



# ThinkCentre Hardware Maintenance Manual



ThinkThink**ThinkCentre**Think

**Machine Types:** 1899, 1928, 1932, and 1934

**Note:** Before using this information and the product it supports, be sure to read and understand Chapter 2 “Safety information” on page 3 and Appendix A “Notices” on page 111.

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## Chapter 1. About this manual

This manual contains service and reference information for ThinkCentre® computer machine types listed on the front cover. This manual is intended only for trained Service Providers who are familiar with Lenovo® computer products.

**Note:** Be sure to read and understand the Chapter 2 “Safety information” on page 3 before using the information in this manual.

The “Symptom-to-FRU Index” chapter and the “Additional service information” chapter apply to all ThinkCentre computers.

This manual includes a complete FRU part number list for each machine type listed on the front cover. If you have internet access, the 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 manual before performing any of the instructions.

Veuillez 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 ThinkCentre 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 hardware maintenance manual 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 substitute 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.

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## Chapter 2. Safety information

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

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### 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 centre 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 an electric 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 (FRU)
- 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 an electric shock. By observing the above rule, you may prevent a current from passing through your body.
  - When using a tester, 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.



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## 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.

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## 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.

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## 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.

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## 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.

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## 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 45C1566 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 lb)



≥32 kg (70.5 lb)



≥55 kg (121.2 lb)

**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 الكهربائي الموجود بمصدر الطاقة أو أجهزة التليفون أو أسلاك الاتصالات 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 إلحاقه 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 المسودم 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 45C1566** 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 تقم بـ:

- القاء 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 الأغشية. قد ينتج عن نزع أغشية منتج الليزر انفجار أشعة الليزر شديدة الخطورة.  
لا يوجد أجزاء يمكن تغييرها داخل الجهاز. قد ينتج عن استخدام تحكمات أو تعديلات أو عمل أي تصرفات أخرى تخالف ما هو محدد هنا إلى انفجار أشعة شديدة الخطورة.



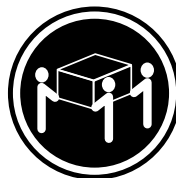
خطر

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

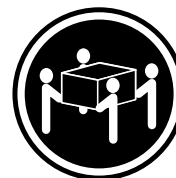
أشعة الليزر عند الفتح. لا تحقق إلى الإشعاع و لا تنظر إليه مباشرة بواسطة أي أجهزة مرئية وتجنب التعرض المباشر للإشعاع .



≥18 kg (37 lb)



≥32 kg (70.5 lb)



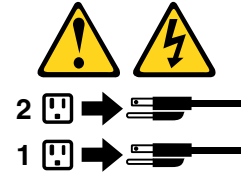
≥55 kg (121.2 lb)

تنبيه :

يجب استخدام ممارسات آمنة عند الرفع



تنبيه :  
لا يقرم 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:
1. DESLIGUE Tudo.	1. DESLIGUE Tudo.
2. Primeiramente, conecte todos os cabos aos dispositivos.	2. Primeiramente, remova os cabos de alimentação das tomadas.
3. Conecte os cabos de sinal aos conectores.	3. Remova os cabos de sinal dos conectores.
4. Conecte os cabos de alimentação às tomadas.	4. Remova todos os cabos dos dispositivos.
5. LIGUE os dispositivos.	



#### **CUIDADO:**

Ao substituir a bateria de lítio, utilize apenas uma bateria com Número de Peça 45C1566 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 lb)



≥32 kg (70.5 lb)



≥55 kg (121.2 lb)

#### **CUIDADO:**

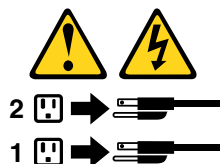
Utilize procedimentos de segurança para levantar equipamentos.





## 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.



### 危險

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 and 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 45C1566 的电池或制造商推荐同类电池。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)

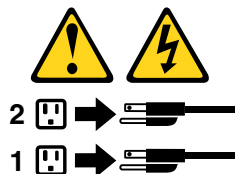


≥55 千克 (121.2 磅)

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 **45C1566** 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 **100°C (212°F)** 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、調整及執执行程序，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
<ol style="list-style-type: none"><li>1. Mettez les unités HORS TENSION.</li><li>2. Commencez par brancher tous les cordons sur les unités.</li><li>3. Branchez les câbles d'interface sur des connecteurs.</li><li>4. Branchez les cordons d'alimentation sur des prises.</li><li>5. Mettez les unités SOUS TENSION.</li></ol>	<ol style="list-style-type: none"><li>1. Mettez les unités HORS TENSION.</li><li>2. Débranchez les cordons d'alimentation des prises.</li><li>3. Débranchez les câbles d'interface des connecteurs.</li><li>4. Débranchez tous les câbles des unités.</li></ol>



#### **ATTENTION:**

Remplacer la pile au lithium usagée par une pile de référence identique exclusivement, (référence 45C1566), 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 lb)



≥32 kg (70.5 lb)



≥55 kg (121.2 lb)

**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 45C1566 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 (37 lb)



≥32 kg (70.5 lb)



≥55 kg (121.2 lb)

#### 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 45C1566 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:

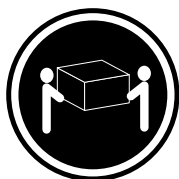
בעת התקנת מוצרי לייזר (כגון כונני תקליטורים ו-DVD, התקני סיב אופטי או משדרים), שימו לב לאזהרות הבאות:

- אל תסירו את הכיסויים. הסרת הכיסויים של מוצר הלייזר עלולה לגרום לחשיפה לקרינת לייזר מסוכנת. אין חלקים ברי טיפול בתוך ההתקן.
- שינויים, שימוש בבקורות או ביצוע הליכים אחרים מאלה המתוארים כאן, עלולים לגרום לחשיפה לקרינה מסוכנת.

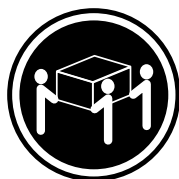


סכנה

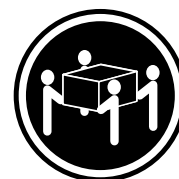
מוצרי ליזר מסוימים מכילים דיודת ליזר מסוג Class 3A או Class 3B. שימו לב לאזהרה הבאה:  
כאשר הוא פתוח, המוצר פולט קרינת ליזר. אל תביטו ישירות בקרן, אל תביטו ישירות בעזרת ציוד אופטי,  
והימנעו מחשיפה לקרן.



$18 \leq$  ק"ג (37 ליב')



$32 \leq$  ק"ג (70.5 ליב')



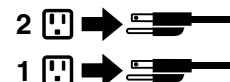
$55 \leq$  ק"ג (121.2 ליב')

זהירות:  
השתמשו בהליכים  
הנאותים בעת  
הרמת הציוד.



זהירות:

לחצן ההפעלה של ההתקן ומתג ההפעלה 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
<ol style="list-style-type: none"><li>1. SPEGNERE le apparecchiature.</li><li>2. Innanzitutto, collegare tutti i cavi alle unità.</li><li>3. Collegare i cavi di segnale ai connettori.</li><li>4. Collegare i cavi di alimentazione alla presa.</li><li>5. Accendere l'unità.</li></ol>	<ol style="list-style-type: none"><li>1. SPEGNERE le apparecchiature.</li><li>2. Innanzitutto, rimuovere i cavi di alimentazione dalla presa.</li><li>3. Rimuovere i cavi di segnale dai connettori.</li><li>4. Rimuovere tutti i cavi dalle unità.</li></ol>



#### **ATTENZIONE:**

Quando si sostituisce la batteria al litio, utilizzare solo il Numero parte 45C1566 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 trassemblytenti), 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 (37 lb)



≥32 kg (70.5 lb)



≥55 kg (121.2 lb)

**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 45C1566 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.

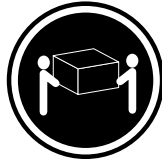
- 덮개를 열지 마십시오. 덮개를 열면 레이저 복사 에너지에 노출될 위험이 있습니다. 장치 내부에는 사용자가 조정하거나 수리할 수 있는 부품이 없습니다.
- 규정된 것 이외의 절차 수행, 제어 조정 등의 행위로 인해 해로운 레이저 복사에 노출될 수 있습니다.



#### 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.



2  → 

1  → 





## 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 45C1566 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 (37 lb)



≥32 kg (70.5 lb)



≥55 kg (121.2 lb)

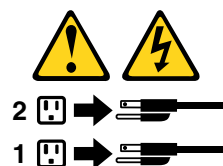
#### PRECAUCIÓN:

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 manual.

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### Lenovo Welcome

The Lenovo Welcome program introduces some innovative built-in features of Lenovo to you and guides you through some important setup tasks to help you make the most of your computer.

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### Lenovo ThinkVantage Tools

The Lenovo ThinkVantage® Tools program guides you to a host of information sources and provides easy access to various tools to help you work more easily and securely.

To access the Lenovo ThinkVantage Tools program, click **Start → All Programs → Lenovo ThinkVantage Tools**.

The following table lists the programs that you can access from the Lenovo ThinkVantage Tools program. To access a program, double-click the corresponding icon.

*Table 1. Program icon names in Lenovo ThinkVantage Tools*

Program name	Icon name in Lenovo ThinkVantage Tools
Create Recovery Media	Factory Recovery Disks
Fingerprint Software	Fingerprint Reader
Lenovo ThinkVantage Toolbox/Lenovo Solution Center	System Health and Diagnostics
SimpleTap	SimpleTap
ThinkVantage Password Manager	Password Vault
ThinkVantage Power Manager	Power Controls
ThinkVantage Rescue and Recovery®	Enhanced Backup and Restore
ThinkVantage System Update	Update and Drives

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### Lenovo Solution Center

The Lenovo Solution Center program enables you to troubleshoot and resolve computer problems. It combines diagnostic tests, system information collection, security status, and support information, along with hints and tips for maximum system performance. See “Lenovo Solution Center” on page 39 for detailed information.

---

### SimpleTap

The SimpleTap program provides you with a quick way to customize some basic computer settings such as muting the speakers, adjusting the volume, locking the computer operating system, launching a program, opening a Web page, opening a file, and so on. You also can use the SimpleTap program to access the Lenovo App Shop, from which you can download various applications and computer software.

To start the SimpleTap program in a quick way, do any of the following:

- Click the red SimpleTap launch point on the desktop. The red launch point is available on the desktop after you have launched the SimpleTap program for the first time.
- Press the blue ThinkVantage button if your keyboard has one.

**Note:** The SimpleTap program is only available on certain models preinstalled with the Windows 7 operating system. If your Windows 7 model is not preinstalled with the SimpleTap program, you can download it from <http://www.lenovo.com/support>.

---

## Additional information resources

If you have Internet access, the most up-to-date information for your computer is available at: <http://www.lenovo.com/support>

You can find the following information:

- Customer Replaceable Unit (CRU) installation or replacement instructions
- Downloads and drivers
- Parts information
- Publications
- Troubleshooting information
- Links to other useful sources of information

---

## Specifications

This section lists the physical specifications for your computer.

### Dimensions

Width: 160 mm (6.3 inches)

Height: 388 mm (15.28 inches)

Depth: 422 mm (16.61 inches)

### Weight

Maximum configuration as shipped: 9.4 kg (20.72 lb)

### Environment

- Air temperature:
  - Operating: 10°C to 35°C (50°F to 95°F)
  - Non-operating: -40°C to 60°C (-40°F to 140°F)
  - Non-operating: -10°C to 60°C (14°F to 140°F) (without package)
- Humidity:
  - Operating: 20% to 80% (non-condensing)
  - Non-operating: 20% to 90% (non-condensing)
- Altitude:
  - Operating: -50 to 10 000 ft (-15.2 to 3 048 m)
  - Non-operating: -50 to 35 000 ft (-15.2 to 10 668 m)

### Electrical input

- Input voltage:
  - Low range:
    - Minimum: 100 V ac
    - Maximum: 127 V ac

Input frequency range: 50 to 60 Hz

– High range:

Minimum: 200 V ac

Maximum: 240 V ac

Input frequency range: 50 to 60 Hz





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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 might have been 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.

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

Before replacing a FRU, 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 107.

Use the following procedure to help determine the cause of a 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 65.
  - If the computer displays a POST error, go to “POST error codes” on page 66.
  - If the computer hangs and no error is displayed, turn off the computer and the power. Then, turn the power and the computer back on, continue at step 7.
7. Run the Diagnostic programs. See Chapter 5 “Diagnostic programs” on page 39.
  - If you receive an error, replace the part that the diagnostic program calls out or go to “Diagnostic error codes” on page 47.
  - If the test stops and you cannot continue, replace the last device tested.

