>5. System board</li> </ol>   |
| <b>030-027-XXX</b><br>SCSI interface Configuration/Setup error           | <ol style="list-style-type: none"> <li>1. <b>SCSI signal cable</b></li> <li>2. Flash the system. See "Flash update procedures" on page 213</li> <li>3. SCSI device</li> <li>4. SCSI adapter card, if installed</li> <li>5. System board</li> </ol>  |
| <b>030-03X-XXX</b><br><b>030-04X-XXX</b><br>SCSI interface error         | <ol style="list-style-type: none"> <li>1. <b>SCSI signal cable</b></li> <li>2. Check power supply</li> <li>3. SCSI device</li> <li>4. SCSI adapter card, if installed</li> <li>5. System board</li> </ol>   |
| <b>030-195-XXX</b><br>SCSI interface Test aborted by user                | <b>Information only</b><br>Re-start the test, if necessary  |
| <b>030-196-XXX</b><br>SCSI interface test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| <b>030-197-XXX</b><br>SCSI interface test warning                        | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |

| Diagnostic Error Code  | FRU/Action  |
|--|---|
| <b>030-198-XXX</b><br>SCSI interface test aborted                        | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| <b>030-199-XXX</b><br>SCSI interface test failed, cause unknown          | <ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| <b>035-000-XXX</b><br>RAID interface Test Passed                         | <b>No action</b>  |
| <b>035-0XX-XXX</b><br>RAID interface Failure                             | <ol style="list-style-type: none"> <li>1. <b>RAID signal cable</b></li> <li>2. RAID device</li> <li>3. RAID adapter card, if installed</li> <li>4. System board</li> </ol>  |
| <b>035-195-XXX</b><br>RAID interface Test aborted by user                | <b>Information only</b><br>Re-start the test, if necessary  |
| <b>035-196-XXX</b><br>RAID interface test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| <b>035-197-XXX</b><br>RAID interface test warning                        | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| <b>035-198-XXX</b><br>RAID interface test aborted                        | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| <b>035-199-XXX</b><br>RAID interface test failed, cause unknown          | <ol style="list-style-type: none"> <li>1. See "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| <b>071-000-XXX</b><br>Audio port Interface Test Passed                   | <b>No action</b>  |



| Diagnostic Error Code   | FRU/Action  |
|---|---|
| 071-00X-XXX<br>071-01X-XXX<br>071-02X-XXX<br>Audio port error | <ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Flash the system. See "Flash update procedures" on page 213</li> <li>3. System board</li> </ol>  |
| 071-03X-XXX<br>Audio port failure                             | <ol style="list-style-type: none"> <li>1. <b>Speakers</b></li> <li>2. Microphone</li> <li>3. Audio card, if installed</li> <li>4. System board</li> </ol>   |
| 071-04X-XXX<br>Audio port failure                             | <ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Audio card, if installed</li> <li>3. System board</li> </ol>   |
| 071-195-XXX<br>Audio port Test aborted by user                | <p><b>Information only</b><br/>Re-start the test, if necessary</p>  |
| 071-196-XXX<br>Audio port test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| 071-197-XXX<br>Audio port test warning                        | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| 071-198-XXX<br>Audio port test aborted                        | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| 071-199-XXX<br>Audio port test failed, cause unknown          | <ol style="list-style-type: none"> <li>1. See "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| 071-25X-XXX<br>Audio port failure                             | <ol style="list-style-type: none"> <li>1. <b>Speakers</b></li> <li>2. Audio card, if installed</li> <li>3. System board</li> </ol>  |
| 080-000-XXX<br>Game Port interface Test Passed                | <b>No action</b>  |
| 080-XXX-XXX<br>Game Port interface Error                      | <ol style="list-style-type: none"> <li>1. <b>Remove the game port device and re-test the system</b></li> </ol>  |
| 080-195-XXX<br>Game Port interface Test aborted by user       | <p><b>Information only</b><br/>Re-start the test, if necessary</p>  |

| Diagnostic Error Code  | FRU/Action  |
|--|---|
| <b>080-196-XXX</b><br>Game Port interface test halt, error threshold exceeded  | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| <b>080-197-XXX</b><br>Game Port interface test warning                         | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| <b>080-198-XXX</b><br>Game Port interface test aborted                         | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| <b>080-199-XXX</b><br>Game Port interface test failed, cause unknown           | <ol style="list-style-type: none"> <li>1. See "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| <b>086-000-XXX</b><br>Mouse Port interface Test Passed                         | <b>No action</b>  |
| <b>086-001-XXX</b><br>Mouse Port interface Presence                            | <ol style="list-style-type: none"> <li>1. <b>Mouse</b></li> <li>2. System board</li> </ol>  |
| <b>086-032-XXX</b><br>Mouse Port interface Device controller failure           | <ol style="list-style-type: none"> <li>1. <b>Mouse</b></li> <li>2. System board</li> </ol>  |
| <b>086-035-XXX</b><br>Mouse Port interface Reset                               | <ol style="list-style-type: none"> <li>1. <b>Mouse</b></li> <li>2. System board</li> </ol>  |
| <b>086-040-XXX</b><br>Mouse Port interface IRQ failure                         | <ol style="list-style-type: none"> <li>1. <b>Run Setup</b></li> <li>2. Mouse</li> <li>3. System board</li> </ol>  |
| <b>086-195-XXX</b><br>Mouse Port interface Test aborted by user                | <b>Information only</b><br>Re-start the test, if necessary  |
| <b>086-196-XXX</b><br>Mouse Port interface test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |

| Diagnostic Error Code   | FRU/Action  |
|---|---|
| 086-197-XXX<br>Mouse Port interface test warning                  | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| 086-198-XXX<br>Mouse Port interface test aborted                  | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| 086-199-XXX<br>Mouse Port interface test failed, cause unknown    | <ol style="list-style-type: none"> <li>1. See "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| 089-000-XXX<br>Microprocessor Test Passed                         | <b>No action</b>  |
| 089-XXX-XXX<br>Microprocessor failure                             | <ol style="list-style-type: none"> <li>1. <b>Microprocessor(s)</b></li> <li>2. System board</li> </ol>  |
| 089-195-XXX<br>Microprocessor Test aborted by user                | <b>Information only</b><br>Re-start the test, if necessary  |
| 089-196-XXX<br>Microprocessor test halt, error threshold exceeded | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| 089-197-XXX<br>Microprocessor test warning                        | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| 089-198-XXX<br>Microprocessor test aborted                        | <ol style="list-style-type: none"> <li>1. <b>Flash the system. See "Flash update procedures" on page 213</b></li> <li>2. Go to "Undetermined problems" on page 86</li> </ol>  |
| 089-199-XXX<br>Microprocessor test failed, cause unknown          | <ol style="list-style-type: none"> <li>1. See "Undetermined problems" on page 86</li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>   |
| 170-000-XXX<br>Voltage Sensor(s) Test Passed                      | <b>No action</b>  |

| Diagnostic Error Code   | FRU/Action  |
|---|---|
| <b>170-0XX-XXX</b><br>Voltage Sensor(s) failure                                   | <ol style="list-style-type: none"> <li>1. <b>Flash system</b></li> <li>2. System board</li> </ol>   |
| <b>170-195-XXX</b><br>Voltage Sensor(s) Test aborted by user                      | <p><b>Information only</b><br/>Re-start the test, if necessary</p>  |
| <b>170-196-XXX</b><br>Voltage Sensor(s) test halt, error threshold exceeded       | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |
| <b>170-197-XXX</b><br>Voltage Sensor(s) test warning                              | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| <b>170-198-XXX</b><br>Voltage Sensor(s) test aborted                              | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>       |
| <b>170-199-XXX</b><br>Voltage Sensor(s) test failed, cause unknown                | <ol style="list-style-type: none"> <li>1. <b>See "Undetermined problems" on page 86</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>  |
| <b>170-250-XXX</b><br><b>170-251-XXX</b><br>Voltage Sensor(s) Voltage limit error | <ol style="list-style-type: none"> <li>1. <b>Power supply</b></li> <li>2. System board</li> </ol>   |
| <b>170-254-XXX</b><br>Voltage Sensor(s) Voltage Regulator Module error            | <ol style="list-style-type: none"> <li>1. <b>Voltage Regulator Module (VRM)</b></li> <li>2. Microprocessor</li> <li>3. System board</li> </ol>  |
| <b>175-000-XXX</b><br>Thermal Sensor(s) Test Passed                               | <b>No action</b>  |
| <b>175-0XX-XXX</b><br>Thermal Sensor(s) failure                                   | <ol style="list-style-type: none"> <li>1. <b>Flash system</b></li> <li>2. System board</li> </ol>   |
| <b>175-195-XXX</b><br>Thermal Sensor(s) Test aborted by user                      | <p><b>Information only</b><br/>Re-start the test, if necessary</p>  |
| <b>175-196-XXX</b><br>Thermal Sensor(s) test halt, error threshold exceeded       | <ol style="list-style-type: none"> <li>1. <b>Press F3 to review the log file</b></li> <li>2. Re-start the test to reset the log file</li> </ol>   |

| Diagnostic Error Code                                       | FRU/Action  |
|---|---|
| 175-197-XXX<br>Thermal Sensor(s) test warning               | <ol style="list-style-type: none"> <li>1. <b>Make sure the component that is called out is connected and/or enabled. See Chapter 6, "Using the Setup Utility," on page 49</b></li> <li>2. Re-run test</li> <li>3. Replace the component that is called out in warning statement</li> <li>4. Replace the component under test</li> </ol> |
| 175-198-XXX<br>Thermal Sensor(s) test aborted               | <ol style="list-style-type: none"> <li>1. <b>If a component is called out, make sure it is connected and/or enabled</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Go to "Undetermined problems" on page 86</li> </ol>   |
| 175-199-XXX<br>Thermal Sensor(s) test failed, cause unknown | <ol style="list-style-type: none"> <li>1. <b>See "Undetermined problems" on page 86</b></li> <li>2. Flash the system and re-test. See "Flash update procedures" on page 213</li> <li>3. Replace component under function test</li> </ol>  |
| 175-250-XXX<br>175-251-XXX<br>Thermal Sensor(s) limit error | <ol style="list-style-type: none"> <li>1. <b>Check fans</b></li> <li>2. Check Power supply voltages</li> <li>3. Microprocessor</li> <li>4. System board</li> </ol>  |
| 185-000-XXX<br>Asset Security Test Passed                   | <b>No action</b>  |
| 185-XXX-XXX<br>Asset Security failure                       | <ol style="list-style-type: none"> <li>1. <b>Flash system</b></li> <li>2. System board</li> </ol>   |
| 185-278-XXX<br>Asset Security Chassis Intrusion             | <ol style="list-style-type: none"> <li>1. <b>Assure Asset Security Enabled</b></li> <li>2. C2 Cover Switch</li> <li>3. System board</li> </ol>  |
| 201-000-XXX<br>System Memory Test Passed                    | <b>No action</b>  |
| 201-XXX-XXX<br>System Memory error                          | <ol style="list-style-type: none"> <li>1. <b>Replace the memory module called out by the test</b></li> <li>2. System board</li> </ol>   |
| 202-000-XXX<br>System Cache Test Passed                     | <b>No action</b>  |
| 202-XXX-XXX<br>System Cache error                           | <ol style="list-style-type: none"> <li>1. <b>Cache, if removable</b></li> <li>2. System board</li> <li>3. Microprocessor</li> </ol>   |
| 206-000-XXX<br>Diskette Drive Test Passed                   | <b>No action</b>  |
| 206-XXX-XXX<br>Diskette Drive error                         | <ol style="list-style-type: none"> <li>1. <b>Diskette Drive Cable</b></li> <li>2. Check power supply voltages</li> <li>3. Diskette drive</li> <li>4. System board</li> </ol>  |

| <b>Diagnostic Error Code</b>   | <b>FRU/Action</b>  |
|--|--|
| <b>215-000-XXX</b><br>CD-ROM Drive Test Passed                           | <b>No action</b>   |
| <b>215-XXX-XXX</b><br>CD-ROM Drive error                                 | <ol style="list-style-type: none"> <li>1. <b>CD-ROM Drive Cable</b></li> <li>2. Check power supply voltages</li> <li>3. CD-ROM drive</li> <li>4. System board</li> </ol>   |
| <b>217-000-XXX</b><br>Hard Disk Drive Test Passed                        | <b>No action</b>   |
| <b>217-25X-XXX</b><br><b>217-26X-XXX</b><br>Hard Disk Drive (IDE) error  | <ol style="list-style-type: none"> <li>1. <b>Hard Disk Drive Cable</b></li> <li>2. Check power supply voltages</li> <li>3. Reseat the hard disk drive cable</li> <li>4. Hard Disk drive (IDE)</li> <li>5. System board</li> </ol>                                |
| <b>217-28X-XXX</b><br><b>217-29X-XXX</b><br>Hard Disk Drive (SCSI) error | <ol style="list-style-type: none"> <li>1. <b>Hard Disk Drive Cable</b></li> <li>2. Check power supply voltages</li> <li>3. Reseat the hard disk drive cable</li> <li>4. Hard Disk drive (SCSI)</li> <li>5. SCSI adapter card</li> <li>6. System board</li> </ol> |
| <b>220-000-XXX</b><br>Hi-Capacity Cartridge Drive Test Passed            | <b>No action</b>   |
| <b>220-XXX-XXX</b><br>Hi-Capacity Cartridge Drive error                  | <ol style="list-style-type: none"> <li>1. <b>Remove the Hi-Capacity Cartridge Drive and re-test the system</b></li> </ol>  |
| <b>301-XXX-XXX</b><br>Keyboard error                                     | <ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Check and test mouse</li> <li>3. System board</li> </ol>   |
| <b>301-000-XXX</b><br>Keyboard Test Passed                               | <b>No action</b>   |
| <b>302-000-XXX</b><br>Mouse Test Passed                                  | <b>No action</b>   |
| <b>302-XXX-XXX</b><br>Mouse error  | <ol style="list-style-type: none"> <li>1. <b>Mouse</b></li> <li>2. Check and test Keyboard</li> <li>3. System board</li> </ol>   |
| <b>303-000-XXX</b><br>Joystick Test Passed                               | <b>No action</b>   |
| <b>303-XXX-XXX</b><br>Joystick error                                     | <b>Remove the Joystick and re-test the system</b>  |
| <b>305-000-XXX</b><br>Monitor DDC Test Passed                            | <b>No action</b>   |
| <b>305-250-XXX</b><br>Monitor DDC self test failure                      | <ol style="list-style-type: none"> <li>1. <b>Run Setup to enable DDC</b></li> <li>2. Cable</li> <li>3. Monitor</li> <li>4. Video card</li> <li>5. System board</li> </ol>  |

| <b>Diagnostic Error Code</b>     | <b>FRU/Action</b>                       |
|----------------------------------|---|
| 415-000-XXX<br>Modem Test Passed | No action                               |
| 415-XXX-XXX<br>Modem error       | Remove the Modem and re-test the system |

## Beep symptoms

Beep symptoms are tones or a series of tones separated by pauses (intervals without sound) during POST.

The following tables describes beep symptoms.

| Beep Symptom   | FRU/Action   |
|--|--|
| <b>2 short beeps</b><br>CMOS setting error                             | Perform the following actions in order. <ol style="list-style-type: none"><li>1. Start the Setup Utility program and press F10 to Save and exit. See Chapter 6, "Using the Setup Utility," on page 49.</li><li>2. Start the Setup Utility program and press F9 to load defaults and then press F10 to Save and exit.</li><li>3. Perform a Boot block recovery. See "Recovering from a POST/BIOS update failure" on page 214.</li></ol> |
| <b>1 long and 2 short beeps</b><br>Monitor or video adapter card error | Perform the following actions in order. <ol style="list-style-type: none"><li>1. Make sure the monitor is properly connected to the computer.</li><li>2. Replace the video adapter card (if present).</li><li>3. Replace the system board.</li></ol>   |
| <b>1 long and 3 short beeps</b><br>Keyboard error                      | Perform the following actions in order. <ol style="list-style-type: none"><li>1. Make sure the keyboard is properly connected to the keyboard connector.</li><li>2. Replace the keyboard.</li><li>3. Replace the system board.</li></ol>   |
| <b>1 long and 9 short beeps</b> BIOS ROM error                         | Perform the following actions in order. <ol style="list-style-type: none"><li>1. Start the Setup Utility program and press F9 to load defaults and then press F10 to Save and exit. See Chapter 6, "Using the Setup Utility," on page 49.</li><li>2. Perform a Boot block recovery. See "Recovering from a POST/BIOS update failure" on page 214.</li><li>3. Replace the system board.</li></ol>                                       |
| <b>Continuos long beeps</b><br>DRAM memory error                       | Perform the following actions in order. <ol style="list-style-type: none"><li>1. Make sure the memory module(s) are properly seated in the connector(s).</li><li>2. Replace the memory module(s).</li><li>3. Replace the system board.</li></ol>   |



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## POST error codes

Each time you power-on the system, it performs a series of tests that check the operation of the system and some options. This series of tests is called the *Power-On Self-Test*, or *POST*. POST does the following operations.

- Checks some basic system-board operations
- Checks the memory operation
- Starts the video operation
- Verifies that the boot drive is working

If the POST detects a problem, an error message appears on the screen. A single problem can cause several error messages to appear. When you correct the cause of the first error message, the other error messages probably will not appear on the screen the next time you turn on the system.

| POST Error Message                    | Description/Action  |
|---------------------------------------|---|
| CMOS battery failed                   | The CMOS battery is no longer functional.<br>Replace the battery.   |
| CMOS checksum error - defaults loaded | Checksum of CMOS is incorrect.<br>The computer loads the default configuration settings. This error might indicate that CMOS has become corrupt due to a weak CMOS battery.   |
| CPU at nnnn                           | nnnn is the running speed of the microprocessor.  |
| Press Esc to skip memory test         | Pressing Esc skips the full memory test   |
| HARD DISK INSTALL FAILURE             | Cannot find or initialize the hard disk drive controller or the drive.<br>Make sure the hard disk drive is correctly installed.<br>If no hard disk drives are installed, make sure the hard disk drive selection in Setup is set to NONE.   |
| Keyboard error or no keyboard present | Cannot initialize the keyboard.<br>Make sure the keyboard is properly connected to the computer and that no keys are held pressed during POST.<br>To purposely configure the computer without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. The BIOS then ignores the missing keyboard during POST. |
| Memory Test:                          | This message displays during a full memory test, counting down the memory areas being tested.   |
| Memory test fail                      | If POST detects an error during memory testing, additional information appears. This information gives specifics about the type and location of the memory error.   |

| POST Error Message   | Description/Action  |
|--|---|
| Press TAB to show POST screen  | Pressing the TAB key permits the user to toggle between the default POST display screen and a custom POST display screen.   |
| Error: Non-System disk or disk error<br>Replace and press any key when ready | <p>The BIOS was unable to find a suitable boot device.</p> <p>Make sure the boot drive is properly connected to the computer.</p> <p>Make sure you have bootable media.</p> |

## Miscellaneous error messages

| Message/Symptom   | FRU/Action   |
|---|--|
| Changing display colors   | <b>Display/Monitor</b>   |
| Computer will <i>not</i> power-off. See "Power Supply Errors" on page 59.                                     | <ol style="list-style-type: none"> <li><b>Power Switch</b></li> <li>System Board</li> <li>Riser card, if installed</li> </ol>  |
| Computer will <i>not</i> RPL from server  | <ol style="list-style-type: none"> <li><b>Ensure that network is in startup sequence as first device or first device after diskette</b></li> <li>Ensure that network adapter is enabled for RPL</li> <li>Network adapter (Advise network administrator of new MAC address)</li> </ol>  |
| Computer will <i>not</i> perform a Wake on LAN (if applicable)  | <ol style="list-style-type: none"> <li><b>Check power supply and signal cable connections to network adapter</b></li> <li>Ensure that the operating system settings are set to enable Wake on LAN</li> <li>Ensure Wake on LAN feature is enabled in Setup/Configuration (see "Starting the Setup Utility program" on page 49)</li> <li>Ensure network administrator is using correct MAC address</li> <li>Ensure no interrupt or I/O address conflicts</li> <li>Network adapter (advise network administrator of new MAC address)</li> </ol> |
| Dead computer. See "Power Supply Errors" on page 59.  | <ol style="list-style-type: none"> <li><b>Power Supply</b></li> <li>System Board</li> </ol>  |
| Diskette drive in-use light remains on or does not light when drive is active.                                | <ol style="list-style-type: none"> <li><b>Diskette Drive</b></li> <li>System Board</li> <li>Diskette Drive Cable</li> </ol>  |
| Flashing cursor with an otherwise blank display.  | <ol style="list-style-type: none"> <li><b>System Board</b></li> <li>Primary Hard Disk Drive</li> <li>Hard Disk Drive Cable</li> </ol>  |
| Incorrect memory size during POST   | <ol style="list-style-type: none"> <li><b>Run the Memory tests</b></li> <li>Memory Module</li> <li>System Board</li> </ol>   |
| "Insert a Diskette" icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive. | <ol style="list-style-type: none"> <li><b>System Board</b></li> <li>Diskette Drive Cable</li> <li>Network Adapter</li> </ol>   |
| Intensity or color varies from left to right of characters and color bars                                     | <ol style="list-style-type: none"> <li><b>Display</b></li> <li>Video adapter (if present)</li> <li>System Board</li> </ol>   |
| No power or fan not running   | <ol style="list-style-type: none"> <li><b>See "Power Supply Errors" on page 59.</b></li> </ol>   |

| Message/Symptom  | FRU/Action  |
|--|---|
| Non-system disk or disk error-type message with a known-good diagnostic diskette.                            | <ol style="list-style-type: none"> <li>1. <b>Diskette Drive</b></li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> </ol>  |
| Other display symptoms not listed above (including blank or illegible display)                               | <ol style="list-style-type: none"> <li>1. <b>Display</b></li> <li>2. System Board</li> </ol>  |
| Power-on indicator or hard disk drive in-use light not on, but computer works correctly                      | <ol style="list-style-type: none"> <li>1. Power switch/LED assembly</li> <li>2. System Board</li> </ol>   |
| Printer problems   | <ol style="list-style-type: none"> <li>1. <b>Printer</b></li> <li>2. System Board</li> </ol>  |
| Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive | <ol style="list-style-type: none"> <li>1. <b>Run Setup</b> and check Startup sequence.</li> <li>2. Diskette Drive</li> <li>3. Diskette Drive Cable</li> <li>4. System Board</li> <li>5. Power Supply</li> </ol>   |
| RPL computer cannot access programs from its own hard disk.  | <ol style="list-style-type: none"> <li>1. <b>If network administrator is using LCCM Hybrid RPL, check startup sequence:</b> <ol style="list-style-type: none"> <li>a. <b>First device - network</b></li> <li>b. <b>Second device - hard disk</b></li> </ol> </li> <li>2. Hard disk drive</li> </ol> |
| RPL computer does not RPL from server  | <ol style="list-style-type: none"> <li>1. <b>Check startup sequence</b></li> <li>2. Check the network adapter LED status</li> </ol>   |
| Serial or parallel port device failure (system board port)   | <ol style="list-style-type: none"> <li>1. <b>External Device Self-Test OK?</b></li> <li>2. External Device</li> <li>3. Cable</li> <li>4. System Board</li> </ol>  |
| Serial or parallel port device failure (adapter port)  | <ol style="list-style-type: none"> <li>1. <b>External Device Self-Test OK?</b></li> <li>2. External Device</li> <li>3. Cable</li> <li>4. Alternate Adapter</li> <li>5. System Board</li> </ol>  |
| Some or all keys on the keyboard do not work   | <ol style="list-style-type: none"> <li>1. <b>Keyboard</b></li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>  |

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## Undetermined problems

1. Power-off the computer.
2. Remove or disconnect the following components (if installed) one at a time.
  - a. External devices (modem, printer, or mouse)
  - b. Any adapters
  - c. Memory modules
  - d. Extended video memory

- e. External Cache
  - f. External Cache RAM
  - g. Hard disk drive
  - h. Diskette drive
3. Power-on the computer to re-test the system.
  4. Repeat steps 1 through 3 until you find the failing device or adapter.

If all devices and adapters have been removed, and the problem continues, replace the system board.



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## Chapter 9. Replacing FRUs(types 6423 and 6483)

**Important**

Before you replace any FRU, read Chapter 2, "Safety information," on page 3. These precautions and guidelines will help you work safely.

FRU replacements are to be done by trained service technicians only.

This chapter does not contain a remove and replace procedure for all FRUs. Only the major FRUs are documented.

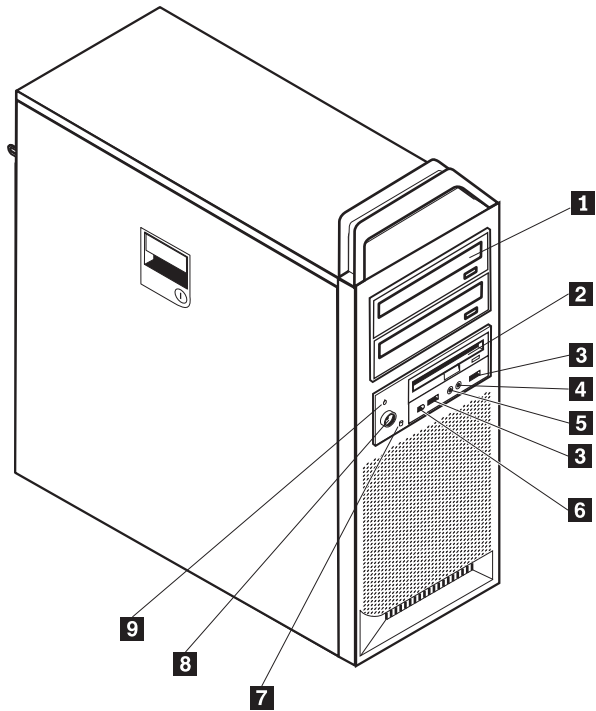
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## Locations

This section contains illustrations to help locate the various connectors, controls, and components of the computer.

### Controls and connectors on the front of the computer

**Note:** Not all computer models will have the following controls and connections.

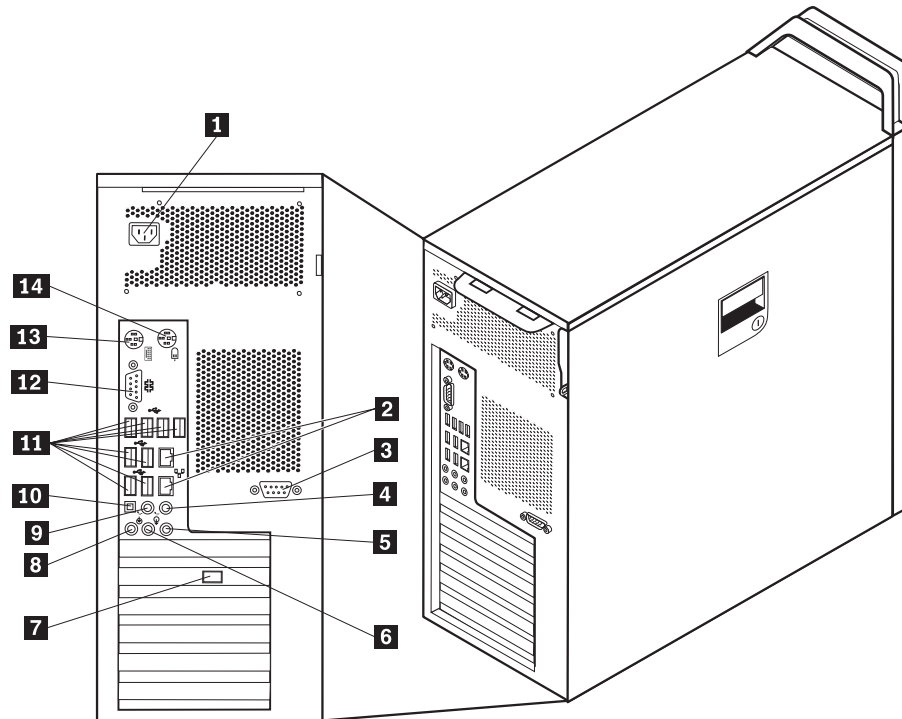


- |          |   |          |                                    |
|----------|---|----------|------------------------------------|
| <b>1</b> | Optical drive (some models)                     | <b>6</b> | IEEE 1394 connector                |
| <b>2</b> | 3.5 Diskette drive or card reader (some models) | <b>7</b> | Hard disk drive activity indicator |
| <b>3</b> | USB connectors (2)                              | <b>8</b> | Power button                       |
| <b>4</b> | Microphone connector                            | <b>9</b> | Power-on indicator                 |
| <b>5</b> | Headphone connector                             |          |                                    |



## Connectors on the rear of the computer

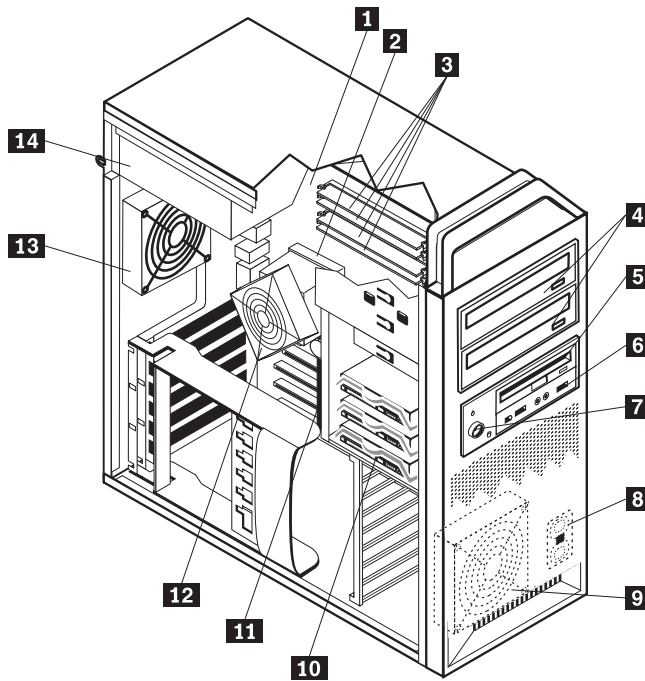
Some connectors on the rear of your computer are color-coded to help you determine where to connect the cables on your computer.



- |          |   |           |   |
|----------|---|-----------|---|
| <b>1</b> | Power cord connector                    | <b>8</b>  | Microphone connector                    |
| <b>2</b> | Ethernet connector                      | <b>9</b>  | Audio-line-out connector, rear speakers |
| <b>3</b> | Serial connector (some models)          | <b>10</b> | SPDIF connector                         |
| <b>4</b> | Audio-line-out sub/center connector     | <b>11</b> | USB connectors (8)                      |
| <b>5</b> | Audio-line-in connector                 | <b>12</b> | Serial connector                        |
| <b>6</b> | Audio-line-out front speakers connector | <b>13</b> | Keyboard connector                      |
| <b>7</b> | Video connector (some models)           | <b>14</b> | Mouse connector                         |

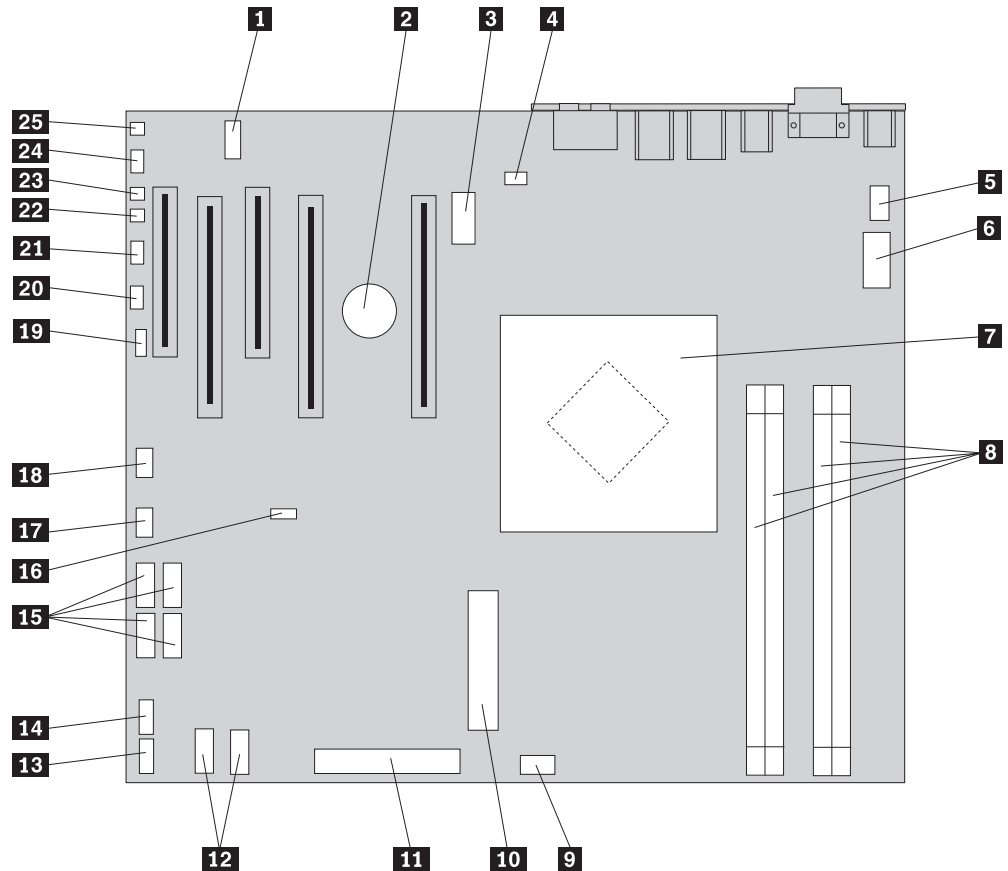
## Internal components

To open the computer cover, see "Opening the cover" on page 94.



- |          |                                      |           |                          |
|----------|--------------------------------------|-----------|--------------------------|
| <b>1</b> | System board                         | <b>8</b>  | Internal speaker         |
| <b>2</b> | Microprocessor                       | <b>9</b>  | Front fan assembly       |
| <b>3</b> | Memory modules                       | <b>10</b> | Hard disk drive          |
| <b>4</b> | Optical disk drives                  | <b>11</b> | Hard disk drive fan      |
| <b>5</b> | Diskette drive                       | <b>12</b> | Microprocessor heat sink |
| <b>6</b> | Front panel USB and Audio connectors | <b>13</b> | Rear system fan          |
| <b>7</b> | Power switch and LED assembly        | <b>14</b> | Power-supply assembly    |

## System board connectors and components



- |           |   |           |                               |
|-----------|---|-----------|-------------------------------|
| <b>1</b>  | COM2                                      | <b>14</b> | Front USB connector           |
| <b>2</b>  | Battery                                   | <b>15</b> | SATA connectors (4)           |
| <b>3</b>  | 12 volt power connector,<br>graphics      | <b>16</b> | Clear CMOS/Recovery jumper    |
| <b>4</b>  | Rear fan connector                        | <b>17</b> | Front adapter fan connector   |
| <b>5</b>  | Microprocessor heat sink fan<br>connector | <b>18</b> | IEEE 1394 Connector           |
| <b>6</b>  | Microprocessor 12 V power<br>connector    | <b>19</b> | SAS LED connector             |
| <b>7</b>  | Microprocessor and heat sink              | <b>20</b> | Auxiliary LEDs connector      |
| <b>8</b>  | Memory connectors (4)                     | <b>21</b> | Front panel connector         |
| <b>9</b>  | Front hard disk drive fan<br>connector    | <b>22</b> | Cover tamper switch connector |
| <b>10</b> | 24- pin system power connector            | <b>23</b> | Ambient temperature connector |
| <b>11</b> | Diskette drive connector                  | <b>24</b> | Front audio connector         |
| <b>12</b> | SATA connectors (2)                       | <b>25</b> | Internal speaker              |
| <b>13</b> | Auxiliary USB connector                   |           |                               |

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## Opening the cover

To open the computer cover:

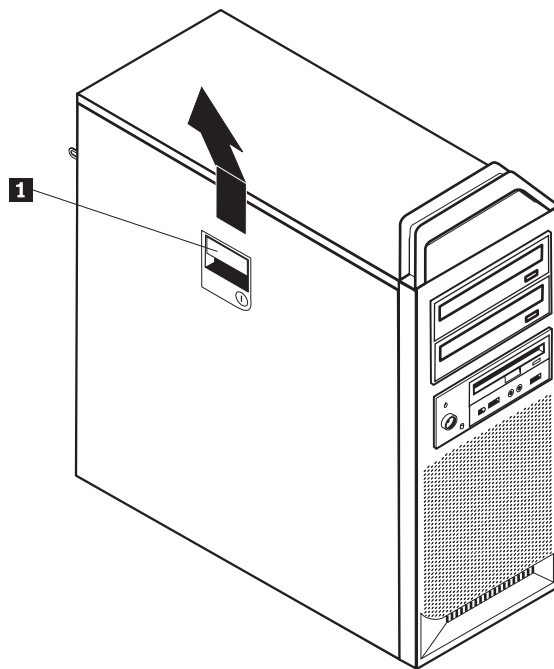
1. Remove any media (diskettes, CDs, or tapes) from the drives, shut down your operating system. Turn off all attached devices. Turn off the computer.

### Important



**Turn off the computer and wait 3 to 5 minutes to let the computer cool before opening the computer cover.**

2. Unplug all power cords from electrical outlets.
3. Disconnect the cables attached to the computer. This includes power cords, input/output (I/O) cables, and any other cables that are connected to the computer.
4. Remove any locking devices, such as a cable lock or padlock that secures the computer cover.
5. Disengage the cover latch **1**, and open the cover. Remove the cover and place it on a flat surface.



To replace the cover:

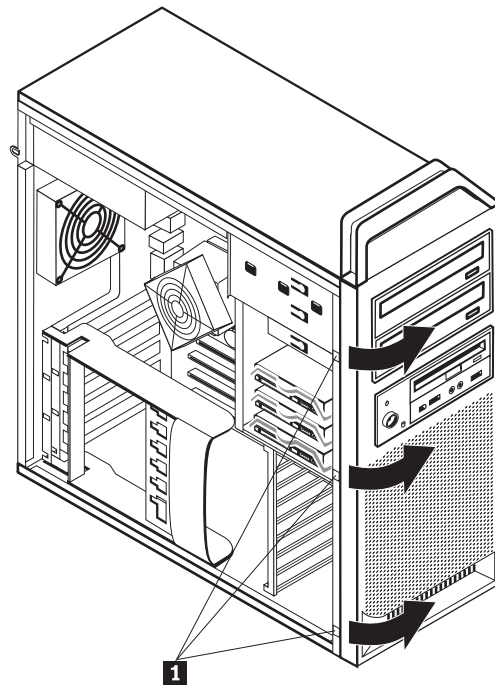
1. Align the cover with the chassis.
2. Close the cover.
3. Engage the cover latch.
4. Check to be sure the cover is latched.
5. Secure the cover using your locking device.

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## Removing the front bezel

To remove the front bezel:

1. Open the cover. See “Opening the cover” on page 94.
2. Disengage the bezel latches **1**, one at a time while rotating the bezel away from the computer just enough to keep the latches disengaged.
3. Lay the front bezel on a flat surface.
4. Reverse these steps to replace the front bezel.