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### 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 drive 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 operating-system-controlled files

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

---

## Chapter 5. Diagnostic programs

Diagnostic programs are used to test hardware components of your computer. Diagnostic programs can also report operating-system-controlled settings that interfere with the correct operation of your system. You can use the preinstalled diagnostic program to diagnose computer problems, if your computer is running in the Windows® operating system.

### Notes:

1. Depending on the date when your computer was manufactured, your computer is preinstalled with either the Lenovo Solution Center program or the Lenovo ThinkVantage Toolbox program for diagnostic purposes. For more information about the Lenovo ThinkVantage Toolbox program, see “Lenovo ThinkVantage Toolbox” on page 39. For more information about the Lenovo Solution Center program, see “Lenovo Solution Center” on page 39.
2. You can also download the PC-Doctor for DOS diagnostic program from <http://www.lenovo.com/support>. See “PC-Doctor for DOS” on page 40 for detailed information.
3. If you are unable to isolate and repair the problem yourself after running the programs, save and print the log files created by the programs. You will need the log files when you speak to a Lenovo technical support representative.

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### Lenovo ThinkVantage Toolbox

The Lenovo ThinkVantage Toolbox program helps you maintain your computer, improve computing security, diagnose computer problems, get familiar with the innovative technologies provided by Lenovo, and get more information about your computer. You can use the diagnostics feature of the Lenovo ThinkVantage Toolbox program to test devices, diagnose computer problems, create bootable diagnostic media, update system drivers, and view system information.

To run the Lenovo ThinkVantage Toolbox program on the Windows 7 operating system, click **Start → All Programs → Lenovo ThinkVantage Tools → System Health and Diagnostics**. Follow the instructions on the screen.

Follow the instructions on the screen. For additional information, refer to the Lenovo ThinkVantage Toolbox help system.

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### Lenovo Solution Center

The Lenovo Solution Center program enables you to troubleshoot and resolve computer problems. It combines diagnostic tests, system information collection, security status, and support information, along with hints and tips for maximum system performance.

### Notes:

- The Lenovo Solution Center program is available only on models preinstalled with the Windows 7 operating system. If your Windows 7 model is not preinstalled with the program, you can download it from <http://www.lenovo.com/diagnose>.
- If you are using the Windows Vista or Windows XP operating system, go to <http://www.lenovo.com/diagnose> for the latest information on diagnostics for your computer.

To run the Lenovo Solution Center program on the Windows 7 operating system, click **Start → All Programs → Lenovo ThinkVantage Tools → System Health and Diagnostics**. Follow the instructions on the screen.

For additional information, refer to the Lenovo Solution Center help system.

**Note:** If you are unable to isolate and repair the problem yourself after running the program, save and print the log files created by the program. You will need the log files when you speak to a Lenovo technical support representative.

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## PC-Doctor for DOS

You can also download the latest version of the PC-Doctor for DOS diagnostic program from <http://www.lenovo.com/support>. The PC-Doctor for DOS diagnostic program runs independently of the Windows operating system. Use the PC-Doctor for DOS diagnostic program if you are unable to start the Windows operating system. You can run the PC-Doctor for DOS diagnostic program from a diagnostic disc that you created.

## Creating a diagnostic disc

This section provides instructions on how to create a diagnostic disc.

To create a diagnostic disc, do the following:

1. Download a self-starting bootable disc image (known as an ISO image) of the diagnostic program from: <http://www.lenovo.com/support>
2. Use any disc burning software to create a diagnostic disc with the ISO image.

## Running the diagnostic program from the diagnostic disc

This section provides instructions on how to run the diagnostic program from the diagnostic disc that you created.

To run the diagnostic program from the diagnostic disc that you created, do the following:

1. Make sure your computer is turned off.
2. Repeatedly press and release the F12 key when turning on the computer. When the **Startup Device Menu** opens, release the F12 key.
3. Insert the diagnostic disc into the optical drive.
4. Select the optical drive with the diagnostic disc as the startup device and press Enter. The diagnostic program opens.
5. Follow the instructions on the screen to run the desired diagnostic test. For additional help, press the F1 key.
6. Remove the diagnostic disc from the optical drive after completing the diagnostic test.

## Navigating through the diagnostic 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 **Run Quick Test** does 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 42.

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 computer.
- **Failure Type:**  
Represents the type of error encountered.
- **DeviceID:**  
Contains the component's unit-ID that corresponds to a fixed disk drive, removable media drive, 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 47 for error code listings.

## Quick and Full erase - hard disk drive

The diagnostics program offers two hard disk drive format utilities:

- Quick Erase Hard Drive
- Full Erase Hard Drive

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

- Destroys the Master Boot Record (MBR) on the hard disk 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.

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 disk drive.
- Provides an estimate of time to completion along with a visual representation of completion status.
- Provides messages that warn the user about a non-recoverable process.

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

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

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

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.

---

## Chapter 6. Using the Setup Utility program

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. Make sure your computer is turned off.
2. Repeatedly press and release the F1 key when turning on the computer. When you hear multiple beeps or see a logo screen, release the F1 key.

**Note:** If a Power-On Password or an Administrator Password has been set, the Setup Utility program menu will not be displayed until you type the correct password. For more information, see “Using passwords” on page 43.

When the POST detects that the hard disk drive has been removed from your computer or the memory module size has decreased, an error message will be displayed when you start the computer and you will be prompted to do one of the following:

- Press F1 to enter the Setup Utility program.

**Note:** After you enter the Setup Utility program, select **Save Changes and Exit** at the bottom of the screen. The error message will not be displayed again.

- Press F2 to bypass the error message and log in to the operating system.

---

### Viewing and changing settings

The Setup Utility program menu lists various items about the system configuration. To view or change settings, start the Setup Utility program. See “Starting the Setup Utility program” on page 43. Then, follow the instructions on the screen.

You can use either the keyboard or the mouse to navigate through BIOS menu choices. 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 access to your computer and data. The following types of passwords are available:

- Power-On Password
- Administrator Password

You do not have to set any passwords to use your computer. However, using passwords improves computing security. If you decide to set any passwords, read the following sections.

### Password considerations

A password can be any combination of up to 64 alphabetic and numeric characters. For security reasons, it is recommended to use a strong password that cannot be easily compromised. To set a strong password, use the following guidelines:

- Have at least eight characters in length
- Contain at least one alphabetic character and one numeric character
- Setup Utility program password is 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 passwords

## Power-On Password

When a Power-On Password is set, you are prompted to type a valid password each time the computer is turned on. The computer cannot be used until the valid password is typed in.

## Administrator Password

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

When an Administrator Password is set, you are prompted to type a valid password each time you try to access the Setup Utility program. The Setup Utility program cannot be accessed until a valid password is typed in.

If both the Power-On Password and Administrator Password are set, you can type either password. However, you must use your Administrator Password to change any configuration settings.

## Setting, changing, and deleting a password

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

1. Start the Setup Utility program. See “Starting the Setup Utility program” on page 43.
2. From the Setup Utility program main menu, select **Security**.
3. Depending on the password type, select **Set Power-On Password** or **Set Administrator Password**.
4. Follow the instructions on the right side of the screen to set, change, or delete a password.

**Note:** A password can be any combination of up to 64 alphabetic and numeric characters. For more information, see “Password considerations” on page 43.

## Erasing lost or forgotten passwords (clearing CMOS)

This section provides instructions on how to erase lost or forgotten passwords, such as a user password.

To erase a lost or forgotten password, do the following:

1. Remove all media from the drives and turn off all attached devices and the computer. Then, disconnect all power cords from electrical outlets and disconnect all cables that are connected to the computer.
2. Remove the computer cover. See “Removing the computer cover” on page 78.
3. Locate the Clear CMOS /Recovery jumper on the system board. See “Locating parts on the system board” on page 76.
4. Move the jumper from the standard position (pin 1 and pin 2) to the maintenance position (pin 2 and pin 3).
5. Reinstall the computer cover and connect the power cord. See “Completing the parts replacement” on page 99.



6. Turn on the computer and leave it on for approximately 10 seconds. Then, turn off the computer by holding the power switch for approximately five seconds.
7. Repeat step 1 through step 3.
8. Move the Clear CMOS /Recovery jumper back to the standard position (pin 1 and pin 2).
9. Reinstall the computer cover and connect the power cord. See “Completing the parts replacement” on page 99.

---

## Enabling or disabling a device

This section provides information on how to enable or disable user access to the following devices:

<b>USB Setup</b>	Use this option to enable or disable a USB connector. When a USB connector is disabled, the device connected to the USB connector cannot be used.
<b>SATA Controller</b>	When this feature is set to <b>Disable</b> , all devices connected to the SATA connectors (such as hard disk drives or the optical drive) are disabled and cannot be accessed.
<b>External SATA Port</b>	When this option is set to <b>Disable</b> , the device connected to the External SATA connector cannot be accessed.

To enable or disable a device, do the following:

1. Start the Setup Utility program. See “Starting the Setup Utility program” on page 43.
2. From the Setup Utility program main menu, select **Devices**.
3. Depending on the device you want to enable or disable, do one of the following:
  - Select **USB Setup** to enable or disable a USB device.
  - Select **ATA Drive Setup** to enable or disable an internal or external SATA device.
4. Select the desired settings and press Enter.
5. Press F10 to save changes and exit the Setup Utility program. See “Exiting the Setup Utility program” on page 46.

---

## Selecting a startup device

If your computer does not start up from a device such as the disc or hard disk drive as expected, do one of the following to select the startup device you want.

### Selecting a temporary startup device

Use this procedure to select a temporary startup device.

**Note:** Not all discs and hard disk drives are bootable.

1. Turn off your computer.
2. Repeatedly press and release the F12 key when turning on the computer. When the Please select boot device window displays, release the F12 key.
3. Select the desired startup device and press Enter. The computer will start up from the device you selected.

**Note:** Selecting a startup device from the Please select boot device window 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 43.
2. From the Setup Utility program main menu, select **Startup**.
3. Select the devices for the Primary Startup Sequence, the Automatic Startup Sequence, and the Error Startup Sequence. Read the information displayed on the right side of the screen.
4. Press F10 to save changes and exit the Setup Utility program. See “Exiting the Setup Utility program” on page 46.

---

## Exiting the Setup Utility program

After you finish viewing or changing settings, press Esc to return to the Setup Utility program main menu. You might have to press Esc several times. Do one of the following:

- If you want to save the new settings, press F10 to save changes and exit the Setup Utility program.
- If you do not want to save the settings, select **Exit → Discard Changes and Exit**, and then press Enter. When the Reset Without Saving window shows, select **Yes**, and then press Enter to exit the Setup Utility program.
- If you want to return to the default settings, press F9 to load the default settings, and then press F10 to save and exit the Setup Utility program.

---

## Chapter 7. 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 the Chapter 4 “General checkout” on page 37. You can use this index to help you decide which FRUs are needed when servicing a computer. If you are unable to correct the problem using this index, go to “Undetermined problems” on page 69.

### Notes:

1. If you have both an error message and an incorrect audio response, diagnose the error message first.
2. 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.
3. 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 program, format the hard disk drive.</li></ol>
The drive is defective.	Replace the hard disk drive.

---

### Power supply problems

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

---

### Diagnostic error codes

Refer to the following diagnostic error codes when using the diagnostic tests. See “Running tests” on page 40 for the specific type for information about the diagnostic programs.

In the following index, X can represent any number.

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>000-000-XXX</b> BIOS Test Passed	<b>No action</b>
<b>000-002-XXX</b> BIOS Timeout	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107.</li> <li>2. System board</li> </ol>
<b>000-024-XXX</b> BIOS Addressing test failure	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107.</li> <li>2. System board</li> </ol>
<b>000-025-XXX</b> BIOS Checksum Value error	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107.</li> <li>2. System board</li> </ol>
<b>000-026-XXX</b> FLASH data error	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107.</li> <li>2. System board</li> </ol>
<b>000-027-XXX</b> BIOS Configuration/Setup error	<ol style="list-style-type: none"> <li>1. Run Setup</li> <li>2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. System board</li> </ol>
<b>000-034-XXX</b> BIOS Buffer Allocation failure	<ol style="list-style-type: none"> <li>1. Reboot the system</li> <li>2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Run memory test</li> <li>4. System board</li> </ol>
<b>000-035-XXX</b> BIOS Reset Condition detected	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107.</li> <li>2. System board</li> </ol>
<b>000-036-XXX</b> BIOS Register error	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107.</li> <li>2. System board</li> </ol>
<b>000-038-XXX</b> BIOS Extension failure	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>2. Adapter card</li> <li>3. System board</li> </ol>
<b>000-039-XXX</b> BIOS DMI data error	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107.</li> <li>2. System board</li> </ol>
<b>000-195-XXX</b> BIOS Test aborted by user	Information only Re-start the test, if necessary
<b>000-196-XXX</b> 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>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>000-197-XXX</b> 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 program” on page 43</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> 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 program” on page 43</li> <li>2. Flash the system and retest. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>000-199-XXX</b> BIOS test failed, cause unknown	<ol style="list-style-type: none"> <li>1. Go to “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test</li> </ol>
<b>000-250-XXX</b> BIOS APM failure	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>2. System board</li> </ol>
<b>000-270-XXX</b> BIOS ACPI failure	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>2. System board</li> </ol>
<b>001-000-XXX</b> System Test Passed	No action
<b>001-00X-XXX</b> System Error	System board
<b>001-01X-XXX</b> System Error	System board
<b>001-024-XXX</b> System Addressing test failure	System board
<b>001-025-XXX</b> System Checksum Value error	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>2. System board</li> </ol>
<b>001-026-XXX</b> System FLASH data error	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>2. System board</li> </ol>
<b>001-027-XXX</b> System Configuration/Setup error	<ol style="list-style-type: none"> <li>1. Run Setup</li> <li>2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. System board</li> </ol>
<b>001-032-XXX</b> System Device Controller failure	System board
<b>001-034-XXX</b> System Device Buffer Allocation failure	<ol style="list-style-type: none"> <li>1. Reboot the system</li> <li>2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Run memory test</li> <li>4. System board</li> </ol>
<b>001-035-XXX</b> System Device Reset condition detected	System board
<b>001-036-XXX</b> System Register error	System board

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>001-038-XXX</b> System Extension failure	<ol style="list-style-type: none"> <li>1. Adapter card</li> <li>2. System board</li> </ol>
<b>001-039-XXX</b> System DMI data structure error	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>2. System board</li> </ol>
<b>001-040-XXX</b> System IRQ failure	<ol style="list-style-type: none"> <li>1. Power-off/on system and re-test</li> <li>2. System board</li> </ol>
<b>001-041-XXX</b> System DMA failure	<ol style="list-style-type: none"> <li>1. Power-off/on system and re-test</li> <li>2. System board</li> </ol>
<b>001-195-XXX</b> System Test aborted by user	Information only Re-start the test, if necessary
<b>001-196-XXX</b> System 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>001-197-XXX</b> System 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 program” on page 43</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> System test aborted	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and retest. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>001-199-XXX</b> System test failed, cause unknown	<ol style="list-style-type: none"> <li>1. Go to “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test</li> </ol>
<b>001-250-XXX</b> System ECC error	System board
<b>001-254-XXX 001-255-XXX 001-256-XXX 001-257-XXX</b> System DMA error	System board
<b>001-260-XXX 001-264-XXX</b> System IRQ error	System board
<b>001-268-XXX</b> System IRQ1 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ1</li> <li>2. System board</li> </ol>
<b>001-269-XXX</b> System IRQ2 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ2</li> <li>2. System board</li> </ol>
<b>001-270-XXX</b> System IRQ3 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ3</li> <li>2. System board</li> </ol>
<b>001-271-XXX</b> System IRQ4 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ4</li> <li>2. System board</li> </ol>
<b>001-272-XXX</b> System IRQ5 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ5</li> <li>2. System board</li> </ol>

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>001-273-XXX</b> System IRQ6 (diskette drive) failure	<ol style="list-style-type: none"> <li>1. Diskette Cable</li> <li>2. Diskette drive</li> <li>3. System board</li> </ol>
<b>001-274-XXX</b> System IRQ7 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ7</li> <li>2. System board</li> </ol>
<b>001-275-XXX</b> System IRQ8 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ8</li> <li>2. System board</li> </ol>
<b>001-276-XXX</b> System IRQ9 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ9</li> <li>2. System board</li> </ol>
<b>001-277-XXX</b> System IRQ10 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ10</li> <li>2. System board</li> </ol>
<b>001-278-XXX</b> System IRQ11 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ11</li> <li>2. System board</li> </ol>
<b>001-279-XXX</b> System IRQ12 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ12</li> <li>2. System board</li> </ol>
<b>001-280-XXX</b> System IRQ13 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ13</li> <li>2. System board</li> </ol>
<b>001-281-XXX</b> System IRQ14 (hard disk drive) failure	<ol style="list-style-type: none"> <li>1. Hard disk drive cable</li> <li>2. Hard disk drive</li> <li>3. System board</li> </ol>
<b>001-282-XXX</b> System IRQ15 failure	<ol style="list-style-type: none"> <li>1. Device on IRQ15</li> <li>2. System board</li> </ol>
<b>001-286-XXX 001-287-XXX 001-288-XXX</b> System Timer failure	System board
<b>001-292-XXX</b> System CMOS RAM error	<ol style="list-style-type: none"> <li>1. Run Setup and re-test</li> <li>2. System board</li> </ol>
<b>001-293-XXX</b> System CMOS Battery	<ol style="list-style-type: none"> <li>1. CMOS battery</li> <li>2. System board</li> </ol>
<b>001-298-XXX</b> System RTC date/time update failure	<ol style="list-style-type: none"> <li>1. Flash the system. See "Updating (flashing) the BIOS from a disc" on page 107</li> <li>2. System board</li> </ol>
<b>001-299-XXX</b> System RTC periodic interrupt failure	System board
<b>001-300-XXX</b> System RTC Alarm failure	System board
<b>001-301-XXX</b> System RTC Century byte error	<ol style="list-style-type: none"> <li>1. Flash the system. See "Updating (flashing) the BIOS from a disc" on page 107</li> <li>2. System board</li> </ol>
<b>005-000-XXX</b> Video Test Passed	No action
<b>005-00X-XXX</b> Video error	<ol style="list-style-type: none"> <li>1. Video card, if installed</li> <li>2. System board</li> </ol>
<b>005-010-XXX 005-011-XXX 005-012-XXX 005-013-XXX</b> Video Signal failure	<ol style="list-style-type: none"> <li>1. Video card, if installed</li> <li>2. System board</li> </ol>

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>005-016-XXX</b> Video Simple Pattern test failure	<ol style="list-style-type: none"> <li>1. Video Ram</li> <li>2. Video card, if installed</li> <li>3. System board</li> </ol>
<b>005-024-XXX</b> Video Addressing test failure	<ol style="list-style-type: none"> <li>1. Video card, if installed</li> <li>2. System board</li> </ol>
<b>005-025-XXX</b> Video Checksum Value error	<ol style="list-style-type: none"> <li>1. Video card, if installed</li> <li>2. System board</li> </ol>
<b>005-027-XXX</b> Video Configuration/Setup error	<ol style="list-style-type: none"> <li>1. Run Setup</li> <li>2. Video drivers update</li> <li>3. Video card, if installed</li> <li>4. System board</li> </ol>
<b>005-031-XXX</b> Video Device Cable failure	<ol style="list-style-type: none"> <li>1. Video cable</li> <li>2. Monitor</li> <li>3. Video card, if installed</li> <li>4. System board</li> </ol>
<b>005-032-XXX</b> Video Device Controller failure	<ol style="list-style-type: none"> <li>1. Video card, if installed</li> <li>2. System board</li> </ol>
<b>005-036-XXX</b> Video Register error	<ol style="list-style-type: none"> <li>1. Video card, if installed</li> <li>2. System board</li> </ol>
<b>005-038-XXX</b> System BIOS extension failure	<ol style="list-style-type: none"> <li>1. Video card, if installed</li> <li>2. System board</li> </ol>
<b>005-040-XXX</b> Video IRQ failure	<ol style="list-style-type: none"> <li>1. Video card, if installed</li> <li>2. System board</li> </ol>
<b>005-195-XXX</b> Video Test aborted by user	Information only Re-start the test, if necessary
<b>005-196-XXX</b> Video 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>005-197-XXX</b> Video 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 program” on page 43</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> Video test aborted	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>005-199-XXX</b> Video test failed, cause unknown	<ol style="list-style-type: none"> <li>1. Go to “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>



<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>005-2XX-XXX 005-3XX-XXX</b> Video subsystem error	<ol style="list-style-type: none"> <li>1. Video card, if installed</li> <li>2. System board</li> </ol>
<b>006-000-XXX</b> Diskette interface Test Passed	No action
<b>006-0XX-XXX</b> Diskette interface error	<ol style="list-style-type: none"> <li>1. Diskette drive Cable</li> <li>2. Diskette drive</li> <li>3. System board</li> </ol>
<b>006-195-XXX</b> Diskette interface Test aborted by user	Information only Re-start the test, if necessary
<b>006-196-XXX</b> Diskette interface 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>006-197-XXX</b> Diskette interface test warning	<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. 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>006-198-XXX</b> Diskette interface 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 "Updating (flashing) the BIOS from a disc" on page 107</li> <li>3. Go to "Undetermined problems" on page 69</li> </ol>
<b>006-199-XXX</b> Diskette interface test failed, cause unknown	<ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 69</li> <li>2. Flash the system and re-test</li> <li>3. Replace component under function test</li> </ol>
<b>006-25X-XXX</b> Diskette interface Error	<ol style="list-style-type: none"> <li>1. Diskette drive cable</li> <li>2. Diskette drive</li> <li>3. System board</li> </ol>
<b>011-000-XXX</b> Serial port Interface Test Passed	No action
<b>011-001-XXX</b> Serial port Presence	<ol style="list-style-type: none"> <li>1. Remove external serial device, if present</li> <li>2. Run setup, enable port</li> <li>3. System board</li> </ol>
<b>011-002-XXX 011-003-XXX</b> Serial port Timeout/Parity error	System board
<b>011-013-XXX 011-014-XXX</b> Serial port Control Signal/Loopback test failure	System board
<b>011-015-XXX</b> Serial port External Loopback failure	<ol style="list-style-type: none"> <li>1. Wrap plug</li> <li>2. System board</li> </ol>
<b>011-027-XXX</b> Serial port Configuration/Setup error	<ol style="list-style-type: none"> <li>1. Run Setup, enable port</li> <li>2. Flash the system. See "Updating (flashing) the BIOS from a disc" on page 107</li> <li>3. System board</li> </ol>
<b>011-03X-XXX 011-04X-XXX</b> Serial port failure	System board
<b>011-195-XXX</b> Serial port Test aborted by user	Information only Re-start the test, if necessary

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>011-196-XXX</b> Serial 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>011-197-XXX</b> Serial 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 program” on page 43</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>011-198-XXX</b> Serial 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. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>011-199-XXX</b> Serial port test failed, cause unknown	<ol style="list-style-type: none"> <li>1. Go to “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>011-2XX-XXX</b> Serial port signal failure	<ol style="list-style-type: none"> <li>1. External serial device</li> <li>2. System board</li> </ol>
<b>014-000-XXX</b> Parallel port Interface Test Passed	No action
<b>014-001-XXX</b> Parallel port Presence	<ol style="list-style-type: none"> <li>1. Remove external parallel device, if present</li> <li>2. Run setup, enable port</li> <li>3. System board</li> </ol>
<b>014-002-XXX 014-003-XXX</b> Parallel port Timeout/Parity error	System board
<b>014-013-XXX 014-014-XXX</b> Parallel port Control Signal/Loopback test failure	System board
<b>014-015-XXX</b> Parallel port External Loopback failure	<ol style="list-style-type: none"> <li>1. Wrap plug</li> <li>2. System board</li> </ol>
<b>014-027-XXX</b> Parallel port Configuration/Setup error	<ol style="list-style-type: none"> <li>1. Run Setup, enable port</li> <li>2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. System board</li> </ol>
<b>014-03X-XXX 014-04X-XXX</b> Parallel port failure	System board
<b>014-195-XXX</b> Parallel port Test aborted by user	Information only Re-start the test, if necessary
<b>014-196-XXX</b> 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>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>014-197-XXX</b> 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 program” on page 43</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> 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 “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>014-199-XXX</b> Parallel port test failed, cause unknown	<ol style="list-style-type: none"> <li>1. Go to “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>014-2XX-XXX 014-3XX-XXX</b> 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> USB port Interface Test Passed	No action
<b>015-001-XXX</b> 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> 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> 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> USB port Configuration/Setup error	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>2. System board</li> </ol>
<b>015-032-XXX</b> USB port Device Controller failure	System board
<b>015-034-XXX</b> 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 “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Run memory test</li> <li>4. System board</li> </ol>
<b>015-035-XXX</b> 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>
<b>015-036-XXX</b> USB port Register error	System board
<b>015-040-XXX</b> USB port IRQ failure	<ol style="list-style-type: none"> <li>1. Run setup and check for conflicts</li> <li>2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. System board</li> </ol>
<b>015-195-XXX</b> USB port Test aborted by user	Information only Re-start the test, if necessary