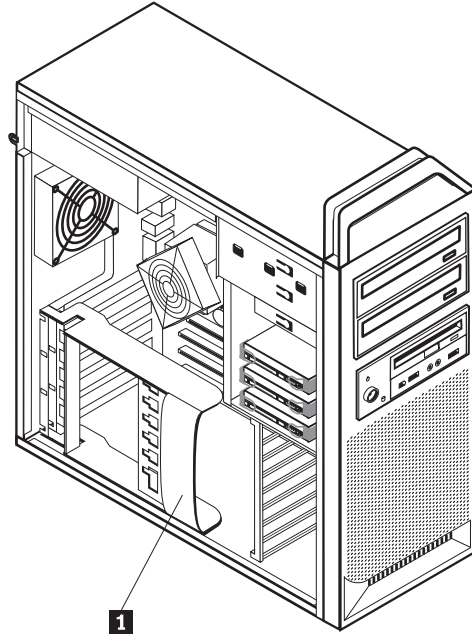


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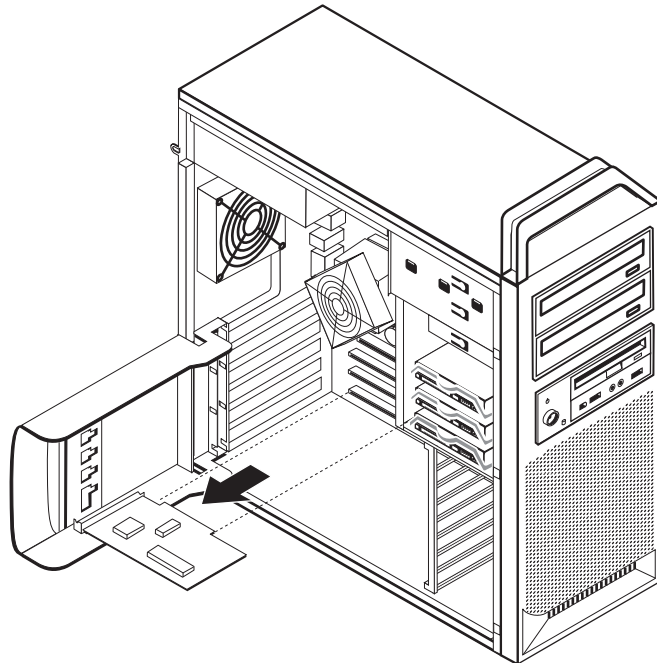
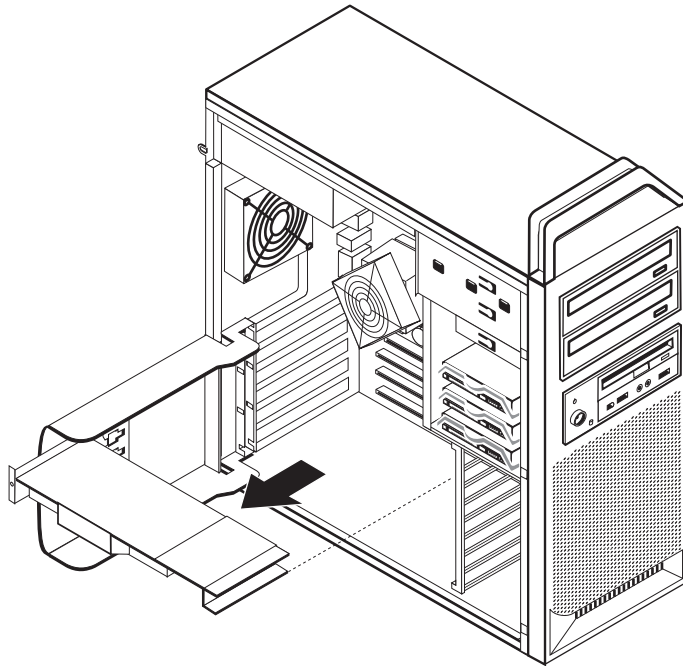
## Accessing system board components and drives

To access system board components:

1. Open the computer cover. See “Opening the cover” on page 94.
2. Unlatch and open the adapter card retainer **1**.



3. Remove the hard disk drive fan and bracket if necessary (some models). See “Replacing a fan assembly” on page 117.
4. Take note of the location of all cable connections on the adapter cards. It will be necessary to reconnect them properly when replacing the cards.
5. Disconnect all cables connected to the adapter cards. See “System board connectors and components” on page 93.
6. Remove the adapter cards as necessary. See “Replacing an adapter card” on page 103 for more information.



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## Replacing the battery

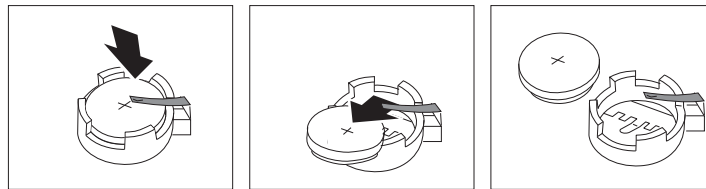
Your computer has a special type of memory that maintains the date, time, and settings for built-in features, such as serial-port assignments (configuration). A battery keeps this information active when you turn off the computer.

The battery normally requires no charging or maintenance throughout its life; however, no battery lasts forever. If the battery fails, the date, time, and configuration information (including passwords) are lost. An error message is displayed when you turn on the computer.

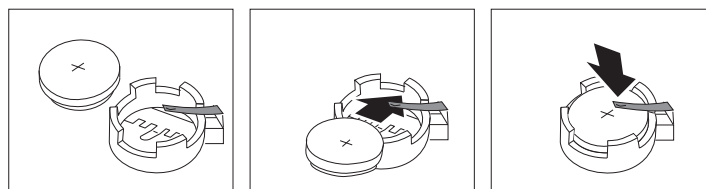
Refer to “Safety notices (multi-lingual translations)” on page 7 for information about replacing and disposing of the battery.

To change the battery:

1. Turn off the computer and disconnect the power cord from the electrical outlet and from the computer.
2. Open the computer cover. See “Opening the cover” on page 94.
3. Access the system board. See “Accessing system board components and drives” on page 96.
4. Locate the battery. See “System board connectors and components” on page 93.
5. Remove the old battery.



6. Install the new battery.



**Note:** When the computer is turned on for the first time after battery replacement, an error message might be displayed. This is normal after replacing the battery.

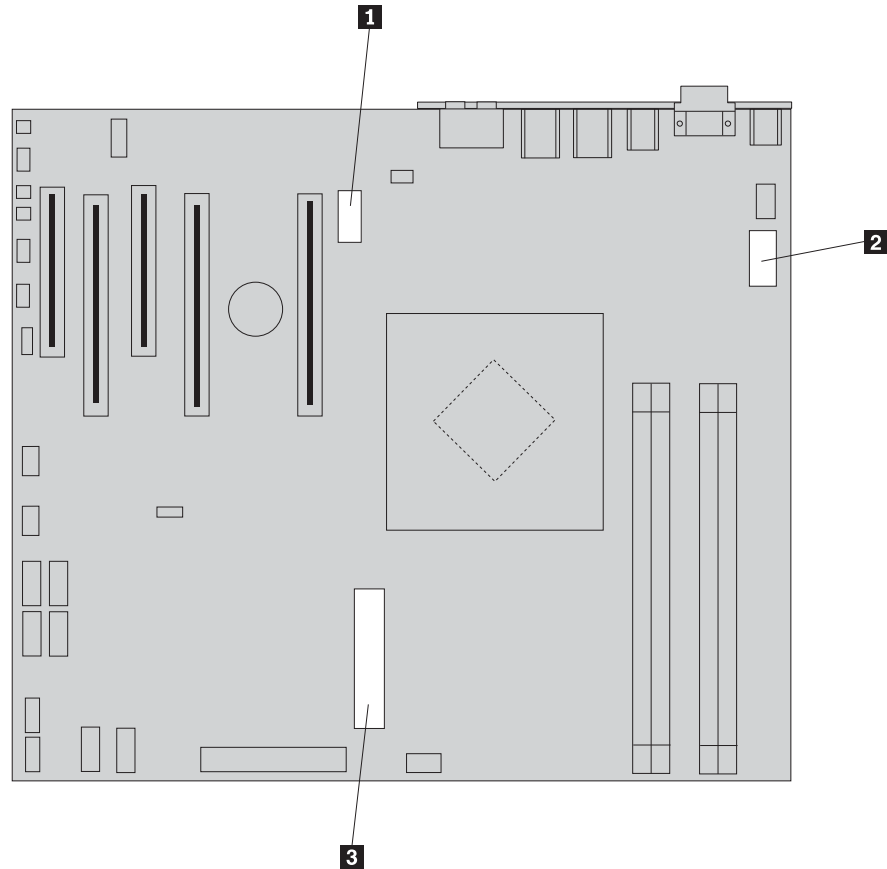
7. Go to “Completing the FRU replacement” on page 121.



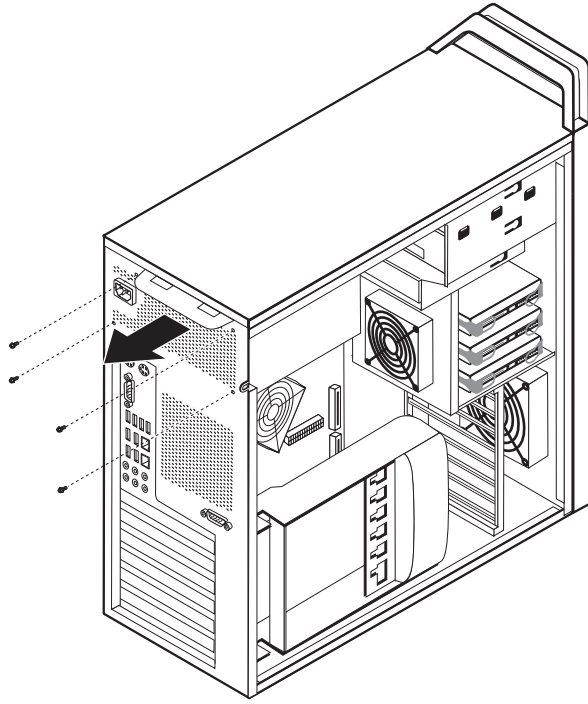
## Replacing the power supply assembly

To replace the power-supply assembly:

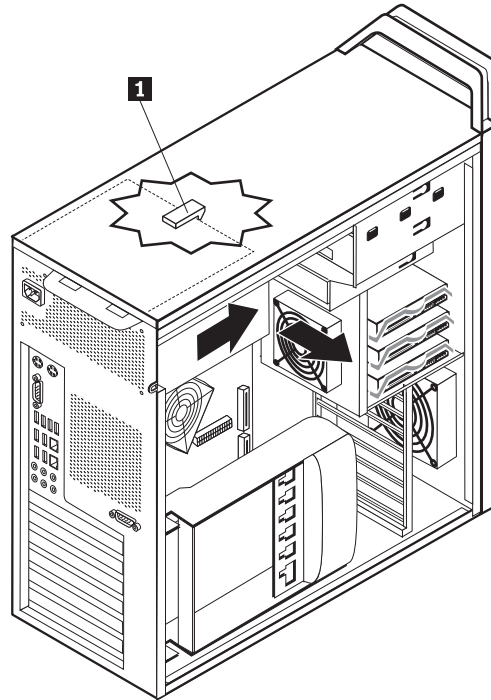
1. Open the computer cover. See “Opening the cover” on page 94.
2. Locate the power-supply assembly. See “Internal components” on page 92.
3. Disconnect the power-supply cables **1**, **2**, and **3** from the system-board connectors, all adapter cards (some models) and from all drives.



4. Remove the power-supply cables from the cable clips and ties.
5. Remove the four screws at the rear of the chassis that secure the power supply.



6. Depress the power supply latch **1**. Slide the power-supply assembly toward the front of the computer, remove it from the chassis.



7. Install the new power-supply assembly into the chassis so that the screw holes in the power-supply assembly align with those in the chassis.

**Note:** Use only the screws provided by Lenovo.

8. Install and tighten the four screws at the rear of the chassis to secure the power-supply assembly.

9. Ensure that the power supply is the correct replacement. Some power supplies auto sense the voltage, some power supplies are voltage specific, and some power supplies have a voltage selection switch. If there is a selection switch use a ballpoint pen to slide the switch, if necessary.

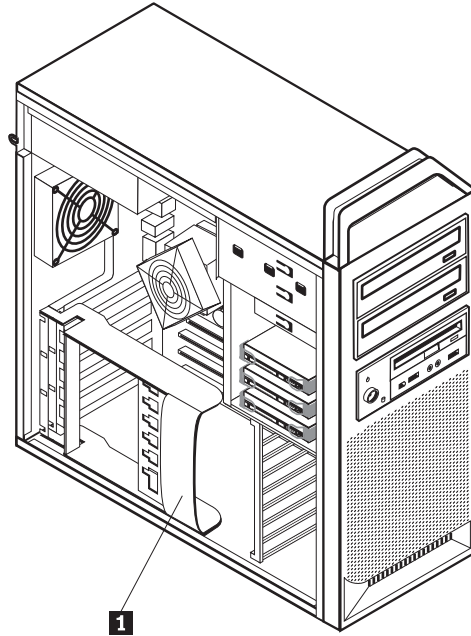
**Note:** For models that have a switch:

- If the voltage supply range is 100–127 V ac, set the switch to 115 V.
  - If the voltage supply range is 200–240 V ac, set the switch to 230 V.
10. Reconnect all the power supply cables to the drives, adapters, and the system board. Make sure to reconnect power to the graphics cards that require an additional cable.
  11. Go to “Completing the FRU replacement” on page 121.

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## Replacing an adapter card

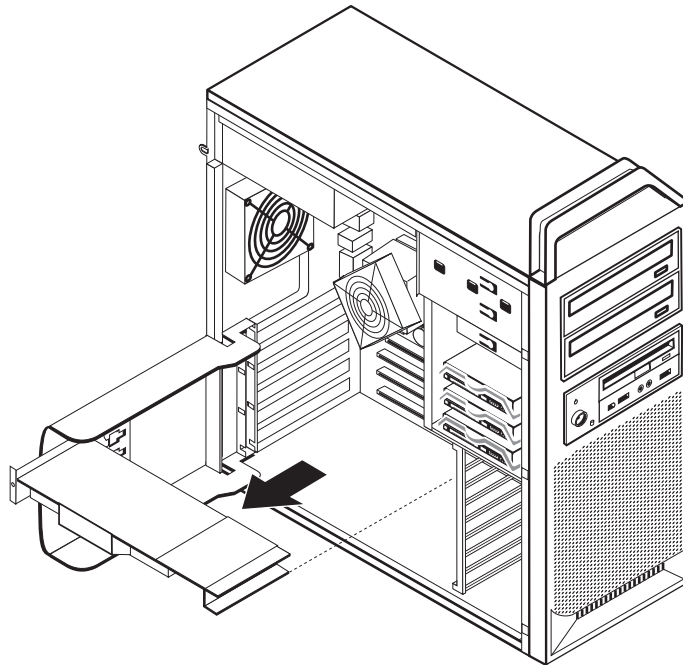
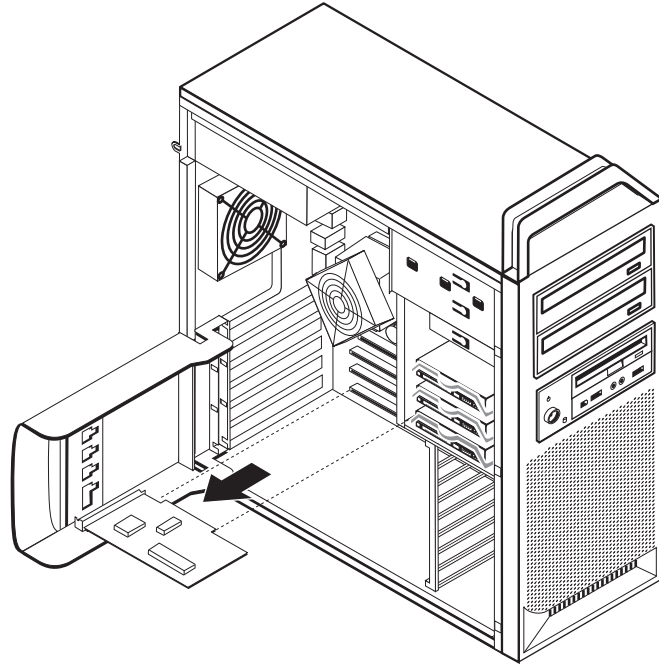
1. Turn off the computer and allow the computer to cool for 3-5 minutes.
2. Open the computer cover. See “Opening the cover” on page 94.
3. Unlatch and open the card retainer **1**.



4. Take note of the location of all cable connections on the adapter card. It will be necessary to reconnect them properly when installing a new card.
5. Disconnect all cables connected to the adapter card. See “System board connectors and components” on page 93.
6. Some models have:
  - A screw installed in the adapter bracket, remove this screw.
  - An additional retention feature located on the card guide end. Push the retention feature toward the front of the chassis before removing the adapter card.

7. Release the card support retaining latches. Grasp the adapter card and pull the card out of the slot.

**Note:** The card is a tight fit, so it might be necessary to remove each side a little at a time until the card is removed from the card slot.



8. Reverse this procedure to install the card, and then proceed to step 9.
9. Go to “Completing the FRU replacement” on page 121.

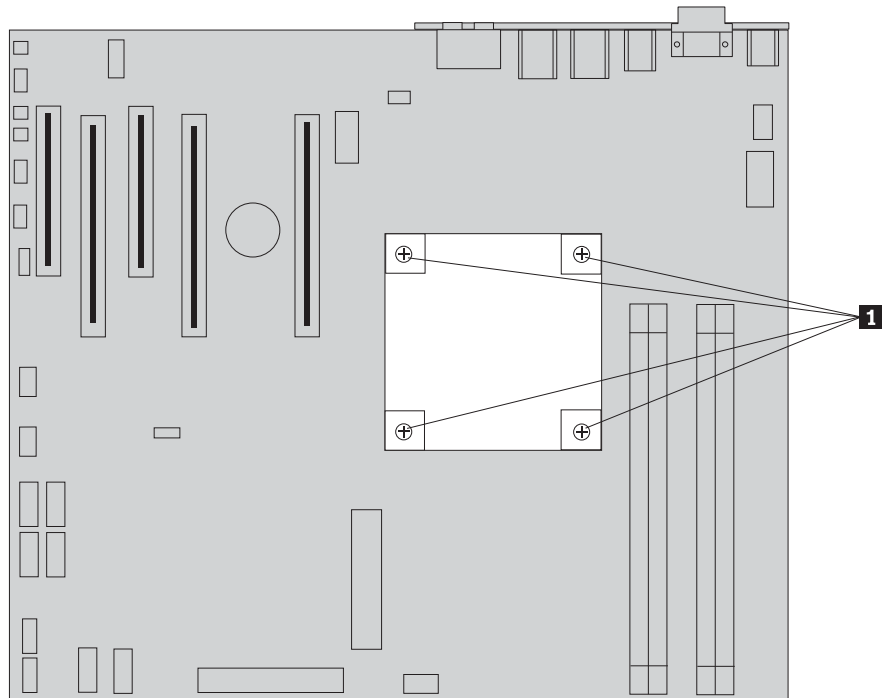
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## Replacing the heat sink

This section provides instructions on how to replace the heat sink.

To replace the heat sink:

1. Open the computer cover. See “Opening the cover” on page 94.
2. To make it easier to access the heat sink, lay the computer on its side.
3. Remove the heat sink fan cable from the system board. Note the cable location. See “System board connectors and components” on page 93.
4. Remove the heat sink from the system board by removing the 4 screws holding the heat sink to the system board **1**. Carefully lift the heat sink off of the system board.



5. Remove the plastic covering from the bottom of the new heat sink to expose the heat sink grease (this cover protects the heat sink grease from contamination).

**Note:** Do not remove the plastic covering the grease until you are ready to install the heat sink on the microprocessor. Do not touch the grease the heat sink. Do not put the heat sink anywhere except on the microprocessor after the plastic covering has been removed and the grease exposed.

6. Place the new heat sink into position and replace the 4 screws to secure the heat sink.
7. Reconnect the heat sink fan cable. See “System board connectors and components” on page 93.
8. Go to “Completing the FRU replacement” on page 121.

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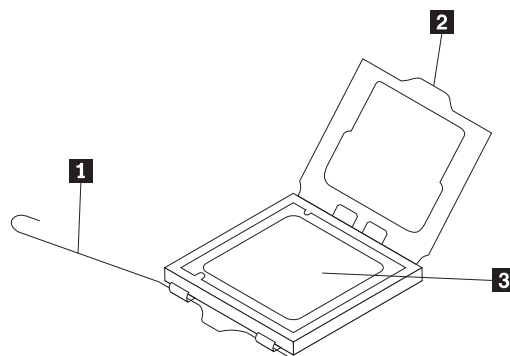
## Replacing the microprocessor

This section provides instructions on how to replace the microprocessor.

To replace the microprocessor:

1. Open the computer cover. See “Opening the cover” on page 94.
2. Place the computer on its side to help make the system board more accessible.
3. Remove the heat sink from the system board. See “Replacing the heat sink” on page 105.
4. To remove the microprocessor **3** from the system board, lift the small handle **1** and open the retainer **2**.

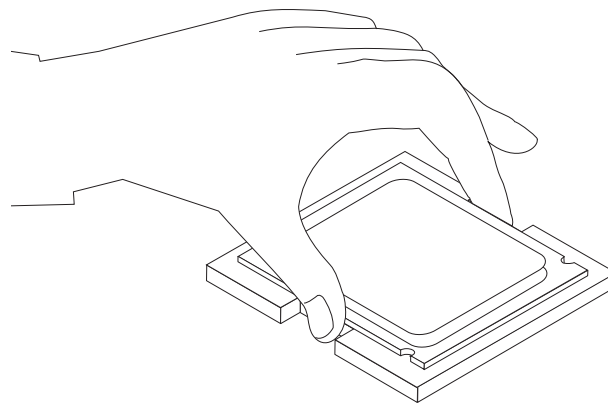
**Note:** The system board in your computer looks different than the one illustrated.



### Important

Touch only the sides of the microprocessor. Do not touch the gold contacts on the bottom.

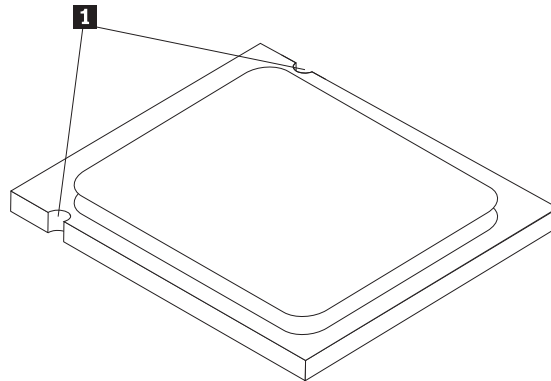
5. Lift the microprocessor straight up and out of the socket.





**Notes:**

- a. Note the orientation of the notches **1** on the microprocessor. This is important when reinstalling the microprocessor on the new system board.

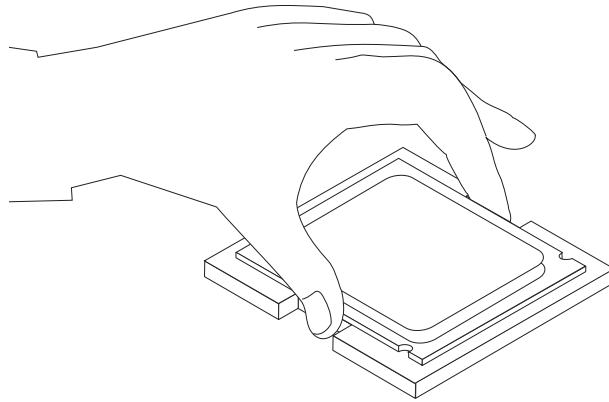


- b. Do not drop anything onto the microprocessor socket while it is exposed. The socket pins must be kept as clean as possible.
6. Holding the microprocessor with your fingers, position the microprocessor so that the notches on the microprocessor are aligned with the tabs in the microprocessor socket.

**Important**

To avoid damaging the microprocessor contacts, do not tilt the microprocessor when installing it into the socket.

7. Lower the microprocessor straight down into the system board socket of the new system board.



8. Close the microprocessor retainer and clamp it with the small handle.
9. Place the heat sink into position and replace the 4 screws to secure the heat sink to the system board.
10. Reconnect the heat sink fan cable.
11. Go to "Completing the FRU replacement" on page 121.

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## Replacing the system board

This procedure describes how to remove and replace the system board.

### **Important**

The heat sink and microprocessor might be very hot. Make sure these components are cool enough to safely handle before continuing this procedure.

1. Open the cover. See “Opening the cover” on page 94.
2. Place the computer on its side to help make the system board more accessible.
3. Remove any adapter cards installed in the PCI connectors. See “Replacing an adapter card” on page 103.
4. Remove the hard disk drive fan. See “Replacing a fan assembly” on page 117.
5. Carefully take note of the location of all cable connections on the system board and disconnect all cables. See “System board connectors and components” on page 93.
6. Remove the screws (9) that secure the system board to the chassis.
7. Lift the system board out of the chassis.
8. Remove the memory modules from the failing system board and install them in the same location on the new system board.
9. Remove the heat sink from the failing system board. See “Replacing the heat sink” on page 105.
10. Remove the microprocessor from the failing system board and install it on the new system board. See “Replacing the microprocessor” on page 106.
11. Install the heat sink on the new system board. See “Replacing the heat sink” on page 105.
12. Connect the heat sink and fan assembly cable to the new system board. See “System board connectors and components” on page 93.
13. Install the new system board into the chassis and align the screw holes with those in the chassis. Insert and tighten the screws that secure the system board.
14. Install the hard disk drive fan. See “Replacing a fan assembly” on page 117.
15. Connect all cables to the system board. See the system board illustration for your machine type at “System board connectors and components” on page 93.
16. Go to “Completing the FRU replacement” on page 121.

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## Replacing a hard disk drive

This section provides instructions on how to replace a hard disk drive.

### Important

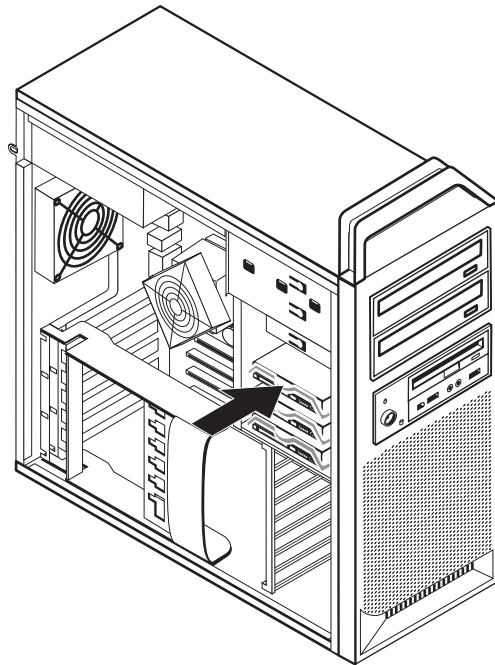
When you receive a new hard disk drive, you also receive a set of *Product Recovery CDs*. The set of *Product Recovery CDs* will enable you to restore the contents of the hard disk to the same state as when your computer was originally shipped from the factory. For more information on recovering factory-installed software, refer to “Recovering software” in the *User Guide*.

### Attention

When replacing a hard disk drive in a RAID configured array, depending on which type of array is used, rebuilding the RAID array might be required. If the array is redundant, make sure to connect the new drive to the same port from which the replaced drive was removed.

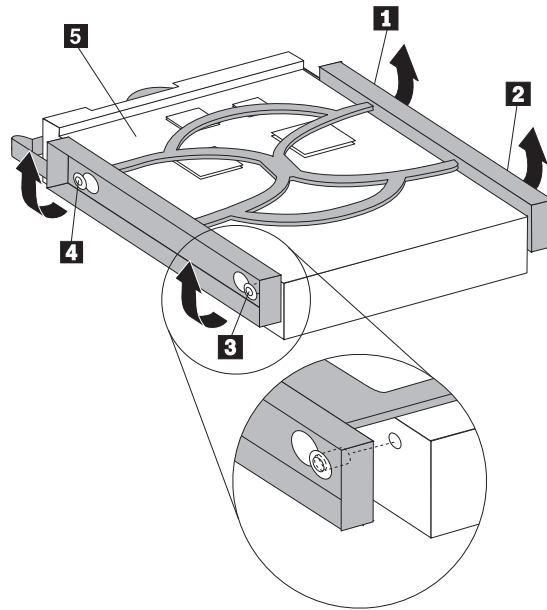
To replace the hard disk drive:

1. Open the computer cover. See “Opening the cover” on page 94.
2. Disconnect the signal and power cables from the hard disk drive.
3. Pull the handle to remove the hard disk drive.



4. Remove the failing hard disk drive from the bracket by flexing the bracket.

5. Install the new drive into the bracket, flex the bracket, and align the pins **1** through **4** on the bracket with the holes in the hard disk drive. Do not touch the circuit board **5** on the bottom of the hard disk drive.



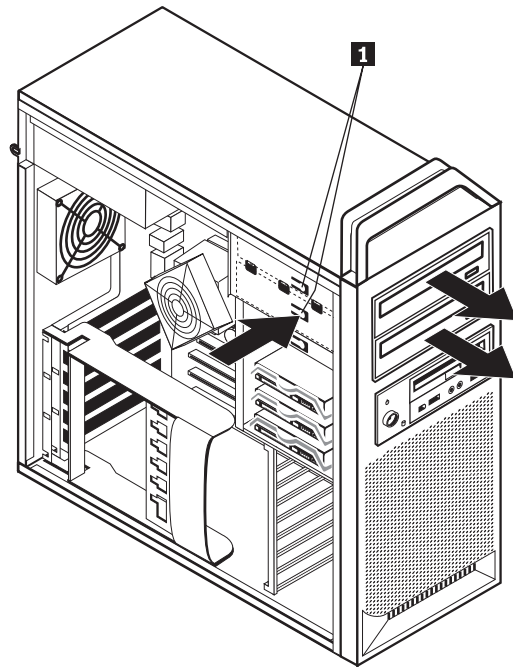
6. Install the hard disk drive and bracket into the drive bay.
7. Connect the signal and power cables to the rear of the new hard disk drive.
8. Go to “Completing the FRU replacement” on page 121.

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## Replacing an optical drive

This section provides instructions on how to replace the optical drive.

1. Open the computer cover. See “Opening the cover” on page 94.
2. Remove the front bezel. See “Removing the front bezel” on page 95.
3. Locate the optical-drive connectors. See “System board connectors and components” on page 93.
4. Note the location of the optical-drive cables. Disconnect the signal and power cables from the rear of the optical drive.
5. Press the drive latch **1** (for the drive you want to remove) and slide the optical-drive from the chassis.



6. Install the new optical-drive from the front of the drive-bay assembly. Slide the optical-drive toward the rear of the chassis to lock the drive into position.
7. Connect the flat cable to the new optical-drive.
8. Go to “Completing the FRU replacement” on page 121.

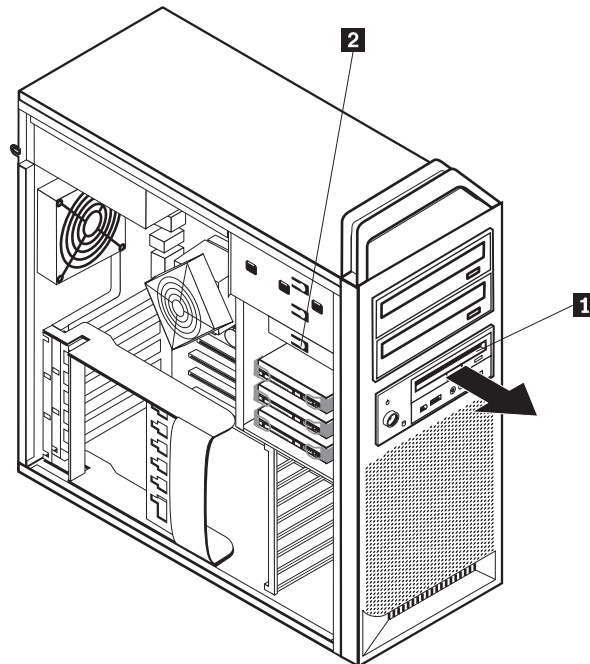
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## Replacing the diskette drive or optional card reader

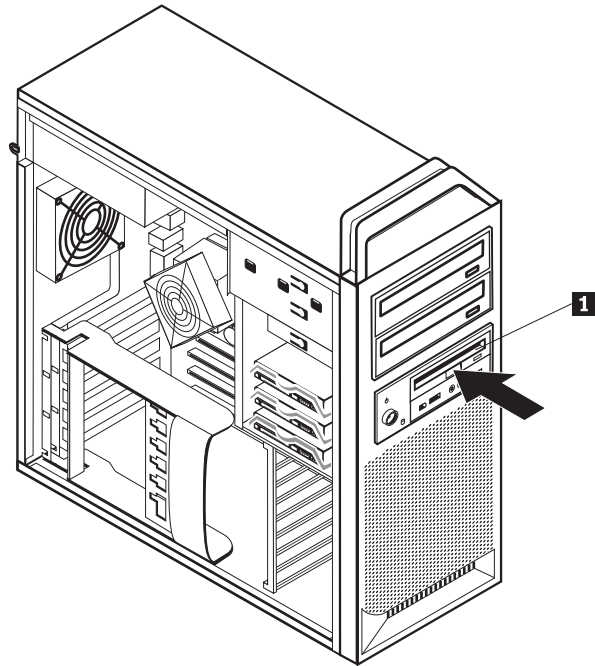
This section provides instructions on how to replace the diskette drive or card reader.

1. Open the computer cover. See “Opening the cover” on page 94.
2. Locate the drive cable connectors. See “System board connectors and components” on page 93.
3. Note the location of the drive cables. Disconnect the drive cables from the system board.
4. Press the drive latch **2** and slide the drive from the chassis.

**Note:** If necessary, remove the front bezel. See “Removing the front bezel” on page 95.



5. Disconnect the flat cable from the rear of the failing diskette drive.
6. Install the new drive into the drive-bay assembly and lock the drive into position.



7. Connect the flat cable to the new diskette drive.
8. If the front bezel was removed, install the bezel.
9. Go to “Completing the FRU replacement” on page 121.

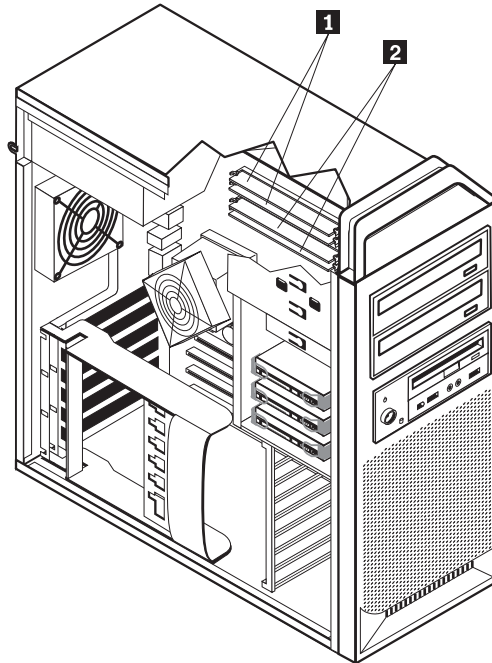


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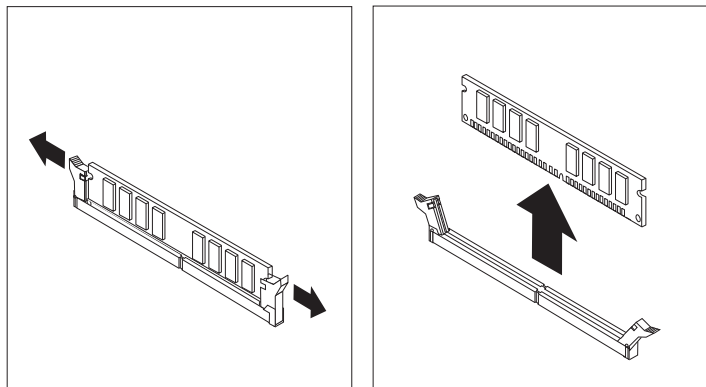
## Replacing a memory module

This section provides instructions on how to replace a memory module.

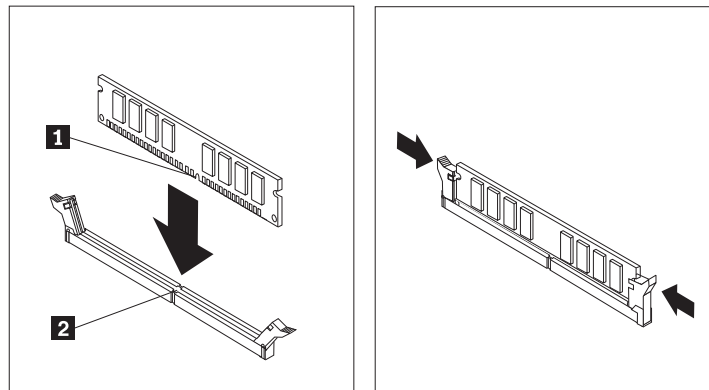
1. Open the computer cover. See “Opening the cover” on page 94.
2. Locate the memory-module connectors **1** and **2** . .



3. Remove the memory module being replaced by opening the retaining clips.



4. Position the replacement memory module over the memory connector. Make sure the notch **1** on the memory module aligns correctly with the connector key **2** on the system board. Push the memory module straight down into the connector until the retaining clips close.

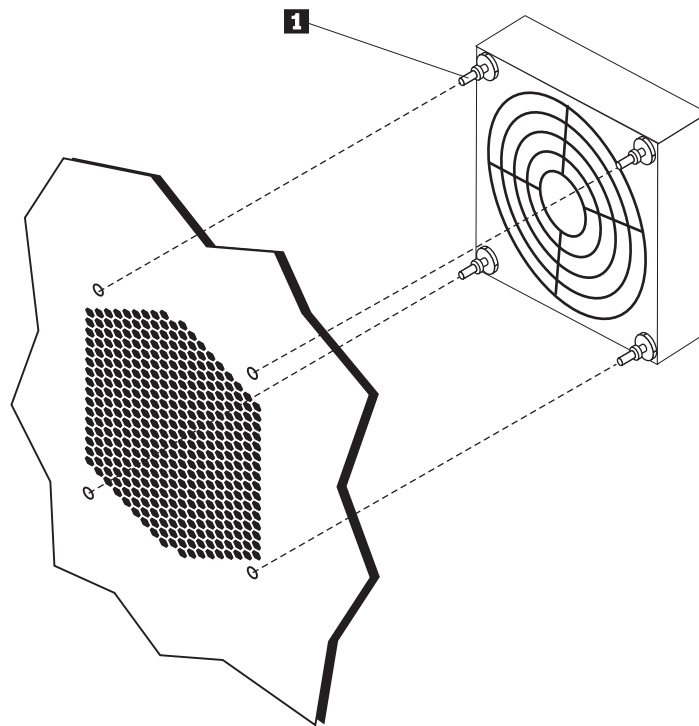


5. Go to “Completing the FRU replacement” on page 121.

## Replacing a fan assembly

This section provides instructions on how to replace a fan assembly. Some models will have three fans. See “Internal components” on page 92.

1. Open the computer cover. See “Opening the cover” on page 94.
2. If necessary, remove the adapter cards to access the failing fan. See “Accessing system board components and drives” on page 96.
3. Note the routing of the fan-assembly wiring. See “System board connectors and components” on page 93. Disconnect the fan-assembly-wiring connector from the system board.
4. If you are replacing the front fan, remove the front bezel. See “Removing the front bezel” on page 95.
5. If you are replacing the hard disk drive fan, remove the fan bracket that holds the fan by using your fingers to release the fan bracket and then slide it outward.
6. For all fans, remove the fan assembly by pulling the fan grommets **1** free of the bracket as shown.



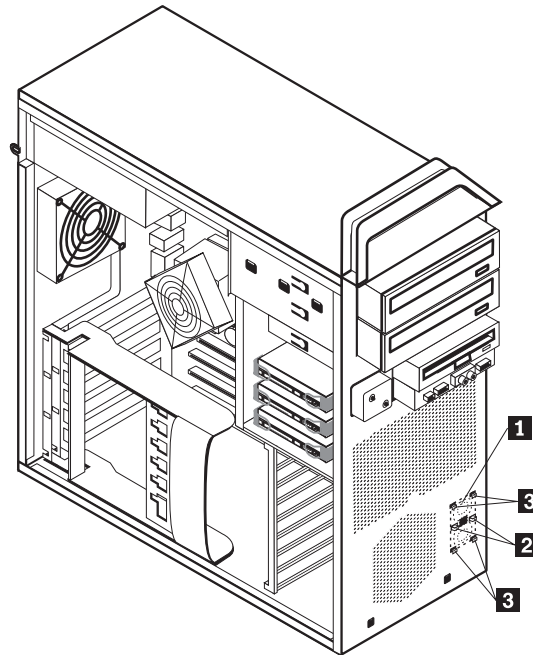
7. Install the new fan assembly, route the wiring, and then connect the fan-wiring connector to the system board. See “System board connectors and components” on page 93.
8. Reinstall any adapters that were removed. See “Replacing an adapter card” on page 103.
9. Reinstall the front bezel if it was removed. See “Removing the front bezel” on page 95.
10. Go to “Completing the FRU replacement” on page 121.