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>015-196-XXX</b> USB 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>015-197-XXX</b> USB 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 program” on page 43</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> USB 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. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>015-199-XXX</b> USB port test failed, cause unknown	<ol style="list-style-type: none"> <li>1. Go to “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>018-000-XXX</b> PCI Card Test Passed	No action
<b>018-0XX-XXX</b> PCI Card Failure	<ol style="list-style-type: none"> <li>1. Riser card, if installed</li> <li>2. System board</li> </ol>
<b>018-195-XXX</b> PCI Card Test aborted by user	<ol style="list-style-type: none"> <li>1. PCI card</li> <li>2. Information only Re-start the test, if necessary</li> </ol>
<b>018-196-XXX</b> PCI Card 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>018-197-XXX</b> PCI Card 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 program” on page 43</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> PCI Card test aborted	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>018-199-XXX</b> PCI Card test failed, cause unknown	<ol style="list-style-type: none"> <li>1. Go to “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>018-250-XXX</b> PCI Card Services 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>
<b>020-000-XXX</b> PCI Interface Test Passed	No action
<b>020-0XX-XXX</b> PCI Interface 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>
<b>020-195-XXX</b> PCI Test aborted by user	Information only Re-start the test, if necessary
<b>020-196-XXX</b> PCI 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>020-197-XXX</b> PCI test warning	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility program” on page 43</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>020-198-XXX</b> PCI test aborted	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>020-199-XXX</b> PCI test failed, cause unknown	<ol style="list-style-type: none"> <li>1. Go to “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>020-262-XXX</b> 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>
<b>025-000-XXX</b> IDE interface Test Passed	No action
<b>025-00X-XXX 025-01X-XXX</b> IDE interface failure	<ol style="list-style-type: none"> <li>1. IDE signal cable</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>
<b>025-027-XXX</b> IDE interface Configuration/Setup error	<ol style="list-style-type: none"> <li>1. IDE signal cable</li> <li>2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Reseat IDE signal cable</li> <li>4. IDE device</li> <li>5. System board</li> </ol>

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>025-02X-XXX 025-03X-XXX 025-04X-XXX</b> IDE Interface failure	<ol style="list-style-type: none"> <li>1. IDE signal cable</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>
<b>025-195-XXX</b> IDE interface Test aborted by user	Information only Re-start the test, if necessary
<b>025-196-XXX</b> IDE interface 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>025-197-XXX</b> IDE interface test warning	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 "Using the Setup Utility program" on page 43</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>025-198-XXX</b> IDE interface test aborted	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 "Using the Setup Utility program" on page 43</li> <li>2. Flash the system and re-test. See "Updating (flashing) the BIOS from a disc" on page 107</li> <li>3. Go to "Undetermined problems" on page 69</li> </ol>
<b>025-199-XXX</b> IDE interface test failed, cause unknown	<ol style="list-style-type: none"> <li>1. Go to "Undetermined problems" on page 69</li> <li>2. Flash the system and re-test. See "Updating (flashing) the BIOS from a disc" on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>030-000-XXX</b> SCSI interface Test Passed	No action
<b>030-00X-XXX 030-01X-XXX</b> SCSI interface failure	<ol style="list-style-type: none"> <li>1. SCSI signal cable</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> SCSI interface Configuration/Setup error	<ol style="list-style-type: none"> <li>1. SCSI signal cable</li> <li>2. Flash the system. See "Updating (flashing) the BIOS from a disc" on page 107</li> <li>3. SCSI device</li> <li>4. SCSI adapter card, if installed</li> <li>5. System board</li> </ol>
<b>030-03X-XXX 030-04X-XXX</b> SCSI interface error	<ol style="list-style-type: none"> <li>1. SCSI signal cable</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> SCSI interface Test aborted by user	Information only Re-start the test, if necessary

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>030-196-XXX</b> SCSI interface 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>030-197-XXX</b> SCSI interface test warning	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility program” on page 43</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>030-198-XXX</b> SCSI interface test aborted	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>030-199-XXX</b> SCSI interface test failed, cause unknown	<ol style="list-style-type: none"> <li>1. Go to “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>035-000-XXX</b> RAID interface Test Passed	No action
<b>035-0XX-XXX</b> RAID interface Failure	<ol style="list-style-type: none"> <li>1. RAID signal cable</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> RAID interface Test aborted by user	Information only Re-start the test, if necessary
<b>035-196-XXX</b> RAID interface 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>035-197-XXX</b> RAID interface 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 program” on page 43</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> RAID interface test aborted	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>035-199-XXX</b> RAID interface test failed, cause unknown	<ol style="list-style-type: none"> <li>1. See “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>071-000-XXX</b> Audio port Interface Test Passed	No action

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>071-00X-XXX 071-01X-XXX 071-02X-XXX</b> Audio port error	<ol style="list-style-type: none"> <li>1. Run Setup</li> <li>2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. System board</li> </ol>
<b>071-03X-XXX</b> Audio port failure	<ol style="list-style-type: none"> <li>1. Speakers</li> <li>2. Microphone</li> <li>3. Audio card, if installed</li> <li>4. System board</li> </ol>
<b>071-04X-XXX</b> Audio port failure	<ol style="list-style-type: none"> <li>1. Run Setup</li> <li>2. Audio card, if installed</li> <li>3. System board</li> </ol>
<b>071-195-XXX</b> Audio port Test aborted by user	Information only Re-start the test, if necessary
<b>071-196-XXX</b> Audio 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>071-197-XXX</b> Audio 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 program” on page 43</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>071-198-XXX</b> Audio 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. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>071-199-XXX</b> Audio port test failed, cause unknown	<ol style="list-style-type: none"> <li>1. See “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>071-25X-XXX</b> Audio port failure	<ol style="list-style-type: none"> <li>1. Speakers</li> <li>2. Audio card, if installed</li> <li>3. System board</li> </ol>
<b>080-000-XXX</b> Game Port interface Test Passed	No action
<b>080-XXX-XXX</b> Game Port interface Error	<ol style="list-style-type: none"> <li>1. Remove the game port device and re-test the system</li> </ol>
<b>080-195-XXX</b> Game Port interface Test aborted by user	Information only Re-start the test, if necessary
<b>080-196-XXX</b> Game Port interface 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>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>080-197-XXX</b> Game Port interface 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 program” on page 43</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> Game Port interface test aborted	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>080-199-XXX</b> Game Port interface test failed, cause unknown	<ol style="list-style-type: none"> <li>1. See “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>086-000-XXX</b> Mouse Port interface Test Passed	No action
<b>086-001-XXX</b> Mouse Port interface Presence	<ol style="list-style-type: none"> <li>1. Mouse</li> <li>2. System board</li> </ol>
<b>086-032-XXX</b> Mouse Port interface Device controller failure	<ol style="list-style-type: none"> <li>1. Mouse</li> <li>2. System board</li> </ol>
<b>086-035-XXX</b> Mouse Port interface Reset	<ol style="list-style-type: none"> <li>1. Mouse</li> <li>2. System board</li> </ol>
<b>086-040-XXX</b> Mouse Port interface IRQ failure	<ol style="list-style-type: none"> <li>1. Run Setup</li> <li>2. Mouse</li> <li>3. System board</li> </ol>
<b>086-195-XXX</b> Mouse Port interface Test aborted by user	Information only Re-start the test, if necessary
<b>086-196-XXX</b> Mouse Port interface 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>086-197-XXX</b> Mouse Port interface 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 program” on page 43</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>086-198-XXX</b> Mouse Port interface test aborted	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>086-199-XXX</b> Mouse Port interface test failed, cause unknown	<ol style="list-style-type: none"> <li>1. See “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>089-000-XXX</b> Microprocessor Test Passed	No action
<b>089-XXX-XXX</b> Microprocessor failure	<ol style="list-style-type: none"> <li>1. Microprocessor(s)</li> <li>2. System board</li> </ol>
<b>089-195-XXX</b> Microprocessor Test aborted by user	Information only Re-start the test, if necessary
<b>089-196-XXX</b> Microprocessor 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>089-197-XXX</b> Microprocessor 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 program” on page 43</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>089-198-XXX</b> Microprocessor test aborted	<ol style="list-style-type: none"> <li>1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>2. Go to “Undetermined problems” on page 69</li> </ol>
<b>089-199-XXX</b> Microprocessor test failed, cause unknown	<ol style="list-style-type: none"> <li>1. See “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>170-000-XXX</b> Voltage Sensor(s) Test Passed	No action
<b>170-0XX-XXX</b> Voltage Sensor(s) failure	<ol style="list-style-type: none"> <li>1. Flash system</li> <li>2. System board</li> </ol>
<b>170-195-XXX</b> Voltage Sensor(s) Test aborted by user	Information only Re-start the test, if necessary
<b>170-196-XXX</b> Voltage Sensor(s) 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>170-197-XXX</b> Voltage Sensor(s) 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 program” on page 43</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> Voltage Sensor(s) test aborted	<ol style="list-style-type: none"> <li>1. If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility program” on page 43</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>170-199-XXX</b> Voltage Sensor(s) test failed, cause unknown	<ol style="list-style-type: none"> <li>1. See “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>170-250-XXX 170-251-XXX</b> Voltage Sensor(s) Voltage limit error	<ol style="list-style-type: none"> <li>1. Power supply</li> <li>2. System board</li> </ol>
<b>170-254-XXX</b> Voltage Sensor(s) Voltage Regulator Module error	<ol style="list-style-type: none"> <li>1. Voltage Regulator Module (VRM)</li> <li>2. Microprocessor</li> <li>3. System board</li> </ol>
<b>175-000-XXX</b> Thermal Sensor(s) Test Passed	No action
<b>175-0XX-XXX</b> Thermal Sensor(s) failure	<ol style="list-style-type: none"> <li>1. Flash system</li> <li>2. System board</li> </ol>
<b>175-195-XXX</b> Thermal Sensor(s) Test aborted by user	Information only Re-start the test, if necessary
<b>175-196-XXX</b> Thermal Sensor(s) 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>175-197-XXX</b> Thermal Sensor(s) 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 program” on page 43</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>175-198-XXX</b> Thermal Sensor(s) 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 “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Go to “Undetermined problems” on page 69</li> </ol>
<b>175-199-XXX</b> Thermal Sensor(s) test failed, cause unknown	<ol style="list-style-type: none"> <li>1. See “Undetermined problems” on page 69</li> <li>2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 107</li> <li>3. Replace component under function test</li> </ol>
<b>175-250-XXX 175-251-XXX</b> Thermal Sensor(s) limit error	<ol style="list-style-type: none"> <li>1. Check fans</li> <li>2. Check Power supply voltages</li> <li>3. Microprocessor</li> <li>4. System board</li> </ol>
<b>185-000-XXX</b> Asset Security Test Passed	No action
<b>185-XXX-XXX</b> Asset Security failure	<ol style="list-style-type: none"> <li>1. Flash system</li> <li>2. System board</li> </ol>
<b>185-278-XXX</b> Asset Security Chassis Intrusion	<ol style="list-style-type: none"> <li>1. Assure Asset Security Enabled</li> <li>2. C2 Cover Switch</li> <li>3. System board</li> </ol>
<b>201-000-XXX</b> System Memory Test Passed	No action

<b>Diagnostic Error Code</b>	<b>FRU/Action</b>
<b>201-XXX-XXX</b> System Memory error	<ol style="list-style-type: none"> <li>1. Replace the memory module called out by the test</li> <li>2. System board</li> </ol>
<b>202-000-XXX</b> System Cache Test Passed	No action
<b>202-XXX-XXX</b> System Cache error	<ol style="list-style-type: none"> <li>1. Cache, if removable</li> <li>2. System board</li> <li>3. Microprocessor</li> </ol>
<b>206-000-XXX</b> Diskette Drive Test Passed	No action
<b>206-XXX-XXX</b> Diskette Drive error	<ol style="list-style-type: none"> <li>1. Diskette Drive Cable</li> <li>2. Check power supply voltages</li> <li>3. Diskette drive</li> <li>4. System board</li> </ol>
<b>215-000-XXX</b> CD-ROM Drive Test Passed	No action
<b>215-XXX-XXX</b> CD-ROM Drive error	<ol style="list-style-type: none"> <li>1. CD-ROM Drive Cable</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> Hard Disk Drive Test Passed	No action
<b>217-25X-XXX 217-26X-XXX</b> Hard Disk Drive (IDE) error	<ol style="list-style-type: none"> <li>1. Hard Disk Drive Cable</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 217-29X-XXX</b> Hard Disk Drive (SCSI) error	<ol style="list-style-type: none"> <li>1. Hard Disk Drive Cable</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> Hi-Capacity Cartridge Drive Test Passed	No action
<b>220-XXX-XXX</b> Hi-Capacity Cartridge Drive error	<ol style="list-style-type: none"> <li>1. Remove the Hi-Capacity Cartridge Drive and re-test the system</li> </ol>
<b>301-XXX-XXX</b> Keyboard error	<ol style="list-style-type: none"> <li>1. Keyboard</li> <li>2. Check and test mouse</li> <li>3. System board</li> </ol>
<b>301-000-XXX</b> Keyboard Test Passed	No action
<b>302-000-XXX</b> Mouse Test Passed	No action
<b>302-XXX-XXX</b> Mouse error	<ol style="list-style-type: none"> <li>1. Mouse</li> <li>2. Check and test Keyboard</li> <li>3. System board</li> </ol>
<b>303-000-XXX</b> Joystick Test Passed	No action
<b>303-XXX-XXX</b> Joystick error	Remove the Joystick and re-test the system

Diagnostic Error Code	FRU/Action
<b>305-000-XXX</b> Monitor DDC Test Passed	No action
<b>305-250-XXX</b> Monitor DDC self test failure	<ol style="list-style-type: none"> <li>1. Run Setup to enable DDC</li> <li>2. Cable</li> <li>3. Monitor</li> <li>4. Video card</li> <li>5. System board</li> </ol>
<b>415-000-XXX</b> Modem Test Passed	No action
<b>415-XXX-XXX</b> 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 the POST.

The following tables describes beep symptoms.

Beep Symptom	FRU/Action
<b>2 short beeps</b> 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 program” on page 43.</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 and BIOS update failure” on page 108.</li> </ol>
<b>1 long and 2 short beeps</b> 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 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 program” on page 43.</li> <li>2. Perform a Boot-block recovery. See “Recovering from a POST and BIOS update failure” on page 108.</li> <li>3. Replace the system board.</li> </ol>
<b>Continuous long beeps</b> 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 Turn 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*. The 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.  Replace the battery.
CMOS checksum error - defaults loaded	Checksum of CMOS is incorrect.  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.  Make sure the hard disk drive is correctly installed.  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.  Make sure the keyboard is properly connected to the computer and that no keys are held pressed during POST.  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 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	Display/Monitor
Computer will <i>not</i> power-off. See "Hard disk drive boot error" on page 47.	<ol style="list-style-type: none"> <li>1. Power Switch</li> <li>2. System Board</li> <li>3. Riser card, if installed</li> </ol>
Computer will <i>not</i> RPL from server	<ol style="list-style-type: none"> <li>1. Ensure that network is in startup sequence as first device or first device after diskette</li> <li>2. Ensure that network adapter is enabled for RPL</li> <li>3. 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>1. Check power supply and signal cable connections to network adapter</li> <li>2. Ensure that the operating system settings are set to enable Wake on LAN</li> <li>3. Ensure Wake on LAN feature is enabled in Setup/Configuration (see "Starting the Setup Utility program" on page 43)</li> <li>4. Ensure network administrator is using correct MAC address</li> <li>5. Ensure no interrupt or I/O address conflicts</li> <li>6. Network adapter (advise network administrator of new MAC address)</li> </ol>
Dead computer. See "Hard disk drive boot error" on page 47.	<ol style="list-style-type: none"> <li>1. Power Supply</li> <li>2. 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>1. Diskette Drive</li> <li>2. System Board</li> <li>3. Diskette Drive Cable</li> </ol>
Flashing cursor with an otherwise blank display.	<ol style="list-style-type: none"> <li>1. System Board</li> <li>2. Primary Hard Disk Drive</li> <li>3. Hard Disk Drive Cable</li> </ol>
Incorrect memory size during POST	<ol style="list-style-type: none"> <li>1. Run the Memory tests</li> <li>2. Memory Module</li> <li>3. System Board</li> </ol>

Message/Symptom	FRU/Action
"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>1. System Board</li> <li>2. Diskette Drive Cable</li> <li>3. Network Adapter</li> </ol>
Intensity or color varies from left to right of characters and color bars	<ol style="list-style-type: none"> <li>1. Display</li> <li>2. Video adapter (if present)</li> <li>3. System Board</li> </ol>
No power or fan not running	<ol style="list-style-type: none"> <li>1. See "Hard disk drive boot error" on page 47.</li> </ol>
Non-system disk or disk error-type message with a known-good diagnostic diskette.	<ol style="list-style-type: none"> <li>1. Diskette Drive</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. Display</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. Printer</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. Run Setup 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. If network administrator is using LCCM Hybrid RPL, check startup sequence: <ol style="list-style-type: none"> <li>a. First device - network</li> <li>b. Second device - hard disk</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. Check startup sequence</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. External Device Self-Test OK?</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. External Device Self-Test OK?</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. Keyboard</li> <li>2. Keyboard Cable</li> <li>3. System Board</li> </ol>



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## Undetermined problems

If you encounter undetermined problems, do the following:

1. Turn off the computer and the power.
2. Remove or disconnect the following components (if installed) one at a time.
  - a. External devices (modem, printer, or mouse)
  - b. Any adapter cards
  - c. Memory modules
  - d. Extended video memory
  - e. External Cache
  - f. External Cache RAM
  - g. Hard disk drive
  - h. Diskette drive
3. Turn on the power and the computer to re-test the system.
4. Repeat steps 1 through 3 until you find the failing device or adapter cards.

If all devices and adapter cards

have been removed, and the problem continues, replace the system board. See “Replacing the system board” on page 95.



---

## Chapter 8. Replacing FRUs (Machine Types: 1899, 1928, 1932, and 1934)

**Important:** Be sure to read and understand Chapter 2 “Safety information” on page 3 before you replace any FRU. These precautions and guidelines will help you work safely.

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

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

---

### Locations

This section provides information to help you locate your computer connectors, components, parts on the system board, and internal drives.

**Note:** The components in your computer might look slightly different from the illustrations.

## Locating connectors, controls, and indicators on the front of your computer

Figure 1 “Front connector, control, and indicator locations” on page 72 shows the locations of the connectors, controls, and indicators on the front of your computer.

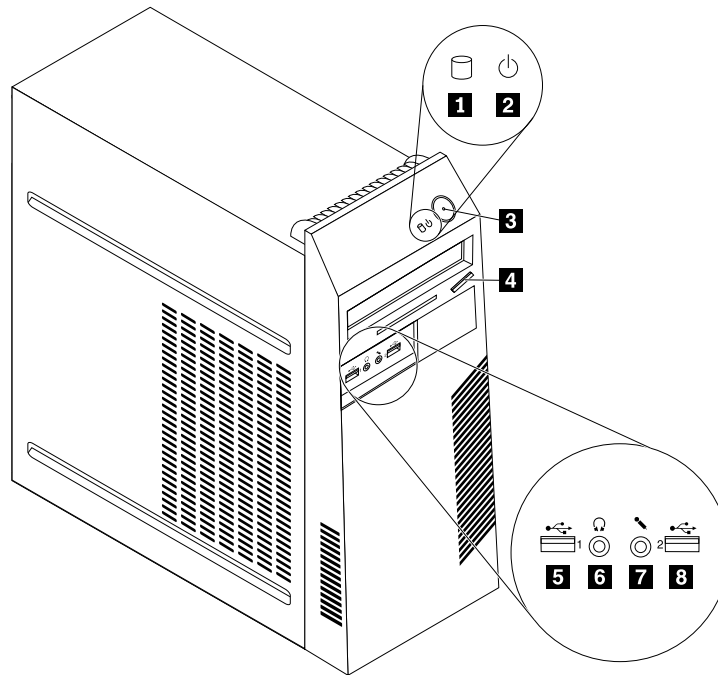


Figure 1. Front connector, control, and indicator locations

- |   |                               |
|---|-------------------------------|
| <b>1</b> Hard disk drive activity indicator | <b>5</b> USB connector        |
| <b>2</b> Power indicator                    | <b>6</b> Headphone connector  |
| <b>3</b> Power switch                       | <b>7</b> Microphone connector |
| <b>4</b> Optical drive eject/close button   | <b>8</b> USB connector        |

## Locating connectors and parts on the rear of your computer

Figure 2 “Rear connector and part locations” on page 73 shows the locations of the connectors and parts on the rear of your computer. Some connectors on the rear of your computer are color-coded to help you determine where to connect the cables on your computer.

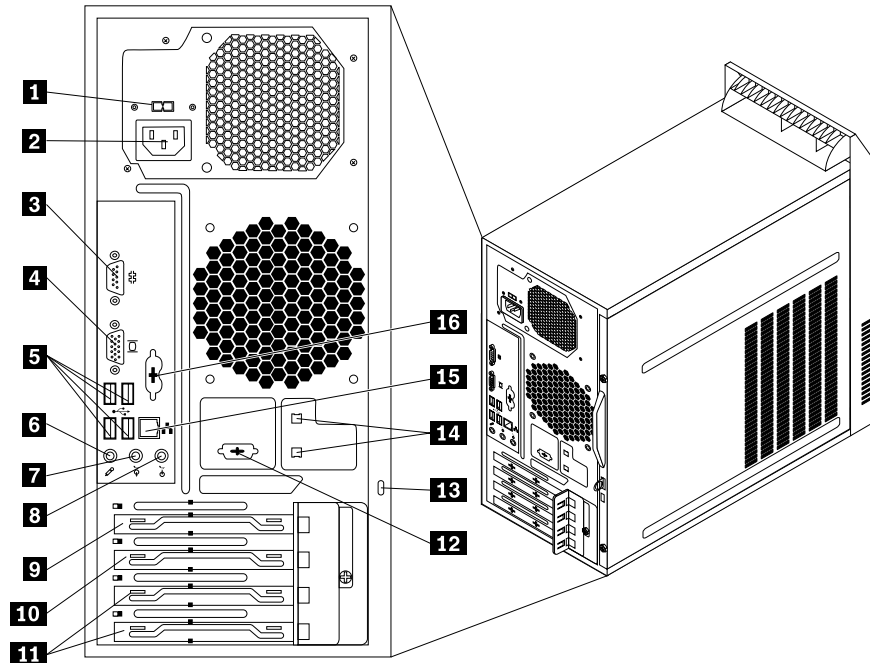


Figure 2. Rear connector and part locations

- 1** Voltage-selection switch (available on some models)
- 2** Power cord connector
- 3** Serial port
- 4** VGA monitor connector
- 5** USB connectors (4)
- 6** Microphone connector
- 7** Audio line-out connector
- 8** Audio line-in connector

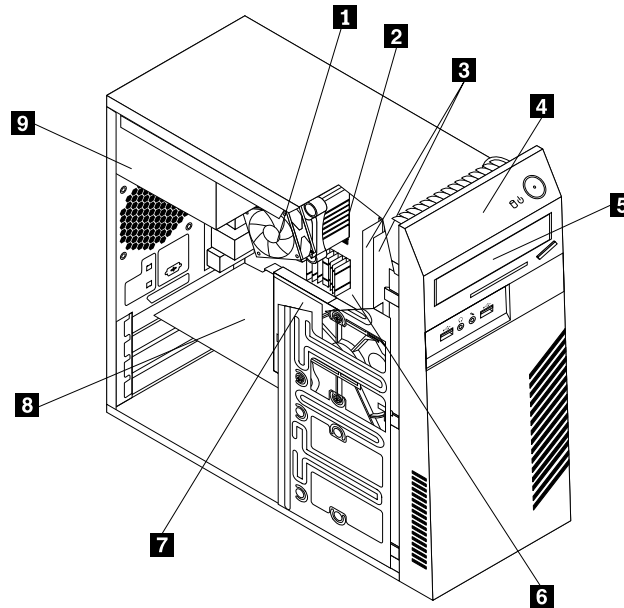
- 9** PCI Express x16 graphics card slot
- 10** PCI Express x1 card slot
- 11** PCI card slots (2)
- 12** Optional serial port
- 13** Padlock loop
- 14** Cable lock slots (2)
- 15** Ethernet connector
- 16** Personal System/2 (PS/2) keyboard and mouse connector (available on some models)

Connector	Description
Audio line-in connector	Used to receive audio signals from an external audio device, such as a stereo system. When you attach an external audio device, a cable is connected between the audio line-out connector of the device and the audio line-in connector of the computer.
Audio line-out connector	Used to send audio signals from the computer to external devices, such as powered stereo speakers (speakers with built-in amplifiers), headphones, multimedia keyboards, the audio line-in connector on a stereo system, or other external recording devices.