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## Replacing the internal speaker

This section provides instructions on how to replace the internal speaker.

1. Open the computer cover. See “Opening the cover” on page 94.
2. Remove the front bezel. See “Removing the front bezel” on page 95.
3. Locate the internal-speaker connector on the system board. See “Internal components” on page 92.
4. Note the location of the internal-speaker cable connection. Note the routing of the internal-speaker cable. Disconnect the internal-speaker cable from the system board. See “System board connectors and components” on page 93.
5. Use a blunt instrument (such as, the top of a ball point pen) to disengage one of the internal-speaker-locking tabs **2** and slide that side of the speaker **1** upward enough to keep the locking tab disengaged. Then disengage the other internal-speaker-locking tab and slide the internal speaker upward until the speaker is released.



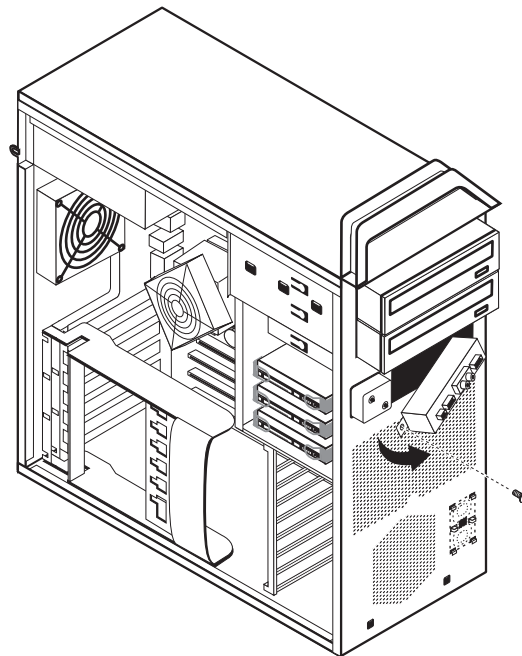
6. Remove the speaker and speaker cable from the computer.
7. Route the speaker cable and then position the new internal-speaker tabs **3** into the metal speaker slots and then push the internal speaker downward until the speaker-locking tabs snap into position.
8. Connect the speaker cable to the system board. See “System board connectors and components” on page 93.
9. Go to “Completing the FRU replacement” on page 121.

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## Replacing the front panel connector assembly

This section provides instructions on how to replace the front panel connector assembly.

1. Open the computer cover. See “Opening the cover” on page 94.
2. Remove the front bezel. See “Removing the front bezel” on page 95.
3. Remove any installed adapters. See “Replacing an adapter card” on page 103.
4. To have easier access to the computer, lay it down on its side.
5. Remove the plastic adapter retainer in the front of the computer.
6. Remove the diskette drive or card reader if installed in this computer. See “Replacing the diskette drive or optional card reader” on page 113
7. To have easier access to the front panel connector cables, remove the hard disk drives. See “Replacing a hard disk drive” on page 110.
8. Remove the screw holding the front panel connector assembly.
9. Note the routing of the front panel connector assembly cables. They are routed between the front frame and the hard disk drive bay.
10. Disconnect the front panel connector assembly cables from the system board. See “System board connectors and components” on page 93.
11. Rotate the front panel connector assembly outward as shown and remove from the computer. Be careful to not damage the cable connectors when pulling the cables out between the front frame and the hard disk drive bay.



12. Slide the front panel connector assembly cables out the opening in the front of the computer.
13. Route the front panel connector assembly cables and then position the new front panel connector assembly
14. Install the screw holding the front panel connector assembly.
15. Replace the hard disk drives. See “Replacing a hard disk drive” on page 110.
16. Replace the diskette drive or card reader if it was removed. See “Replacing the diskette drive or optional card reader” on page 113

17. Connect the front panel connector assembly cables to the system board. See “System board connectors and components” on page 93.
18. Replace the plastic adapter retainer in the front of the computer.
19. Replace any adapters that were removed. See “Replacing an adapter card” on page 103.
20. Replace the front bezel. See “Removing the front bezel” on page 95.
21. Go to “Completing the FRU replacement” on page 121.

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## Completing the FRU replacement

After replacing FRUs, you need to install any removed parts, replace the cover, and reconnect any cables, including telephone lines and power cords. Also, depending on the FRU that is replaced, you might need to confirm the updated information in the Setup Utility program.

**Note:** When the power cord is first plugged in, the computer might appear to turn on for a few seconds and then turn off. This is a normal sequence to enable the computer to initialize.





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## Chapter 10. Replacing FRUs (types 6427 and 6493)

**Important**

Before you replace any FRU, read Chapter 2, "Safety information," on page 3. These precautions and guidelines will help you work safely.

FRU replacements are to be done by trained service technicians only.

This chapter does not contain a remove and replace procedure for all FRUs. Only the major FRUs are documented.

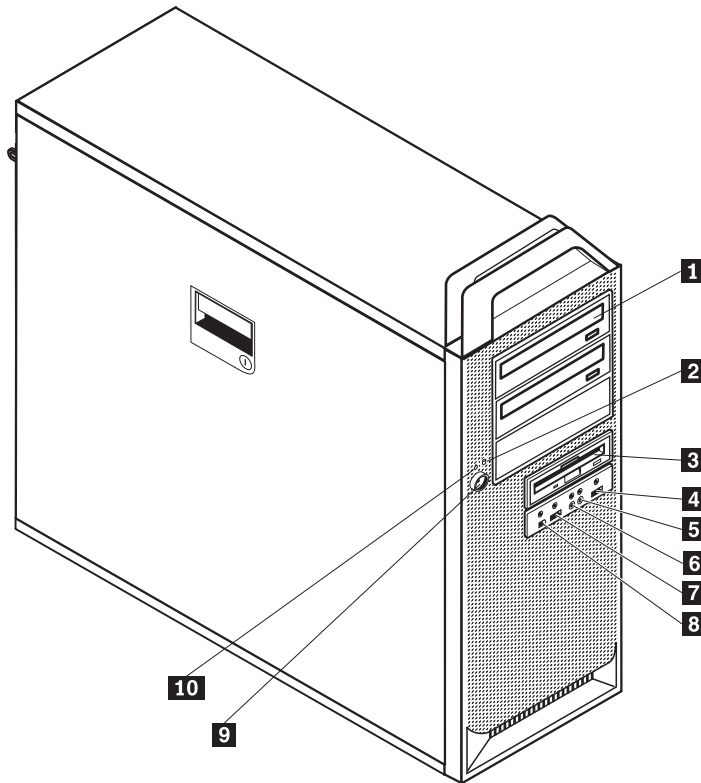
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## Locations

This section contains illustrations to help locate the various connectors, controls, and components of the computer.

### Controls and connectors on the front of the computer

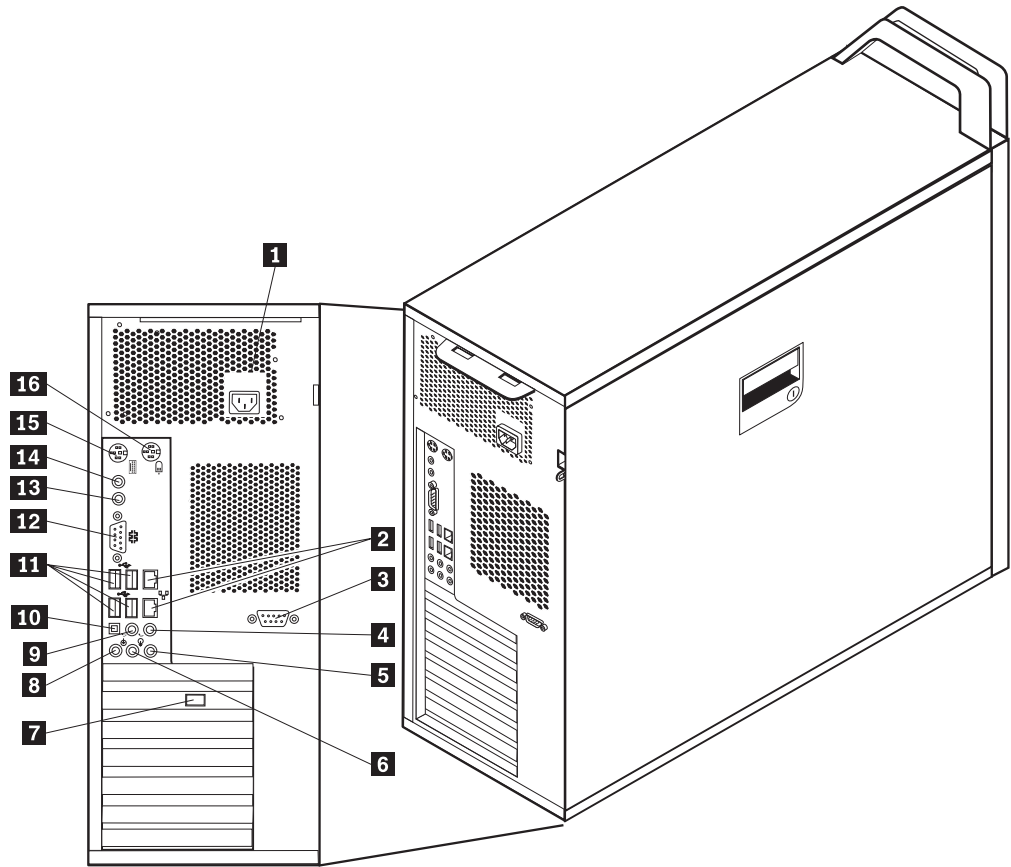
**Note:** Not all computer models will have the following controls and connections.



- |          |   |           |                     |
|----------|---|-----------|---------------------|
| <b>1</b> | Optical drive (some models)                     | <b>6</b>  | Headphone connector |
| <b>2</b> | Hard drive activity light                       | <b>7</b>  | USB connector       |
| <b>3</b> | 3.5 Diskette drive or card reader (some models) | <b>8</b>  | IEEE 1394 connector |
| <b>4</b> | USB connector                                   | <b>9</b>  | Power button        |
| <b>5</b> | Microphone connector                            | <b>10</b> | Power-on indicator  |

## Connectors on the rear of the computer

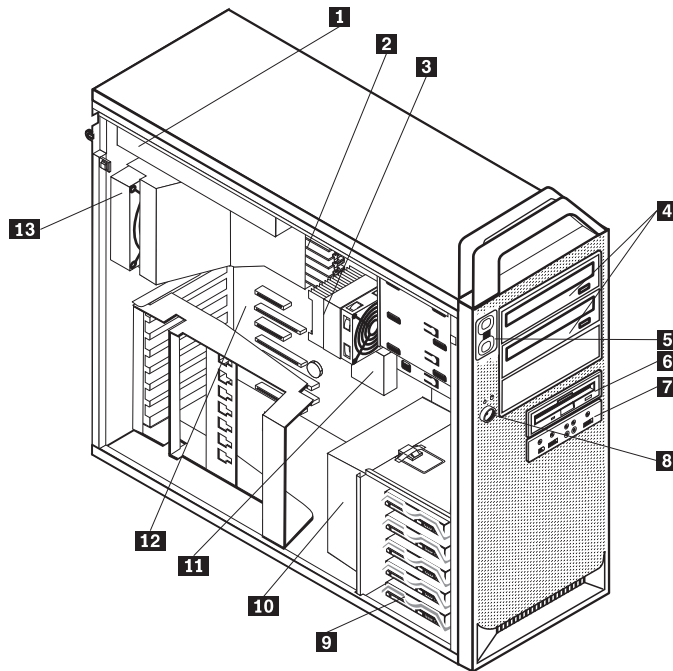
Some connectors on the rear of your computer are color-coded to help you determine where to connect the cables on your computer.



- |          |   |           |   |
|----------|---|-----------|---|
| <b>1</b> | Power cord connector                    | <b>9</b>  | Audio-line-out surround sound connector, rear                 |
| <b>2</b> | Ethernet connector                      | <b>10</b> | Audio-line-out surround sound connector, side, left and right |
| <b>3</b> | Serial connector (some models)          | <b>11</b> | USB connectors (4)  |
| <b>4</b> | Audio-line-out sub/center connector     | <b>12</b> | Serial connector  |
| <b>5</b> | Audio-line-in connector                 | <b>13</b> | SPDIF in  |
| <b>6</b> | Audio-line-out front speakers connector | <b>14</b> | SPDIF out   |
| <b>7</b> | Video connector (some models)           | <b>15</b> | Keyboard connector  |
| <b>8</b> | Microphone connector                    | <b>16</b> | Mouse connector   |

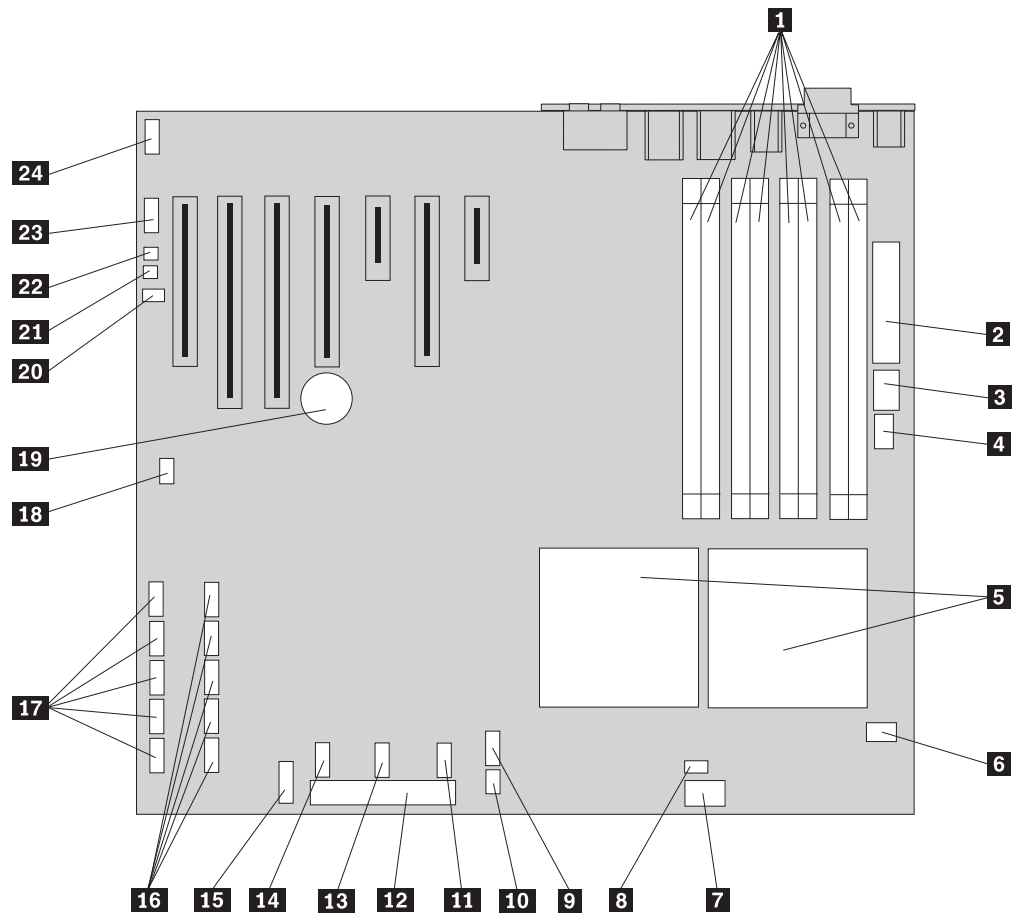
## Internal components

To open the computer cover, see "Opening the cover" on page 94.



- |          |   |           |                               |
|----------|---|-----------|-------------------------------|
| <b>1</b> | Power-supply assembly                             | <b>8</b>  | Power switch and LED assembly |
| <b>2</b> | Memory modules                                    | <b>9</b>  | Hard disk drive               |
| <b>3</b> | Microprocessor heat sinks (2)                     | <b>10</b> | Hard disk drive fan assembly  |
| <b>4</b> | Optical drives (such as a CD or DVD drive) 3 bays | <b>11</b> | Microprocessors (2)           |
| <b>5</b> | Internal speaker                                  | <b>12</b> | System board                  |
| <b>6</b> | 3.5 inch diskette drive or card reader            | <b>13</b> | Rear system fan               |
| <b>7</b> | Front USB and audio connectors                    |           |                               |

## System board connectors and components



- |           |                                |           |   |
|-----------|--------------------------------|-----------|---|
| <b>1</b>  | Memory connectors (8)          | <b>13</b> | Auxiliary USB connector 2                   |
| <b>2</b>  | 24 Pin power connector         | <b>14</b> | IEEE 1394 Connector                         |
| <b>3</b>  | 10 Pin power connector         | <b>15</b> | Front-panel connector                       |
| <b>4</b>  | Rear exhaust fan connector     | <b>16</b> | SATA connectors (5)                         |
| <b>5</b>  | Microprocessor and heat sink   | <b>17</b> | SAS connectors (5)                          |
| <b>6</b>  | Microprocessor fan 1 connector | <b>18</b> | Clear CMOS/Recovery jumper                  |
| <b>7</b>  | 8 Pin power connector          | <b>19</b> | Battery                                     |
| <b>8</b>  | Microprocessor fan 2 connector | <b>20</b> | Cover-presence-switch (Tamper SW) connector |
| <b>9</b>  | Front USB connector            | <b>21</b> | Internal speaker connector                  |
| <b>10</b> | HDD fan connector              | <b>22</b> | Ambient temperature sensor connector        |
| <b>11</b> | Auxiliary LED connectors       | <b>23</b> | COM2  |
| <b>12</b> | Diskette drive connector       | <b>24</b> | Front audio connector                       |

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## Opening the cover

To open the computer cover:

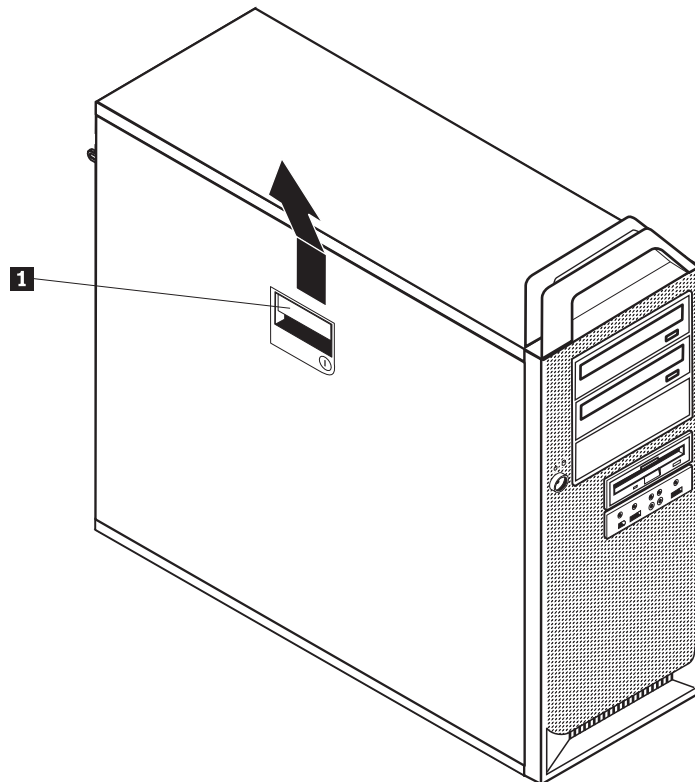
1. Remove any media (diskettes, CDs, or tapes) from the drives, shut down your operating system. Turn off all attached devices. Turn off the computer.

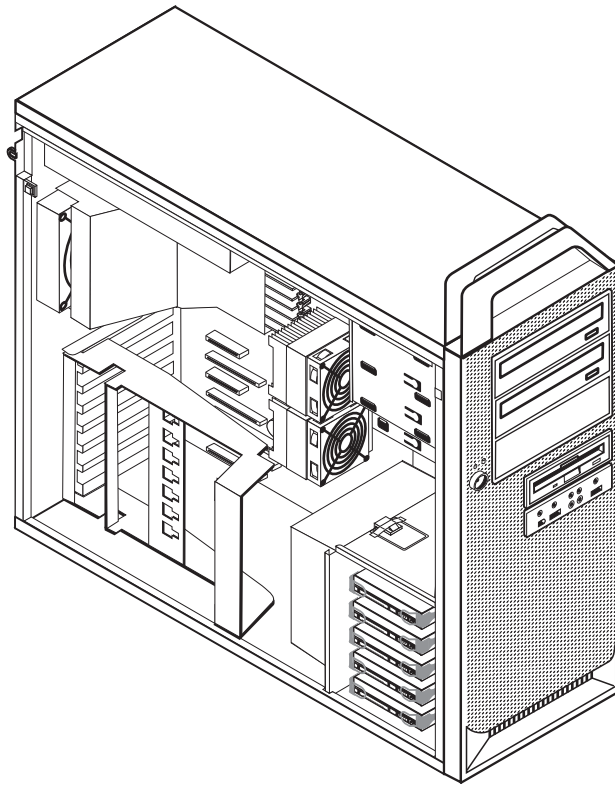
### Important



**Turn off the computer and wait 3 to 5 minutes to let the computer cool before opening the computer cover.**

2. Unplug all power cords from electrical outlets.
3. Disconnect the cables attached to the computer. This includes power cords, input/output (I/O) cables, and any other cables that are connected to the computer.
4. Remove any locking devices, such as a cable lock or padlock that secures the computer cover.
5. Disengage the cover latch **1**, and open the cover. Remove the cover and place it on a flat surface.





To replace the cover:

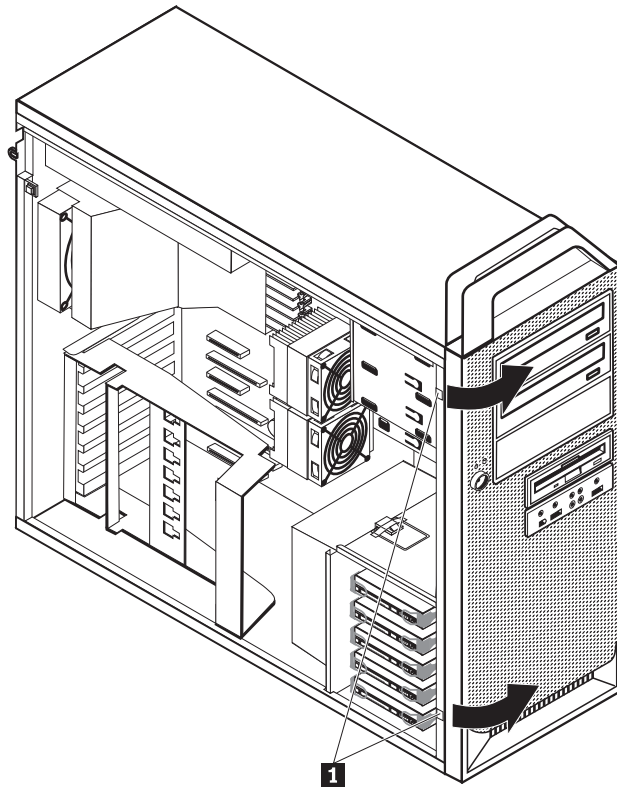
1. Align the cover with the chassis.
2. Close the cover.
3. Engage the cover latch.
4. Check to be sure the cover is latched.
5. Secure the cover using your locking device.

---

## Removing the front bezel

To remove the front bezel:

1. Open the cover. See “Opening the cover” on page 128.
2. Disengage the bezel latches **1**, one at a time while rotating the bezel away from the computer just enough to keep the latches disengaged.
3. Lay the front bezel on a flat surface.
4. Reverse these steps to replace the front bezel.





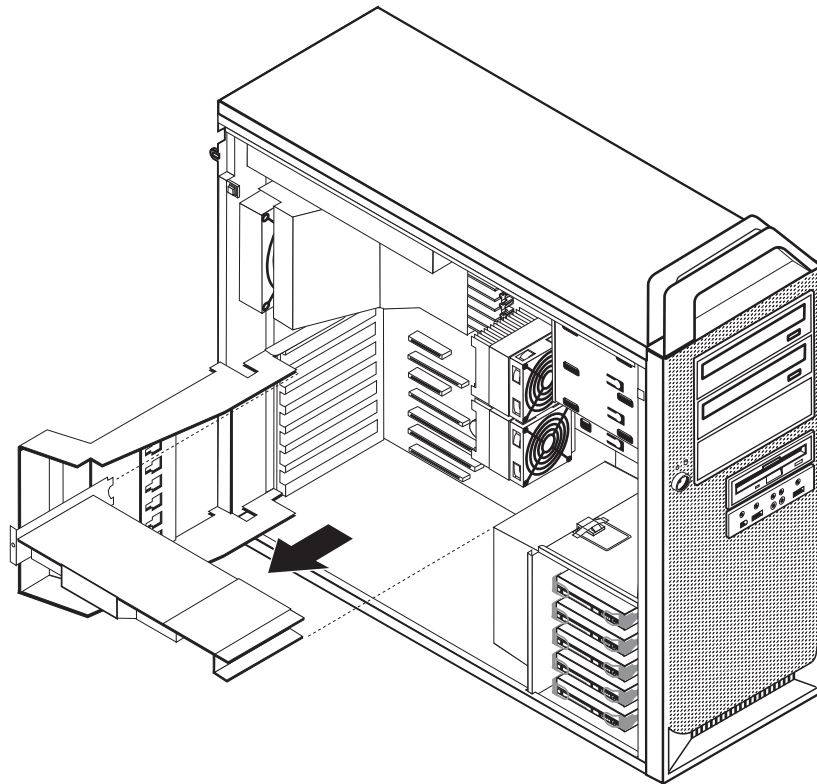
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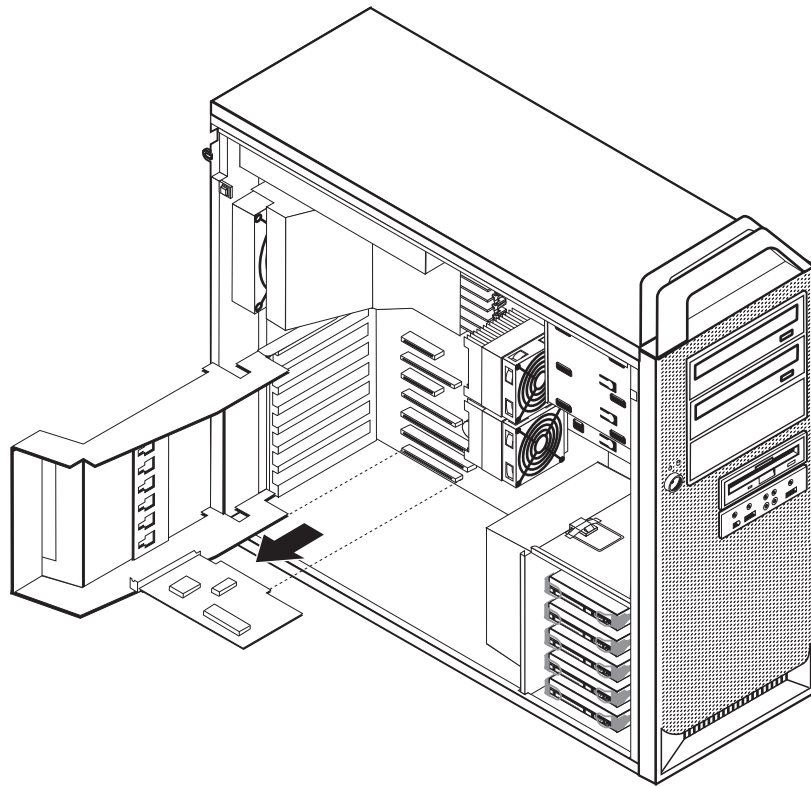
## Accessing system board components and drives

To access system board components:

1. Open the computer cover. See “Opening the cover” on page 128.
2. Unlatch and open the adapter card retainer.
3. Take note of the location of all cable connections on the adapter cards. It will be necessary to reconnect them properly when replacing the cards.
4. Disconnect all cables connected to the adapter cards. See “System board connectors and components” on page 127.
5. Remove the card retaining screw, if one is used.
6. Release the card support retaining latches. Grasp the adapter card and pull the card out of the slot. See “Replacing an adapter card” on page 137 for more information.

**Note:** The card is a tight fit, so it might be necessary to remove each side a little at a time until the card is removed from the card slot.





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## Replacing the battery

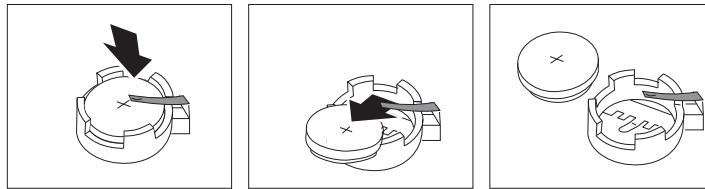
Your computer has a special type of memory that maintains the date, time, and settings for built-in features, such as serial-port assignments (configuration). A battery keeps this information active when you turn off the computer.

The battery normally requires no charging or maintenance throughout its life; however, no battery lasts forever. If the battery fails, the date, time, and configuration information (including passwords) are lost. An error message is displayed when you turn on the computer.

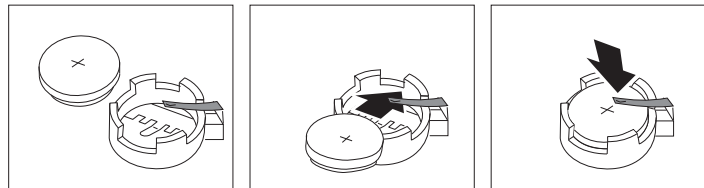
Refer to “Safety notices (multi-lingual translations)” on page 7 for information about replacing and disposing of the battery.

To change the battery:

1. Turn off the computer and disconnect the power cord from the electrical outlet and from the computer.
2. Open the computer cover. See “Opening the cover” on page 128.
3. Access the system board. See “Accessing system board components and drives” on page 131.
4. Locate the battery. See “System board connectors and components” on page 127.
5. Remove the old battery.



6. Install the new battery.



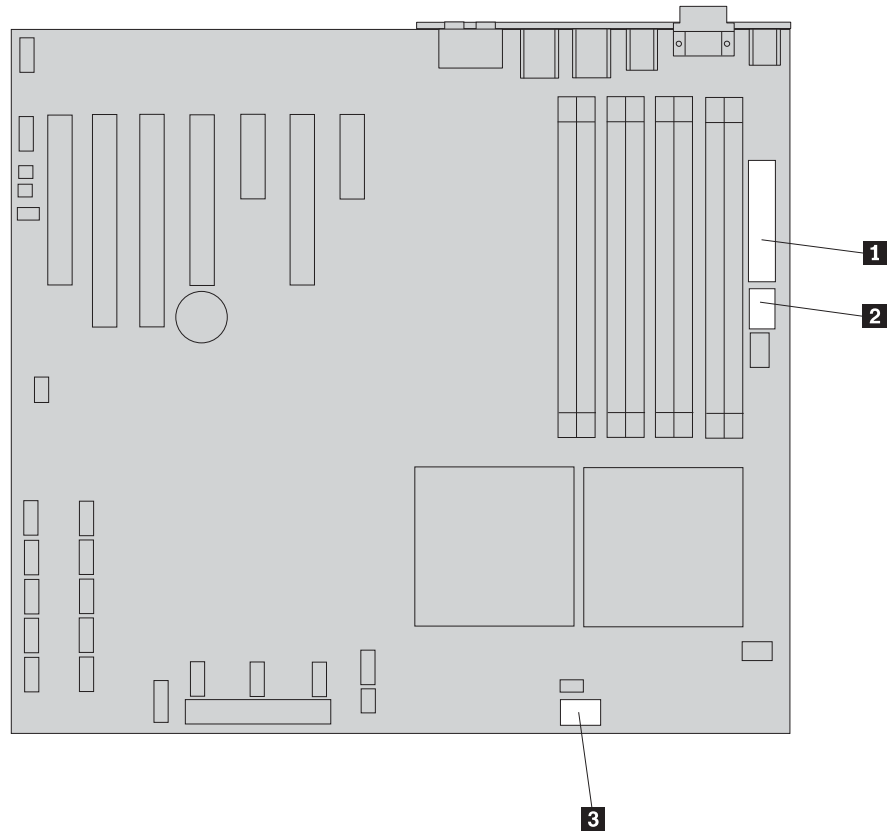
**Note:** When the computer is turned on for the first time after battery replacement, an error message might be displayed. This is normal after replacing the battery.

7. Go to “Completing the FRU replacement” on page 153.

## Replacing the power supply assembly

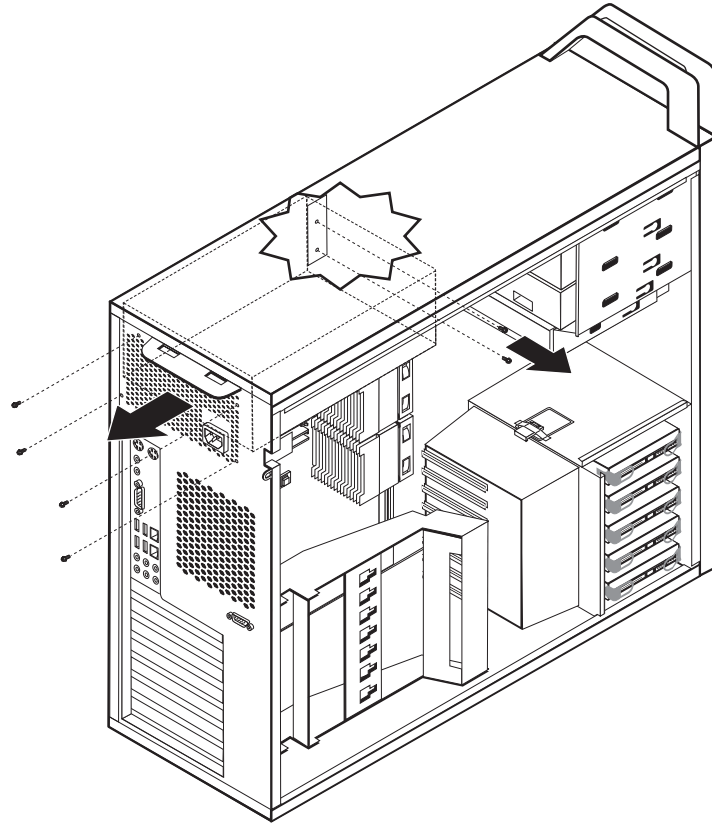
To replace the power-supply assembly:

1. Open the computer cover. See “Opening the cover” on page 128.
2. Locate the power-supply assembly. See “Internal components” on page 126.
3. Disconnect the power-supply cables **1**, **2**, and **3** from the system-board connectors, all adapter cards (some models) and from all drives.

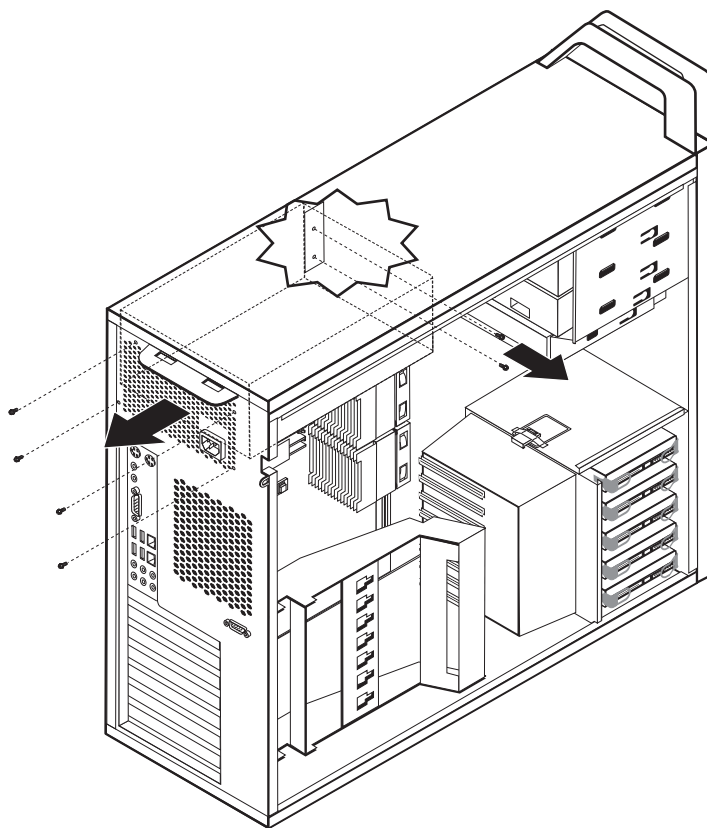


**Note:** The latches for the power connectors are difficult to reach using your fingers. Use a tool such as a screwdriver or pliers to unlatch the connectors.

4. Remove the power-supply cables from the cable clips and ties.
5. Remove the microprocessor heat sink (see “Replacing the heat sink” on page 139) nearest the power supply before removing the power supply from the chassis.
6. Remove the four screws at the rear of the chassis that secure the power supply.



7. Remove the power supply retaining screws located inside the computer chassis.
8. Slide the power-supply assembly toward the front of the computer, remove it from the chassis.



9. Install the new power-supply assembly into the chassis so that the screw holes in the power-supply assembly align with those in the chassis.

**Note:** Use only the screws provided by Lenovo.

10. Install and tighten the four screws at the rear of the chassis to secure the power-supply assembly.
11. Install and tighten the 2 screws that secure the power supply to the inside of the chassis.
12. Check the power supply and ensure it is the correct replacement. Some power supplies auto sense the voltage, some power supplies are voltage specific, and some power supplies have a voltage selection switch. Use a ballpoint pen to slide the switch, if necessary.

**Note:** For models that have a switch:

- If the voltage supply range is 100–127 V ac, set the switch to 115 V.
- If the voltage supply range is 200–240 V ac, set the switch to 230 V.

13. Replace the heat sink.

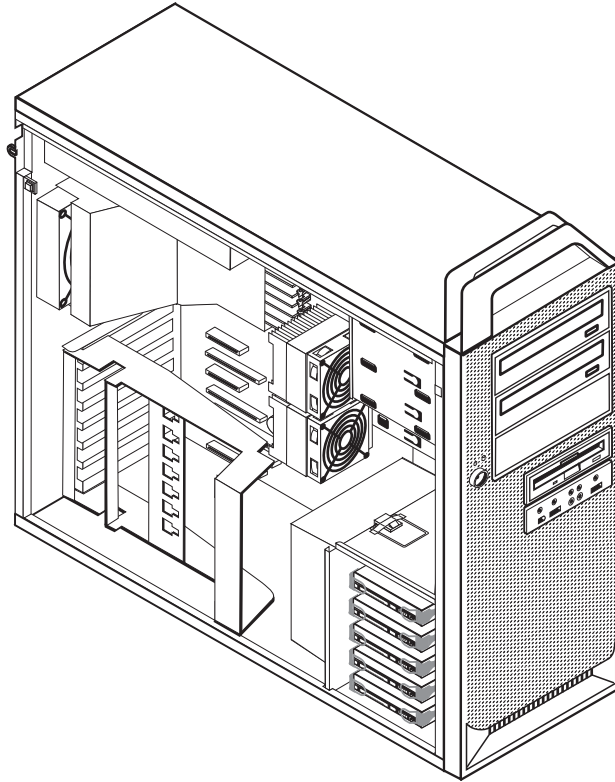
**Note:** You can reuse the heat sink without replacing the grease as long as the grease on the heat sink or the microprocessor has not been disturbed or contaminated. Be careful not to touch the heat sink or set the heat sink down where the grease comes in contact with any surface or contaminates.

14. Reconnect the heat sink fan cable.
15. Reconnect all the power supply cables to the drives and the system board.
16. Go to “Completing the FRU replacement” on page 153.