Connector	Description
Ethernet connector	Used to attach an Ethernet cable for a local area network (LAN). <b>Note:</b> To operate the computer within FCC Class B limits, use a Category 5 Ethernet cable.
Microphone connector	Used to attach a microphone to your computer when you want to record sound or if you use speech-recognition software.
PS/2 keyboard connector (available on some models)	Used to attach a keyboard that uses a PS/2 keyboard connector.
PS/2 mouse connector (available on some models)	Used to attach a mouse, a trackball, or other pointing devices that use a PS/2 mouse connector.
Serial port	Used to attach an external modem, a serial printer, or other devices that use a 9-pin serial port.
USB connector	Used to attach a device that uses a USB connector, such as a USB keyboard, a USB mouse, a USB scanner, or a USB printer. If the USB connectors on your computer are not enough for you to connect all your USB devices, you can purchase a USB hub, which you can use to connect additional USB devices.
VGA monitor connector	Used to attach a VGA monitor or other devices that use a VGA monitor connector.

## Locating components

Figure 3 “Component locations” on page 75 shows the locations of the various components in your computer. To remove the computer cover and gain access to the inside of the computer, see “Removing the computer cover” on page 78.



*Figure 3. Component locations*

- |                                     |                                |
|-------------------------------------|--------------------------------|
| <b>1</b> Heat sink and fan assembly | <b>6</b> System board          |
| <b>2</b> Microprocessor             | <b>7</b> Hard disk drive       |
| <b>3</b> Memory modules             | <b>8</b> PCI card              |
| <b>4</b> Front bezel                | <b>9</b> Power supply assembly |
| <b>5</b> Optical drive              |                                |

## Locating parts on the system board

Figure 4 “System board part locations” on page 76 shows the locations of the parts on the system board.

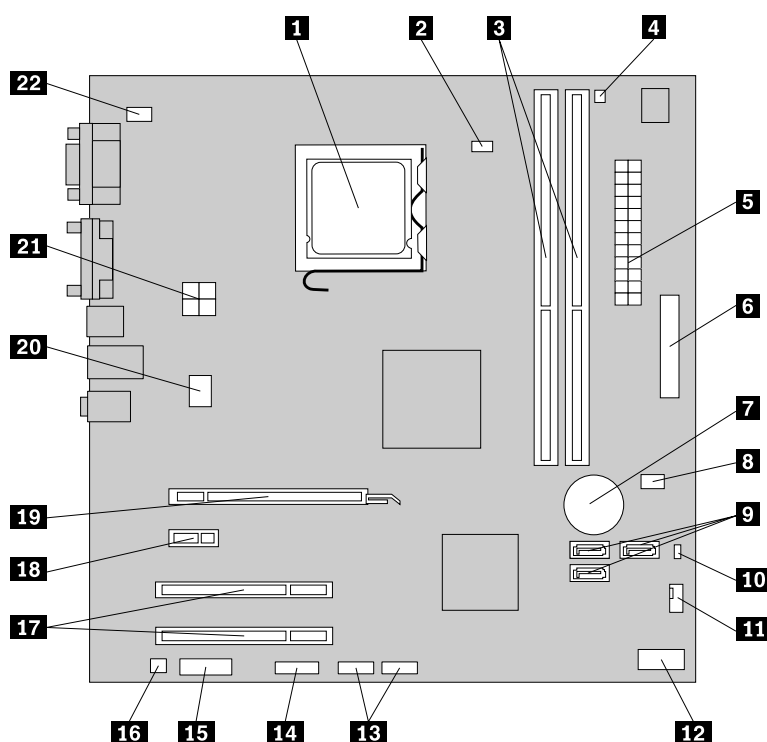


Figure 4. System board part locations

- |  |  |
|--|--|
| <b>1</b> Microprocessor  | <b>12</b> Front panel connector (for connecting LED indicators and power switch) |
| <b>2</b> Microprocessor fan connector  | <b>13</b> USB connectors (2)   |
| <b>3</b> Memory slots (2)  | <b>14</b> Serial (COM 2) connector   |
| <b>4</b> Thermal sensor connector  | <b>15</b> Front audio connector  |
| <b>5</b> 24-pin power connector  | <b>16</b> Internal speaker connector   |
| <b>6</b> Parallel connector  | <b>17</b> PCI card slots (2)   |
| <b>7</b> Battery   | <b>18</b> PCI Express x1 card slot   |
| <b>8</b> Cover presence switch connector (Intrusion switch connector) (available on some models) | <b>19</b> PCI Express x16 graphics card slot                                     |
| <b>9</b> SATA connectors (3)   | <b>20</b> System fan connector   |
| <b>10</b> Clear CMOS (Complementary Metal Oxide Semiconductor) /Recovery jumper                  | <b>21</b> 4-pin power connector  |
| <b>11</b> Power fan connector  | <b>22</b> PS/2 keyboard and mouse connector                                      |



## Locating internal drives

Internal drives are devices that your computer uses to read and store data. You can add drives to your computer to increase storage capacity and enable your computer to read other types of media. Internal drives are installed in bays. In this manual, the bays are referred to as bay 1, bay 2, and so on.

When installing or replacing an internal drive, it is important to note the type and size of the drive that you can install or replace in each bay and correctly connect the cables to the drive installed. Refer to the appropriate section in “Installing or replacing hardware” on page 78 for instructions on how to install or replace internal drives for your computer.

Figure 5 “Drive bay locations” on page 77 shows the locations of the drive bays.

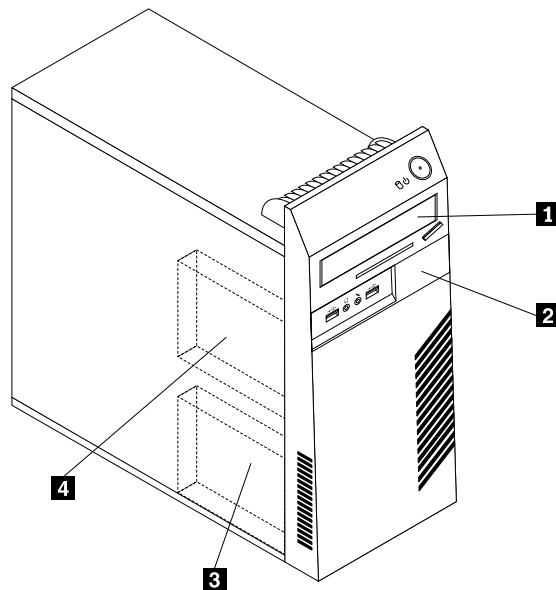


Figure 5. Drive bay locations

- 1** Bay 1 - Optical drive bay (with an optical drive installed)
- 2** Bay 2 - Slim card reader drive bay
- 3** Bay 3 - Secondary SATA hard disk drive bay
- 4** Bay 4 - Primary SATA hard disk drive bay (with a 3.5-inch SATA hard disk drive installed)

---

## Handling static-sensitive devices

Do not open the static-protective package containing the new part until the defective part has been removed from the computer and you are ready to install the new part. Static electricity, although harmless to you, can seriously damage computer components and parts.

When you handle computer parts and components, take these precautions to avoid static-electricity damage:

- Limit your movement. Movement can cause static electricity to build up around you.
- Always carefully handle the parts and other computer components. Handle PCI cards, memory modules, system boards, and microprocessors by the edges. Never touch exposed circuitry.
- Prevent others from touching the parts and other computer components.

- Before you replace a new part, touch the static-protective package containing the new part to a metal expansion-slot cover or other unpainted metal surface on the computer for at least two seconds. This reduces static electricity from the package and your body.
- Remove the new part from the static-protective package and directly install it in the computer without placing it on any other surface. If it is hard for you to do this in your specific situation, place the static-protective package of the new part on a smooth, level surface, and then place the new part on the static-protective package.
- Do not place the part on the computer cover or other metal surface.

---

## Installing or replacing hardware

This section provides instructions on how to install or replace hardware for your computer. You can expand the capabilities of your computer and maintain your computer by installing or replacing hardware.

### Attention:

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

### Notes:

1. Use only computer parts provided by Lenovo.
2. When installing or replacing an option, use the appropriate instructions in this section along with the instructions that come with the option.

## Removing the computer cover

### Attention:

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

This section provides instructions on how to remove the computer cover.

### CAUTION:



**Turn off the computer and wait three to five minutes to let the computer cool before removing the computer cover.**

To remove the computer cover, do the following:

1. Remove any media from the drives and turn off all attached devices and the computer.
2. Disconnect all power cords from electrical outlets.
3. Disconnect the power cords, Input/Output cables, and any other cables that are connected to the computer. See “Locating connectors, controls, and indicators on the front of your computer” on page 72 and “Locating connectors and parts on the rear of your computer” on page 73.
4. Remove any locking device that secures the computer cover, such as a padlock or an integrated cable lock.

5. Remove the two screws that secure the computer cover and slide the computer cover to the rear to remove it.

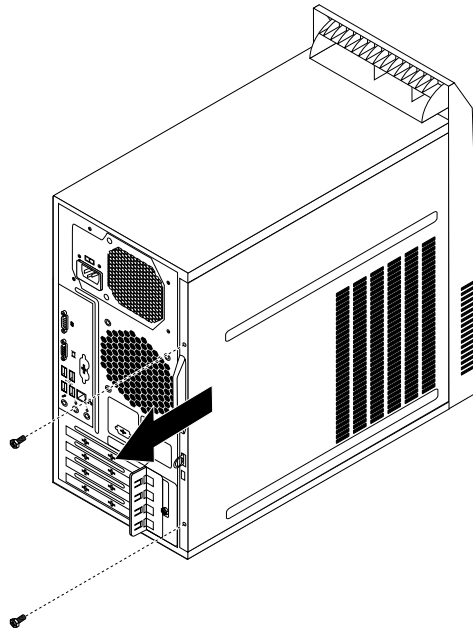


Figure 6. Removing the computer cover

## Removing and reinstalling the front bezel

**Attention:**

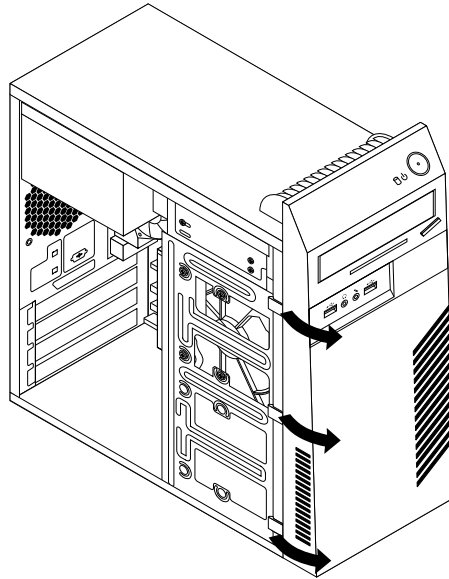
Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to: <http://www.lenovo.com/support>

This section provides instructions on how to remove and reinstall the front bezel.

To remove and reinstall the front bezel, do the following:

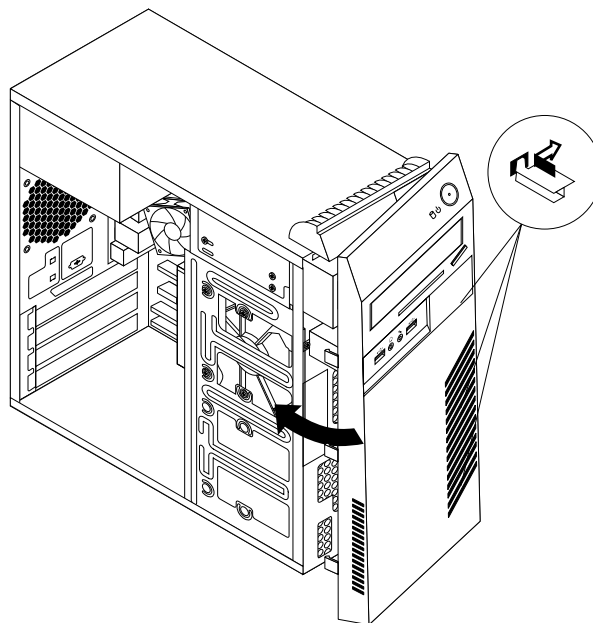
1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Remove the computer cover. See “Removing the computer cover” on page 78.

3. Remove the front bezel by releasing the three plastic tabs on the left side and pivoting the front bezel outward.



*Figure 7. Removing the front bezel*

4. To reinstall the front bezel, align the three plastic tabs on the right side of the front bezel with the corresponding holes in the chassis, then pivot the front bezel inwards until it snaps into position on the left side.



*Figure 8. Reinstalling the front bezel*

5. To complete the installation or replacement, go to “Completing the parts replacement” on page 99.

## Installing or replacing a PCI card

**Attention:**

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

This section provides instructions on how to install or replace a PCI card. Your computer has two standard PCI card slots, one PCI Express x1 card slot, and one PCI Express x16 graphics card slot.

To install or replace a PCI card, do the following:

1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Remove the computer cover. See “Removing the computer cover” on page 78.
3. At the rear of the computer, remove the screw that secures the PCI card latch.

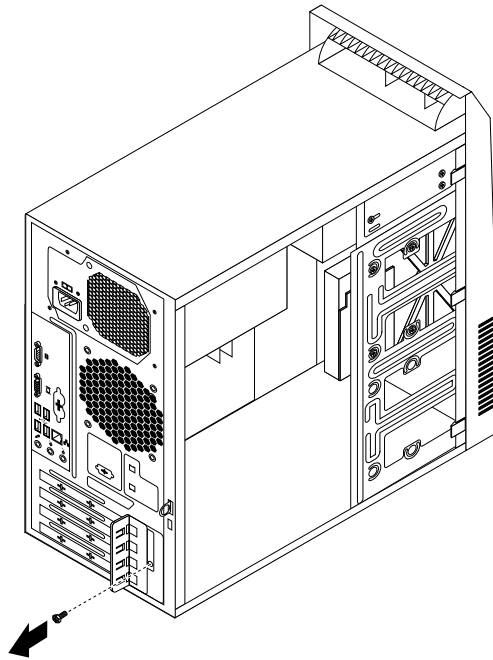


Figure 9. Removing the screw that secures the PCI card latch

4. Depending on whether you are installing or replacing a PCI card, do one of the following:
  - If you are installing a PCI card, remove the appropriate metal slot cover.
  - If you are replacing an old PCI card, grasp the old card that is currently installed and gently pull it out of the slot.

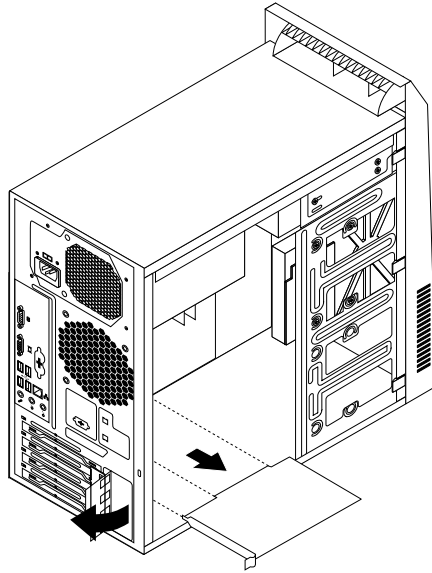
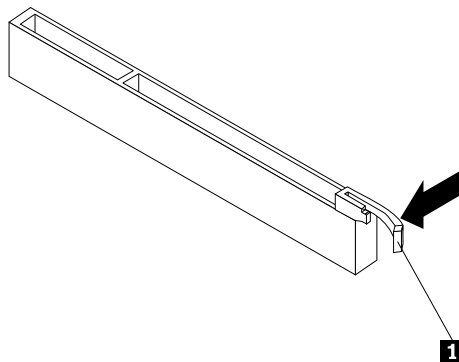


Figure 10. Removing the PCI card

**Notes:**

- a. The card fits tightly into the card slot. If necessary, alternate moving each side of the card a small amount until it is removed from the card slot.
- b. If the card is held in place by a retaining latch, press the card retaining latch **1** as shown to disengage the latch. Grasp the card and gently pull it out of the slot.



5. Remove the new PCI card from its static-protective package.
6. Install the new card into the appropriate slot on the system board. See “Locating parts on the system board” on page 76.

**Note:** If you are installing a PCI Express x16 graphics card, make sure the memory slot retaining clips are closed before you install the graphics card.

7. Pivot the card latch to the closed position to secure the PCI card.

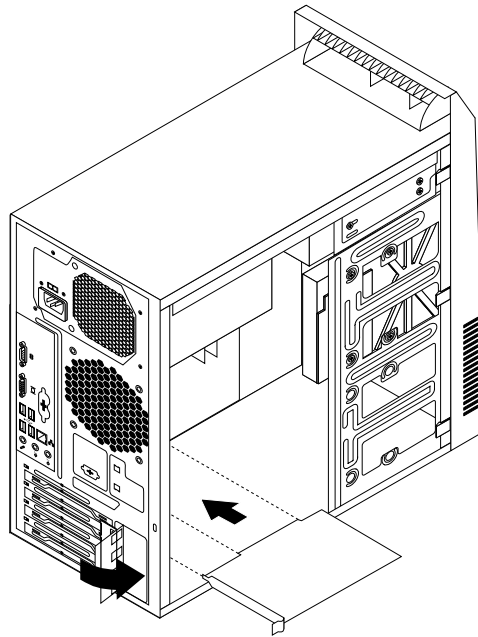


Figure 11. Installing a PCI card

8. Reinstall the screw to secure the PCI card latch in place.
9. To complete the installation or replacement, go to “Completing the parts replacement” on page 99.

## Installing or replacing a memory module

### Attention:

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

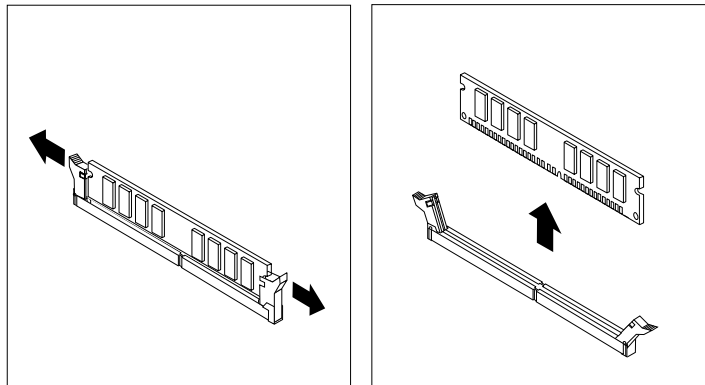
This section provides instructions on how to install or replace a memory module.

Your computer has two slots for installing or replacing DDR3 DIMMs that provide up to a maximum of 8 GB system memory. When installing or replacing a memory module, use 1 GB, 2 GB, or 4 GB DDR3 DIMMs in any combination up to a maximum of 8 GB.

To install or replace a memory module, do the following:

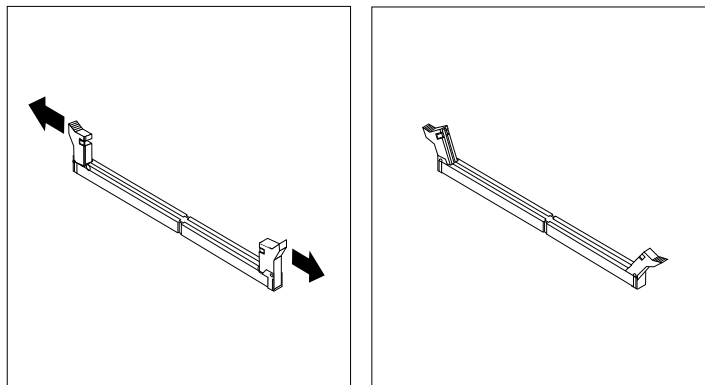
1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Remove the computer cover. See “Removing the computer cover” on page 78.
3. Lay the computer on its side for easier access to the system board.
4. Locate the memory slots. See “Locating parts on the system board” on page 76.
5. Remove any parts that might prevent your access to the memory slots. Depending on your computer model, you might need to remove the PCI Express x16 graphics card for easier access to the memory slots. See “Installing or replacing a PCI card” on page 81.
6. Depending on whether you are installing or replacing a memory module, do one of the following:

- If you are replacing an old memory module, open the retaining clips and gently pull the memory module out of the memory slot.



*Figure 12. Removing a memory module*

- If you are installing a memory module, open the retaining clips of the memory slot into which you want to install the memory module.



*Figure 13. Opening the retaining clips*



7. Position the new memory module over the memory slot. Make sure that the notch **1** on the memory module aligns correctly with the slot key **2** on the system board. Push the memory module straight down into the slot until the retaining clips close.

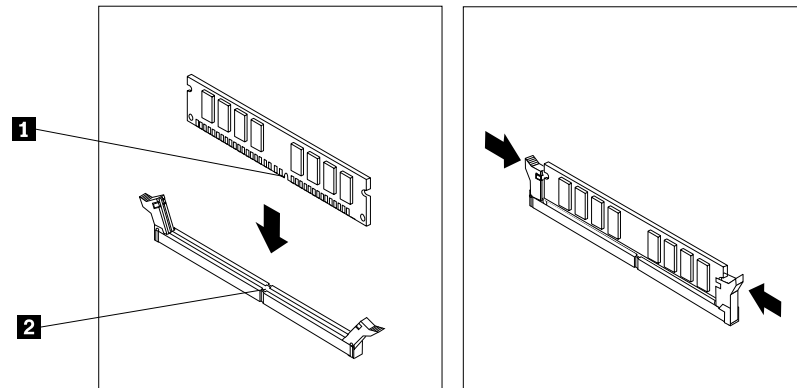


Figure 14. Installing a memory module

8. Reinstall the PCI Express x16 graphics card if you have removed it.
9. To complete the installation or replacement, go to “Completing the parts replacement” on page 99.

## Installing or replacing the optical drive

### Attention:

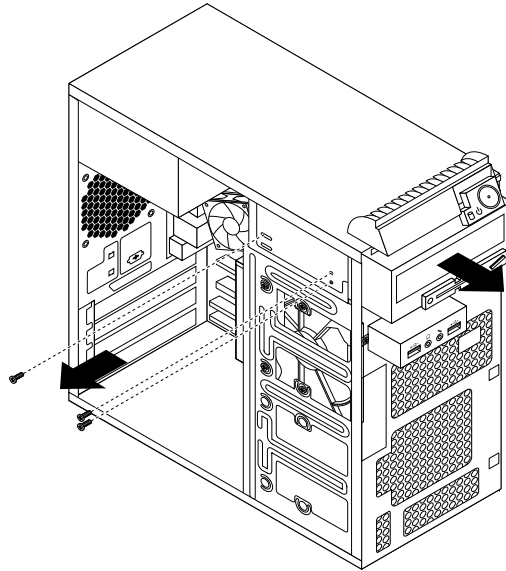
Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

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

To install or replace an optical drive, do the following:

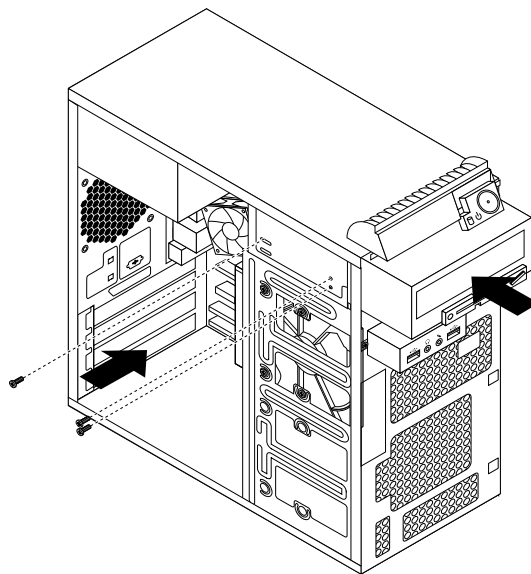
1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Remove the computer cover. See “Removing the computer cover” on page 78.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 79.