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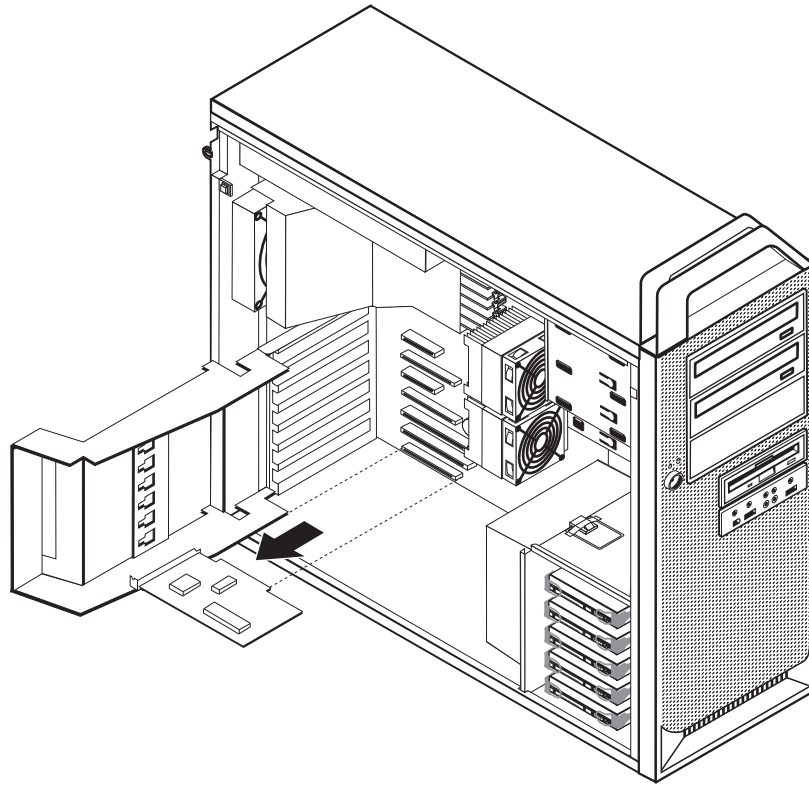
## Replacing an adapter card

1. Turn off the computer and allow the computer to cool for 3-5 minutes.
2. Open the computer cover. See “Opening the cover” on page 128.
3. Unlatch and open the card retainer.



4. Take note of the location of all cable connections on the adapter card. It will be necessary to reconnect them properly when installing a new card.
5. Disconnect all cables connected to the adapter card. See “System board connectors and components” on page 127.
6. Some models have:
  - A screw installed in the adapter bracket, remove this screw.
  - An additional retention feature located on the card guide end. Push the retention feature toward the front of the chassis before removing the adapter card.
7. Release the card support retaining latches. Grasp the adapter card and pull the card out of the slot.

**Note:** The card is a tight fit, so it might be necessary to remove each side a little at a time until the card is removed from the card slot.



8. Reverse this procedure to install the card, and then proceed to the next step.
9. Go to “Completing the FRU replacement” on page 153.



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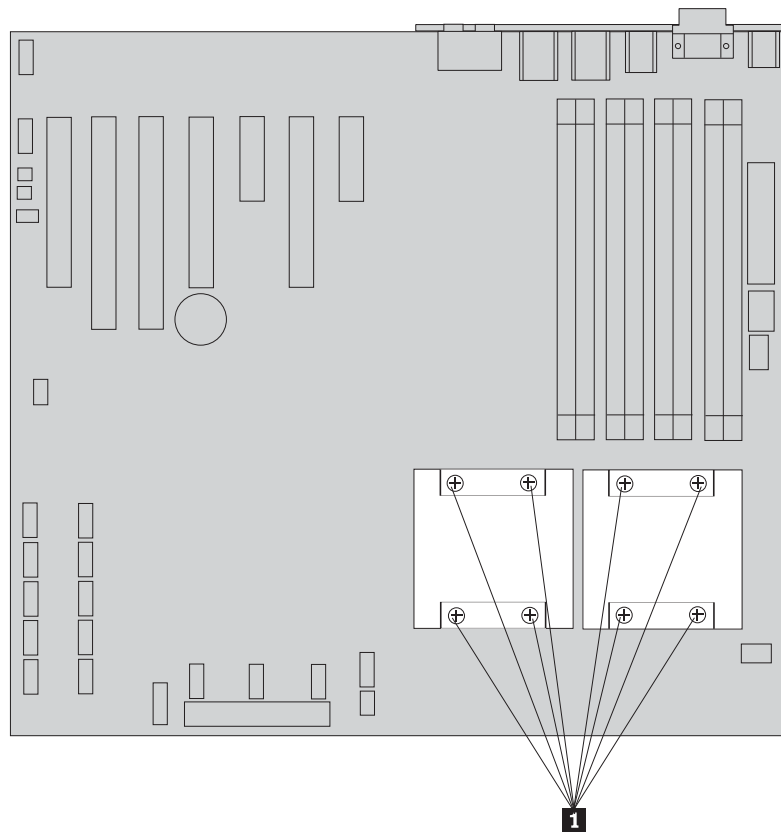
## Replacing the heat sink

This section provides instructions on how to replace the heat sink.

To replace the heat sink:

1. Open the computer cover. See “Opening the cover” on page 128.
2. Remove the heat sink fan cable from the system board. Note the cable location.
3. Remove the heat sink from the system board by removing the screws holding the heat sinks to the system board **1**. Carefully lift the heat sinks off of the system board.

**Note:** If you are removing the heat sink as part of a procedure to remove some other part, you can reuse the heat sink without replacing the grease as long as the grease on the heat sink or the microprocessor has not been disturbed or contaminated. Be careful not to touch the heat sink or set the heat sink down where the grease comes in contact with any surface or contaminates.



4. Remove the plastic covering from the bottom of the new heat sink to expose the heat sink grease (this cover protects the heat sink grease from contamination).

**Note:** Do not remove the plastic covering the grease until you are ready to install the heat sink on the microprocessor. Do not touch the grease the heat sink. Do not put the heat sink anywhere except on the microprocessor after the plastic covering has been removed and the grease exposed.

5. Place the new heat sink into position and replace the 4 screws to secure the heat sink.

6. Reconnect the heat sink fan cable. See “System board connectors and components” on page 127.
7. Go to “Completing the FRU replacement” on page 153.

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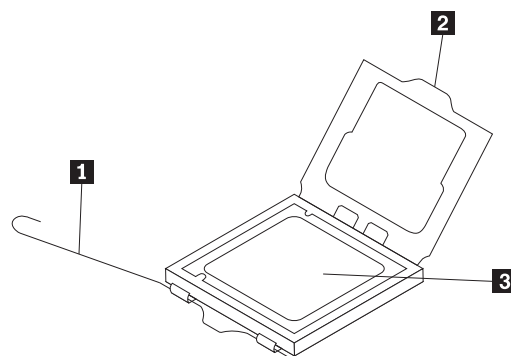
## Replacing the microprocessor

This section provides instructions on how to replace the microprocessor.

To replace the microprocessor:

1. Open the computer cover. See “Opening the cover” on page 128.
2. Place the computer on its right side to help make the system board more accessible.
3. Remove the heat sink from the system board. See “Replacing the heat sink” on page 139.
4. To remove the microprocessor **3** from the system board, lift the small handle **1** and open the retainer **2**.

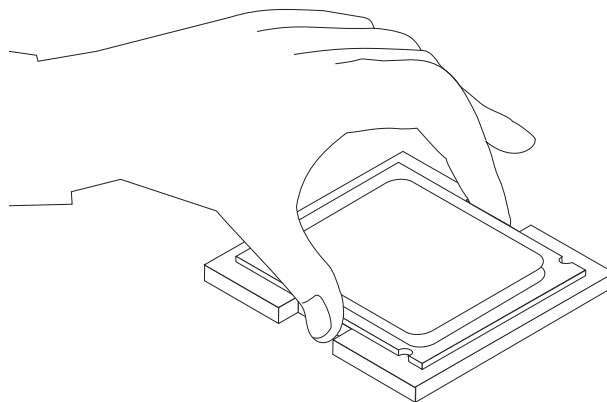
**Note:** The system board in your computer looks different than the one illustrated.



### Important

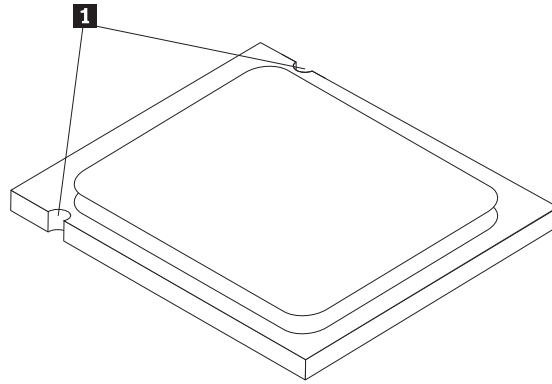
Touch only the sides of the microprocessor. Do not touch the gold contacts on the bottom.

5. Lift the microprocessor straight up and out of the socket.



### Notes:

- a. Note the orientation of the notches **1** on the microprocessor. This is important when reinstalling the microprocessor on the new system board.

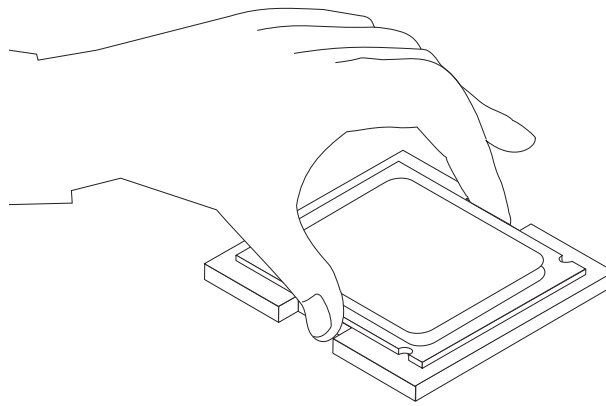


- b. Do not drop anything onto the microprocessor socket while it is exposed.  
The socket pins must be kept as clean as possible.
6. Holding the microprocessor with your fingers, position the microprocessor so that the notches on the microprocessor are aligned with the tabs in the microprocessor socket.

**Important**

To avoid damaging the microprocessor contacts, do not tilt the microprocessor when installing it into the socket.

7. Lower the microprocessor straight down into the system board socket of the new system board.



8. Place the heat sink into position and replace the 4 screws to secure the heat sink to the system board.
9. Reconnect the heat sink fan cable.
10. Go to “Completing the FRU replacement” on page 153.

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## Replacing the system board

This procedure describes how to remove and replace the system board.

### **Important**

The heat sink and microprocessor might be very hot. Make sure these components are cool enough to safely handle before continuing this procedure.

1. Open the computer cover. See “Opening the cover” on page 128.
2. Place the computer on its right side to help make the system board more accessible.
3. Remove any adapter cards installed in the PCI connectors. See “Replacing an adapter card” on page 137.
4. Carefully take note of the location of all cable connections on the system board and disconnect all cables. See “System board connectors and components” on page 127.  
  
**Note:** The latches for the power connectors are difficult to reach using your fingers. Use a tool such as a screwdriver or pliers to unlatch the connectors.
5. Remove the hard disk drive fan. See “Replacing a fan assembly” on page 151.
6. Remove the screws (9) that secure the system board to the chassis.
7. Lift the system board out of the chassis.
8. Remove the memory modules from the failing system board and install them in the same location on the new system board.
9. Remove the heat sink from the failing system board. See “Replacing the heat sink” on page 139.
10. Remove the microprocessor from the failing system board and install it on the new system board. See “Replacing the microprocessor” on page 106.
11. Install the heat sink on the new system board. See “Replacing the heat sink” on page 139.
12. Connect the heat sink and fan assembly cable to the new system board. See “System board connectors and components” on page 127.
13. Install the new system board into the chassis and align the screw holes with those in the chassis. Insert and tighten the screws that secure the system board.
14. Install the hard disk drive fan. See “Replacing a fan assembly” on page 151.
15. Connect all cables to the system board. See the system board illustration for your machine type at “System board connectors and components” on page 127.
16. Go to “Completing the FRU replacement” on page 153.

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## Replacing a hard disk drive

This section provides instructions on how to replace the hard disk drive.

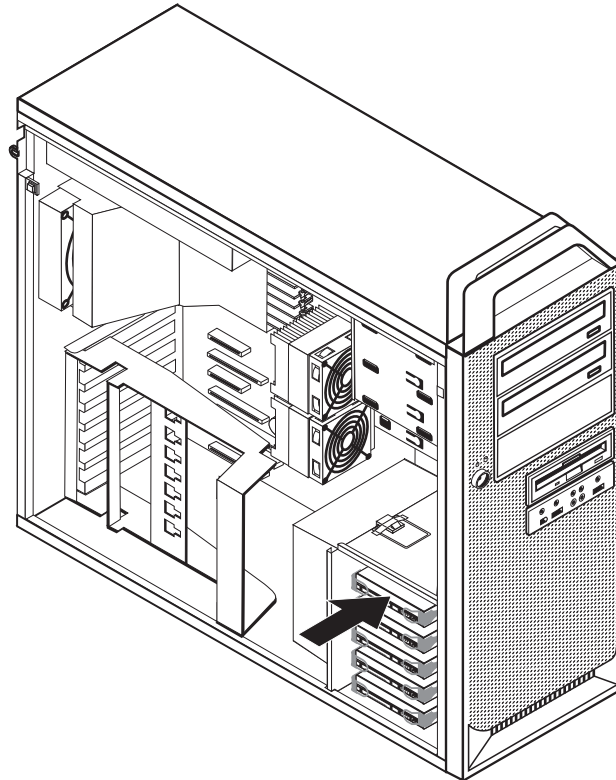
### Important

When you receive a new hard disk drive, you also receive a set of *Product Recovery CDs*. The set of *Product Recovery CDs* will enable you to restore the contents of the hard disk to the same state as when your computer was originally shipped from the factory. For more information on recovering factory-installed software, refer to “Recovering software” in the *User Guide*.

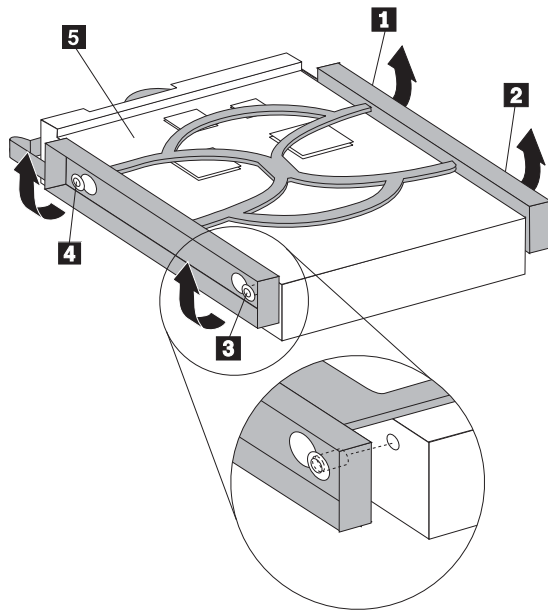
**Note:** When replacing a hard disk drive in a raid configured array, depending on which type of array is used, rebuilding the raid array might be required. If the array is redundant, make sure to connect the new drive to the same port from which the replaced drive was removed.

To replace the hard disk drive:

1. Open the computer cover. See “Opening the cover” on page 128.
2. Disconnect the signal and power cables from the hard disk drive.
3. Pull the handle to remove the hard disk drive.



4. Remove the failing hard disk drive from the bracket by flexing the bracket.
5. Install the new drive into the bracket, flex the bracket, and align the pins **1** through **4** on the bracket with the holes in the hard disk drive. Do not touch the circuit board **5** on the bottom of the hard disk drive.



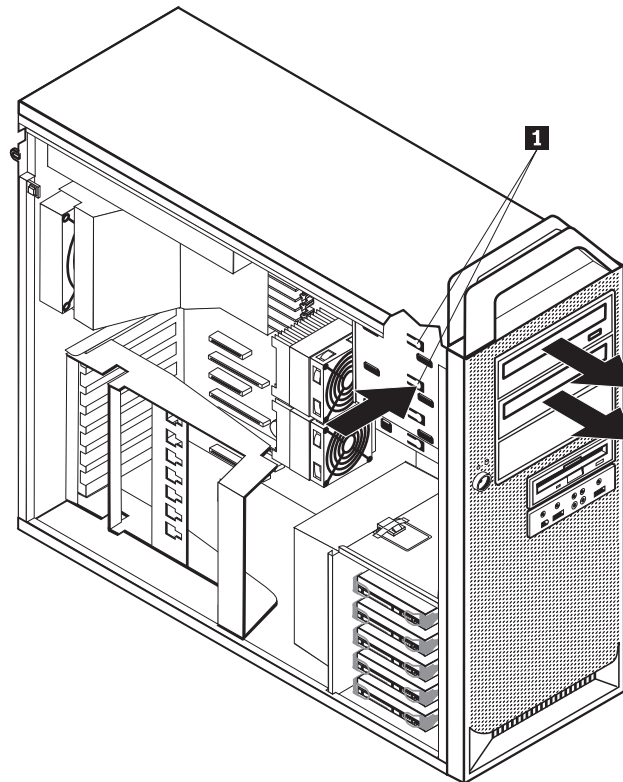
6. Install the hard disk drive and bracket into the drive bay.
7. Connect the signal and power cables to the rear of the new hard disk drive.
8. Go to “Completing the FRU replacement” on page 153.

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## Replacing an optical drive

This section provides instructions on how to replace the optical drive.

1. Open the computer cover. See “Opening the cover” on page 128.
2. Remove the front bezel. See “Removing the front bezel” on page 130.
3. Locate the optical-drive connectors. See “System board connectors and components” on page 127.
4. Note the location of the optical-drive cables. Disconnect the signal and power cables from the rear of the optical drive.
5. Press the drive latch **1** (for the drive you want to remove) and slide the optical-drive from the chassis.



6. Install the new optical-drive from the front of the drive-bay assembly. Slide the optical-drive toward the rear of the chassis to lock the drive into position.
7. Connect the flat cable to the new optical-drive.
8. Go to “Completing the FRU replacement” on page 153.

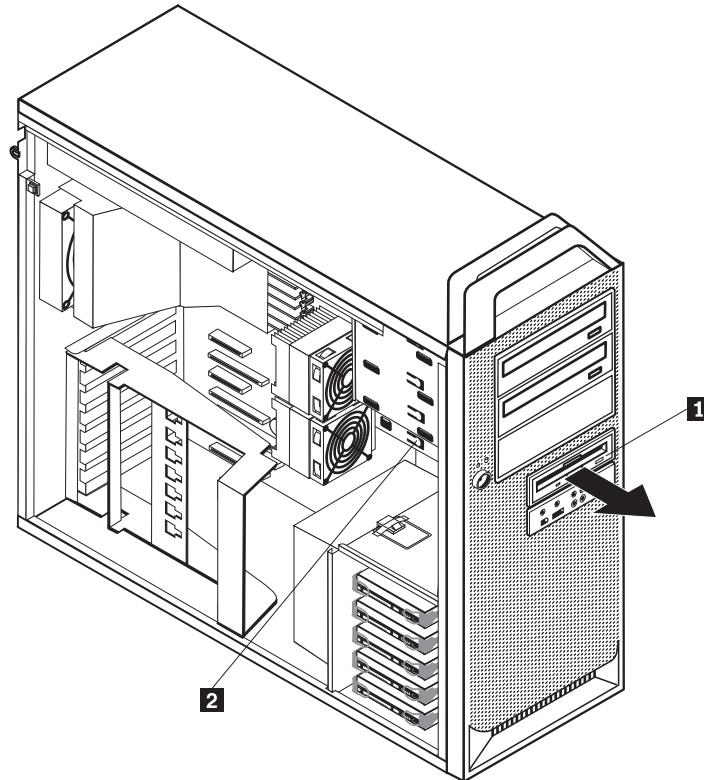


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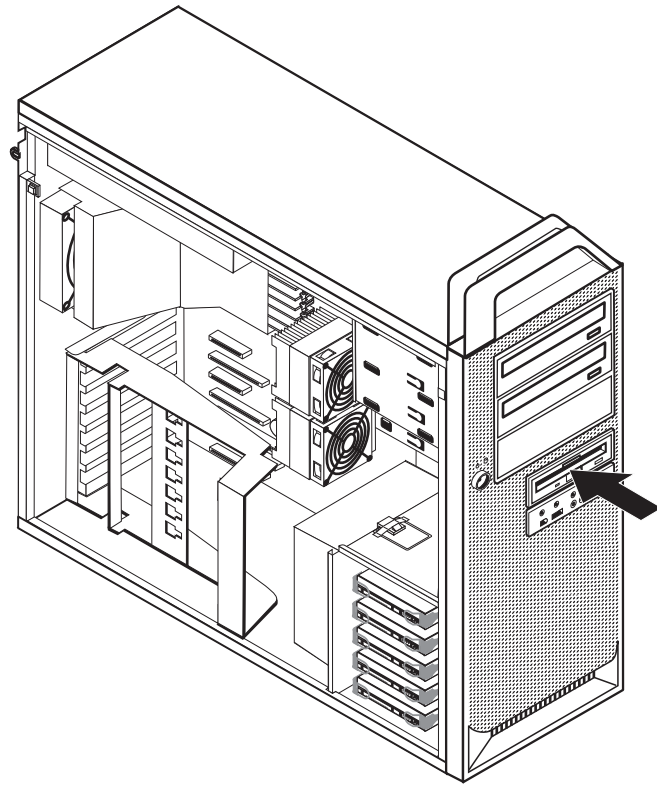
## Replacing the diskette drive or optional card reader

This section provides instructions on how to replace the diskette drive or card reader.

1. Open the computer cover. See “Opening the cover” on page 128.
2. Locate the drive or card reader cable connectors. See “System board connectors and components” on page 127.
3. Note the location of the drive or card reader cables. Disconnect the drive or card reader cables from the system board.
4. Press the drive latch **2** and slide the drive or card reader from the chassis.



5. Disconnect the flat cable from the rear of the failing diskette drive or card reader.
6. Connect the flat cable to the new diskette drive or card reader.
7. Install the new drive into the drive-bay assembly and lock the drive or card reader into position.

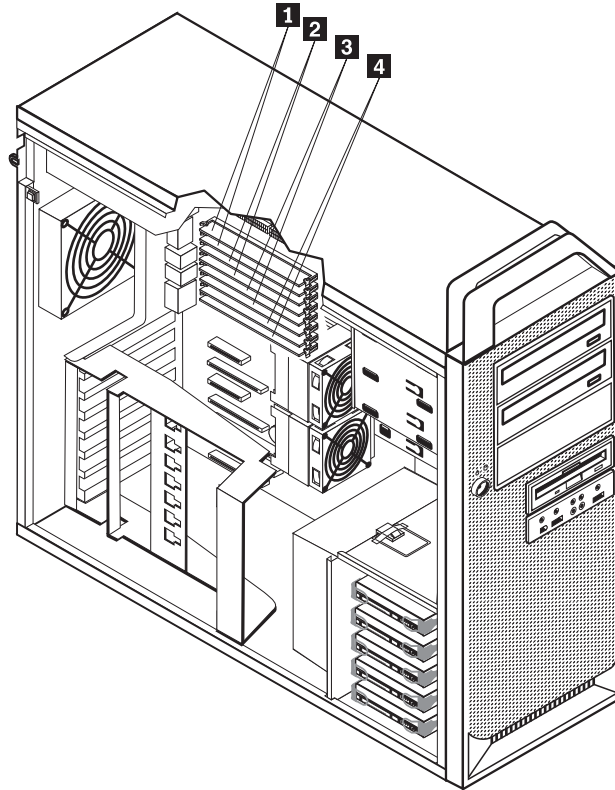


8. Go to “Completing the FRU replacement” on page 153.

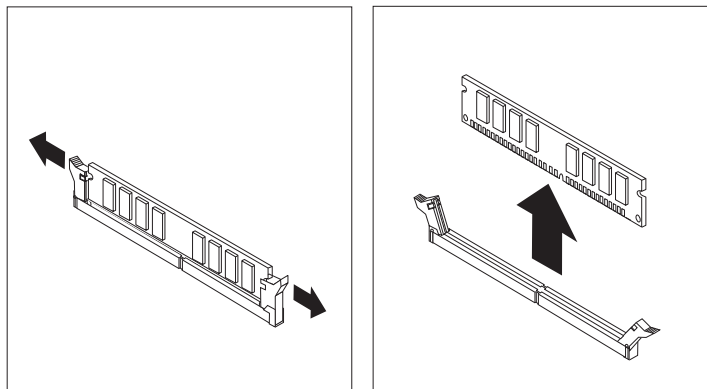
## Replacing a memory module

This section provides instructions on how to replace a memory module.

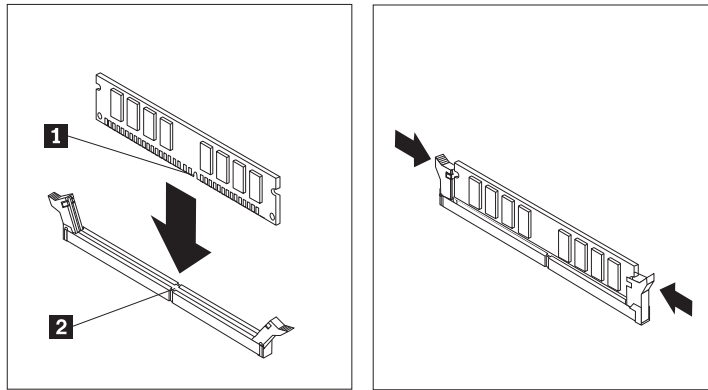
1. Open the computer cover. See “Opening the cover” on page 128.
2. Locate the memory-module connectors. See “System board connectors and components” on page 127. If you are installing additional memory be sure the retaining clips are open.



3. Remove the memory module being replaced by opening the retaining clips.



4. Position the replacement memory module over the memory connector. Make sure the notch **1** on the memory module aligns correctly with the connector key **2** on the system board. Push the memory module straight down into the connector until the retaining clips close.



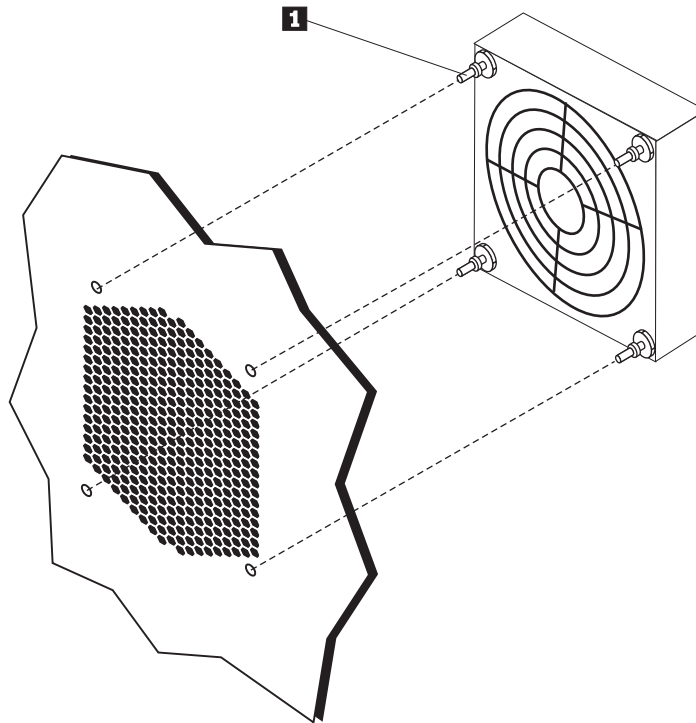
5. Go to “Completing the FRU replacement” on page 153.

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## Replacing a fan assembly

This section provides instructions on how to replace the fan assembly. These removal instructions apply to the both the front fan and the rear fan.

1. Open the computer cover. See “Opening the cover” on page 128.
2. Note the routing of the fan-assembly wiring. See “System board connectors and components” on page 127. Disconnect the fan-assembly-wiring connector from the system board.
3. Remove the adapter cards to access the fans. See “Accessing system board components and drives” on page 131.
4. If you are replacing the front fan, remove the fan bracket .
5. Remove the fan assembly by releasing the fan grommets **1**. Then remove the fan and wiring.



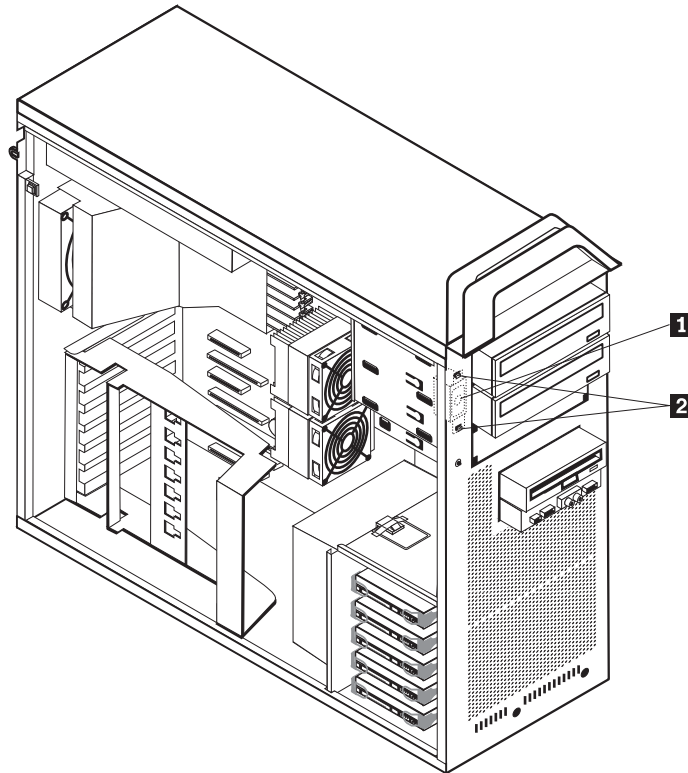
6. Install the new fan assembly using the grommets **1**, route the wiring, and then connect the fan-wiring connector to the system board. .See “System board connectors and components” on page 127.
7. If you are installing the front fan, reinstall the fan bracket.
8. Reinstall any adapter cards that were removed. See “Replacing an adapter card” on page 137.
9. Go to “Completing the FRU replacement” on page 153.

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## Replacing the internal speaker

This section provides instructions on how to replace the internal speaker.

1. Open the computer cover. See “Opening the cover” on page 128.
2. Remove the front bezel. See “Removing the front bezel” on page 130.
3. Locate the internal-speaker connector on the system board. See “System board connectors and components” on page 127.
4. Note the location of the internal-speaker cable connection. Note the routing of the internal-speaker cable. Disconnect the internal-speaker cable and the switch LED cable from the system board.
5. Disengage the internal-speaker-locking tabs **2** and slide that side of the speaker **1** downward to remove.



6. Remove the speaker and speaker cable from the computer.
7. Route the speaker cable and then position the new internal-speaker tabs **2** into the metal speaker slots and then push the internal speaker downward until the speaker-locking tabs snap into position.
8. Connect the speaker cable to the system board. See “System board connectors and components” on page 127.
9. Go to “Completing the FRU replacement” on page 153.

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## Completing the FRU replacement

After replacing FRUs, you need to install any removed parts, replace the cover, and reconnect any cables, including telephone lines and power cords. Also, depending on the FRU that is replaced, you might need to confirm the updated information in the Setup Utility program.

**Note:** When the power cord is first plugged in, the computer might appear to turn on for a few seconds and then turn off. This is a normal sequence to enable the computer to initialize.



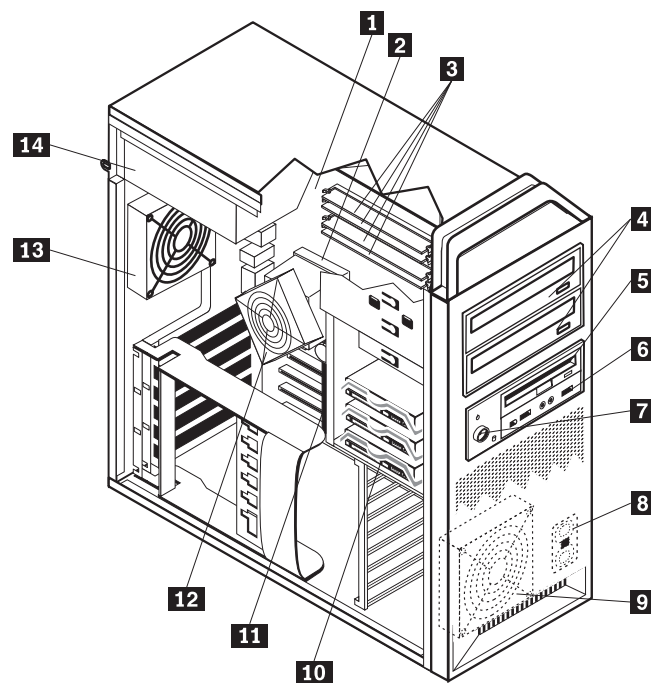


## Chapter 11. FRU lists

**Attention:** Read "Important information about replacing RoHS compliant FRUs" on page 2 before replacing any FRUs.

**Note:** In the following tables, A CRU (Customer Replaceable Unit) is identified by either a 1, 2, or N in the CRU column. A "1" means that the part is an external CRU, A "2" means that the part is an internal CRU, and an "N" means that the part is not a CRU.

### Machine Type 6423



| Item # | 6423 FRUs  | FRU#    | CRU Tier |
|--------|--|---------|----------|
| 1      | System Board, 1P Intel Socket-T, X38, ICH9 (models 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 26U 26F 26G 27U 27F 27G 28U 28G 28F 29U 29F 29G 31U 31F 31G 32U 32F 32G) | 43C1515 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E6750 - 2.66GHz, 2MBx2 L2, 1333MHz FSB, G0 (models 26M 26A 26Q 26T 26K 26R 26E 26J 26U 26F 26G)   | 43C1693 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E6850 - 3.00GHz, 2MBx2 L2, 1333MHz FSB, G0 (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 29M 29A 29Q 29T 29K 29R 29E 29J 27U 27F 27G 28U 28G 28F 29U 29F 29G)   | 43C1694 | N        |
| 2      | Microprocessor, Intel Core 2 Quad Q6600 - 2.40GHz, 4MBx2 L2, 1066MHz FSB, G0 (models 31M 31A 31Q 31T 31K 31R 31E 31J 31U 31F 31G)  | 43C1695 | N        |
| 2      | Microprocessor, Intel Core 2 Quad Q6700 - 2.66GHz, 4MBx2 L2, 1066MHz FSB, G0 (models 32M 32A 32Q 32T 32K 32R 32E 32J 32U 32F 32G)  | 43C6309 | N        |

| Item # | 6423 FRUs  | FRU#    | CRU Tier |
|--------|--|---------|----------|
| 2      | Microprocessor, Intel Core 2 Extreme X6800 - 2.93GHz, 2MBx2 L2, 1066MHz FSB, G0 (models)   | 43C9271 | N        |
| 2      | Microprocessor, Intel Core 2 Extreme QX6850 - 3.00GHz, 4MBx2 L2, 1333MHz FSB, G0 (models)  | 43C9580 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E8500 - 3.16GHz, 6MB L2, 1333MHz FSB (models CTO)   | 45C7735 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E8400 - 3.00GHz, 6MB L2, 1333MHz FSB (models CTO)   | 45C7736 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E8300 - 2.83GHz, 6MB L2, 1333MHz FSB (models CTO)   | 45C7737 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E8200 - 2.66GHz, 6MB L2, 1333MHz FSB (models CTO)   | 45C7738 | N        |
| 2      | Microprocessor, Intel Core 2 Quad Q9550 - 2.83GHz, 12MB L2, 1333MHz FSB (models CTO)   | 45C7739 | N        |
| 2      | Microprocessor, Intel Core 2 Quad Q9450 - 2.66GHz, 12MB L2, 1333MHz FSB (models CTO)   | 45C7740 | N        |
| 2      | Microprocessor, Intel Core 2 Quad Q9300 - 2.50GHz, 12MB L2, 1333MHz FSB (models CTO)   | 45C7741 | N        |
| 2      | Microprocessor, Intel Core 2 Extreme QX9650 - 3.00GHz, 12MB L2, 1333MHz FSB (models CTO)   | 45R2316 | N        |
| 3      | Memory module, 512MB DDR3 ECC UDIMM PC3-8500 (1067MHz) (models)  | 43C1704 | 2        |
| 3      | Memory module, 1GB DDR3 ECC UDIMM PC3-8500 (1067MHz) (models 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 26U 26F 26G 27U 27F 27G 28U 28G 28F 29U 29F 29G 31U 31F 31G 32U 32F 32G) | 43C1705 | 2        |
| 4      | Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) (models 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 26U 26F 26G 27U 27F 27G 28U 28G 28F 29U 29F 29G 31U 31F 31G 32U 32F 32G)       | 43C1042 | 2        |
| 4      | Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) (models 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 26U 26F 26G 27U 27F 27G 28U 28G 28F 29U 29F 29G 31U 31F 31G 32U 32F 32G)       | 43C1043 | 2        |
| 5      | Diskette drive kit (includes diskette drive, bezel, and cable) (models 23U 23G 24U 24G )   | TBD     | 2        |
| 5      | Diskette drive, 3.5" 1.44MB 2-Mode (models 23U 23G 24U 24G )   | 40Y9105 | 2        |
| 5      | Diskette drive, 3.5" 1.44MB 2-Mode (models 23U 23G 24U 24G )   | 40Y9107 | 2        |
| 6      | Front USB/Audio assembly (all models)  | 41R5495 | 2        |
| 7      | Power switch/LED assembly (all models)   | 41R5496 | 2        |
| 8      | Internal speaker and cable Asm (all models)  | 41R5494 | 2        |
| 9      | Front fan (all models)   | 41R5486 | 2        |
| 10     | Hard disk drive, 160GB 7200rpm SATA (models 32U 32F 32G)   | 40Y9035 | 2        |
| 10     | Hard disk drive, 250GB 7200rpm SATA (models 21M 21A 21Q 21K 21R 21E 21J 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 26U 26F 26G 27U 27F 27G 29U 29F 29G 31U 31F 31G)  | 40Y9036 | 2        |

| Item # | 6423 FRUs   | FRU#    | CRU Tier |
|--------|---|---------|----------|
| 10     | Hard disk drive, 146GB SAS - 15000 rpm, 3 Gb/s, 32MB cache (models 22M 22A 22Q 22K 22R 22E 22J 28M 28A 28Q 28T 28K 28R 28E 28J 28U 28G 28F )  | 43C6968 | 2        |
| 11     | Hard disk drive fan and bracket Asm, 70x25 (all models)   | 41R5477 | 2        |
| 12     | Fan sink, 4 Heat Pipe (all models)  | 41R5479 | 2        |
| 12     | Heat Sink, Acoustic Solution (all models)   | 41R5540 | 2        |
| 13     | Rear fan (all models)   | 41R5484 | 2        |
| 14     | Power supply, 650 Watt (models 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 26U 26F 26G 27U 27F 27G 28U 28G 28F 29U 29F 29G 31U 31F 31G 32U 32F 32G) | 41A9712 | 2        |

The FRUs listed in the following tables are not illustrated.

| 6423 FRUs                                      | FRU#    | CRU Tier |
|--|---------|----------|
| Diskette drive cable (all models)              | 41N8294 | 2        |
| SATA Cable (optical disk drive) (all models)   | 41R5481 | 2        |
| SATA Cable (hard disk drive) (all models)      | 41N8298 | 2        |
| SAS Cable- (all models)                        | 41R5482 | 2        |
| Bezel Asm (all models)                         | 41N8296 | 2        |
| Handle with screws (all models)                | 41R5490 | 1        |
| Cover Asm (all models)                         | 41R5492 | 2        |
| Mechanical shell kit (all models)              | 41R5491 | N        |
| Miscellaneous Parts (all models)               | 41R5493 | 2        |
| Cable Asm, Cover Detect Switch (all models)    | 41R5497 | 2        |
| Serial Port Cable (all models)                 | 41R5544 | 2        |
| Label kit (all models)                         | 41R5549 | 1        |
| System board Screw Kit (all models)            | 41R5547 | 2        |
| SAS HDD Filler (all models)                    | 41R5552 | 2        |
| Cable Asm, SAS Controller HDD LED (all models) | 41R5556 | 2        |
| Thermal Sense Cable (all models)               | 41R2511 | 2        |

| 6423 Keyboards (PS2 Preferred Pro) | FRU#    | CRU Tier |
|------------------------------------|---------|----------|
| US English (models)                | 41A5039 | 1        |
| Arabic (models)                    | 41A5040 | 1        |
| Arabic/French (models)             | 41A5041 | 1        |
| Belgian/French (models)            | 41A5042 | 1        |
| Belgian/UK (models)                | 41A5043 | 1        |
| Bulgarian (models)                 | 41A5045 | 1        |
| Hong Kong/Taiwan (models)          | 41A5046 | 1        |
| Czech (models)                     | 41A5047 | 1        |
| Danish (models)                    | 41A5048 | 1        |
| Dutch (models)                     | 41A5049 | 1        |

| <b>6423 Keyboards (PS2 Preferred Pro)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|---|-------------|-----------------|
| French (models)                           | 41A5050     | 1               |
| French Canadian 445 (models)              | 41A5051     | 1               |
| French Canadian 58 (models)               | 41A5052     | 1               |
| German (models)                           | 41A5053     | 1               |
| Greek (models)                            | 41A5054     | 1               |
| Hebrew (models)                           | 41A5055     | 1               |
| Hungarian (models)                        | 41A5056     | 1               |
| Iceland (models)                          | 41A5057     | 1               |
| Italian (models)                          | 41A5058     | 1               |
| Japanese (models)                         | 41A5059     | 1               |
| Korean (models)                           | 41A5060     | 1               |
| LA Spanish (models)                       | 41A5061     | 1               |
| Norwegian (models)                        | 41A5062     | 1               |
| Polish (models)                           | 41A5063     | 1               |
| Portuguese (models)                       | 41A5064     | 1               |
| Romanian (models)                         | 41A5065     | 1               |
| Russian/Cyrilic (models)                  | 41A5066     | 1               |
| Serbian/Cyrilic (models)                  | 41A5067     | 1               |
| Slovak (models)                           | 41A5068     | 1               |
| Spanish (models)                          | 41A5069     | 1               |
| Swedish/Finn (models)                     | 41A5070     | 1               |
| Swiss F/G (models)                        | 41A5071     | 1               |
| Thailand (models)                         | 41A5072     | 1               |
| Turkish 440 (models)                      | 41A5073     | 1               |
| Turkish 179 (models)                      | 41A5074     | 1               |
| UK English (models)                       | 41A5075     | 1               |
| US Euro (models)                          | 41A5076     | 1               |
| Slovenian (models)                        | 41A5077     | 1               |
| Brazil/Portuguese (models)                | 41A5044     | 1               |

| <b>6423 Keyboards (Lenovo Productivity -USB)</b>  | <b>FRU#</b> | <b>CRU Tier</b> |
|---|-------------|-----------------|
| US English (models 26M 26A 26Q 26R 26E 27M 27A 27Q 27R 27E 28M 28A 28Q 28R 28E 29M 29A 29Q 29R 29E 31M 31A 31Q 31R 31E 32M 32A 32Q 32R 32E 26U 26G 27U 27G 28U 28G 29U 29G 31U 31G 32U 32G) | 41A5289     | 1               |
| Arabic (models)   | 41A5290     | 1               |
| Arabic/French (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)  | 41A5291     | 1               |
| Belgian/French (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)   | 41A5292     | 1               |
| Belgian/UK (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)   | 41A5293     | 1               |
| Brazilian (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)  | 41A5294     | 1               |
| Bulgarian (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)  | 41A5295     | 1               |
| Hong Kong/Taiwan (models )  | 41A5296     | 1               |

| <b>6423 Keyboards (Lenovo Productivity -USB)</b>                     | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| Czech (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)               | 41A5297     | 1               |
| Danish (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)              | 41A5298     | 1               |
| Dutch (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)               | 41A5299     | 1               |
| French (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)              | 41A5300     | 1               |
| French Canadian 445 (models 26F 27F 28F 29F 31F 32F)                 | 41A5301     | 1               |
| French Canadian 58 (models 26F 27F 28F 29F 31F 32F)                  | 41A5302     | 1               |
| German (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)              | 41A5303     | 1               |
| Greek (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)               | 41A5304     | 1               |
| Greek/US (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)            | 41A5305     | 1               |
| Hebrew (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)              | 41A5306     | 1               |
| Hungarian (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)           | 41A5307     | 1               |
| Iceland (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)             | 41A5308     | 1               |
| Italian (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)             | 41A5309     | 1               |
| Japanese (models 26J 27J 28J 29J 31J 32J)                            | 41A5310     | 1               |
| Korean (models 26K 27K 28K 29K 31K 32K)                              | 41A5311     | 1               |
| LA Spanish (models)  | 41A5312     | 1               |
| Norwegian (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)           | 41A5313     | 1               |
| Polish (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)              | 41A5314     | 1               |
| Portuguese (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)          | 41A5315     | 1               |
| Romanian 096 (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)        | 41A5317     | 1               |
| Romanian 446 (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)        | 41A5316     | 1               |
| Russian/Cyrillic (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)    | 41A5318     | 1               |
| Serbian/Cyrillic (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)    | 41A5319     | 1               |
| Slovak (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)              | 41A5320     | 1               |
| Spanish (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)             | 41A5321     | 1               |
| Swedish/Finnish (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)     | 41A5322     | 1               |
| Swiss French/German (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G) | 41A5323     | 1               |
| Thailand (models 26T 27T 28T 29T 31T 32T)                            | 41A5324     | 1               |
| Turkish 440 (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)         | 41A5325     | 1               |
| Turkish 179 (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)         | 41A5326     | 1               |
| UK English (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)          | 41A5327     | 1               |
| US Euro (models)   | 41A5328     | 1               |
| Slovenian (models 16G 17G 18G 19G 26G 27G 28G 29G 31G 32G)           | 41A5329     | 1               |

| <b>6423 Keyboards (Preferred Pro Fingerprint Reader USB)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| US English (models)  | 41A5248     | 1               |
| Arabic (models)  | 41A5249     | 1               |
| Arabic/French (models)                                       | 41A5250     | 1               |
| Belgian/French (models)                                      | 41A5251     | 1               |
| Belgian/UK (models)  | 41A5252     | 1               |
| Brazil/Portuguese (models)                                   | 41A5253     | 1               |

| <b>6423 Keyboards (Preferred Pro Fingerprint Reader USB)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| Bulgarian (models )  | 41A5254     | 1               |
| Czech (models )  | 41A5256     | 1               |
| Danish (models )   | 41A5257     | 1               |
| Dutch (models )  | 41A5258     | 1               |
| French (models )   | 41A5259     | 1               |
| French Canadian 445 (models )                                | 41A5260     | 1               |
| French Canadian 58 (models )                                 | 41A5261     | 1               |
| German (models )   | 41A5262     | 1               |
| Greek (models )  | 41A5263     | 1               |
| Greek/US (models )   | 41A5264     | 1               |
| Hebrew (models )   | 41A5265     | 1               |
| Hungarian (models )  | 41A5266     | 1               |
| Iceland (models )  | 41A5267     | 1               |
| Italian 141 (models)   | 41A5268     | 1               |
| Japanese (models )   | 41A5269     | 1               |
| Korean (models )   | 41A5270     | 1               |
| LA/Spanish (models )   | 41A5271     | 1               |
| Norwegian (models )  | 41A5272     | 1               |
| Polish (models )   | 41A5273     | 1               |
| Portuguese (models )   | 41A5274     | 1               |
| Romanian 096 (models )                                       | 41A5275     | 1               |
| Romanian 446 (models )                                       | 41A5276     | 1               |
| Russian/Cyrillic (models )                                   | 41A5277     | 1               |
| Serbian/Cyrillic (models )                                   | 41A5278     | 1               |
| Slovak (models )   | 41A5279     | 1               |
| Spanish (models )  | 41A5280     | 1               |
| Swedish/Finn (models )                                       | 41A5281     | 1               |
| Swiss (models )  | 41A5282     | 1               |
| Thailand (models )   | 41A5283     | 1               |
| Turkish 440 (models )  | 41A5284     | 1               |
| Turkish 179 (models )  | 41A5285     | 1               |
| UK English (models )   | 41A5286     | 1               |
| US Euro (models )  | 41A5287     | 1               |
| Slovenian (models )  | 41A5288     | 1               |

| <b>6423 Keyboards (Wireless)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|----------------------------------|-------------|-----------------|
| US English (models )             | 41A5219     | 1               |
| China (models )                  |             | 1               |
| Arabic (models )                 |             | 1               |
| Arabic/French (models )          |             | 1               |
| Belgian/French (models )         | 41A5220     | 1               |

| 6423 Keyboards (Wireless)     | FRU#    | CRU Tier |
|-------------------------------|---------|----------|
| Belgian/UK (models )          | 41A5221 | 1        |
| Brazil/Portuguese (models )   |         | 1        |
| Bulgarian (models )           |         | 1        |
| Chinese/US (models )          | 41A5222 | 1        |
| Czech (models )               | 41A5223 | 1        |
| Danish (models )              | 41A5224 | 1        |
| Dutch (models )               | 41A5225 | 1        |
| French (models )              | 41A5226 | 1        |
| French Canadian 445 (models ) | 41A5227 | 1        |
| French Canadian 58 (models )  | 41A5228 | 1        |
| German (models )              | 41A5229 | 1        |
| Greek (models )               | 41A5230 | 1        |
| Greek/US (models )            | 41A5231 | 1        |
| Hebrew (models )              |         | 1        |
| Hungarian (models )           | 41A5232 | 1        |
| Iceland (models )             | 41A5233 | 1        |
| Italy (models )               |         | 1        |
| Italy (models )               | 41A5234 | 1        |
| Japanese (models )            | 41A5235 | 1        |
| Korean (models )              |         | 1        |
| LA/Spanish (models )          |         | 1        |
| Norwegian (models )           | 41A5236 | 1        |
| Polish (models )              | 41A5237 | 1        |
| Portuguese (models )          | 41A5238 | 1        |
| Romanian 096 (models )        |         | 1        |
| Romanian 446 (models )        |         | 1        |
| Russian/Cyrillic (models )    |         | 1        |
| Serbian/Cyrillic (models )    |         | 1        |
| Slovak (models )              | 41A5239 | 1        |
| Spanish (models )             | 41A5240 | 1        |
| Swedish/Finn (models )        | 41A5241 | 1        |
| Swiss (models )               | 41A5242 | 1        |
| Thailand (models )            |         | 1        |
| Turkish 440 (models )         |         | 1        |
| Turkish 179 (models )         |         | 1        |
| UK English (models )          | 41A5243 | 1        |
| US Euro (models )             | 41A5244 | 1        |
| US International (models )    | 41A5244 | 1        |
| Slovenian (models )           | 41A5245 | 1        |

| 6423 mice   | FRU#    | CRU Tier |
|---|---------|----------|
| Optical Wheel Mouse (400 DPI), USB - Red wheel (Primary) (all models)   | 41U3013 | 1        |
| Optical Wheel Mouse (400 DPI), USB - Red Wheel (Secondary) (all models) | 41U3030 | 1        |
| ScrollPoint Optical Mouse (800DPI, USB) (models )                       | 41U3019 | 1        |
| Wireless Mouse (models )  | 41U3023 | 1        |

| 6423 Adapters and miscellaneous FRUs  | FRU#    | CRU Tier |
|---|---------|----------|
| 3.5" 9-in-1 Media Card Reader (models 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 26U 26F 26G 27U 27F 27G 28U 28G 28F 29U 29F 29G 31U 31F 31G 32U 32F 32G) | 41R3378 | 2        |
| Transceiver (USB) (models )   | 41A5246 | 2        |
| L1 IEEE 1394 PCI Adapter (models 26M 26A 26Q 26T 26K 26R 26E 26J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T31K 31R 31E 31J 26U 26F 26G 29U 29F 29G 31U 31F 31G)  | 41D2781 | 2        |
| Speakers (2-piece) Lenovo Logo (models )  | 41A5331 | 2        |
| Speakers (2-piece) Lenovo Logo (models )  | 41A5334 | 1        |
| Lenovo 3 pieces Speakers (China Only) (models)  | 45C8640 | 1        |
| Lenovo 2 pieces Speakers (China Only) (models)  | 45C8641 | 1        |
| Speaker Power brick - US, Canada, LA low voltage, ASEAN (models 26A 27A 28A 29A 31A 32A 26U 27U 28U 29U 31U 32U)  | 89P8571 | 1        |
| Speaker Power brick - LA high voltage (non-APU) (models )   | 89P8575 | 1        |
| Speaker Power brick - China, Thailand (models )   | 89P8581 | 1        |
| Speaker Power brick - Japan (models 26E 26J 27E 27J 28E 28J 29E 29J 31E 31J 32E 32J)  | 89P8577 | 1        |
| Speaker Power brick - Brazil (models )  | 89P8583 | 1        |
| Speaker Power brick - Argentina (models )   | 41A4901 | 1        |
| Speaker Power brick - ANZ (models 26M 27M 28M 29M 31M 32M)  | 89P8579 | 1        |
| Speaker Brick - Korea (models 26K 26R 27K 27R 28K 28R 29K 29R 31K 31R 32K 32R)  | 41A4903 | 1        |
| Speaker Brick - Hong Kong, EMEA (models 26G 27G 28G 29G 31G 32G)  | 89P8573 | 1        |
| Speaker Brick - Taiwan (models )  | 41A4905 | 1        |
| Speaker Power brick - India, South Africa (models 26Q 27Q 28Q 29Q 31Q 32Q)  | 89P8585 | 1        |
| 256MB NVIDIA NVS290 (DMS59 Connector) - Quasar (models 32M 32A 32Q 32T 32K 32R 32E 32J 32U 32F 32G)   | 42Y6329 | 2        |
| 256MB NVIDIA FX370 (DVI-DL+DVI-DL) - Brown Dwarf (models 26M 26A 26Q 26T 26K 26R 26E 26J 16U 16G 16F)   | 42Y6331 | 2        |
| 512MB NVIDIA FX1700 (DVI-DL+DVI-DL+HDTV) - Pulsar (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T31K 31R 31E 31J 27U 27F 27G 28U 28G 28F 29U 29F 29G 31U 31F 31G)   | 42Y6333 | 2        |
| 768MB NVIDIA FX4600 (DVI-DL+DVI-DL+ST) - Black Hole (models )   | 42Y6337 | 2        |
| 1536MB NVIDIA C870 Physics Card - Newton Card (models)  | 45C5226 | 2        |
| Soft Modem V.90/V.44 (models )  | 29R9729 | 2        |
| Sound Blaster X-Fi Sound Card (models 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T31K 31R 31E 31J 29U 29F 29G 31U 31F 31G)   | 43C8028 | 2        |
| SAS Controller Card (models 28M 28A 28Q 28T 28K 28R 28E 28J)  | 43C9285 | 2        |



| 6423 Adapters and miscellaneous FRUs                               | FRU#    | CRU Tier |
|--|---------|----------|
| Lenovo Branded 3-Piece Speakers (models )                          | TBD     | 1        |
| Lenovo Branded Headset (models )                                   | TBD     | 1        |
| Dongle Cable - DMS59 to dual DVI (included in Quasar L1) (models ) | 41X6398 | 2        |
| DVI to VGA Dongle (models)   | 45C7816 | 2        |
| Modem Phone Cable (models )  | 39K5120 | 2        |

| 6423 Power Cords   | FRU#    | CRU Tier |
|--|---------|----------|
| Power cord - US (models 26A 27A 28A 29A 31A 32A 26T 27T 28T 29T 31T 32T 26U 26F 27U 27F 28U 28F 29U 29F 31U 32F)                       | 39M5080 | 1        |
| Power cord - China (models )   | 39M5205 | 1        |
| Power cord - Japan (models 26E 26J 27E 27J 28E 28J 29E 29J 31E 31J 32E 32J)  | 39M5193 | 1        |
| Power cord - Brazil (models )  | 39M5232 | 1        |
| Power cord - LA High Volt APU) (models )   | 39M5067 | 1        |
| Power cord - Australia / New Zealand (models 26M 27M 28M 29M 31M 32M)  | 39M5102 | 1        |
| Power cord - Korea (models 26K 26R 27K 27R 28K 28R 29K 29R 31K 31R 32K 32R)  | 39M5212 | 1        |
| Power cord - Hong Kong (models )   | 39M5151 | 1        |
| Power cord - UK, Ireland, Singapore, Malaysia, Brunei (models 26A 27A 28A 29A 31A 32A 26G 27G 28G 29G 31G 32G)                         | 39M5150 | 1        |
| Power cord - Taiwan (models )  | 39M5246 | 1        |
| Power cord - Italy (models 23G 24G 25G)  | 39M5164 | 1        |
| Power cord - G models (models 23G 24G 25G 26A 27A 28A 29A 31A 32A 26G 27G 28G 29G 31G 32G)   | 39M5122 | 1        |
| Power cord - Denmark (models 23G 24G 25G 26G 27G 28G 29G 31G 32G)  | 39M5129 | 1        |
| Power cord - Switzerland (models 23G 24G 25G 26G 27G 28G 29G 31G 32G)  | 39M5157 | 1        |
| Power cord - Israel (models 23G 24G 25G 26G 27G 28G 29G 31G 32G)   | 39M5171 | 1        |
| Power cord - South Africa (models 11M 12M 13M 14M 15M 16M 17M 18M 19M 21M 22M 11A 12A 13A 14A 15A 16A 17A 18A 19A 21A 22A 23G 24G 25G) | 39M5143 | 1        |
| Power cord - India (models 11Q 12Q 13Q 14Q 15Q 16Q 17Q 18Q 19Q 21Q 22Q)  | 39M5004 | 1        |

| 6423 Windows XP Home Recovery CDs | FRU# | CRU Tier |
|-----------------------------------|------|----------|
| US/UK/AP/TH (models )             |      | 1        |
| FR/CF (models )                   |      | 1        |
| GR (models )                      |      | 1        |
| IT (models )                      |      | 1        |
| BR (models )                      |      | 1        |
| SP/LA (models )                   |      | 1        |
| DK (models )                      |      | 1        |
| NL (models )                      |      | 1        |
| AE (models )                      |      | 1        |
| SV (models )                      |      | 1        |
| HE (models )                      |      | 1        |
| FI (models )                      |      | 1        |

| 6423 Windows XP Home Recovery CDs | FRU# | CRU Tier |
|-----------------------------------|------|----------|
| NO (models )                      |      | 1        |
| PL (models )                      |      | 1        |
| PO (models )                      |      | 1        |
| RU (models )                      |      | 1        |
| RE (models )                      |      | 1        |
| HU (models )                      |      | 1        |
| CZ (models )                      |      | 1        |
| TR (models )                      |      | 1        |
| GK (models )                      |      | 1        |
| Japanese (models )                |      | 1        |
| Simplified Chinese (models )      |      | 1        |
| Taiwan-TC (models )               |      | 1        |
| Hong Kong-TC (models )            |      | 1        |
| Korea (models )                   |      | 1        |

| 6423 Windows XP Pro Recovery CDs | FRU# | CRU Tier |
|----------------------------------|------|----------|
| US/UK/AP/TH (models )            |      | 1        |
| FR/CF (models )                  |      | 1        |
| GR (models )                     |      | 1        |
| IT (models )                     |      | 1        |
| BR (models )                     |      | 1        |
| SP/LA (models )                  |      | 1        |
| DK (models )                     |      | 1        |
| NL (models )                     |      | 1        |
| AE (models )                     |      | 1        |
| SV (models )                     |      | 1        |
| HE (models )                     |      | 1        |
| FI (models )                     |      | 1        |
| NO (models )                     |      | 1        |
| PL (models )                     |      | 1        |
| PO (models )                     |      | 1        |
| RU (models )                     |      | 1        |
| RE (models )                     |      | 1        |
| HU (models )                     |      | 1        |
| CZ (models )                     |      | 1        |
| TR (models )                     |      | 1        |
| GK (models )                     |      | 1        |
| SL (models )                     |      | 1        |
| Japanese (models )               |      | 1        |
| Simplified Chinese (models )     |      | 1        |
| Taiwan-TC (models )              |      | 1        |

| 6423 Windows XP Pro Recovery CDs                    | FRU# | CRU Tier |
|---|------|----------|
| Hong Kong-TC (models )                              |      | 1        |
| Korea (models )                                     |      | 1        |
| Multilingual 1 XP-P -- EN, NL, FR, GR, IT (models ) |      | 1        |
| Multilingual 2 XP-P -- EN, DK, FI, NO, SV (models ) |      | 1        |

| 6423 Vista Home Basic 32 Recovery DVDs | FRU# | CRU |
|--|------|-----|
| US/UK/AP/TH (models )                  |      | 1   |
| FR/CF (models )                        |      | 1   |
| GR (models )                           |      | 1   |
| SP/LA (models )                        |      | 1   |
| BR (models )                           |      | 1   |
| IT (models )                           |      | 1   |
| JP (models )                           |      | 1   |
| NO (models )                           |      | 1   |
| SV (models )                           |      | 1   |
| DK (models )                           |      | 1   |
| NL (models )                           |      | 1   |
| CZ (models )                           |      | 1   |
| FI (models )                           |      | 1   |
| PL (models )                           |      | 1   |
| RU (models )                           |      | 1   |
| TR (models )                           |      | 1   |
| HU (models )                           |      | 1   |
| GK (models )                           |      | 1   |
| PO (models )                           |      | 1   |
| SC (models )                           |      | 1   |
| TW (models )                           |      | 1   |
| HK (models )                           |      | 1   |
| KR (models )                           |      | 1   |
| SL (models )                           |      | 1   |
| RE (models )                           |      | 1   |

| 6423 Vista Business 32 Recovery DVDs | FRU#    | CRU |
|--------------------------------------|---------|-----|
| English (models )                    | 45C9638 | 1   |
| FR/CF (models )                      | 45C9640 | 1   |
| GR (models )                         | 45C9641 | 1   |
| SP/LA (models )                      | 45C9642 | 1   |
| BR (models )                         | 45C9643 | 1   |
| IT (models )                         | 45C9644 | 1   |
| JP (models )                         | 45C9645 | 1   |
| NO (models )                         | 45C9646 | 1   |

| 6423 Vista Business 32 Recovery DVDs | FRU#    | CRU |
|--------------------------------------|---------|-----|
| SV (models )                         | 45C9647 | 1   |
| DK (models )                         | 45C9648 | 1   |
| NL (models )                         | 45C9649 | 1   |
| CZ (models )                         | 45C9650 | 1   |
| FI (models )                         | 45C9651 | 1   |
| PL (models )                         | 45C9652 | 1   |
| RU (models )                         | 45C9653 | 1   |
| TR (models )                         | 45C9654 | 1   |
| HU (models )                         | 45C9655 | 1   |
| GK (models )                         | 45C9656 | 1   |
| PO (models )                         | 45C9663 | 1   |
| SC (models )                         | 45C9657 | 1   |
| TC (models )                         | 45C9658 | 1   |
| TC (models )                         | 45C9659 | 1   |
| KR (models )                         | 45C9660 | 1   |
| SL (models )                         | 45C9661 | 1   |
| RE (models )                         | 45C9639 | 1   |
| RO (models )                         | 45C9662 | 1   |
| SH (models )                         | 45C9664 | 1   |
| SK (models )                         | 45C9665 | 1   |
| AR (models )                         | 45C9666 | 1   |
| HE (models )                         | 45C9667 | 1   |

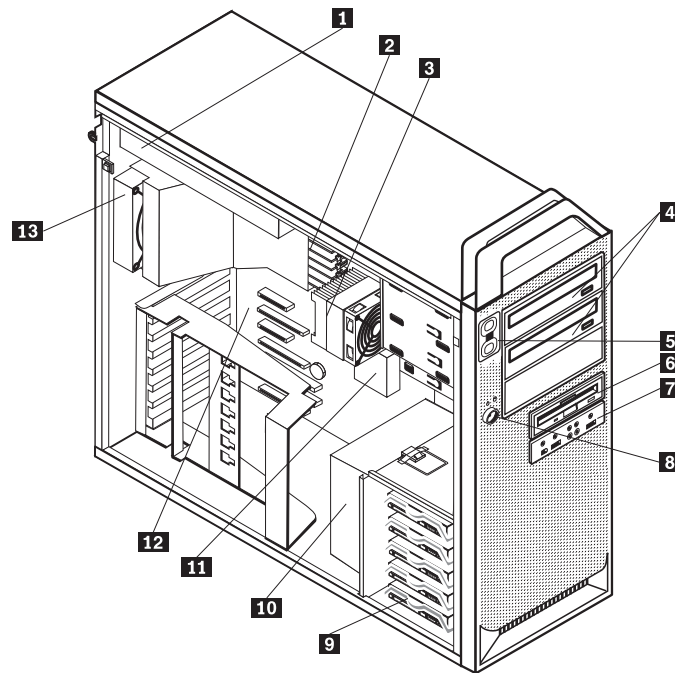
| 6423 Vista Home Pre 32 Recovery DVDs | FRU# | CRU Tier |
|--------------------------------------|------|----------|
| English (models )                    |      | 1        |
| Russian English (models )            |      | 1        |
| French/Canadian French (models )     |      | 1        |
| German (models )                     |      | 1        |
| Spanish/LA (models )                 |      | 1        |
| Brazil (models )                     |      | 1        |
| Italy (models )                      |      | 1        |
| Japanese (models )                   |      | 1        |
| Norway (models )                     |      | 1        |
| Swedish (models )                    |      | 1        |
| Denmark (models )                    |      | 1        |
| Dutch (models )                      |      | 1        |
| Czech (models )                      |      | 1        |
| Finnish (models )                    |      | 1        |
| Polish (models )                     |      | 1        |
| Russian (models )                    |      | 1        |
| Turkish (models )                    |      | 1        |

| 6423 Vista Home Pre 32 Recovery DVDs | FRU# | CRU Tier |
|--------------------------------------|------|----------|
| Hungarian (models )                  |      | 1        |
| Greek (models )                      |      | 1        |
| Simplified Chinese (models )         |      | 1        |
| Traditional Chinese (models )        |      | 1        |
| Traditional Chinese (models )        |      | 1        |
| Korean (models )                     |      | 1        |
| Slovenian (models )                  |      | 1        |
| Hebrew (models )                     |      | 1        |
| Romanian (models )                   |      | 1        |
| Bulgarian (models )                  |      | 1        |
| Croatian (models )                   |      | 1        |
| Portuguese (models )                 |      | 1        |
| Serbian-Latin (models )              |      | 1        |
| Ukrainian (models )                  |      | 1        |
| Slovakian (models )                  |      | 1        |

| 6423 Vista Business 64 Recovery DVDs   | FRU#    | CRU |
|--|---------|-----|
| English (models 26M 26A 26Q 26R 26E 27M 27A 27Q 27R 27E 28M 28A 28Q 28R 28E 29M 29A 29Q 29R 29E 31M 31A 31Q 31R 31E 32M 32A 32Q 32R 32E 26U 26G 27U 27G 28U 28G 29U 29G 31U 31G 32U 32G) | 45C9668 | 1   |
| RE (models 26G 27G 28G 29G 31G 32G)  | 45C9669 | 1   |
| FR/CF (models 26F 27F 28F 29F 31F 32F)   | 45C9670 | 1   |
| GR (models 26G 27G 28G 29G 31G 32G)  | 45C9671 | 1   |
| SP/LA (models 26G 27G 28G 29G 31G 32G)   | 45C9672 | 1   |
| BR (models)  | 45C9673 | 1   |
| IT (models 26G 27G 28G 29G 31G 32G)  | 45C9674 | 1   |
| JP (models 26J 27J 28J 29J 31J 32J)  | 45C9675 | 1   |
| NO (models 26G 27G 28G 29G 31G 32G)  | 45C9676 | 1   |
| SV (models 26G 27G 28G 29G 31G 32G)  | 45C9677 | 1   |
| DK (models 26G 27G 28G 29G 31G 32G)  | 45C9678 | 1   |
| NL (models 26G 27G 28G 29G 31G 32G)  | 45C9679 | 1   |
| CZ (models 26G 27G 28G 29G 31G 32G)  | 45C9680 | 1   |
| FI (models 26G 27G 28G 29G 31G 32G)  | 45C9681 | 1   |
| PL (models 26G 27G 28G 29G 31G 32G)  | 45C9682 | 1   |
| RU (models 26G 27G 28G 29G 31G 32G)  | 45C9683 | 1   |
| TR (models 26G 27G 28G 29G 31G 32G)  | 45C9684 | 1   |
| HU (models 26G 27G 28G 29G 31G 32G)  | 45C9685 | 1   |
| GK (models 26G 27G 28G 29G 31G 32G)  | 45C9686 | 1   |
| SC (models )   | 45C9687 | 1   |
| TW (models )   | 45C9688 | 1   |
| HK (models )   | 45C9689 | 1   |

| 6423 Vista Business 64 Recovery DVDs | FRU#    | CRU |
|--------------------------------------|---------|-----|
| KR (models 26K 27K 28K 29K 31K 32K)  | 45C9690 | 1   |
| SL (models 26G 27G 28G 29G 31G 32G)  | 45C9691 | 1   |
| PO (models)                          | 45C9692 | 1   |
| SK (models)                          | 45C9693 | 1   |
| AR (models)                          | 45C9694 | 1   |
| HE (models)                          | 45C9695 | 1   |

## Machine Type 6427



| Item # | 6427 FRUs   | FRU#    | CRU Tier |
|--------|---|---------|----------|
| 1      | Power supply, 1000 Watt (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 33M 33A 33Q 33T 33K 33R 33E 33J 27U 27F 27G 28U 28F 28G 29U 29G 29F 31U 31F 31G 32U 32F 32G 33U 33F 33G 34U 34F 34G)                        | 41A9709 | N        |
| 2      | Memory module, 1GB DDR2 ECC FBDIMM PC2-5300 (667MHz) (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 31M 31A 31Q 31T 31K 31R 31E 31J 33M 33A 33Q 33T 33K 33R 33E 33J 27U 27F 27G 28U 28F 28G 31U 31F 31G 33U 33F 33G 34U 34F 34G)   | 43C1708 | 2        |
| 2      | Memory module, 2GB DDR2 ECC FBDIMM PC2-5300 (667MHz) (models 29M 29A 29Q 29T 29K 29R 29E 29J 32M 32A 32Q 32T 32K 32R 32E 32J 29U 29G 29F 32U 32F 32G )  | 43C1709 | 2        |
| 3      | Heat sink, Low Acoustics (all models )  | 41R5542 | 2        |
| 4      | Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 33M 33A 33Q 33T 33K 33R 33E 33J 27U 27F 27G 28U 28F 28G 29U 29G 29F 31U 31F 31G 32U 32F 32G 33U 33F 33G 34U 34F 34G) | 43C1042 | 2        |
| 4      | Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 33M 33A 33Q 33T 33K 33R 33E 33J 27U 27F 27G 28U 28F 28G 29U 29G 29F 31U 31F 31G 32U 32F 32G 33U 33F 33G 34U 34F 34G) | 43C1043 | 2        |
| 5      | Internal speaker (see item 8) (models)  | 41R5532 | 2        |
| 6      | Diskette drive kit (includes diskette drive, bezel, and cable) (models)   | TBD     | 2        |
| 6      | Diskette drive, 3.5" 1.44MB 2-Mode (models)   | 40Y9105 | 2        |

| Item # | 6427 FRUs  | FRU#    | CRU Tier |
|--------|--|---------|----------|
| 6      | Diskette drive, 3.5" 1.44MB 2-Mode (models)  | 40Y9107 | 2        |
| 7      | Front Panel Cable Asm (USB, Audio, 1394) (all models)  | 41R5533 | 2        |
| 8      | Power switch/LED/speaker assembly (all models)   | 41R5532 | 2        |
| 9      | Hard disk drive, 250GB 7200rpm SATA (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 31M 31A 31Q 31T 31K 31R 31E 31J 33M 33A 33Q 33T 33K 33R 33E 33J 27U 27F 27G 28U 28F 28G 27U 27F 27G 28U 28F 28G 34U 34F 34G 31U 31F 31G 32U 32F 32G 33U 33F 33G 34U 34F 34G)                               | 40Y9036 | 2        |
| 9      | Hard disk drive, 146GB SAS - 15000 rpm, 3 Gb/s, 32MB cache (models 29M 29A 29Q 29T 29K 29R 29E 29J 32M 32A 32Q 32T 32K 32R 32E 32J 29U 29F 29G 32U 32F 32G)  | 43C6968 | 2        |
| 9      | Hard disk drive, 300GB SAS - 15000 rpm, 3 Gb/s, 32MB cache (models)  | 43C6969 | 2        |
| 10     | Fan Asm,Front 120 mm with grommets and fingerguard (all models )   | 41R5506 | 2        |
| 11     | Microprocessor, Intel Xeon™ 5110 - 1.60GHz, 4MB L2, 1066MHz FSB, G0 (models 2RU 24G)   | TBD     | N        |
| 11     | Microprocessor, Intel Xeon 5130 - 2.00GHz, 4MB L2, 1333MHz FSB, G0 (models 2M 12A 12Q 12K 12R 12E 12J 13M 13A 13Q 13K 13R 13E 13J 8M 18A 18Q 18K 18R 18E 18J 25U 25G )   | TBD     | N        |
| 11     | Microprocessor, Intel Xeon 5150 - 2.66GHz, 4MB L2, 1333MHz FSB, G0 (models 11M 11A 11Q 11K 11R 11E 11J )   | TBD     | N        |
| 11     | Microprocessor, Intel Xeon 5160 - 3.00GHz, 4MB L2, 1333MHz FSB, G0 (models 15M 15A 15Q 15K 15R 15E 15J )   | TBD     | N        |
| 11     | Microprocessor, Intel Xeon E5335 - 2.00GHz, 4MBx2 L2, 1333MHz FSB, G0 (models 14M 14A 14Q 14K 14R 14E 14J 16M 16A 16Q 16K 16R 16E 16J 17M 17A 17Q 17K 17R 17E 17J 19M 19A 19Q 19K 19R 19E 19J 21M 21A 21Q 21K 21R 21E 21J 22M 22A 22Q 22K 22R 22E 22J)   | TBD     | N        |
| 11     | Microprocessor, IntelXeon X5355 - 2.66GHz, 4MBx2 L2, 1333MHz FSB, G0 (models 23M 23A 23Q 23K 23R 23E 23J 26U 26G )   | TBD     | N        |
| 11     | Microprocessor, Intel Xeon E5205 - 1.86GHz, 6MB L2, 1066MHz FSB, 65W (models)  | 45C7445 | N        |
| 11     | Microprocessor, Intel Xeon E5260 - 3.33GHz, 6MB L2, 1333MHz FSB, 80W (models)  | 45C7446 | N        |
| 11     | Microprocessor, Intel Xeon E5405 - 2.00GHz, 12MB L2, 1333MHz FSB, 80W (models)   | 45C7447 | N        |
| 11     | Microprocessor, Intel Xeon E5410 - 2.33GHz, 12MB L2, 1333MHz FSB, 80W (models)   | 45C7448 | N        |
| 11     | Microprocessor, Intel Xeon E5420 - 2.50GHz, 12MB L2, 1333MHz FSB, 80W (models)   | 45C7449 | N        |
| 11     | Microprocessor, Intel Xeon E5430 - 2.66GHz, 12MB L2, 1333MHz FSB, 80W (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 33M 33A 33Q 33T 33K 33R 33E 33J 27U 27F 27G 28U 28F 28G 31U 31F 31G 32U 32F 32G 33U 33F 33G 34U 34F 34G) | 45C7450 | N        |
| 11     | Microprocessor, Intel Xeon E5440 - 2.83GHz, 12MB L2, 1333MHz FSB, 80W (models 29M 29A 29Q 29T 29K 29R 29E 29J 29U 29G 29F)   | 45C7451 | N        |
| 11     | Microprocessor, Intel Xeon E5450 - 3.00GHz, 12MB L2, 1333MHz FSB, 80W (models)   | 45C7452 | N        |
| 11     | Microprocessor, Intel Xeon X5460 - 3.16GHz, 12MB L2, 1333MHz FSB, 120W (models)  | 45C7453 | N        |
| 11     | Microprocessor, Intel Xeon X5450 - 3.00GHz, 12MB L2, 1333MHz FSB, 120W (models CTO)  | 45C8260 | N        |



| Item # | 6427 FRUs   | FRU#    | CRU Tier |
|--------|---|---------|----------|
| 12     | System Board, Skye - 2P Intel Socket LGA771, Seaburg, ESB2 (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 33M 33A 33Q 33T 33K 33R 33E 33J 27U 27F 27G 28U 28F 28G 29U 29G 29F 31U 31F 31G 32U 32F 32G 33U 33F 33G 34U 34F 34G) | 43C1516 | N        |
| 13     | Fan Asm, 120mm, system exhaust (all models )  | 41R5529 | 2        |

The FRUs listed in the following tables are not illustrated.

| 6427 FRUs  | FRU#    | CRU Tier |
|--|---------|----------|
| Diskette drive cable (all models)                | 41N8294 | 2        |
| Bezel Kit (all models)                           | 41R5521 | 2        |
| Handle with screws (all models)                  | 41R5526 | 2        |
| Cable Asm, SATA (all models)                     | 41R5481 | 2        |
| Fansink and RM, High End processors (all models) | 41R5502 | 2        |
| Cable Asm, SATA, optical disk drive (all models) | 41R5517 | 2        |
| Cover Asm (access panel) (all models)            | 41R5530 | 1        |
| Mechanical Shell Kit (all models)                | 41R5508 | N        |
| Miscellaneous Parts Kit (all models)             | 41R5531 | 2        |
| Cable Asm, Cover Detect Switch (all models)      | 41R5534 | 2        |
| Serial Port Cable (all models)                   | 41R5544 | 2        |
| System board Screw Kit (all models)              | 41R5547 | 2        |
| Label Kit (all models)                           | 41R5549 | 1        |
| Cable Asm, HDD SAS (all models)                  | 41R5513 | 2        |
| SAS HDD Filler (all models)                      | 41R5552 | 2        |
| Rail Kit (Option) (all models)                   | 41R5559 | 1        |
| Second Serial Port Cable (all models)            | 39K5021 | 2        |
| Thermal Sense Cable (all models)                 | 41R2511 | 2        |

| 6427 Keyboards (PS2 Preferred Pro) | FRU#    | CRU |
|------------------------------------|---------|-----|
| US English (models )               | 41A5039 | 1   |
| Arabic (models )                   | 41A5040 | 1   |
| Arabic/French (models )            | 41A5041 | 1   |
| Belgian/French (models )           | 41A5042 | 1   |
| Belgian/UK (models )               | 41A5043 | 1   |
| Bulgarian (models )                | 41A5045 | 1   |
| Hong Kong/Taiwan (models )         | 41A5046 | 1   |
| Czech (models )                    | 41A5047 | 1   |
| Danish (models )                   | 41A5048 | 1   |
| Dutch (models )                    | 41A5049 | 1   |
| French (models )                   | 41A5050 | 1   |
| French Canadian 445 (models )      | 41A5051 | 1   |

| <b>6427 Keyboards (PS2 Preferred Pro)</b> | <b>FRU#</b> | <b>CRU</b> |
|---|-------------|------------|
| French Canadian 58 (models )              | 41A5052     | 1          |
| German (models )                          | 41A5053     | 1          |
| Greek (models )                           | 41A5054     | 1          |
| Hebrew (models )                          | 41A5055     | 1          |
| Hungarian (models )                       | 41A5056     | 1          |
| Iceland (models )                         | 41A5057     | 1          |
| Italian (models )                         | 41A5058     | 1          |
| Japanese (models )                        | 41A5059     | 1          |
| Korean (models )                          | 41A5060     | 1          |
| LA Spanish (models )                      | 41A5061     | 1          |
| Norwegian (models )                       | 41A5062     | 1          |
| Polish (models )                          | 41A5063     | 1          |
| Portuguese (models )                      | 41A5064     | 1          |
| Romanian (models )                        | 41A5065     | 1          |
| Russian/Cyrilic (models )                 | 41A5066     | 1          |
| Serbian/Cyrilic (models )                 | 41A5067     | 1          |
| Slovak (models )                          | 41A5068     | 1          |
| Spanish (models )                         | 41A5069     | 1          |
| Swedish/Finn (models )                    | 41A5070     | 1          |
| Swiss F/G (models )                       | 41A5071     | 1          |
| Thailand (models )                        | 41A5072     | 1          |
| Turkish 440 (models )                     | 41A5073     | 1          |
| Turkish 179 (models )                     | 41A5074     | 1          |
| UK English (models )                      | 41A5075     | 1          |
| US Euro (models )                         | 41A5076     | 1          |
| Slovenian (models )                       | 41A5077     | 1          |
| Brazil/Portuguese (models )               | 41A5044     | 1          |

| <b>6427 Keyboards (Lenovo Productivity -USB)</b>  | <b>FRU#</b> | <b>CRU Tier</b> |
|---|-------------|-----------------|
| US English (models 27M 27A 27Q 27R 27E 28M 28A 28Q 28R 28E 34M 34A 34Q 34R 34E 29M 29A 29Q 29R 29E 31M 31A 31Q 31R 31E 32M 32A 32Q 32R 32E 33M 33A 33Q 33R 33E 27U 27G 28U 28G 29U 29G 31U 31G 32U 32G 33U 33G 34U 34G) | 41A5289     | 1               |
| Arabic (models )  | 41A5290     | 1               |
| Arabic/French (models 27G 28G 29G 31G 32G 33G 34G)  | 41A5291     | 1               |
| Belgian/French (models 27G 28G 29G 31G 32G 33G 34G)   | 41A5292     | 1               |
| Belgian/UK (models 27G 28G 29G 31G 32G 33G 34G)   | 41A5293     | 1               |
| Bulgarian (models 27G 28G 29G 31G 32G 33G 34G)  | 41A5295     | 1               |
| Hong Kong/Taiwan (models )  | 41A5296     | 1               |
| Czech (models 27G 28G 29G 31G 32G 33G 34G)  | 41A5297     | 1               |
| Danish (models 27G 28G 29G 31G 32G 33G 34G)   | 41A5298     | 1               |
| Dutch (models 27G 28G 29G 31G 32G 33G 34G)  | 41A5299     | 1               |

| <b>6427 Keyboards (Lenovo Productivity -USB)</b>         | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| French (models 27G 28G 29G 31G 32G 33G 34G)              | 41A5300     | 1               |
| French Canadian 445 (models 27G 28G 29G 31G 32G 33G 34G) | 41A5301     | 1               |
| French Canadian 58 (models 27G 28G 29G 31G 32G 33G 34G)  | 41A5302     | 1               |
| German (models 27G 28G 29G 31G 32G 33G 34G)              | 41A5303     | 1               |
| Greek (models 27G 28G 29G 31G 32G 33G 34G)               | 41A5304     | 1               |
| Greek/US (models 27G 28G 29G 31G 32G 33G 34G)            | 41A5305     | 1               |
| Hebrew (models 27G 28G 29G 31G 32G 33G 34G)              | 41A5306     | 1               |
| Hungarian (models 27G 28G 29G 31G 32G 33G 34G)           | 41A5307     | 1               |
| Iceland (models 27G 28G 29G 31G 32G 33G 34G)             | 41A5308     | 1               |
| Italian (models 27G 28G 29G 31G 32G 33G 34G)             | 41A5309     | 1               |
| Japanese (models 27J 28J 29J 34J 31J 32J 33J)            | 41A5310     | 1               |
| Korean (models 27K 28K 34K 29K 31K 32K 33K)              | 41A5311     | 1               |
| LA Spanish (models 27G 28G 29G 31G 32G 33G 34G)          | 41A5312     | 1               |
| Norwegian (models 27G 28G 29G 31G 32G 33G 34G)           | 41A5313     | 1               |
| Polish (models 27G 28G 29G 31G 32G 33G 34G)              | 41A5314     | 1               |
| Portuguese (models 27G 28G 29G 31G 32G 33G 34G)          | 41A5315     | 1               |
| Romanian 096 (models 27G 28G 29G 31G 32G 33G 34G)        | 41A5317     | 1               |
| Romanian 446 (models 27G 28G 29G 31G 32G 33G 34G)        | 41A5316     | 1               |
| Russian/Cyrillic (models 27G 28G 29G 31G 32G 33G 34G)    | 41A5318     | 1               |
| Serbian/Cyrillic (models 27G 28G 29G 31G 32G 33G 34G)    | 41A5319     | 1               |
| Slovak (models 27G 28G 29G 31G 32G 33G 34G)              | 41A5320     | 1               |
| Spanish (models 27G 28G 29G 31G 32G 33G 34G)             | 41A5321     | 1               |
| Swedish/Finnish (models 27G 28G 29G 31G 32G 33G 34G)     | 41A5322     | 1               |
| Swiss French/German (models 27G 28G 29G 31G 32G 33G 34G) | 41A5323     | 1               |
| Thailand (models 27T 28T 34T 29T 31T 32T 33T)            | 41A5324     | 1               |
| Turkish 440 (models 27G 28G 29G 31G 32G 33G 34G)         | 41A5325     | 1               |
| Turkish 179 (models 27G 28G 29G 31G 32G 33G 34G)         | 41A5326     | 1               |
| UK English (models 27G 28G 29G 31G 32G 33G 34G)          | 41A5327     | 1               |
| US Euro (models )  | 41A5328     | 1               |
| Slovenian (models 27G 28G 29G 31G 32G 33G 34G)           | 41A5329     | 1               |

| <b>6427 Keyboards (Preferred Pro Fingerprint Reader USB)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| US English (models )   | 41A5248     | 1               |
| Arabic (models )   | 41A5249     | 1               |
| Arabic/French (models )                                      | 41A5250     | 1               |
| Belgian/French (models )                                     | 41A5251     | 1               |
| Belgian/UK (models )   | 41A5252     | 1               |
| Brazil/Portuguese (models )                                  | 41A5253     | 1               |
| Bulgarian (models )  | 41A5254     | 1               |
| Czech (models )  | 41A5256     | 1               |
| Danish (models )   | 41A5257     | 1               |

| <b>6427 Keyboards (Preferred Pro Fingerprint Reader USB)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| Dutch (models )  | 41A5258     | 1               |
| French (models )   | 41A5259     | 1               |
| French Canadian 445 (models )                                | 41A5260     | 1               |
| French Canadian 58 (models )                                 | 41A5261     | 1               |
| German (models )   | 41A5262     | 1               |
| Greek (models )  | 41A5263     | 1               |
| Greek/US (models )   | 41A5264     | 1               |
| Hebrew (models )   | 41A5265     | 1               |
| Hungarian (models )  | 41A5266     | 1               |
| Iceland (models )  | 41A5267     | 1               |
| Italian 141 (models )  | 41A5268     | 1               |
| Japanese (models )   | 41A5269     | 1               |
| Korean (models )   | 41A5270     | 1               |
| LA/Spanish (models )   | 41A5271     | 1               |
| Norwegian (models )  | 41A5272     | 1               |
| Polish (models )   | 41A5273     | 1               |
| Portuguese (models )   | 41A5274     | 1               |
| Romanian 096 (models )                                       | 41A5275     | 1               |
| Romanian 446 (models )                                       | 41A5276     | 1               |
| Russian/Cyrillic (models )                                   | 41A5277     | 1               |
| Serbian/Cyrillic (models )                                   | 41A5278     | 1               |
| Slovak (models )   | 41A5279     | 1               |
| Spanish (models )  | 41A5280     | 1               |
| Swedish/Finn (models )                                       | 41A5281     | 1               |
| Swiss (models )  | 41A5282     | 1               |
| Thailand (models )   | 41A5283     | 1               |
| Turkish 440 (models )  | 41A5284     | 1               |
| Turkish 179 (models )  | 41A5285     | 1               |
| UK English (models )   | 41A5286     | 1               |
| US Euro (models )  | 41A5287     | 1               |
| Slovenian (models )  | 41A5288     | 1               |

| <b>6427 Keyboards (Wireless)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|----------------------------------|-------------|-----------------|
| US English (models )             | 41A5219     | 1               |
| China (models )                  |             | 1               |
| Arabic (models )                 |             | 1               |
| Arabic/French (models )          |             | 1               |
| Belgian/French (models )         | 41A5220     | 1               |
| Belgian/UK (models )             | 41A5221     | 1               |
| Brazil/Portuguese (models )      |             | 1               |
| Bulgarian (models )              |             | 1               |

| 6427 Keyboards (Wireless)     | FRU#    | CRU Tier |
|-------------------------------|---------|----------|
| Chinese/US (models )          | 41A5222 | 1        |
| Czech (models )               | 41A5223 | 1        |
| Danish (models )              | 41A5224 | 1        |
| Dutch (models )               | 41A5225 | 1        |
| French (models )              | 41A5226 | 1        |
| French Canadian 445 (models ) | 41A5227 | 1        |
| French Canadian 58 (models )  | 41A5228 | 1        |
| German (models )              | 41A5229 | 1        |
| Greek (models )               | 41A5230 | 1        |
| Greek/US (models )            | 41A5231 | 1        |
| Hebrew (models )              |         | 1        |
| Hungarian (models )           | 41A5232 | 1        |
| Iceland (models )             | 41A5233 | 1        |
| Italy (models )               |         | 1        |
| Italy (models )               | 41A5234 | 1        |
| Japanese (models )            | 41A5235 | 1        |
| Korean (models )              |         | 1        |
| LA/Spanish (models )          |         | 1        |
| Norwegian (models )           | 41A5236 | 1        |
| Polish (models )              | 41A5237 | 1        |
| Portuguese (models )          | 41A5238 | 1        |
| Romanian 096 (models )        |         | 1        |
| Romanian 446 (models )        |         | 1        |
| Russian/Cyrillic (models )    |         | 1        |
| Serbian/Cyrillic (models )    |         | 1        |
| Slovak (models )              | 41A5239 | 1        |
| Spanish (models )             | 41A5240 | 1        |
| Swedish/Finn (models )        | 41A5241 | 1        |
| Swiss (models )               | 41A5242 | 1        |
| Thailand (models )            |         | 1        |
| Turkish 440 (models )         |         | 1        |
| Turkish 179 (models )         |         | 1        |
| UK English (models )          | 41A5243 | 1        |
| US Euro (models )             | 41A5244 | 1        |
| US International (models )    | 41A5244 | 1        |
| Slovenian (models )           | 41A5245 | 1        |

| 6427 mice   | FRU#    | CRU Tier |
|---|---------|----------|
| Optical Wheel Mouse (400 DPI), USB - Red Wheel (Primary) (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 33M 33A 33Q 33T 33K 33R 33E 33J 27U 27F 27G 28U 28F 28G 29U 29G 29F 31U 31F 31G 32U 32F 32G 33U 33F 33G 34U 34F 34G)   | 41U3013 | 1        |
| Optical Wheel Mouse (400 DPI), USB - Red Wheel (Secondary) (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 33M 33A 33Q 33T 33K 33R 33E 33J 27U 27F 27G 28U 28F 28G 29U 29G 29F 31U 31F 31G 32U 32F 32G 33U 33F 33G 34U 34F 34G) | 41U3030 | 1        |
| ScrollPoint Optical Mouse (800DPI, USB) (models )   | 41U3019 | 1        |
| Wireless Mouse (models )  | 41U3023 | 1        |

| 6427 Adapters and miscellaneous FRUs   | FRU#    | CRU Tier |
|--|---------|----------|
| 3.5" 9-in-1 Media Card Reader (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 33M 33A 33Q 33T 33K 33R 33E 33J 27U 27F 27G 28U 28F 28G 29U 29G 29F 31U 31F 31G 32U 32F 32G 33U 33F 33G 34U 34F 34G) | 41R3378 | 2        |
| Transceiver (USB) (models )  | 41A5246 | 2        |
| L1 IEEE 1394 PCI Adapter (models 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 29M 29A 29Q 29T 29K 29R 29E 29J 28U 28F 28G 29U 29G 29F 34U 34F 34G)  | 41D2781 | 2        |
| Speakers (2-piece) Lenovo Logo (models )   | 41A5331 | 1        |
| Speakers (2-piece) Lenovo Logo (models )   | 41A5334 | 1        |
| Lenovo 3 pieces Speakers (China Only) (models)   | 45C8640 | 1        |
| Lenovo 2 pieces Speakers (China Only) (models)   | 45C8641 | 1        |
| Speaker Power brick - US, Canada, LA low voltage, ASEAN (models 11A 12A 13A 14A 15A 16A 17A 18A 19A 21A 22A 23A 24U 25U 26U 27A 28A 34A 29A 31A 32A 33A 27U 28U 29U 31U 32U 33U 34U)   | 89P8571 | 1        |
| Speaker Power brick - LA high voltage (non-APU) (models )  | 89P8575 | 1        |
| Speaker Power brick - China, Thailand (models 27T 28T 34T 29T 31T 32T 33T)   | 89P8581 | 1        |
| Speaker Power brick - Japan (models 27E 27J 28E 28J 29E 29J 31J 32J 33J)   | 89P8577 | 1        |
| Speaker Power brick - Brazil (models )   | 89P8583 | 1        |
| Speaker Power brick - Argentina (models )  | 41A4901 | 1        |
| Speaker Power brick - ANZ (models 27M 28M 34M 29M 31M 32M 33M)   | 89P8579 | 1        |
| Speaker Brick - Korea (models 27K 27R 28K 28R 34K 34R 29K 29R 31K 31R 32K 32R 33K 33R)   | 41A4903 | 1        |
| Speaker Brick - Hong Kong, EMEA (models 27G 28G 29G 31G 32G 33G 34G)   | 89P8573 | 1        |
| Speaker Brick - Taiwan (models )   | 41A4905 | 1        |
| Speaker Power brick - India, South Africa (models 27Q 28Q 29Q 31Q 32Q 33Q)   | 89P8585 | 1        |
| 256MB NVIDIA NVS290 (DMS59 Connector) - Quasar (models 33M 33A 33Q 33T 33K 33R 33E 33J 33U 33F 33G)  | 42Y6329 | 2        |
| 256MB NVIDIA FX370 (DVI-DL+DVI-DL) - Brown Dwarf (models)  | 42Y6331 | 2        |

| 6427 Adapters and miscellaneous FRUs   | FRU#    | CRU Tier |
|--|---------|----------|
| 512MB NVIDIA FX1700 (DVI-DL+DVI-DL+HDTV) - Pulsar (models 27M 27A 27Q 27T 27K 27R 27E 27J 28M 28A 28Q 28T 28K 28R 28E 28J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 27U 27F 27G 28U 28F 28G 29U 29F 29G 31U 31F 31G 32U 32F 32G) | 42Y6333 | 2        |
| 768MB NVIDIA FX4600 (DVI-DL+DVI-DL+ST) - Black Hole (models 34M 34A 34Q 34T 34K 34R 34E 34J 34U 34F 34G)   | 42Y6337 | 2        |
| 1536MB NVIDIA C870 Physics Card - Newton Card (models)   | 45C5226 | 2        |
| Soft Modem V.90/V.44 (models )   | 29R9729 | 2        |
| Sound Blaster X-Fi Sound Card (models 28M 28A 28Q 28T 28K 28R 28E 28J 34M 34A 34Q 34T 34K 34R 34E 34J 29M 29A 29Q 29T 29K 29R 29E 29J)   | 43C8028 | 2        |
| SAS Controller Card (models )  | 43C9285 | 2        |
| Lenovo Branded 3-Piece Speakers (models )  | TBD     | 1        |
| Lenovo Branded Headset (models )   | TBD     | 1        |
| Dongle Cable - DMS59 to dual DVI (included in Quasar L1) (models )   | 41X6398 | 2        |
| DVI to VGA Dongle (models)   | 45C7816 | 2        |
| Modem Phone Cable (models )  | 39K5120 | 2        |

| 6427 Power Cords   | FRU#    | CRU |
|--|---------|-----|
| Power cord - US (models 27A 28A 29A 31A 32A 33A 27T 28T 29T 31T 32T 33T 27U 28U 29U 31U 32U 33U 34U 27F 28F 29F 31F 32F 33F 34F) | 39M5080 | 1   |
| Power cord - China (models )   | 39M5205 | 1   |
| Power cord - Japan (models 27E 27J 28E 28J 29E 29J 31E 31J 32E 32J 33E 33J)  | 39M5193 | 1   |
| Power cord - Brazil (models )  | 39M5232 | 1   |
| Power cord - LA High Volt APU) (models )   | 39M5067 | 1   |
| Power cord - Australia / New Zealand (models 27M 28M 34M 29M 31M 32M 33M)  | 39M5102 | 1   |
| Power cord - Korea (models 27K 27R 28K 28R 34K 34R 29K 29R 31K 31R 32K 32R 33K 33R)  | 39M5212 | 1   |
| Power cord - Hong Kong (models )   | 39M5151 | 1   |
| Power cord - UK, Ireland, Singapore, Malaysia, Brunei (models 27A 28A 29A 31A 32A 33A 27G 28G 29G 31G 32G 33G 34G)               | 39M5150 | 1   |
| Power cord - Taiwan (models)   | 39M5246 | 1   |
| Power cord - Italy (models 27G 28G 29G 31G 32G 33G 34G)  | 39M5164 | 1   |
| Power cord - G models (models 27A 28A 29A 31A 32A 33A 27G 28G 29G 31G 32G 33G 34G)   | 39M5122 | 1   |
| Power cord - Denmark (models 27G 28G 29G 31G 32G 33G 34G)  | 39M5129 | 1   |
| Power cord - Switzerland (models 27G 28G 29G 31G 32G 33G 34G)  | 39M5157 | 1   |
| Power cord - Israel (models 27G 28G 29G 31G 32G 33G 34G)   | 39M5171 | 1   |
| Power cord - South Africa (models 27M 28M 34M 29M 31M 32M 33M 27A 28A 29A 31A 32A 33A 27G 28G 29G 31G 32G 33G 34G)               | 39M5143 | 1   |
| Power cord - India (models 27Q 28Q 29Q 31Q 32Q 33Q)  | 39M5004 | 1   |

| 6427 Windows XP Home Recovery CDs | FRU# | CRU |
|-----------------------------------|------|-----|
| US/UK/AP/TH (models )             |      | 1   |
| FR/CF (models )                   |      | 1   |

| 6427 Windows XP Home Recovery CDs | FRU# | CRU |
|-----------------------------------|------|-----|
| GR (models )                      |      | 1   |
| IT (models )                      |      | 1   |
| BR (models )                      |      | 1   |
| SP/LA (models )                   |      | 1   |
| DK (models )                      |      | 1   |
| NL (models )                      |      | 1   |
| AE (models )                      |      | 1   |
| SV (models )                      |      | 1   |
| HE (models )                      |      | 1   |
| FI (models )                      |      | 1   |
| NO (models )                      |      | 1   |
| PL (models )                      |      | 1   |
| PO (models )                      |      | 1   |
| RU (models )                      |      | 1   |
| RE (models )                      |      | 1   |
| HU (models )                      |      | 1   |
| CZ (models )                      |      | 1   |
| TR (models )                      |      | 1   |
| GK (models )                      |      | 1   |
| Japanese (models )                |      | 1   |
| Simplified Chinese (models )      |      | 1   |
| Taiwan-TC (models )               |      | 1   |
| Hong Kong-TC (models )            |      | 1   |
| Korea (models )                   |      | 1   |

| 6427 Windows XP Pro Recovery CDs | FRU# | CRU |
|----------------------------------|------|-----|
| US/UK/AP/TH (models )            |      | 1   |
| FR/CF (models )                  |      | 1   |
| GR (models )                     |      | 1   |
| IT (models )                     |      | 1   |
| BR (models )                     |      | 1   |
| SP/LA (models )                  |      | 1   |
| DK (models )                     |      | 1   |
| NL (models )                     |      | 1   |
| AE (models )                     |      | 1   |
| SV (models )                     |      | 1   |
| HE (models )                     |      | 1   |
| FI (models )                     |      | 1   |
| NO (models )                     |      | 1   |
| PL (models )                     |      | 1   |
| PO (models )                     |      | 1   |



| 6427 Windows XP Pro Recovery CDs                    | FRU# | CRU |
|---|------|-----|
| RU (models )  |      | 1   |
| RE (models )  |      | 1   |
| HU (models )  |      | 1   |
| CZ (models )  |      | 1   |
| TR (models )  |      | 1   |
| GK (models )  |      | 1   |
| SL (models )  |      | 1   |
| Japanese (models )                                  |      | 1   |
| Simplified Chinese (models )                        |      | 1   |
| Taiwan-TC (models )                                 |      | 1   |
| Hong Kong-TC (models )                              |      | 1   |
| Korea (models )                                     |      | 1   |
| Multilingual 1 XP-P -- EN, NL, FR, GR, IT (models ) |      | 1   |
| Multilingual 2 XP-P -- EN, DK, FI, NO, SV (models ) |      | 1   |

| 6427 Vista Home Basic 32 Recovery DVDs | FRU# | CRU |
|--|------|-----|
| US/UK/AP/TH (models )                  |      | 1   |
| FR/CF (models )                        |      | 1   |
| GR (models )                           |      | 1   |
| SP/LA (models )                        |      | 1   |
| BR (models )                           |      | 1   |
| IT (models )                           |      | 1   |
| JP (models )                           |      | 1   |
| NO (models )                           |      | 1   |
| SV (models )                           |      | 1   |
| DK (models )                           |      | 1   |
| NL (models )                           |      | 1   |
| CZ (models )                           |      | 1   |
| FI (models )                           |      | 1   |
| PL (models )                           |      | 1   |
| RU (models )                           |      | 1   |
| TR (models )                           |      | 1   |
| HU (models )                           |      | 1   |
| GK (models )                           |      | 1   |
| PO (models )                           |      | 1   |
| SC (models )                           |      | 1   |
| TW (models )                           |      | 1   |
| HK (models )                           |      | 1   |
| KR (models )                           |      | 1   |
| SL (models )                           |      | 1   |
| RE (models )                           |      | 1   |

| 6427 Vista Business 32 Recovery DVDs | FRU#    | CRU |
|--------------------------------------|---------|-----|
| English (models )                    | 45C9638 | 1   |
| FR/CF (models )                      | 45C9640 | 1   |
| GR (models )                         | 45C9641 | 1   |
| SP/LA (models )                      | 45C9642 | 1   |
| BR (models )                         | 45C9643 | 1   |
| IT (models )                         | 45C9644 | 1   |
| JP (models )                         | 45C9645 | 1   |
| NO (models )                         | 45C9646 | 1   |
| SV (models )                         | 45C9647 | 1   |
| DK (models )                         | 45C9648 | 1   |
| NL (models )                         | 45C9649 | 1   |
| CZ (models )                         | 45C9650 | 1   |
| FI (models )                         | 45C9651 | 1   |
| PL (models )                         | 45C9652 | 1   |
| RU (models )                         | 45C9653 | 1   |
| TR (models )                         | 45C9654 | 1   |
| HU (models )                         | 45C9655 | 1   |
| GK (models )                         | 45C9656 | 1   |
| PO (models )                         | 45C9663 | 1   |
| SC (models )                         | 45C9657 | 1   |
| TC (models )                         | 45C9658 | 1   |
| TC (models )                         | 45C9659 | 1   |
| KR (models)                          | 45C9660 | 1   |
| SL (models )                         | 45C9661 | 1   |
| RE (models )                         | 45C9639 | 1   |
| RO (models)                          | 45C9662 | 1   |
| SH (models)                          | 45C9664 | 1   |
| SK (models)                          | 45C9665 | 1   |
| AR (models)                          | 45C9666 | 1   |
| HE (models)                          | 45C9667 | 1   |

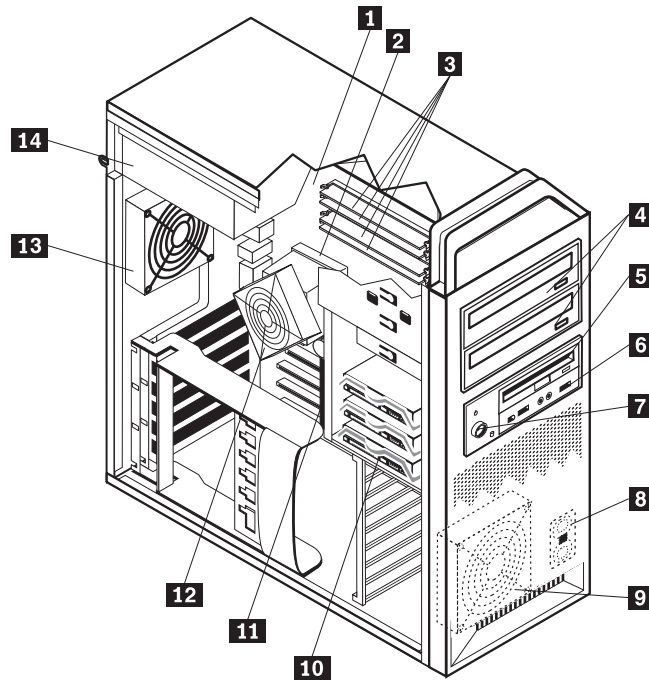
| 6427 Vista Home Pre 32 Recovery DVDs | FRU# | CRU Tier |
|--------------------------------------|------|----------|
| English (models )                    |      | 1        |
| Russian English (models )            |      | 1        |
| French/Canadian French (models )     |      | 1        |
| German (models )                     |      | 1        |
| Spanish/LA (models )                 |      | 1        |
| Brazil (models )                     |      | 1        |
| Italy (models )                      |      | 1        |
| Japanese (models )                   |      | 1        |

| 6427 Vista Home Pre 32 Recovery DVDs | FRU# | CRU Tier |
|--------------------------------------|------|----------|
| Norway (models )                     |      | 1        |
| Swedish (models )                    |      | 1        |
| Denmark (models )                    |      | 1        |
| Dutch (models )                      |      | 1        |
| Czech (models )                      |      | 1        |
| Finnish (models )                    |      | 1        |
| Polish (models )                     |      | 1        |
| Russian (models )                    |      | 1        |
| Turkish (models )                    |      | 1        |
| Hungarian (models )                  |      | 1        |
| Greek (models )                      |      | 1        |
| Simplified Chinese (models )         |      | 1        |
| Traditional Chinese (models )        |      | 1        |
| Traditional Chinese (models )        |      | 1        |
| Korean (models )                     |      | 1        |
| Slovenian (models )                  |      | 1        |
| Hebrew (models )                     |      | 1        |
| Romanian (models )                   |      | 1        |
| Bulgarian (models )                  |      | 1        |
| Croatian (models )                   |      | 1        |
| Portuguese (models )                 |      | 1        |
| Serbian-Latin (models )              |      | 1        |
| Ukrainian (models )                  |      | 1        |
| Slovakian (models )                  |      | 1        |

| 6427 Vista Business 64 Recovery DVDs  | FRU#    | CRU |
|---|---------|-----|
| English (models 7M 27A 27Q 27R 27E 28M 28A 28Q 28R 28E 34M 34A 34Q 34R 34E 29M 29A 29Q 29R 29E 31M 31A 31Q 31R 31E 32M 32A 32Q 32R 32E 33M 33A 33Q 33R 33E 27U 27G 28U 28G 29U 29G 31U 31G 32U 32G 33U 33G 34U 34G) | 45C9668 | 1   |
| RE (models)   | 45C9669 | 1   |
| FR/CF (models 27F 28F 29F 31F 32F 33F 34F)  | 45C9670 | 1   |
| GR (models 27G 28G 29G 31G 32G 33G 34G)   | 45C9671 | 1   |
| SP/LA (models 27G 28G 29G 31G 32G 33G 34G)  | 45C9672 | 1   |
| BR (models)   | 45C9673 | 1   |
| IT (models 27G 28G 29G 31G 32G 33G 34G)   | 45C9674 | 1   |
| JP (models 26J 27J 28J 29J 31J 32J 33J)   | 45C9675 | 1   |
| NO (models 27G 28G 29G 31G 32G 33G 34G)   | 45C9676 | 1   |
| SV (models 27G 28G 29G 31G 32G 33G 34G)   | 45C9677 | 1   |
| DK (models 27G 28G 29G 31G 32G 33G 34G)   | 45C9678 | 1   |
| NL (models 27G 28G 29G 31G 32G 33G 34G)   | 45C9679 | 1   |
| CZ (models 27G 28G 29G 31G 32G 33G 34G)   | 45C9680 | 1   |

| <b>6427 Vista Business 64 Recovery DVDs</b> | <b>FRU#</b> | <b>CRU</b> |
|---|-------------|------------|
| FI (models 27G 28G 29G 31G 32G 33G 34G)     | 45C9681     | 1          |
| PL (models 27G 28G 29G 31G 32G 33G 34G)     | 45C9682     | 1          |
| RU (models 27G 28G 29G 31G 32G 33G 34G )    | 45C9683     | 1          |
| TR (models 27G 28G 29G 31G 32G 33G 34G)     | 45C9684     | 1          |
| HU (models 27G 28G 29G 31G 32G 33G 34G)     | 45C9685     | 1          |
| GK (models 27G 28G 29G 31G 32G 33G 34G )    | 45C9686     | 1          |
| SC (models )                                | 45C9687     | 1          |
| TW (models )                                | 45C9688     | 1          |
| HK (models )                                | 45C9689     | 1          |
| KR (models 27K 28K 34K 29K 31K 32K 33K)     | 45C9690     | 1          |
| SL (models 27G 28G 29G 31G 32G 33G 34G)     | 45C9691     | 1          |
| PO (models)                                 | 45C9692     | 1          |
| SK (models)                                 | 45C9693     | 1          |
| AR (models)                                 | 45C9694     | 1          |
| HE (models)                                 | 45C9695     | 1          |

# Machine Type 6483



| Item # | 6483 FRUs   | FRU#    | CRU Tier |
|--------|---|---------|----------|
| 1      | System Board, 1P Intel Socket-T, X38, ICH9 (models 19U 19G 19M 19A 19Q 19C 19B 19H 19V 19K 19E 19R 19J 21U 21G 21M 21A 21Q 21C 21B 21H 21V 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 24M 24A 24Q 24T 24K 24R 24E 24J 33M 33A 33Q 33T 33K 33R 33E 33J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 22U 22F 22G 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 27U 27F 27C 27B 27H 27V 27U 27F 27C 27B 27H 27V 29U 29F 29C 29B 29H 29V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 19T 21T) | 43C1515 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E6750 - 2.66GHz, 2MBx2 L2, 1333MHz FSB, G0 (models)  | 43C1693 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E6850 - 3.00GHz, 2MBx2 L2, 1333MHz FSB, G0 (models 19U 19G 19M 19A 19Q 19C 19B 19H 19V 19K 19E 19R 19J 19U 19G 19M 19A 19Q 19C 19B 19H 19V 19K 19E 19R 19J 23M 23A 23Q 23T 23K 23R 23E 23J 26M 26A 26Q 26T 26K 26R 26E 26J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 23U 23F 23C 23B 23H 23V 26U 26F 26C 26B 26H 26V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 19T)  | 43C1694 | N        |
| 2      | Microprocessor, Intel Core 2 Quad Q6600 - 2.40GHz, 4MBx2 L2, 1066MHz FSB, G0 (models 27M 27A 27Q 27T 27K 27R 27E 27J 27U 27F 27C 27B 27H 27V 29U 27F 27C 27B 27H 27V)   | 43C1695 | N        |
| 2      | Microprocessor, Intel Core 2 Quad Q6700 - 2.66GHz, 4MBx2 L2, 1066MHz FSB, G0 (models 22M 22A 22Q 22T 22K 22R 22E 22J 25M 25A 25Q 25T 25K 25R 25E 25J 29M 29A 29Q 29T 29K 29R 29E 29J 22U 22F 22G 22C 22B 22H 22V 25U 25F 25C 25B 25H 25V 29U 29F 29C 29B 29H 29V)   | 43C6309 | N        |
| 2      | Microprocessor, Intel Core 2 Extreme QX6800 - 2.93GHz, 4MBx2 L2, 1066MHz FSB, G0 (models CTO 21T)   | 43C9271 | N        |

| Item # | 6483 FRUs   | FRU#    | CRU Tier |
|--------|---|---------|----------|
| 2      | Microprocessor, Intel Core 2 Extreme QX6850 - 3.00GHz, 4MBx2 L2, 1333MHz FSB, G0 (models 24M 24A 24Q 24T 24K 24R 24E 24J 33M 33A 33Q 33T 33K 33R 33E 33J 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V)   | 43C9580 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E8500 - 3.16GHz, 6MB L2, 1333MHz FSB (models CTO)  | 45C7735 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E8400 - 3.00GHz, 6MB L2, 1333MHz FSB (models CTO)  | 45C7736 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E8300 - 2.83GHz, 6MB L2, 1333MHz FSB (models CTO)  | 45C7737 | N        |
| 2      | Microprocessor, Intel Core 2 Duo E8200 - 2.66GHz, 6MB L2, 1333MHz FSB (models CTO)  | 45C7738 | N        |
| 2      | Microprocessor, Intel Core 2 Quad Q9550 - 2.83GHz, 12MB L2, 1333MHz FSB (models CTO)  | 45C7739 | N        |
| 2      | Microprocessor, Intel Core 2 Quad Q9450 - 2.66GHz, 12MB L2, 1333MHz FSB (models CTO)  | 45C7740 | N        |
| 2      | Microprocessor, Intel Core 2 Quad Q9300 - 2.50GHz, 12MB L2, 1333MHz FSB (models CTO)  | 45C7741 | N        |
| 2      | Microprocessor, Intel Core 2 Extreme QX9650 - 3.00GHz, 12MB L2, 1333MHz FSB (models CTO)  | 45R2316 | N        |
| 3      | Memory module, 512MB DDR3 ECC UDIMM PC3-8500 (1067MHz) (models)   | 43C1704 | 2        |
| 3      | Memory module, 1GB DDR3 ECC UDIMM PC3-8500 (1067MHz) (models 19U 19G 19M 19A 19Q 19C 19B 19H 19V 19K 19E 19R 19J 21U 21G 21M 21A 21Q 21C 21B 21H 21V 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 24M 24A 24Q 24T 24K 24R 24E 24J 33M 33A 33Q 33T 33K 33R 33E 33J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 22U 22F 22G 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 27U 27F 27C 27B 27H 27V 29U 29F 29C 29B 29H 29V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 19T 21T) | 43C1705 | 2        |
| 4      | Optical drive, DVD-ROM Drive - 16x/48x (SATA) (models)  | 43C1040 | 2        |
| 4      | Optical drive, DVD-ROM Drive - 16x/48x (SATA) (models)  | 41N3325 | 2        |
| 4      | Optical drive, DVD-ROM Drive - 16x/48x (SATA) (models)  | 42Y6324 | 2        |
| 4      | Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) (models 19U 19G 19M 19A 19Q 19C 19B 19H 19V 19K 19E 19R 19J 21U 21G 21M 21A 21Q 21C 21B 21H 21V 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 24M 24A 24Q 24T 24K 24R 24E 24J 33M 33A 33Q 33T 33K 33R 33E 33J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 22U 22F 22G 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 27U 27F 27C 27B 27H 27V 29U 29F 29C 29B 29H 29V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 19T)           | 43C1042 | 2        |

| Item # | 6483 FRUs   | FRU#    | CRU Tier |
|--------|---|---------|----------|
| 4      | Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) (models 19U 19G 19M 19A 19Q 19C 19B 19H 19V 19K 19E 19R 19J 21U 21G 21M 21A 21Q 21C 21B 21H 21V 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 24M 24A 24Q 24T 24K 24R 24E 24J 33M 33A 33Q 33T 33K 33R 33E 33J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 22U 22F 22G 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 27U 27F 27C 27B 27H 27V 27U 27F 27C 27B 27H 27V 29U 29F 29C 29B 29H 29V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 19T) | 43C1043 | 2        |
| 4      | Optical drive, Blu-Ray DVD Burner (SATA) (models 21U 21G 21M 21A 21Q 21C 21B 21H 21V 21K 21R 21E 21J 21T)   | 43C9584 | 2        |
| 5      | Diskette drive kit (includes diskette drive, bezel, and cable) (models 16U 16G 17U 17G )  | TBD     | 2        |
| 5      | Diskette drive, 3.5" 1.44MB 2-Mode (models)   | 40Y9105 | 2        |
| 5      | Diskette drive, 3.5" 1.44MB 2-Mode (models)   | 40Y9107 | 2        |
| 6      | Front Panel Cable Asm (USB, Audio, 1394) (all models)   | 41R5495 | 2        |
| 7      | Power switch/LED Cable assembly (all models)  | 41R5496 | 2        |
| 8      | Internal speaker and cable Asm (all models)   | 41R5494 | 2        |
| 9      | Fan, 92 mm Front Asm (all models)   | 41R5486 | 2        |
| 10     | Hard disk drive, 160GB 7200rpm SATA (models)  | 40Y9035 | 2        |
| 10     | Hard disk drive, 250GB 7200rpm SATA (models 11B 11H 11V 12C 12B 12H 12V 13B 13H 13V 14C 15C 18U 18G 19U 19G 19M 19A 19Q 19C 19B 19H 19V 19K 19E 19R 19J 22M 22A 22Q 22T 22K 22R 22E 22J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 22U 22F 22G 22C 22B 22H 22V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 29U 27F 27C 27B 27H 27V 29U 29F 29C 29B 29H 29V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 19T)  | 40Y9036 | 2        |
| 10     | Hard disk drive, 500GB 7200rpm SATA (models 21U 21G 21M 21A 21Q 21C 21B 21H 21V 21K 21R 21E 21J 21T)  | 41X5582 | 2        |
| 10     | Hard disk drive, 146GB SAS - 15000 rpm, 3 Gb/s, 32MB cache (models 23M 23A 23Q 23T 23K 23R 23E 23J 24M 24A 24Q 24T 24K 24R 24E 24J 33M 33A 33Q 33T 33K 33R 33E 33J 27M 27A 27Q 27T 27K 27R 27E 27J 23U 23F 23C 23B 23H 23V 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V 27B 27H 27V 27U 27F 27C 27B 27H 27V)   | 43C6968 | 2        |
| 11     | Hard disk drive fan and bracket Asm, 70x25 (all models)   | 41R5477 | 2        |
| 12     | Fan sink, 4 Heat Pipe (all models)  | 41R5479 | 2        |
| 12     | Heat Sink, Acoustic Solution (all models)   | 41R5540 | 2        |
| 13     | Fan Asm, 92 mm system exhaust (models)  | 41R5484 | 2        |

| Item # | 6483 FRUs   | FRU#    | CRU Tier |
|--------|---|---------|----------|
| 14     | Power supply, 650 Watt (models 19U 19G 19M 19A 19Q 19C 19B 19H 19V 19K 19E 19R 19J 21U 21G 21M 21A 21Q 21C 21B 21H 21V 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 24M 24A 24Q 24T 24K 24R 24E 24J 33M 33A 33Q 33T 33K 33R 33E 33J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 22U 22F 22G 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 27U 27F 27C 27B 27H 27V 27U 27F 27C 27B 27H 27V 29U 29F 29C 29B 29H 29V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 19T 21T) | 41A9712 | 2        |

The FRUs listed in the following tables are not illustrated.

| 6483 FRUs                                      | FRU#    | CRU Tier |
|--|---------|----------|
| Diskette drive cable (all models)              | 41N8294 | 2        |
| SATA Cable (optical disk drive) (all models)   | 41R5481 | 2        |
| SATA Cable (hard disk drive) (all models)      | 41N8298 | 2        |
| SAS Cable- (all models)                        | 41R5482 | 2        |
| Bezel Asm (all models)                         | 41N8296 | 2        |
| Handle with screws (all models)                | 41R5490 | 1        |
| Cover Asm (access panel) (all models)          | 41R5492 | 2        |
| Mechanical shell kit (all models)              | 41R5491 | N        |
| Miscellaneous Parts (all models)               | 41R5493 | 2        |
| Cable Asm, Cover Detect Switch (all models)    | 41R5497 | 2        |
| Serial Port Cable (all models)                 | 41R5544 | 2        |
| Label kit (all models)                         | 41R5549 | 1        |
| Systemboard Screw Kit (all models)             | 41R5547 | 2        |
| SAS HDD Filler (all models)                    | 41R5552 | 2        |
| Cable Asm, SAS Controller HDD LED (all models) | 41R5556 | 2        |
| Thermal Sense Cable (all models)               | 41R2511 | 2        |

| 6483 Keyboards (PS2 Preferred Pro) | FRU#    | CRU Tier |
|------------------------------------|---------|----------|
| US English (models )               | 41A5039 | 1        |
| Arabic (models )                   | 41A5040 | 1        |
| Arabic/French (models )            | 41A5041 | 1        |
| Belgian/French (models )           | 41A5042 | 1        |
| Belgian/UK (models )               | 41A5043 | 1        |
| Bulgarian (models )                | 41A5045 | 1        |
| Hong Kong/Taiwan (models )         | 41A5046 | 1        |
| Czech (models )                    | 41A5047 | 1        |
| Danish (models )                   | 41A5048 | 1        |
| Dutch (models )                    | 41A5049 | 1        |
| French (models )                   | 41A5050 | 1        |



| <b>6483 Keyboards (PS2 Preferred Pro)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|---|-------------|-----------------|
| French Canadian 445 (models )             | 41A5051     | 1               |
| French Canadian 58 (models )              | 41A5052     | 1               |
| German (models )                          | 41A5053     | 1               |
| Greek (models )                           | 41A5054     | 1               |
| Hebrew (models )                          | 41A5055     | 1               |
| Hungarian (models )                       | 41A5056     | 1               |
| Iceland (models )                         | 41A5057     | 1               |
| Italian (models )                         | 41A5058     | 1               |
| Japanese (models )                        | 41A5059     | 1               |
| Korean (models )                          | 41A5060     | 1               |
| LA Spanish (models )                      | 41A5061     | 1               |
| Norwegian (models )                       | 41A5062     | 1               |
| Polish (models )                          | 41A5063     | 1               |
| Portuguese (models )                      | 41A5064     | 1               |
| Romanian (models )                        | 41A5065     | 1               |
| Russian/Cyrilic (models )                 | 41A5066     | 1               |
| Serbian/Cyrilic (models )                 | 41A5067     | 1               |
| Slovak (models )                          | 41A5068     | 1               |
| Spanish (models )                         | 41A5069     | 1               |
| Swedish/Finn (models )                    | 41A5070     | 1               |
| Swiss F/G (models )                       | 41A5071     | 1               |
| Thailand (models )                        | 41A5072     | 1               |
| Turkish 440 (models )                     | 41A5073     | 1               |
| Turkish 179 (models )                     | 41A5074     | 1               |
| UK English (models )                      | 41A5075     | 1               |
| US Euro (models )                         | 41A5076     | 1               |
| Slovenian (models )                       | 41A5077     | 1               |
| Brazil/Portuguese (models )               | 41A5044     | 1               |

| <b>6483 Keyboards (Lenovo Productivity -USB)</b>   | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| US English (models 19U 19G 19M 19A 19Q 19H 19R 19E 22M 22A 22Q 22R 22E 23M 23A 23Q 23R 23E 24M 24A 24Q 24R 24E 33M 33A 33Q 33R 33E 25M 25A 25Q 25R 25E 26M 26A 26Q 26R 26E 27M 27A 27Q27R 27E 29M 29A 29Q 29R 29E 31M 31A 31Q 31R 31E 32M 32A 32Q 32E 32R 22U 22G 22H 23U 23G 23H 24U 24G 24H 33U 33G 33H 25U 25G 25H 26U 26G 26H 27U 27G 27H 29U 29G 29H 31U 31G 31H 32U 32G 32H) | 41A5289     | 1               |
| Arabic (models )   | 41A5290     | 1               |
| Arabic/French (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)   | 41A5291     | 1               |
| Belgian/French (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)  | 41A5292     | 1               |
| Belgian/UK (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)  | 41A5293     | 1               |
| Bulgarian (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)   | 41A5295     | 1               |
| Hong Kong/Taiwan (models 19B 19V 22B 22V 23B 23V 24B 24V 33B 33V 25B 25V 26B 26V 27B 27V 29B 29V 31B 31V 32B 32V)  | 41A5296     | 1               |

| <b>6483 Keyboards (Lenovo Productivity -USB)</b>                         | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| Czech (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)               | 41A5297     | 1               |
| Danish (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)              | 41A5298     | 1               |
| Dutch (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)               | 41A5299     | 1               |
| French (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G )             | 41A5300     | 1               |
| French Canadian 445 (models 22F 23F 24F 33F 25F 26F 27F 29F 31F 32F)     | 41A5301     | 1               |
| French Canadian 58 (models 22F 23F 24F 33F 25F 26F 27F 29F 31F 32F)      | 41A5302     | 1               |
| German (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)              | 41A5303     | 1               |
| Greek (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)               | 41A5304     | 1               |
| Greek/US (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)            | 41A5305     | 1               |
| Hebrew (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)              | 41A5306     | 1               |
| Hungarian (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G )          | 41A5307     | 1               |
| Iceland (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)             | 41A5308     | 1               |
| Italian (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)             | 41A5309     | 1               |
| Japanese (models 22J 23J 24J 33J 25J 26J 27J 29J 31J 32J)                | 41A5310     | 1               |
| Korean (models 22K 23K 24K 33K 25K 26K 27K 29K 31K 32K)                  | 41A5311     | 1               |
| LA Spanish (models)  | 41A5312     | 1               |
| Norwegian (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)           | 41A5313     | 1               |
| Polish (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)              | 41A5314     | 1               |
| Portuguese (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)          | 41A5315     | 1               |
| Romanian 096 (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)        | 41A5317     | 1               |
| Romanian 446 (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)        | 41A5316     | 1               |
| Russian/Cyrillic (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)    | 41A5318     | 1               |
| Serbian/Cyrillic (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)    | 41A5319     | 1               |
| Slovak (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)              | 41A5320     | 1               |
| Spanish (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)             | 41A5321     | 1               |
| Swedish/Finnish (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)     | 41A5322     | 1               |
| Swiss French/German (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G) | 41A5323     | 1               |
| Thailand (models 22T 23T 24T 33T 25T 26T 27T 29T 31T 32T 19T)            | 41A5324     | 1               |
| Turkish 440 (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)         | 41A5325     | 1               |
| Turkish 179 (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)         | 41A5326     | 1               |
| UK English (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)          | 41A5327     | 1               |
| US Euro (models)   | 41A5328     | 1               |
| Slovenian (models 19G 22G 23G 24G 33G 25G 26G 27G 29G 32G 32G)           | 41A5329     | 1               |

| <b>6483 Keyboards (Preferred Pro Fingerprint Reader USB)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| US English (models 21U 21G 21M 21A 21Q 21H 21R 21E )         | 41A5248     | 1               |
| Arabic (models )   | 41A5249     | 1               |
| Arabic/French (models 21G)                                   | 41A5250     | 1               |
| Belgian/French (models 21G)                                  | 41A5251     | 1               |
| Belgian/UK (models 21G)                                      | 41A5252     | 1               |
| Brazil/Portuguese (models 21G)                               | 41A5253     | 1               |

| <b>6483 Keyboards (Preferred Pro Fingerprint Reader USB)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| Bulgarian (models 21G)                                       | 41A5254     | 1               |
| Chinese/US (models 21C)                                      | 41A5255     | 1               |
| Czech (models 21G)   | 41A5256     | 1               |
| Danish (models 21G)  | 41A5257     | 1               |
| Dutch (models 21G)   | 41A5258     | 1               |
| French (models 21G)  | 41A5259     | 1               |
| French Canadian 445 (models )                                | 41A5260     | 1               |
| French Canadian 58 (models )                                 | 41A5261     | 1               |
| German (models 21G)  | 41A5262     | 1               |
| Greek (models 21G)   | 41A5263     | 1               |
| Greek/US (models 21G)  | 41A5264     | 1               |
| Hebrew (models 21G)  | 41A5265     | 1               |
| Hungarian (models 21G)                                       | 41A5266     | 1               |
| Iceland (models 21G)   | 41A5267     | 1               |
| Italian 141 (models 21G)                                     | 41A5268     | 1               |
| Japanese (models 21J)  | 41A5269     | 1               |
| Korean (models 21K)  | 41A5270     | 1               |
| LA/Spanish (models )   | 41A5271     | 1               |
| Norwegian (models 21G)                                       | 41A5272     | 1               |
| Polish (models 21G)  | 41A5273     | 1               |
| Portuguese (models 21G)                                      | 41A5274     | 1               |
| Romanian 096 (models 21G)                                    | 41A5275     | 1               |
| Romanian 446 (models 21G)                                    | 41A5276     | 1               |
| Russian/Cyrillic (models 21G)                                | 41A5277     | 1               |
| Serbian/Cyrillic (models 21G)                                | 41A5278     | 1               |
| Slovak (models 21G)  | 41A5279     | 1               |
| Spanish (models 21G)   | 41A5280     | 1               |
| Swedish/Finn (models 21G)                                    | 41A5281     | 1               |
| Swiss (models 21G)   | 41A5282     | 1               |
| Thailand (models 21G 21T)                                    | 41A5283     | 1               |
| Turkish 440 (models 21G)                                     | 41A5284     | 1               |
| Turkish 179 (models 21G)                                     | 41A5285     | 1               |
| UK English (models 21G)                                      | 41A5286     | 1               |
| US Euro (models )  | 41A5287     | 1               |
| Slovenian (models 21G)                                       | 41A5288     | 1               |

| <b>6483 Keyboards (Wireless)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|----------------------------------|-------------|-----------------|
| US English (models )             | 41A5219     | 1               |
| China (models )                  |             | 1               |
| Arabic (models )                 |             | 1               |
| Arabic/French (models )          |             | 1               |

| 6483 Keyboards (Wireless)     | FRU#    | CRU Tier |
|-------------------------------|---------|----------|
| Belgian/French (models )      | 41A5220 | 1        |
| Belgian/UK (models )          | 41A5221 | 1        |
| Brazil/Portuguese (models )   |         | 1        |
| Bulgarian (models )           |         | 1        |
| Chinese/US (models )          | 41A5222 | 1        |
| Czech (models )               | 41A5223 | 1        |
| Danish (models )              | 41A5224 | 1        |
| Dutch (models )               | 41A5225 | 1        |
| French (models )              | 41A5226 | 1        |
| French Canadian 445 (models ) | 41A5227 | 1        |
| French Canadian 58 (models )  | 41A5228 | 1        |
| German (models )              | 41A5229 | 1        |
| Greek (models )               | 41A5230 | 1        |
| Greek/US (models )            | 41A5231 | 1        |
| Hebrew (models )              |         | 1        |
| Hungarian (models )           | 41A5232 | 1        |
| Iceland (models )             | 41A5233 | 1        |
| Italy (models )               |         | 1        |
| Italy (models )               | 41A5234 | 1        |
| Japanese (models )            | 41A5235 | 1        |
| Korean (models )              |         | 1        |
| LA/Spanish (models )          |         | 1        |
| Norwegian (models )           | 41A5236 | 1        |
| Polish (models )              | 41A5237 | 1        |
| Portuguese (models )          | 41A5238 | 1        |
| Romanian 096 (models )        |         | 1        |
| Romanian 446 (models )        |         | 1        |
| Russian/Cyrillic (models )    |         | 1        |
| Serbian/Cyrillic (models )    |         | 1        |
| Slovak (models )              | 41A5239 | 1        |
| Spanish (models )             | 41A5240 | 1        |
| Swedish/Finn (models )        | 41A5241 | 1        |
| Swiss (models )               | 41A5242 | 1        |
| Thailand (models )            |         | 1        |
| Turkish 440 (models )         |         | 1        |
| Turkish 179 (models )         |         | 1        |
| UK English (models )          | 41A5243 | 1        |
| US Euro (models )             | 41A5244 | 1        |
| US International (models )    | 41A5244 | 1        |
| Slovenian (models )           | 41A5245 | 1        |

| 6483 mice   | FRU#    | CRU Tier |
|---|---------|----------|
| Optical Wheel Mouse (400 DPI), USB - Red Wheel (Primary) (all models)   | 41U3013 | 1        |
| Optical Wheel Mouse (400 DPI), USB - Red Wheel (Secondary) (all models) | 41U3030 | 1        |
| ScrollPoint Optical Mouse (800DPI, USB) (models )                       | 41U3019 | 1        |
| Wireless Mouse (models )  | 41U3023 | 1        |

| 6483 Adapters and miscellaneous FRUs   | FRU#    | CRU Tier |
|--|---------|----------|
| 3.5" 9-in-1 Media Card Reader (models 19U 19G 19M 19A 19Q 19C 19B 19H 19V 19K 19E 19R 19J 21U 21G 21M 21A 21Q 21C 21B 21H 21V 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 24M 24A 24Q 24T 24K 24R 24E 24J 33M 33A 33Q 33T 33K 33R 33E 33J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 22U 22F 22G 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 27U 27F 27C 27B 27H 27V 29U 29F 29C 29B 29H 29V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 19T 21T) | 41R3378 | 2        |
| Transceiver (USB) (models )  | 41A5246 | 2        |
| L1 IEEE 1394 PCI Adapter (models 24M 24A 24Q 24T 24K 24R 24E 24J 33M 33A 33Q 33T 33K 33R 33E 33J 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V)  | 41D2781 | 2        |
| Speakers (2-piece) Lenovo Logo (models )   | 41A5331 | 1        |
| Speakers (2-piece) Lenovo Logo (models )   | 41A5334 | 1        |
| Lenovo 3 pieces Speakers (China Only) (models )  | 45C8640 | 1        |
| Lenovo 2 pieces Speakers (China Only) (models )  | 45C8641 | 1        |
| Speaker Power brick - US, Canada, LA low voltage, ASEAN (models 19U 21U 22U 23U 24U 25U 26U 27U 29U 31U 32U 33U)   | 89P8571 | 1        |
| Speaker Power brick - LA high voltage (non-APU) (models )  | 89P8575 | 1        |
| Speaker Power brick - China, Thailand (models 19C 21C 22C 24C 25C 26C 27C 29C 31C 32C 33C 19T 21T)   | 89P8581 | 1        |
| Speaker Power brick - Japan (models 19J 21J 19E 21E)   | 89P8577 | 1        |
| Speaker Power brick - Brazil (models )   | 89P8583 | 1        |
| Speaker Power brick - Argentina (models )  | 41A4901 | 1        |
| Speaker Power brick - ANZ (models 22M 23M 24M 25M 26M 27M 29M 31M 32M 33M)   | 89P8579 | 1        |
| Speaker Brick - Korea (models 19K 21K 21R 19R)   | 41A4903 | 1        |
| Speaker Brick - Hong Kong, EMEA (models 19G 21G 19H 21H 22G 22H 23G 23H 24G 24H 25G 25H 26G 26H 27G 27H 29G 29H 31G 31H 32G 32H 33G 33H)   | 89P8573 | 1        |
| Speaker Brick - Taiwan (models 19V 21V 22V 23V 24V 25V 26V 27V 29V 31V 32V 33V)  | 41A4905 | 1        |
| Speaker Power brick - India, South Africa (models 19Q 21Q)   | 89P8585 | 1        |
| 256MB NVIDIA NVS290 (DMS59 Connector) - Quasar (models )   | 42Y6329 | 2        |
| 256MB NVIDIA FX370 (DVI-DL+DVI-DL) - Brown Dwarf (models )   | 42Y6331 | 2        |
| 512MB NVIDIA FX1700 (DVI-DL+DVI-DL+HDTV) - Pulsar (models 19U 19G 19M 19A 19Q 19C 19B 19H 19V 19K 19E 19R 19J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 27M 27A 27Q 27T 27K 27R 27E 27J 29M 29A 29Q 29T 29K 29R 29E 29J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 27U 27F 27C 27B 27H 27V 29U 29F 29C 29B 29H 29V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 19T )  | 42Y6333 | 2        |

| 6483 Adapters and miscellaneous FRUs   | FRU#    | CRU Tier |
|--|---------|----------|
| 768MB NVIDIA FX4600 (DVI-DL+DVI-DL+ST) - Black Hole (models 21U 21G 21M 21A 21Q 21C 21B 21H 21V 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 24M 24A 24Q 24T 24K 24R 24E 24J 33M 33A 33Q 33T 33K 33R 33E 33J 22U 22F 22G 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V 21T) | 42Y6337 | 2        |
| 1536MB NVIDIA C870 Physics Card - Newton Card (models)   | 45C5226 | 2        |
| Soft Modem V.90/V.44 (models )   | 29R9729 | 2        |
| Sound Blaster X-Fi Sound Card (models 21U 21G 21M 21A 21Q 21C 21B 21H 21V 21K 21R 21E 21J 24M 24A 24Q 24T 24K 24R 24E 24J 33M 33A 33Q 33T 33K 33R 33E 33J 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V )  | 43C8028 | 2        |
| SAS Controller Card (models 23M 23A 23Q 23T 23K 23R 23E 23J 24M 24A 24Q 24T 24K 24R 24E 27M 27A 27Q 27T 27K 27R 27E 27J 23B 23H 23V 24U 24F 24C 24B 24H 24V 33U 33F 33C 33B 33H 33V 27U 27F 27C 27B 27H 27V )  | 43C9285 | 2        |
| Lenovo Branded 3-Piece Speakers (models )  | TBD     | 1        |
| Lenovo Branded Headset (models )   | TBD     | 1        |
| Dongle Cable - DMS59 to dual DVI (included in Quasar L1) (models)  | 41X6398 | 2        |
| DVI to VGA Dongle (models)   | 45C7816 | 2        |
| Modem Phone Cable (models)   | 39K5120 | 2        |

| 6483 Power Cords   | FRU#    | CRU Tier |
|--|---------|----------|
| Power cord - US (models 19U 19A 20U 21A 22A 23A 24A 33A 25A 26A 27A 29A 31A 32A 22U 22F 23U 23F 24U 24F 25U 25F 26U 26F 27U 27F 29U 29F 31U 31F 32U 32F 33U 33F 19T 21T) | 39M5080 | 1        |
| Power cord - China (models 19C 21C 22C 23C 24C 25C 26C 27C 29C 31C 32C 33C)  | 39M5205 | 1        |
| Power cord - Japan (models 19J 21J 19E 21E 22E 22J 23E 23J 24E 23J 24E 24J 33E 33J 25E 25J 26E 26J 27E 27J 29E 29J 31E 31J 32E 32J)                                      | 39M5193 | 1        |
| Power cord - Brazil (models )  | 39M5232 | 1        |
| Power cord - LA High Volt APU) (models )   | 39M5067 | 1        |
| Power cord - Australia / New Zealand (models 19M 21M 22M 23M 24M 33M 25M 26M 27M 29M 31M 32M)  | 39M5102 | 1        |
| Power cord - Korea (models 19K 21K 21R 19R 22K 22R 23K 23R 24K 24R 33K 33R 25K 25R 26K 26R 27K 27R 29K 29R 31K 31R 32K 32R)  | 39M5212 | 1        |
| Power cord - Hong Kong (models 19B 19H 21B 21H 22B 22H 223B 23H 24B 24H 25B 25H 26B 26H 27B 27H 29B 29H 31B 31H 32B 32H 33B 33H)   | 39M5151 | 1        |
| Power cord - UK, Ireland, Singapore, Malaysia, Brunei (models 19G 19A 21G 21A 22A 23A 24A 33A 25A 26A 27A 29A 31A 32A 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)       | 39M5150 | 1        |
| Power cord - Taiwan (models 19V 21V 22V 23V 24V 25V 26V 27V 28V 29V 31V 32V 33V)   | 39M5246 | 1        |
| Power cord - Italy (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)  | 39M5164 | 1        |
| Power cord - G models (models 19G 21G 19A 21A 22A 23A 24A 33A 25A 26A 27A 29A 31A 32A 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)                                       | 39M5122 | 1        |
| Power cord - Denmark (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)  | 39M5129 | 1        |
| Power cord - Switzerland (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)  | 39M5157 | 1        |
| Power cord - Israel (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)   | 39M5171 | 1        |

| 6483 Power Cords   | FRU#    | CRU Tier |
|--|---------|----------|
| Power cord - South Africa (models 19G 21G 19M 21M 19A 21A 22M 23M 24M 33M 25M 26M 27M 29M 31M 32M 22A 23A 24A 33A 25A 26A 27A 29A 31A 32A 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G) | 39M5143 | 1        |
| Power cord - India (models 19Q 21Q )   | 39M5004 | 1        |

| 6483 Windows XP Home Recovery CDs | FRU# | CRU Tier |
|-----------------------------------|------|----------|
| US/UK/AP/TH (models )             |      | 1        |
| FR/CF (models )                   |      | 1        |
| GR (models )                      |      | 1        |
| IT (models )                      |      | 1        |
| BR (models )                      |      | 1        |
| SP/LA (models )                   |      | 1        |
| DK (models )                      |      | 1        |
| NL (models )                      |      | 1        |
| AE (models )                      |      | 1        |
| SV (models )                      |      | 1        |
| HE (models )                      |      | 1        |
| FI (models )                      |      | 1        |
| NO (models )                      |      | 1        |
| PL (models )                      |      | 1        |
| PO (models )                      |      | 1        |
| RU (models )                      |      | 1        |
| RE (models )                      |      | 1        |
| HU (models )                      |      | 1        |
| CZ (models )                      |      | 1        |
| TR (models )                      |      | 1        |
| GK (models )                      |      | 1        |
| Japanese (models )                |      | 1        |
| Simplified Chinese (models )      |      | 1        |
| Taiwan-TC (models )               |      | 1        |
| Hong Kong-TC (models )            |      | 1        |
| Korea (models )                   |      | 1        |

| 6483 Windows XP Pro Recovery CDs | FRU# | CRU Tier |
|----------------------------------|------|----------|
| US/UK/AP/TH (models )            |      | 1        |
| FR/CF (models )                  |      | 1        |
| GR (models )                     |      | 1        |
| IT (models )                     |      | 1        |
| BR (models )                     |      | 1        |
| SP/LA (models )                  |      | 1        |
| DK (models )                     |      | 1        |

| 6483 Windows XP Pro Recovery CDs                    | FRU# | CRU Tier |
|---|------|----------|
| NL (models )  |      | 1        |
| AE (models )  |      | 1        |
| SV (models )  |      | 1        |
| HE (models )  |      | 1        |
| FI (models )  |      | 1        |
| NO (models )  |      | 1        |
| PL (models )  |      | 1        |
| PO (models )  |      | 1        |
| RU (models )  |      | 1        |
| RE (models )  |      | 1        |
| HU (models )  |      | 1        |
| CZ (models )  |      | 1        |
| TR (models )  |      | 1        |
| GK (models )  |      | 1        |
| SL (models )  |      | 1        |
| Japanese (models )                                  |      | 1        |
| Simplified Chinese (models )                        |      | 1        |
| Taiwan-TC (models )                                 |      | 1        |
| Hong Kong-TC (models )                              |      | 1        |
| Korea (models )                                     |      | 1        |
| Multilingual 1 XP-P -- EN, NL, FR, GR, IT (models ) |      | 1        |
| Multilingual 2 XP-P -- EN, DK, FI, NO, SV (models ) |      | 1        |

| 6483 Vista Home Basic 32 Recovery DVDs | FRU# | CRU |
|--|------|-----|
| US/UK/AP/TH (models )                  |      | 1   |
| FR/CF (models )                        |      | 1   |
| GR (models )                           |      | 1   |
| SP/LA (models )                        |      | 1   |
| BR (models )                           |      | 1   |
| IT (models )                           |      | 1   |
| JP (models )                           |      | 1   |
| NO (models )                           |      | 1   |
| SV (models )                           |      | 1   |
| DK (models )                           |      | 1   |
| NL (models )                           |      | 1   |
| CZ (models )                           |      | 1   |
| FI (models )                           |      | 1   |
| PL (models )                           |      | 1   |
| RU (models )                           |      | 1   |
| TR (models )                           |      | 1   |
| HU (models )                           |      | 1   |



| 6483 Vista Home Basic 32 Recovery DVDs | FRU# | CRU |
|--|------|-----|
| GK (models )                           |      | 1   |
| PO (models )                           |      | 1   |
| SC (models )                           |      | 1   |
| TW (models )                           |      | 1   |
| HK (models )                           |      | 1   |
| KR (models )                           |      | 1   |
| SL (models )                           |      | 1   |
| RE (models )                           |      | 1   |

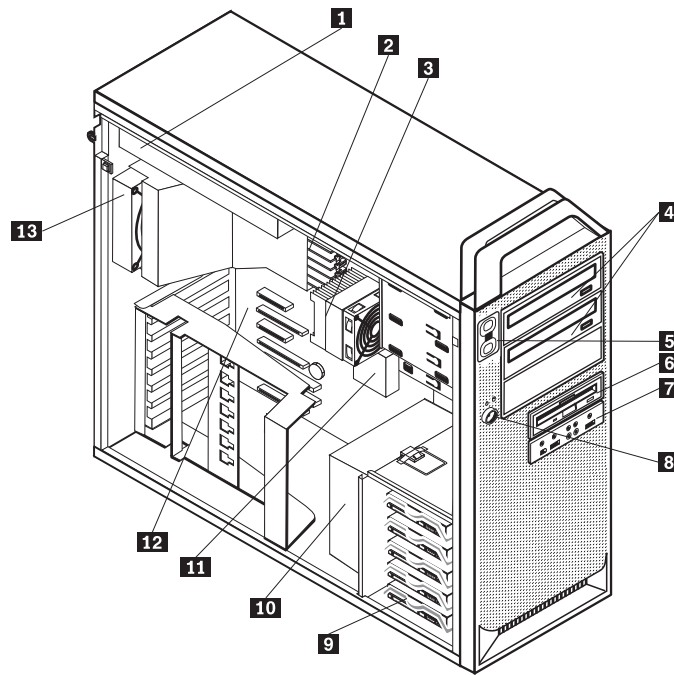
| 6483 Vista Business 32 Recovery DVDs | FRU#    | CRU |
|--------------------------------------|---------|-----|
| English (models )                    | 45C9638 | 1   |
| FR/CF (models )                      | 45C9640 | 1   |
| GR (models )                         | 45C9641 | 1   |
| SP/LA (models )                      | 45C9642 | 1   |
| BR (models )                         | 45C9643 | 1   |
| IT (models )                         | 45C9644 | 1   |
| JP (models )                         | 45C9645 | 1   |
| NO (models )                         | 45C9646 | 1   |
| SV (models )                         | 45C9647 | 1   |
| DK (models )                         | 45C9648 | 1   |
| NL (models )                         | 45C9649 | 1   |
| CZ (models )                         | 45C9650 | 1   |
| FI (models )                         | 45C9651 | 1   |
| PL (models )                         | 45C9652 | 1   |
| RU (models )                         | 45C9653 | 1   |
| TR (models )                         | 45C9654 | 1   |
| HU (models )                         | 45C9655 | 1   |
| GK (models )                         | 45C9656 | 1   |
| PO (models )                         | 45C9663 | 1   |
| SC (models )                         | 45C9657 | 1   |
| TC (models )                         | 45C9658 | 1   |
| TC (models )                         | 45C9659 | 1   |
| KR (models )                         | 45C9660 | 1   |
| SL (models )                         | 45C9661 | 1   |
| RE (models )                         | 45C9639 | 1   |
| RO (models )                         | 45C9662 | 1   |
| SH (models )                         | 45C9664 | 1   |
| SK (models )                         | 45C9665 | 1   |
| AR (models )                         | 45C9666 | 1   |
| HE (models )                         | 45C9667 | 1   |

| 6483 Vista Home Pre 32 Recovery DVDs | FRU# | CRU Tier |
|--------------------------------------|------|----------|
| English (models )                    |      | 1        |
| Russian English (models )            |      | 1        |
| French/Canadian French (models )     |      | 1        |
| German (models )                     |      | 1        |
| Spanish/LA (models )                 |      | 1        |
| Brazil (models )                     |      | 1        |
| Italy (models )                      |      | 1        |
| Japanese (models )                   |      | 1        |
| Norway (models )                     |      | 1        |
| Swedish (models )                    |      | 1        |
| Denmark (models )                    |      | 1        |
| Dutch (models )                      |      | 1        |
| Czech (models )                      |      | 1        |
| Finnish (models )                    |      | 1        |
| Polish (models )                     |      | 1        |
| Russian (models )                    |      | 1        |
| Turkish (models )                    |      | 1        |
| Hungarian (models )                  |      | 1        |
| Greek (models )                      |      | 1        |
| Simplified Chinese (models )         |      | 1        |
| Traditional Chinese (models )        |      | 1        |
| Traditional Chinese (models )        |      | 1        |
| Korean (models )                     |      | 1        |
| Slovenian (models )                  |      | 1        |
| Hebrew (models )                     |      | 1        |
| Romanian (models )                   |      | 1        |
| Bulgarian (models )                  |      | 1        |
| Croatian (models )                   |      | 1        |
| Portuguese (models )                 |      | 1        |
| Serbian-Latin (models )              |      | 1        |
| Ukrainian (models )                  |      | 1        |
| Slovakian (models )                  |      | 1        |

| 6483 Vista Business 64 Recovery DVDs  | FRU#    | CRU |
|---|---------|-----|
| English (models 19U 19G 19M 19A 19Q 19H 19R 19E 21U 21G 21M 21A 21Q 21H 21R 21E 22M 22A 22Q 22R 22E 23M 23A 23Q 23R 23E 24M 24A 24Q 24R 24E 33M 33A 33Q 33R 33E 25M 25A 25Q 25R 25E 26M 26A 26Q 26R 26E 27M 27A 27Q27R 27E 29M 29A 29Q 29R 29E 31M 31A 31Q 31R 31E 32M 32A 32Q 32E 32R 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G 22U 23U 24U 25U 26U 27U 29U 31U 32U 33U) | 45C9668 | 1   |
| RE (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)   | 45C9669 | 1   |
| FR/CF (models 22F 23F 24F 25F 26F 27F 28F 29F31F 32F 33F)   | 45C9670 | 1   |
| GR (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)   | 45C9671 | 1   |

| 6483 Vista Business 64 Recovery DVDs                               | FRU#    | CRU |
|--|---------|-----|
| SP/LA (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G) | 45C9672 | 1   |
| BR (models)  | 45C9673 | 1   |
| IT (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9674 | 1   |
| JP (models 19J 21J 22J 23J 24J 33J 25J 26J 27J 29J 31J 32J)        | 45C9675 | 1   |
| NO (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9676 | 1   |
| SV (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9677 | 1   |
| DK (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9678 | 1   |
| NL (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9679 | 1   |
| CZ (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9680 | 1   |
| FI (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9681 | 1   |
| PL (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9682 | 1   |
| RU (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9683 | 1   |
| TR (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9684 | 1   |
| HU (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9685 | 1   |
| GK (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9686 | 1   |
| SC (models 19C 21C 22C 23C 24C 25C 26C 27C 29C 31C 32C 33C)        | 45C9687 | 1   |
| TW (models 19V 21V 22V 23V 24V 25V 26V 27V 29V 31V 32V 33V)        | 45C9688 | 1   |
| HK (models 19B 21B 22B 23B 24B 25B 26B 27B 29B 31B 32B 33B)        | 45C9689 | 1   |
| KR (models 22K 23K 24K 33K 25K 26K 27K 29K 31K 32K)                | 45C9690 | 1   |
| SL (models 19G 21G 22G 23G 24G 25G 26G 27G 28G 29G 31G 32G 33G)    | 45C9691 | 1   |
| PO (models)  | 45C9692 | 1   |
| SK (models)  | 45C9693 | 1   |
| AR (models)  | 45C9694 | 1   |
| HE (models)  | 45C9695 | 1   |

# Machine Type 6493



| Item # | 6493 FRUs  | FRU#    | CRU Tier |
|--------|--|---------|----------|
| 1      | Power supply, 1000 Watt (models 11C 11B 11H 11V 12C 12B 12H 12V 13C 13B 13H 13V 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 19M 19A 19Q 19T 19K 19R 19E 19J 21M 21A 21Q 21T 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 33M 33A 33Q 33T 33K 33R 33E 33J 27M 27A 27Q 27T 27K 27R 27E 27J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 19U 19F 19G 19C 19B 19H 19V 21U 21F 21C 21B 21H 21V 22U 22F 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 33U 33F 33C 33B 33H 33V 27U 27F 27C 27B 27H 27V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 17T 18T) | 41A9709 | N        |
| 2      | Memory module, 1GB DDR2 ECC FBDIMM PC2-5300 (667MHz) (models 11C 11B 11H 11V 12C 12B 12H 12V 13C 13B 13H 13V 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 19M 19A 19Q 19T 19K 19R 19E 19J 23M 23A 23Q 23T 23K 23R 23E 23J 25M 25A 25Q 25T 25K 25R 25E 25J 27M 27A 27Q 27T 27K 27R 27E 27J 19U 19F 19G 19C 19B 19H 19V 23U 23F 23C 23B 23H 23V 25U 25F 25C 25B 25H 25V 27U 27F 27C 27B 27H 27V 17T)  | 43C1708 | 2        |
| 2      | Memory module, 2GB DDR2 ECC FBDIMM PC2-5300 (667MHz) (models 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 21M 21A 21Q 21T 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 26M 26A 26Q 26T 26K 26R 26E 26J 33M 33A 33Q 33T 33K 33R 33E 33J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 21U 21F 21C 21B 21H 21V 22U 22F 22C 22B 22H 22V 26U 26F 26C 26B 26H 26V 33U 33F 33C 33B 33H 33V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 18T)  | 43C1709 | 2        |
| 3      | Heat sink, Low Acoustics (all models)  | 41R5542 | 2        |

| Item # | 6493 FRUs   | FRU#    | CRU Tier |
|--------|---|---------|----------|
| 4      | Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) (models 11C 11B 11H 11V 12C 12B 12H 12V 13C 13B 13H 13V 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 19M 19A 19Q 19T 19K 19R 19E 19J 21M 21A 21Q 21T 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 33M 33A 33Q 33T 33K 33R 33E 33J 27M 27A 27Q 27T 27K 27R 27E 27J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 19U 19F 19G 19C 19B 19H 19V 21U 21F 21C 21B 21H 21V 22U 22F 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 33U 33F 33C 33B 33H 33V 27U 27F 27C 27B 27H 27V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 17T) | 43C1042 | 2        |
| 4      | Optical drive, DVD Burner/CD-RW Rambo 8 (SATA) (models 11C 11B 11H 11V 12C 12B 12H 12V 13C 13B 13H 13V 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 19M 19A 19Q 19T 19K 19R 19E 19J 21M 21A 21Q 21T 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 33M 33A 33Q 33T 33K 33R 33E 33J 27M 27A 27Q 27T 27K 27R 27E 27J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 19U 19F 19G 19C 19B 19H 19V 21U 21F 21C 21B 21H 21V 22U 22F 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 33U 33F 33C 33B 33H 33V 27U 27F 27C 27B 27H 27V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 17T) | 43C1043 | 2        |
| 4      | Optical drive, Blu-Ray DVD Burner (SATA) (models 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 18T)   | 43C9584 | 2        |
| 5      | Internal speaker (see item 8) (models)  | 41R5532 | 2        |
| 6      | Diskette drive kit (includes diskette drive, bezel, and cable) (models 13C 13B 13H 13V 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J)   | TBD     | 2        |
| 6      | Diskette drive, 3.5" 1.44MB 2-Mode (models 13C 13B 13H 13V 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J)   | 40Y9105 | 2        |
| 6      | Diskette drive, 3.5" 1.44MB 2-Mode (models 13C 13B 13H 13V 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J)   | 40Y9107 | 2        |
| 7      | Front Panel Cable Asm (USB, Audio, 1394) (all models)   | 41R5533 | 2        |
| 8      | Speaker, Power Switch, LED, and bracket Asm (all models)  | 41R5532 | 2        |
| 9      | Hard disk drive, 250GB 7200rpm SATA (models 19M 19A 19Q 19T 19K 19R 19E 19J 23M 23A 23Q 23T 23K 23R 23E 23J 25M 25A 25Q 25T 25K 25R 25E 25J 27M 27A 27Q 27T 27K 27R 27E 27J 19U 19F 19G 19C 19B 19H 19V 23U 23F 23C 23B 23H 23V 25U 25F 25C 25B 25H 25V 27U 27F 27C 27B 27H 27V)  | 40Y9036 | 2        |
| 9      | Hard disk drive, 500GB 7200rpm SATA (models 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 17T)  | 41X5582 | 2        |
| 9      | Hard disk drive, 146GB SAS - 15000 rpm, 3 Gb/s, 32MB cache (models 11C 11B 11H 11V 12C 12B 12H 12V 13C 13B 13H 13V 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 21M 21A 21Q 21T 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 26M 26A 26Q 26T 26K 26R 26E 26J 33M 33A 33Q 33T 33K 33R 33E 33J 31M 31A 31Q 31T 31K 31R 31E 31J 31M 32A 32Q 32T 32K 32R 32E 32J 21U 21F 21C 21B 21H 21V 22U 22F 22C 22B 22H 22V 26U 26F 26C 26B 26H 26V 33U 33F 33C 33B 33H 33V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 18T )  | 43C6968 | 2        |
| 9      | Hard disk drive, 300GB SAS - 15000 rpm, 3 Gb/s, 32MB cache (models)   | 43C6969 | 2        |
| 10     | Fan Asm, Front 120 mm with grommets and fingerguard (all models)  | 41R5506 | 2        |
| 11     | Microprocessor, Intel Xeon 5110 - 1.60GHz, 4MB L2, 1066MHz FSB, G0 (models 14U 14G)   | TBD     | N        |

| Item # | 6493 FRUs   | FRU#    | CRU Tier |
|--------|---|---------|----------|
| 11     | Microprocessor, Intel Xeon 5130 - 2.00GHz, 4MB L2, 1333MHz FSB, G0 (models 11C 11B 11H 11V 12U 12G 15U 15G )  | TBD     | N        |
| 11     | Microprocessor, Intel Xeon 5140 - 2.33GHz, 4MB L2, 1333MHz FSB, G0 (models 12C 12B 12H 12V )  | TBD     | N        |
| 11     | Microprocessor, Intel Xeon 5150 - 2.66GHz, 4MB L2, 1333MHz FSB, G0 (models 13C 13B 13H 13V )  | TBD     | N        |
| 11     | Microprocessor, Intel Xeon 5160 - 3.00GHz, 4MB L2, 1333MHz FSB, G0 (models )  | TBD     | N        |
| 11     | Microprocessor, Intel Xeon E5310 - 1.60GHz, 4MBx2 L2, 1066MHz FSB, G0 (models 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J )   | TBD     | N        |
| 11     | Microprocessor, Intel Xeon E5335 - 2.00GHz, 4MBx2 L2, 1333MHz FSB, G0 (models )   | TBD     | N        |
| 11     | Microprocessor, IntelXeon X5355 - 2.66GHz, 4MBx2 L2, 1333MHz FSB, G0 (models16U 16G 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J )   | TBD     | N        |
| 11     | Microprocessor, Intel Xeon E5205 - 1.86GHz, 6MB L2, 1066MHz FSB, 65W (models)   | 45C7445 | N        |
| 11     | Microprocessor, Intel Xeon E5260 - 3.33GHz, 6MB L2, 1333MHz FSB, 80W (models)   | 45C7446 | N        |
| 11     | Microprocessor, Intel Xeon E5405 - 2.00GHz, 12MB L2, 1333MHz FSB, 80W (models 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 17T)  | 45C7447 | N        |
| 11     | Microprocessor, Intel Xeon E5410 - 2.33GHz, 12MB L2, 1333MHz FSB, 80W (models)  | 45C7448 | N        |
| 11     | Microprocessor, Intel Xeon E5420 - 2.50GHz, 12MB L2, 1333MHz FSB, 80W (models 11C 11B 11H 11V 5M 25A 25Q 25T 25K 25R 25E 25J)   | 45C7449 | N        |
| 11     | Microprocessor, Intel Xeon E5430 - 2.66GHz, 12MB L2, 1333MHz FSB, 80W (models 12C 12B 12H 12V 19M 19A 19Q 19T 19K 19R 19E 19J 23M 23A 23Q 23T 23K 23R 23E 23J 19U 19F 19G 19C 19B 19H 19V 23U 23F 23C 23B 23H 23V)  | 45C7450 | N        |
| 11     | Microprocessor, Intel Xeon E5440 - 2.83GHz, 12MB L2, 1333MHz FSB, 80W (models 13C 13B 13H 13V 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 21M 21A 21Q 21T 21K 21R 21E 21J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 21U 21F 21C 21B 21H 21V 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 18T)  | 45C7451 | N        |
| 11     | Microprocessor, Intel Xeon E5450 - 3.00GHz, 12MB L2, 1333MHz FSB, 80W (models)  | 45C7452 | N        |
| 11     | Microprocessor, Intel Xeon X5460 - 3.Hz, 12MB L2, 1333MHz FSB, 120W (models 22M 22A 22Q 22T 22K 22R 22E 22J 26M 26A 26Q 26T 26K 26R 26E 26J 33M 33A 33Q 33T 33K 33R 33E 33J 27M 27A 27Q 27T 27K 27R 27E 27J 22U 22F 22C 22B 22H 22V 26U 26F 26C 26B 26H 26V 33U 33F 33C 33B 33H 33V 27U 27F 27C 27B 27H 27V)  | 45C7453 | N        |
| 11     | Microprocessor, Intel Xeon X5450 - 3.00GHz, 12MB L2, 1333MHz FSB, 120W (models CTO)   | 45C8260 | N        |
| 12     | System Board, Skye - 2P Intel Socket LGA771, Seaburg, ESB2 (models 11C 11B 11H 11V 12C 12B 12H 12V 13C 13B 13H 13V 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 19M 19A 19Q 19T 19K 19R 19E 19J 21M 21A 21Q 21T 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 33M 33A 33Q 33T 33K 33R 33E 33J 27M 27A 27Q 27T 27K 27R 27E 27J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 19U 19F 19G 19C 19B 19H 19V 21U 21F 21C 21B 21H 21V 22U 22F 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 33U 33F 33C 33B 33H 33V 27U 27F 27C 27B 27H 27V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 17T 18T) | 43C1516 | N        |
| 13     | Fan Asm, 120mm, system exhaust (all models)   | 41R5529 | 2        |

The FRUs listed in the following tables are not illustrated.

| 6493 FRUs  | FRU#    | CRU Tier |
|--|---------|----------|
| Diskette drive cable Asm (all models)            | 41N8294 | 2        |
| Bezel Kit (all models)                           | 41R5521 | 2        |
| Handle with screws (all models)                  | 41R5526 | 2        |
| Cable Asm, SATA (all models)                     | 41R5481 | 2        |
| Fansink and RM, High End processors (all models) | 41R5502 | 2        |
| Cable Asm, SATA, optical disk drive (all models) | 41R5517 | 2        |
| Cover Asm (access panel) (all models)            | 41R5530 | 1        |
| Mechanical Shell Kit (all models)                | 41R5508 | N        |
| Miscellaneous Parts Kit (all models)             | 41R5531 | 2        |
| Cable Asm, Cover Detect Switch (all models)      | 41R5534 | 2        |
| Serial Port Cable (all models)                   | 41R5544 | 2        |
| System board Screw Kit (all models)              | 41R5547 | 2        |
| Label Kit (all models)                           | 41R5549 | 1        |
| Cable Asm, HDD SAS (all models)                  | 41R5513 | 2        |
| SAS HDD Filler (all models)                      | 41R5552 | 2        |
| Rail Kit (Option) (all models)                   | 41R5559 | 1        |
| Thermal Sense Cable (all models)                 | 41R2511 | 2        |

| 6493 Keyboards (PS2 Preferred Pro) | FRU#    | CRU |
|------------------------------------|---------|-----|
| US English (models )               | 41A5039 | 1   |
| Arabic (models )                   | 41A5040 | 1   |
| Arabic/French (models )            | 41A5041 | 1   |
| Belgian/French (models )           | 41A5042 | 1   |
| Belgian/UK (models )               | 41A5043 | 1   |
| Bulgarian (models )                | 41A5045 | 1   |
| Hong Kong/Taiwan (models )         | 41A5046 | 1   |
| Czech (models )                    | 41A5047 | 1   |
| Danish (models )                   | 41A5048 | 1   |
| Dutch (models )                    | 41A5049 | 1   |
| French (models )                   | 41A5050 | 1   |
| French Canadian 445 (models )      | 41A5051 | 1   |
| French Canadian 58 (models )       | 41A5052 | 1   |
| German (models )                   | 41A5053 | 1   |
| Greek (models )                    | 41A5054 | 1   |
| Hebrew (models )                   | 41A5055 | 1   |
| Hungarian (models )                | 41A5056 | 1   |
| Iceland (models )                  | 41A5057 | 1   |
| Italian (models )                  | 41A5058 | 1   |
| Japanese (models )                 | 41A5059 | 1   |

| 6493 Keyboards (PS2 Preferred Pro) | FRU#    | CRU |
|------------------------------------|---------|-----|
| Korean (models )                   | 41A5060 | 1   |
| LA Spanish (models )               | 41A5061 | 1   |
| Norwegian (models )                | 41A5062 | 1   |
| Polish (models )                   | 41A5063 | 1   |
| Portuguese (models )               | 41A5064 | 1   |
| Romanian (models )                 | 41A5065 | 1   |
| Russian/Cyrilic (models )          | 41A5066 | 1   |
| Serbian/Cyrilic (models )          | 41A5067 | 1   |
| Slovak (models )                   | 41A5068 | 1   |
| Spanish (models )                  | 41A5069 | 1   |
| Swedish/Finn (models )             | 41A5070 | 1   |
| Swiss F/G (models )                | 41A5071 | 1   |
| Thailand (models )                 | 41A5072 | 1   |
| Turkish 440 (models )              | 41A5073 | 1   |
| Turkish 179 (models )              | 41A5074 | 1   |
| UK English (models )               | 41A5075 | 1   |
| US Euro (models )                  | 41A5076 | 1   |
| Slovenian (models )                | 41A5077 | 1   |
| Brazil/Portuguese (models )        | 41A5044 | 1   |

| 6493 Keyboards (Lenovo Productivity -USB)  | FRU#    | CRU Tier |
|--|---------|----------|
| US English (models 11H 17U 17G 17M 17A 17Q 17H 17R 17E 17J 19M 19A 19Q 19R 19E 1M 21A 21Q 21R 21E 22M 22A 22Q 22R 22E 23M 23A 23Q 23R 23E 25M 25A 25Q 25R 25E 26M 26A 26Q 26R 26E 33M 33A 33Q 33R 33E 27M 27A 27Q 27R 27E 31M 31A 31Q 31R 31E 32M 32A 32Q 32R 32E 19U 19G 19H 21U 21G 21H 22U 22G 22H 23U 23G 23H 25U 25G 25H 26U 26G 26H 33U 33G 33H 27U 27G 27H 31U 31G 31H 32U 32G 32H) | 41A5289 | 1        |
| Arabic (models)  | 41A5290 | 1        |
| Arabic/French (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 41A5291 | 1        |
| Belgian/French (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)  | 41A5292 | 1        |
| Belgian/UK (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)  | 41A5293 | 1        |
| Bulgarian (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 41A5295 | 1        |
| Hong Kong/Taiwan (models 11B 11V 12B 12V 13B 13V 17B 17V 19B 19V 21B 21V 22B 22V 23B 23V 25B 25V 26B 26V 33B 33V 27B 27V 31B 31V 32B 32V)  | 41A5296 | 1        |
| Czech (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 41A5297 | 1        |
| Danish (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)  | 41A5298 | 1        |
| Dutch (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 41A5299 | 1        |
| French (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)  | 41A5300 | 1        |
| French Canadian 445 (models 19F 21F 22F 23F 25F 26F 27F 31F 32F 33F)   | 41A5301 | 1        |
| French Canadian 58 (models 19F 21F 22F 23F 25F 26F 27F 31F 32F 33F)  | 41A5302 | 1        |
| German (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)  | 41A5303 | 1        |
| Greek (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 41A5304 | 1        |
| Greek/US (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)  | 41A5305 | 1        |



| <b>6493 Keyboards (Lenovo Productivity -USB)</b>                         | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| Hebrew (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)              | 41A5306     | 1               |
| Hungarian (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)           | 41A5307     | 1               |
| Iceland (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)             | 41A5308     | 1               |
| Italian (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)             | 41A5309     | 1               |
| Japanese (models 17J 19J 21J 22J 23J 25J 26J 27J 31J 32J)                | 41A5310     | 1               |
| Korean (models 17K 19K 21K 22K 23K 25K 26K 27K 31K 32K)                  | 41A5311     | 1               |
| LA Spanish (models )   | 41A5312     | 1               |
| Norwegian (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)           | 41A5313     | 1               |
| Polish (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)              | 41A5314     | 1               |
| Portuguese (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)          | 41A5315     | 1               |
| Romanian 096 (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)        | 41A5317     | 1               |
| Romanian 446 (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)        | 41A5316     | 1               |
| Russian/Cyrillic (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)    | 41A5318     | 1               |
| Serbian/Cyrillic (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)    | 41A5319     | 1               |
| Slovak (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)              | 41A5320     | 1               |
| Spanish (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)             | 41A5321     | 1               |
| Swedish/Finnish (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)     | 41A5322     | 1               |
| Swiss French/German (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G) | 41A5323     | 1               |
| Thailand (models 19T 21T 22T 23T 25T 26T 27T 31T 32T 17T)                | 41A5324     | 1               |
| Turkish 440 (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)         | 41A5325     | 1               |
| Turkish 179 (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)         | 41A5326     | 1               |
| UK English (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)          | 41A5327     | 1               |
| US Euro (models)   | 41A5328     | 1               |
| Slovenian (models 17G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)           | 41A5329     | 1               |

| <b>6493 Keyboards (Preferred Pro Fingerprint Reader USB)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| US English (models 18U 18G 18M 18A 18Q 18H 18R 18E)          | 41A5248     | 1               |
| Arabic (models )   | 41A5249     | 1               |
| Arabic/French (models 18G)                                   | 41A5250     | 1               |
| Belgian/French (models 18G)                                  | 41A5251     | 1               |
| Belgian/UK (models 18G)                                      | 41A5252     | 1               |
| Brazil/Portuguese (models )                                  | 41A5253     | 1               |
| Bulgarian (models 18G)                                       | 41A5254     | 1               |
| Chinese/US (models 18C)                                      | 41A5255     | 1               |
| Czech (models 18G)   | 41A5256     | 1               |
| Danish (models 18G)  | 41A5257     | 1               |
| Dutch (models 18G)   | 41A5258     | 1               |
| French (models 18G)  | 41A5259     | 1               |
| French Canadian 445 (models )                                | 41A5260     | 1               |
| French Canadian 58 (models )                                 | 41A5261     | 1               |
| German (models 18G)  | 41A5262     | 1               |

| <b>6493 Keyboards (Preferred Pro Fingerprint Reader USB)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|--|-------------|-----------------|
| Greek (models 18G)   | 41A5263     | 1               |
| Greek/US (models 18G)  | 41A5264     | 1               |
| Hebrew (models 18G)  | 41A5265     | 1               |
| Hungarian (models 18G)                                       | 41A5266     | 1               |
| Iceland (models 18G)   | 41A5267     | 1               |
| Italian 141 (models 18G)                                     | 41A5268     | 1               |
| Japanese (models 18J)  | 41A5269     | 1               |
| Korean (models 18K)  | 41A5270     | 1               |
| LA/Spanish (models )   | 41A5271     | 1               |
| Norwegian (models 18G)                                       | 41A5272     | 1               |
| Polish (models 18G)  | 41A5273     | 1               |
| Portuguese (models 18G)                                      | 41A5274     | 1               |
| Romanian 096 (models 18G)                                    | 41A5275     | 1               |
| Romanian 446 (models 18G)                                    | 41A5276     | 1               |
| Russian/Cyrillic (models 18G)                                | 41A5277     | 1               |
| Serbian/Cyrillic (models 18G)                                | 41A5278     | 1               |
| Slovak (models 18G)  | 41A5279     | 1               |
| Spanish (models 18G)   | 41A5280     | 1               |
| Swedish/Finn (models 18G)                                    | 41A5281     | 1               |
| Swiss (models 18G)   | 41A5282     | 1               |
| Thailand (models 18T)  | 41A5283     | 1               |
| Turkish 440 (models 18G)                                     | 41A5284     | 1               |
| Turkish 179 (models 18G)                                     | 41A5285     | 1               |
| UK English (models 18G)                                      | 41A5286     | 1               |
| US Euro (models )  | 41A5287     | 1               |
| Slovenian (models 18G)                                       | 41A5288     | 1               |

| <b>6493 Keyboards (Wireless)</b> | <b>FRU#</b> | <b>CRU Tier</b> |
|----------------------------------|-------------|-----------------|
| US English (models )             | 41A5219     | 1               |
| China (models )                  |             | 1               |
| Arabic (models )                 |             | 1               |
| Arabic/French (models )          |             | 1               |
| Belgian/French (models )         | 41A5220     | 1               |
| Belgian/UK (models )             | 41A5221     | 1               |
| Brazil/Portuguese (models )      |             | 1               |
| Bulgarian (models )              |             | 1               |
| Chinese/US (models )             | 41A5222     | 1               |
| Czech (models )                  | 41A5223     | 1               |
| Danish (models )                 | 41A5224     | 1               |
| Dutch (models )                  | 41A5225     | 1               |
| French (models )                 | 41A5226     | 1               |

| 6493 Keyboards (Wireless)     | FRU#    | CRU Tier |
|-------------------------------|---------|----------|
| French Canadian 445 (models ) | 41A5227 | 1        |
| French Canadian 58 (models )  | 41A5228 | 1        |
| German (models )              | 41A5229 | 1        |
| Greek (models )               | 41A5230 | 1        |
| Greek/US (models )            | 41A5231 | 1        |
| Hebrew (models )              |         | 1        |
| Hungarian (models )           | 41A5232 | 1        |
| Iceland (models )             | 41A5233 | 1        |
| Italy (models )               |         | 1        |
| Italy (models )               | 41A5234 | 1        |
| Japanese (models )            | 41A5235 | 1        |
| Korean (models )              |         | 1        |
| LA/Spanish (models )          |         | 1        |
| Norwegian (models )           | 41A5236 | 1        |
| Polish (models )              | 41A5237 | 1        |
| Portuguese (models )          | 41A5238 | 1        |
| Romanian 096 (models )        |         | 1        |
| Romanian 446 (models )        |         | 1        |
| Russian/Cyrillic (models )    |         | 1        |
| Serbian/Cyrillic (models )    |         | 1        |
| Slovak (models )              | 41A5239 | 1        |
| Spanish (models )             | 41A5240 | 1        |
| Swedish/Finn (models )        | 41A5241 | 1        |
| Swiss (models )               | 41A5242 | 1        |
| Thailand (models )            |         | 1        |
| Turkish 440 (models )         |         | 1        |
| Turkish 179 (models )         |         | 1        |
| UK English (models )          | 41A5243 | 1        |
| US Euro (models )             | 41A5244 | 1        |
| US International (models )    | 41A5244 | 1        |
| Slovenian (models )           | 41A5245 | 1        |

| 6493 mice   | FRU#    | CRU Tier |
|---|---------|----------|
| Optical Wheel Mouse (400 DPI), USB - Red Wheel (Primary) (models 11C 11B 11H 11V 12C 12B 12H 12V 13C 13B 13H 13V 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 19M 19A 19Q 19T 19K 19R 19E 19J 21M 21A 21Q 21T 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 33M 33A 33Q 33T 33K 33R 33E 33J 27M 27A 27Q 27T 27K 27R 27E 27J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 19U 19F 19G 19C 19B 19H 19V 21U 21F 21C 21B 21H 21V 22U 22F 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 33U 33F 33C 33B 33H 33V 27U 27F 27C 27B 27H 27V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 17T 18T) | 41U3013 | 1        |

| 6493 mice   | FRU#    | CRU Tier |
|---|---------|----------|
| Optical Wheel Mouse (400 DPI), USB - Red Wheel (Secondary) (models 11C 11B 11H 11V 12C 12B 12H 12V 13C 13B 13H 13V 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 19M 19A 19Q 19T 19K 19R 19E 19J 21M 21A 21Q 21T 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 33M 33A 33Q 33T 33K 33R 33E 33J 27M 27A 27Q 27T 27K 27R 27E 27J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 19U 19F 19G 19C 19B 19H 19V 21U 21F 21C 21B 21H 21V 22U 22F 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 33U 33F 33C 33B 33H 33V 27U 27F 27C 27B 27H 27V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 17T 18T) | 41U3030 | 1        |
| ScrollPoint Optical Mouse (800DPI, USB) (models )   | 41U3019 | 1        |
| Wireless Mouse (models )  | 41U3023 | 1        |

| 6493 Adapters and miscellaneous FRUs   | FRU#    | CRU Tier |
|--|---------|----------|
| 3.5" 9-in-1 Media Card Reader (models 13C 13B 13H 13V 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 19M 19A 19Q 19T 19K 19R 19E 19J 21M 21A 21Q 21T 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 23M 23A 23Q 23T 23K 23R 23E 23J 25M 25A 25Q 25T 25K 25R 25E 25J 26M 26A 26Q 26T 26K 26R 26E 26J 33M 33A 33Q 33T 33K 33R 33E 33J 27M 27A 27Q 27T 27K 27R 27E 27J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 19U 19F 19G 19C 19B 19H 19V 21U 21F 21C 21B 21H 21V 22U 22F 22C 22B 22H 22V 23U 23F 23C 23B 23H 23V 25U 25F 25C 25B 25H 25V 26U 26F 26C 26B 26H 26V 33U 33F 33C 33B 33H 33V 27U 27F 27C 27B 27H 27V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 17T 18T) | 41R3378 | 2        |
| Transceiver (USB) (models )  | 41A5246 | 2        |
| L1 IEEE 1394 PCI Adapter (models 23M 23A 23Q 23T 23K 23R 23E 23J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 23U 23F 23C 23B 23H 23V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V)  | 41D2781 | 2        |
| Speakers (2-piece) Lenovo Logo (models)  | 41A5331 | 1        |
| Speakers (2-piece) Lenovo Logo (models)  | 41A5334 | 1        |
| Lenovo 3 pieces Speakers (China Only) (models)   | 45C8640 | 1        |
| Lenovo 2 pieces Speakers (China Only) (models)   | 45C8641 | 1        |
| Speaker Power brick - US, Canada, LA low voltage, ASEAN (models 17U 18U 19U 21U 22U 23U 25U 26U 27U 29U 31U 32U 33U)   | 89P8571 | 1        |
| Speaker Power brick - LA high voltage (non-APU) (models )  | 89P8575 | 1        |
| Speaker Power brick - China, Thailand (models 11C 12C 13C 19C 21C 22C 23C 25C 26C 27C 29C 31C 32C 33C 17T 18T)   | 89P8581 | 1        |
| Speaker Power brick - Japan (models 17J 18J 17E 18E 19J 19E 21J 21E 22J 22E 23J 23E 25E 25J 26E 26J 33E 33J 27E 27J 31E 31J 32E 32J)   | 89P8577 | 1        |
| Speaker Power brick - Brazil (models)  | 89P8583 | 1        |
| Speaker Power brick - Argentina (models)   | 41A4901 | 1        |
| Speaker Power brick - ANZ (models 19M 21M 22M 23M 25M 26M 33M 26M 27M 31M 32M)   | 89P8579 | 1        |
| Speaker Brick - Korea (models 17K 18K 17R 18R 17K 19K 21K 22K 23K 25K 26K 27K 31K 32K 19R 21R 22R 23R 25R 26R 27R 31R 32R)   | 41A4903 | 1        |
| Speaker Brick - Hong Kong, EMEA (models 11B 11H 12B 12H 13B 13H 17G 18G 17B 17H 18B 18H 19G 21G 2G 23G 25G 26G 27G 29G 31G 32G 33G 19B 19H 21B 21H 22B 22H 23B 23H 25B 25H 26B 26H 27B 27H 29B 29H 31B 31H 32B 32H 33B 33H)  | 89P8573 | 1        |

| 6493 Adapters and miscellaneous FRUs  | FRU#    | CRU Tier |
|---|---------|----------|
| Speaker Brick - Taiwan (models 11V 12V 13V 17V 18V 19V 21V 22V 23V 25V 26V 27V 29V 31V 32V 33V)   | 41A4905 | 1        |
| Speaker Power brick - India, South Africa (models 17Q 18Q)  | 89P8585 | 1        |
| 256MB NVIDIA NVS290 (DMS59 Connector) - Quasar (models 27M 27A 27Q 27T 27K 27R 27E 27J 27U 27F 27C 27B 27H 27V)   | 42Y6329 | 2        |
| 256MB NVIDIA FX370 (DVI-DL+DVI-DL) - Brown Dwarf (models )  | 42Y6331 | 2        |
| 512MB NVIDIA FX1700 (DVI-DL+DVI-DL+HDTV) - Pulsar (models 17U 17G 17M 17A 17Q 17C 17B 17H 17V 17K 17R 17E 17J 11C 11B 11H 11V 12C 12B 12H 12V 13C 13B 13H 13V 19M 19A 19Q 19T 19K 19R 19E 19J 23M 23A 23Q 23T 23K 23R 23E 23J 11C 11B 11H 11V 12C 12B 12H 12V 13C 13B 13H 13V 19U 19F 19G 19C 19B 19H 19V 23U 23F 23C 23B 23H 23V 25U 25F 25C 25B 25H 25V 17T)  | 42Y6333 | 2        |
| 768MB NVIDIA FX4600 (DVI-DL+DVI-DL+ST) - Black Hole (models 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 1M 21A 21Q 21T 21K 21R 21E 21J 22M 22A 22Q 22T 22K 22R 22E 22J 26M 26A 26Q 26T 26K 26R 26E 26J 33M 33A 33Q 33T 33K 33R 33E 33J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 21U 21F 21C 21B 21H 21V 22U 22F 22C 22B 22H 22V 26U 26F 26C 26B 26H 26V 33U 33F 33C 33B 33H 33V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 18T) | 42Y6337 | 2        |
| 1536MB NVIDIA C870 Physics Card - Newton Card (models)  | 45C5226 | 2        |
| Soft Modem V.90/V.44 (models )  | 29R9729 | 2        |
| Sound Blaster X-Fi Sound Card (models 18U 18G 18M 18A 18Q 18C 18B 18H 18V 18K 18R 18E 18J 23M 23A 23Q 23T 23K 23R 23E 23J 31M 31A 31Q 31T 31K 31R 31E 31J 32M 32A 32Q 32T 32K 32R 32E 32J 23U 23F 23C 23B 23H 23V 31U 31F 31C 31B 31H 31V 32U 32F 32C 32B 32H 32V 18T)  | 43C8028 | 2        |
| SAS Controller Card (models )   | 43C9285 | 2        |
| Lenovo Branded 3-Piece Speakers (models )   | TBD     | 1        |
| Lenovo Branded Headset (models )  | TBD     | 1        |
| Dongle Cable - DMS59 to dual DVI (included in Quasar L1) (models )  | 41X6398 | 2        |
| DVI to VGA Dongle (models)  | 45C7816 | 2        |
| Modem Phone Cable (models )   | 39K5120 | 2        |

| 6493 Power Cords   | FRU#    | CRU |
|--|---------|-----|
| Power cord - US (models 17U 17A 18U 18A 19A 21A 22A 23A 25A 26A 27A 31A 32A 33A 19U 21U 22U 23U 25U 26U 27U 29U 31U 32U 33U 19F 21F 22F 23F 25F 26F 27F 29F 31F 32F 17T 18T) | 39M5080 | 1   |
| Power cord - China (models 11C 12C 13C 17C 18C 19C 21C 22C 23C 25C 26C 27C 29C 31C 32C 33C)  | 39M5205 | 1   |
| Power cord - Japan (models 17J 18J 17E 18E 19J 19E 21J 21E 22J 22E 23J 23E 25E 25J 26E 26J 33E 33J 27E 27J 31E 31J 32E 32J)  | 39M5193 | 1   |
| Power cord - Brazil (models )  | 39M5232 | 1   |
| Power cord - LA High Volt APU (models )  | 39M5067 | 1   |
| Power cord - Australia / New Zealand (models 17M 18M 19M 21M 22M 23M 25M 26M 33M 27M 31M 32M)  | 39M5102 | 1   |
| Power cord - Korea (models 17K 17R 18K 18R 19K 21K 22K 23K 25K 26K 27K 31K 32K 19R 21R 22R 23R 25R 26R 27R 31R 32R)  | 39M5212 | 1   |
| Power cord - Hong Kong (models 11B 11H 12B 12H 13B 13H 17B 17H 18B 18H)  | 39M5151 | 1   |
| Power cord - UK, Ireland, Singapore, Malaysia, Brunei (models 17G 18G 17A 18A 19A 21A 22A 23A 25A 26A 27A 31A 32A 33A)   | 39M5150 | 1   |

| <b>6493 Power Cords</b>  | <b>FRU#</b> | <b>CRU</b> |
|--|-------------|------------|
| Power cord - Taiwan (models 11V 12V 13V 17V 18V 19V 21V 22V 23V 25V 27V 26V 29V 31V 32V 33V)   | 39M5246     | 1          |
| Power cord - Italy (models 17G 18G 19G 21G 22G 23G 25G 26G 27G 29G 31G 32G 33G)  | 39M5164     | 1          |
| Power cord - G models (models 17G 18G 19A 21A 22A 23A 25A 26A 27A 31A 32A 33A 19G 21G 22G 23G 25G 26G 27G 29G 31G 32G 33G)   | 39M5122     | 1          |
| Power cord - Denmark (models 17G 18G 19G 21G 22G 23G 25G 26G 27G 29G 31G 32G 33G)  | 39M5129     | 1          |
| Power cord - Switzerland (models 17G 18G 19G 21G 22G 23G 25G 26G 27G 29G 31G 32G 33G)  | 39M5157     | 1          |
| Power cord - Israel (models 17G 18G 19G 21G 22G 23G 25G 26G 27G 29G 31G 32G 33G)   | 39M5171     | 1          |
| Power cord - South Africa (models 17G 18G 17M 17A 18M 18A 19M 21M 22M 23M 25M 26M 33M 27M 31M 32M 19A 21A 22A 23A 25A 26A 27A 31A 32A 33A 19G 21G 22G 23G 25G 26G 27G 29G 31G 32G 33G) | 39M5143     | 1          |
| Power cord - India (models 17Q 18Q 19Q 21Q 22Q 23Q 25Q 26Q 33Q 27Q 31Q 32Q)  | 39M5004     | 1          |

| <b>6493 Windows XP Home Recovery CDs</b> | <b>FRU#</b> | <b>CRU</b> |
|--|-------------|------------|
| US/UK/AP/TH (models )                    |             | 1          |
| FR/CF (models )                          |             | 1          |
| GR (models )                             |             | 1          |
| IT (models )                             |             | 1          |
| BR (models )                             |             | 1          |
| SP/LA (models )                          |             | 1          |
| DK (models )                             |             | 1          |
| NL (models )                             |             | 1          |
| AE (models )                             |             | 1          |
| SV (models )                             |             | 1          |
| HE (models )                             |             | 1          |
| FI (models )                             |             | 1          |
| NO (models )                             |             | 1          |
| PL (models )                             |             | 1          |
| PO (models )                             |             | 1          |
| RU (models )                             |             | 1          |
| RE (models )                             |             | 1          |
| HU (models )                             |             | 1          |
| CZ (models )                             |             | 1          |
| TR (models )                             |             | 1          |
| GK (models )                             |             | 1          |
| Japanese (models )                       |             | 1          |
| Simplified Chinese (models )             |             | 1          |
| Taiwan-TC (models )                      |             | 1          |
| Hong Kong-TC (models )                   |             | 1          |
| Korea (models )                          |             | 1          |

| 6493 Windows XP Pro Recovery CDs                    | FRU# | CRU |
|---|------|-----|
| US/UK/AP/TH (models )                               |      | 1   |
| FR/CF (models )                                     |      | 1   |
| GR (models )  |      | 1   |
| IT (models )  |      | 1   |
| BR (models )  |      | 1   |
| SP/LA (models )                                     |      | 1   |
| DK (models )  |      | 1   |
| NL (models )  |      | 1   |
| AE (models )  |      | 1   |
| SV (models )  |      | 1   |
| HE (models )  |      | 1   |
| FI (models )  |      | 1   |
| NO (models )  |      | 1   |
| PL (models )  |      | 1   |
| PO (models )  |      | 1   |
| RU (models )  |      | 1   |
| RE (models )  |      | 1   |
| HU (models )  |      | 1   |
| CZ (models )  |      | 1   |
| TR (models )  |      | 1   |
| GK (models )  |      | 1   |
| SL (models )  |      | 1   |
| Japanese (models )                                  |      | 1   |
| Simplified Chinese (models )                        |      | 1   |
| Taiwan-TC (models )                                 |      | 1   |
| Hong Kong-TC (models )                              |      | 1   |
| Korea (models )                                     |      | 1   |
| Multilingual 1 XP-P -- EN, NL, FR, GR, IT (models ) |      | 1   |
| Multilingual 2 XP-P -- EN, DK, FI, NO, SV (models ) |      | 1   |

| 6493 Vista Home Basic 32 Recovery DVDs | FRU# | CRU |
|--|------|-----|
| US/UK/AP/TH (models )                  |      | 1   |
| FR/CF (models )                        |      | 1   |
| GR (models )                           |      | 1   |
| SP/LA (models )                        |      | 1   |
| BR (models )                           |      | 1   |
| IT (models )                           |      | 1   |
| JP (models )                           |      | 1   |
| NO (models )                           |      | 1   |
| SV (models )                           |      | 1   |
| DK (models )                           |      | 1   |

| 6493 Vista Home Basic 32 Recovery DVDs | FRU# | CRU |
|--|------|-----|
| NL (models )                           |      | 1   |
| CZ (models )                           |      | 1   |
| FI (models )                           |      | 1   |
| PL (models )                           |      | 1   |
| RU (models )                           |      | 1   |
| TR (models )                           |      | 1   |
| HU (models )                           |      | 1   |
| GK (models )                           |      | 1   |
| PO (models )                           |      | 1   |
| SC (models )                           |      | 1   |
| TW (models )                           |      | 1   |
| HK (models )                           |      | 1   |
| KR (models )                           |      | 1   |
| SL (models )                           |      | 1   |
| RE (models )                           |      | 1   |

| 6493 Vista Business 32 Recovery DVDs | FRU#    | CRU |
|--------------------------------------|---------|-----|
| English (models )                    | 45C9638 | 1   |
| FR/CF (models )                      | 45C9640 | 1   |
| GR (models )                         | 45C9641 | 1   |
| SP/LA (models )                      | 45C9642 | 1   |
| BR (models )                         | 45C9643 | 1   |
| IT (models )                         | 45C9644 | 1   |
| JP (models )                         | 45C9645 | 1   |
| NO (models )                         | 45C9646 | 1   |
| SV (models )                         | 45C9647 | 1   |
| DK (models )                         | 45C9648 | 1   |
| NL (models )                         | 45C9649 | 1   |
| CZ (models )                         | 45C9650 | 1   |
| FI (models )                         | 45C9651 | 1   |
| PL (models )                         | 45C9652 | 1   |
| RU (models )                         | 45C9653 | 1   |
| TR (models )                         | 45C9654 | 1   |
| HU (models )                         | 45C9655 | 1   |
| GK (models )                         | 45C9656 | 1   |
| PO (models )                         | 45C9663 | 1   |
| SC (models )                         | 45C9657 | 1   |
| TC (models )                         | 45C9658 | 1   |
| TC (models )                         | 45C9659 | 1   |
| KR (models)                          | 45C9660 | 1   |
| SL (models )                         | 45C9661 | 1   |



| 6493 Vista Business 32 Recovery DVDs | FRU#    | CRU |
|--------------------------------------|---------|-----|
| RE (models )                         | 45C9639 | 1   |
| RO (models)                          | 45C9662 | 1   |
| SH (models)                          | 45C9664 | 1   |
| SK (models)                          | 45C9665 | 1   |
| AR (models)                          | 45C9666 | 1   |
| HE (models)                          | 45C9667 | 1   |

| 6493 Vista Home Pre 32 Recovery DVDs | FRU# | CRU Tier |
|--------------------------------------|------|----------|
| English (models)                     |      | 1        |
| Russian English (models )            |      | 1        |
| French/Canadian French (models )     |      | 1        |
| German (models )                     |      | 1        |
| Spanish/LA (models )                 |      | 1        |
| Brazil (models )                     |      | 1        |
| Italy (models )                      |      | 1        |
| Japanese (models )                   |      | 1        |
| Norway (models )                     |      | 1        |
| Swedish (models )                    |      | 1        |
| Denmark (models )                    |      | 1        |
| Dutch (models )                      |      | 1        |
| Czech (models )                      |      | 1        |
| Finnish (models )                    |      | 1        |
| Polish (models )                     |      | 1        |
| Russian (models )                    |      | 1        |
| Turkish (models )                    |      | 1        |
| Hungarian (models )                  |      | 1        |
| Greek (models )                      |      | 1        |
| Simplified Chinese (models )         |      | 1        |
| Traditional Chinese (models )        |      | 1        |
| Traditional Chinese (models )        |      | 1        |
| Korean (models )                     |      | 1        |
| Slovenian (models )                  |      | 1        |
| Hebrew (models )                     |      | 1        |
| Romanian (models )                   |      | 1        |
| Bulgarian (models )                  |      | 1        |
| Croatian (models )                   |      | 1        |
| Portuguese (models )                 |      | 1        |
| Serbian-Latin (models )              |      | 1        |
| Ukrainian (models )                  |      | 1        |
| Slovakian (models )                  |      | 1        |

| 6493 Vista Business 64 Recovery DVDs  | FRU#    | CRU |
|---|---------|-----|
| English (models 11H 12H 13H 17U 17G 17M 17A 17Q 17H 17R 17E 18U 18G 18M 18A 18Q 18H 18R 18E 19M 19A 19Q 19R 19E 1M 21A 21Q 21R 21E 22M 22A 22Q 22R 22E 23M 23A 23Q 23R 23E 25M 25A 25Q 25R 25E 26M 26A 26Q 26R 26E 33M 33A 33Q 33R 33E 27M 27A 27Q 27R 27E 31M 31A 31Q 31R 31E 32M 32A 32Q 32R 32E 19U 19G 19H 21U 21G 21H 22U 22G 22H 23U 23G 23H 25U 25G 25H 26U 26G 26H 33U 33G 33H 27U 27G 27H 31U 31G 31H 32U 32G 32H) | 45C9668 | 1   |
| RE (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9669 | 1   |
| FR/CF (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)  | 45C9670 | 1   |
| GR (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9671 | 1   |
| SP/LA (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)  | 45C9672 | 1   |
| BR (models)   | 45C9673 | 1   |
| IT (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9674 | 1   |
| JP (models 19J 21J 22J 23J 25J 26J 27J 31J 32J)   | 45C9675 | 1   |
| NO (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9676 | 1   |
| SV (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9677 | 1   |
| DK (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9678 | 1   |
| NL (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9679 | 1   |
| CZ (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9680 | 1   |
| FI (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9681 | 1   |
| PL (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9682 | 1   |
| RU (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9683 | 1   |
| TR (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9684 | 1   |
| HU (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9685 | 1   |
| GK (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9686 | 1   |
| SC (models 11C 12C 13C 17C 18C 19C 21C 22C 23C 25C 26C 27C 29C 31C 32C 33C)   | 45C9687 | 1   |
| TW (models 11V 12V 13V 17V 18V 19V 21V 22V 23V 25V 26V 27V 29V 31V 32V 33V)   | 45C9688 | 1   |
| HK (models 11B 12B 13B 17B 18B 19B 21B 22B 23B 25B 26B 27B 29B 31B 32B 33B)   | 45C9689 | 1   |
| KR (models 19K 21K 22K 23K 25K 26K 27K 31K 32K)   | 45C9690 | 1   |
| SL (models 17G 18G 19G 21G 22G 23G 25G 26G 33G 27G 31G 32G)   | 45C9691 | 1   |
| PO (models)   | 45C9692 | 1   |
| SK (models)   | 45C9693 | 1   |
| AR (models)   | 45C9694 | 1   |
| HE (models)   | 45C9695 | 1   |

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## Chapter 12. Additional Service Information

This chapter provides additional information that the service representative might find helpful.

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### Security features

Security features in this section include the following:

- Passwords
- Vital Product Data
- Management Information Format (MIF)

### Hardware controlled Passwords

Hardware controlled passwords are set using the Setup Utility program. For more information about passwords, see "Using passwords" on page 49.

### Operating system password

An operating system password is very similar to a power-on password and denies access to the computer by an unauthorized user when the password is activated. The computer is unusable until the password is entered and recognized by the computer.

### Vital product data

Each computer has a unique Vital Product Data (VPD) code stored in the nonvolatile memory on the system board. After you replace the system board, the VPD must be updated. To update the VPD, see "Flash update procedures."

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### BIOS levels

An incorrect level of BIOS can cause false errors and unnecessary FRU replacement. Use the following information to determine the current level of BIOS installed in the computer, the latest BIOS available for the computer, and where to obtain the latest level of BIOS.

- To determine the current Level of BIOS:
  - Start the Setup Utility.
  - Select Standard CMOS Features.
- Sources for obtaining the latest level BIOS available
  1. Lenovo support web site:  
<http://www.lenovo.com/support/>
  2. Lenovo Customer Support Center
  3. Levels 1 and 2 Support

To update (flash) the BIOS, see "Flash update procedures."

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### Flash update procedures

This section details how to flash (update) the BIOS.

## Updating (flashing) BIOS from a diskette or CD-ROM

This section describes how to update (flash) the BIOS using a diskette or CD-ROM. System program updates are available at <http://www.lenovo.com/support> on the World Wide Web.

1. To update (flash) the BIOS:
  - From a diskette, make sure the computer is turned off and insert a system program update (flash diskette). Then turn the computer on. The update begins.
  - From a CD-ROM, make sure the computer is turned on. Insert the CD-ROM into the optical drive.
2. Turn on the computer. If it is on already, you must turn it off and back on again. The update begins.
3. When you are prompted to select a language, press the number on your keyboard that corresponds to the language and then press Enter.
4. When prompted to change the serial number, press Y.
5. Type in the seven character serial number of your computer and then press Enter.
6. When prompted to change the machine type/model, press Y.
7. Type in the seven character machine type/model of your computer and then press Enter.
8. Follow the instructions on the screen to complete the update.

---

## Updating (flashing) BIOS from the operating system

**Note:** Due to the constant improvements made to the Web site, Web page content (including the links referenced in the following procedure) is subject to change.

1. From your browser, type <http://www.lenovo.com/support> in the address field and press Enter.
2. Locate the Downloadable files for your machine type as follows:
  - a. Type your machine type and click **Go**.
  - b. Click **Continue**.
  - c. Click **Downloads and drivers**.
  - d. Under the BIOS category, click the Flash BIOS update.
  - e. Click the .txt file that contains the installation instructions for the flash BIOS update (flash from the operating system version).
3. Print these instructions. This is very important since they are not on the screen after the download begins.
4. From your browser, click **Back** to return to the list of files. Carefully follow the printed instructions to download, extract, and install the update.

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## Recovering from a POST/BIOS update failure

If power to your computer is interrupted while POST/BIOS is being updated (flash update), your computer might not restart correctly. If this happens, perform the following procedure commonly called Boot-block Recovery.

1. Turn off the computer and any attached devices, such as printers, monitors, and external drives.

2. Unplug all power cords from electrical outlets, and open the computer cover. See "Opening the cover" on page 94.
3. Access the system board. See "Accessing system board components and drives" on page 96.
4. Locate the Clear CMOS/Recovery jumper on the system board. See "System board connectors and components" on page 93.
5. Remove any cables that impede access to the Clear CMOS/Recovery jumper.
6. Move the jumper from the standard position (pins 1 and 2) to pins 2 and 3.
7. Reinstall the adapter cards (some models).
8. Close the computer cover and reconnect any cables that were disconnected.
9. Reconnect the power cords for the computer and monitor to electrical outlets.
10. Insert the POST/BIOS update (flash) diskette into drive A, and turn on the computer and the monitor.
11. The recovery session will take two to three minutes. During this time you will hear a series of beeps. After the update session is completed, there will be no video, the series of beeps will end, and the system will automatically turn off. Remove the diskette from the diskette drive.
12. Repeat steps 2 through 5.
13. Replace the Clear CMOS/Recovery jumper to its original position.
14. Reinstall the adapter cards (some models) if removed.
15. Close the computer cover and reconnect any cables that were disconnected.
16. Turn on the computer to restart the operating system.

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## Power management

Power management reduces the power consumption of certain components of the computer such as the system power supply, processor, hard disk drives, and some monitors.

### Automatic configuration and power interface (ACPI) BIOS

Being an ACPI BIOS system, the operating system is allowed to control the power management features of the computer and the setting for Advanced Power Management (APM) BIOS mode is ignored. Not all operating systems support ACPI BIOS mode.

### Automatic Power-On features

The Automatic Power-On features within the Power Management menu allow you to enable and disable features that turn on the computer automatically.

- **Serial Port A Ring Detect:** With this feature set to **Enabled** and an external modem connected to serial port (COM1), the computer will turn on automatically when a ring is detected on the modem.
- **PCI Modem Ring Detect:** With this feature set to **Enabled**, the computer will turn on automatically when a ring is detected on the internal modem.
- **PCI Wake Up:** This feature allows PCI cards that support this capability to wake the system.
- **Wake Up on Alarm:** You can specify a date and time at which the computer will be turned on automatically. This can be either a single event or a daily event.
- **Wake on LAN:** If the computer has a properly configured token-ring or Ethernet LAN adapter card that is Wake on LAN-enabled and there is remote network management software, you can use the Wake on LAN feature. When you set Wake on LAN to **Enabled**, the computer will turn on when it receives a specific signal from another computer on the local area network (LAN).

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