4. Remove the three screws that secure the optical drive. Then, slide the optical drive out of the front of the computer.



*Figure 15. Removing the optical drive*

5. Slide the new optical drive into the drive bay from the front and align the screw holes in the new optical drive with the corresponding holes in the drive bay. Then, install the three screws to secure the new optical drive in place.



*Figure 16. Installing the optical drive*

6. Connect one end of the signal cable to the rear of the new optical drive and the other end to an available SATA connector on the system board. See “Locating parts on the system board” on page 76. Then, locate an available five-wire power connector and connect it to the rear of the new optical drive.

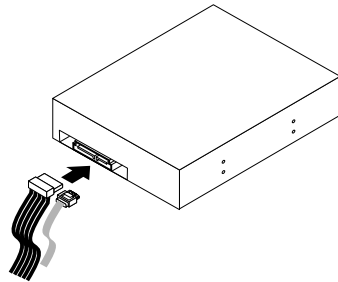


Figure 17. Connecting a SATA optical drive

7. To complete the installation or replacement, go to “Completing the parts replacement” on page 99.

## Replacing the battery

### Attention:

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

Your computer has a special type of memory that maintains the date, time, and settings for built-in features, such as parallel-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 the “Lithium battery notice” in the *ThinkCentre Safety and Warranty Guide* for information about replacing and disposing of the battery.

To replace the battery, do the following:

1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Remove the computer cover. See “Removing the computer cover” on page 78.
3. Locate the battery. See “Locating parts on the system board” on page 76.
4. Remove the old battery.

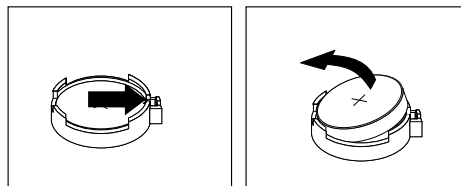


Figure 18. Removing the old battery

5. Install a new battery.

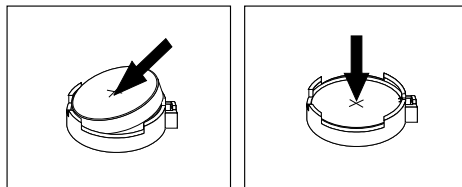


Figure 19. Installing a new battery

6. Reinstall the computer cover and connect the cables. See “Completing the parts replacement” on page 99.

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

7. Turn on the computer and all attached devices.
8. Use the Setup Utility program to set the date, time, and any passwords. See Chapter 6 “Using the Setup Utility program” on page 43.
9. To complete the installation or replacement, go to “Completing the parts replacement” on page 99.

## Replacing the heat sink and fan assembly

### Attention:

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

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

### CAUTION:



**The heat sink and fan assembly might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before removing the computer cover.**

To replace the heat sink and fan assembly, do the following:

1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Remove the computer cover. See “Removing the computer cover” on page 78.
3. Lay the computer on its side for easier access to the system board.
4. Locate the heat sink and fan assembly. See “Locating parts on the system board” on page 76.
5. Disconnect the heat sink and fan assembly cable from the microprocessor fan connector on the system board. See “Locating parts on the system board” on page 76.

6. Follow this sequence to remove the four screws that secure the heat sink and fan assembly to the system board:
  - a. Partially remove screw **1**, then fully remove screw **2**, and then fully remove screw **1**.
  - b. Partially remove screw **3**, then fully remove screw **4**, and then fully remove screw **3**.

**Note:** Carefully remove the four screws from the system board to avoid any possible damage to the system board. The four screws cannot be removed from the heat sink and fan assembly.

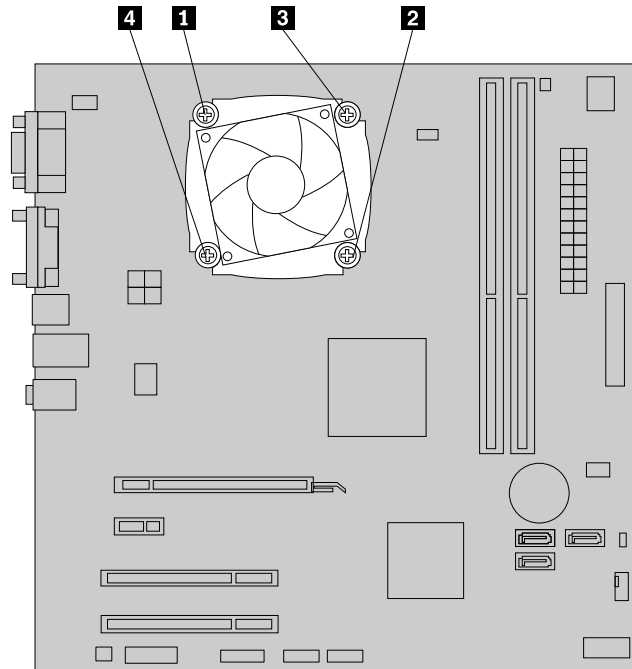


Figure 20. Removing the heat sink and fan assembly

7. Lift the failing heat sink and fan assembly off the system board.

**Notes:**

- a. You might have to gently twist the heat sink and fan assembly to free it from the microprocessor.
  - b. Do not touch the thermal grease while handling the heat sink and fan assembly.
8. Position the new heat sink and fan assembly on the system board so that the four screws are aligned with the holes on the system board.

**Note:** Position the new heat sink and fan assembly so that the heat sink and fan assembly cable is toward the microprocessor fan connector on the system board.

9. Follow the following sequence to install the four screws to secure the new heat sink and fan assembly. Do not over-tighten the screws.
  - a. Partially tighten screw **1**, then fully tighten screw **2**, and then fully tighten screw **1**.
  - b. Partially tighten screw **3**, then fully tighten screw **4**, and then fully tighten screw **3**.
10. Connect the heat sink and fan assembly cable to the microprocessor fan connector on the system board. See “Locating parts on the system board” on page 76.
11. To complete the installation or replacement, go to “Completing the parts replacement” on page 99.

## Replacing the power supply assembly

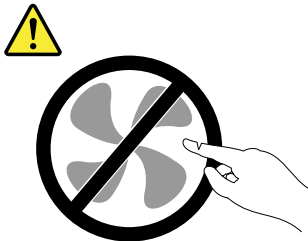
### Attention:

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

This section provides instructions on how to replace the power supply assembly.

Although there are no moving parts in your computer after the power cord has been disconnected, the following warnings are required for your safety and proper Underwriters Laboratories (UL) certification.

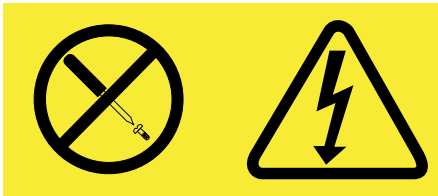
### CAUTION:



**Hazardous moving parts. Keep fingers and other body parts away.**

### CAUTION:

**Never remove the cover on a power supply or any part that has the following label attached.**



**Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.**

To replace the power supply assembly, do the following:

1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Remove the computer cover. See “Removing the computer cover” on page 78.
3. Disconnect the power supply assembly cables from all drives and from the 24-pin power connector and 4-pin power connector on the system board. See “Locating parts on the system board” on page 76.

**Note:** You might also need to release the power supply assembly cables from some cable clips or ties that secure the cables to the chassis.

4. Lay the computer on its side and remove the four screws at the rear of the chassis that secure the power supply assembly.

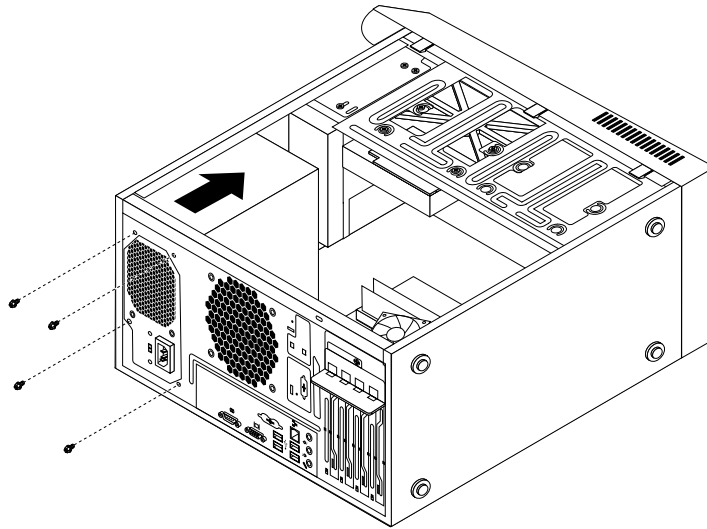


Figure 21. Removing the screws for the power supply assembly

5. Slide the power supply assembly to the front of the computer and then lift it out of the chassis.
6. Make sure that the new power supply assembly is the correct replacement. Some power supply assemblies automatically sense the voltage, some power supply assemblies are voltage specific, and some power supply assemblies have a voltage-selection switch. If your power supply assembly has a voltage-selection switch, make sure that you set the voltage-selection switch to match the voltage available at your electrical outlet. If necessary, use a ballpoint pen to slide the voltage-selection switch to the correct position.
  - If the voltage supply range in your local country or region is 100–127 V ac, set the voltage-selection switch to 115 V.
  - If the voltage supply range in your local country or region is 200–240 V ac, set the voltage-selection switch to 230 V.
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.
8. Install and tighten the four screws to secure the power supply assembly.

**Note:** Use only screws provided by Lenovo.
9. Reconnect the power supply assembly cables to the system board and each of the drives.
10. Secure the power supply assembly cables with the cable clips and ties in the chassis.
11. To complete the installation or replacement, go to “Completing the parts replacement” on page 99.

## Replacing the microprocessor

### Attention:

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

This section provides instructions on how to replace the microprocessor.

**CAUTION:**



The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before removing the computer cover.

To replace the microprocessor, do the following:

1. Remove all media from the drives and turn off all attached devices and the computer. Then, disconnect all power cords from electrical outlets and disconnect all cables that are connected to the computer.
2. Remove the computer cover. See “Removing the computer cover” on page 78.
3. Lay the computer on its side for easier access to the system board.
4. Remove the heat sink and fan assembly. See “Replacing the heat sink and fan assembly” on page 88.

**Note:** Place the heat sink and fan assembly on its side so that the thermal grease on the bottom of it does not get in contact with anything.

5. Lift the small handle **3** and open the retainer **1** to access the microprocessor **2**.

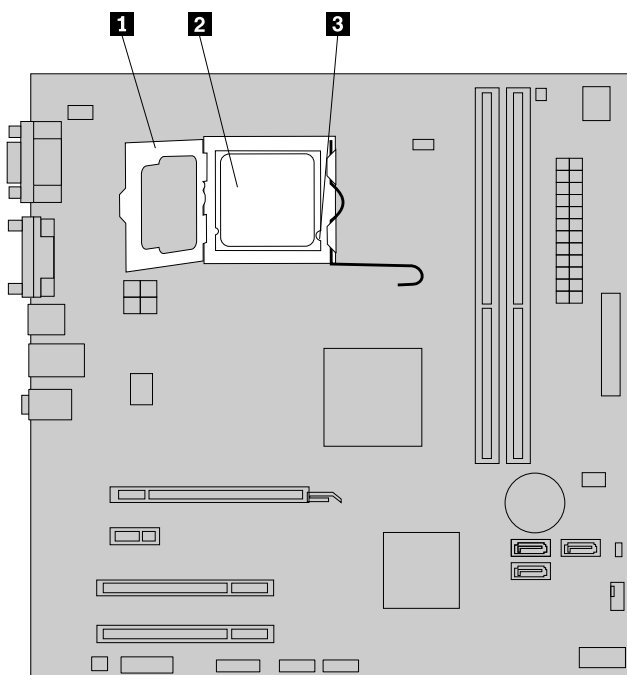


Figure 22. Accessing the microprocessor

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



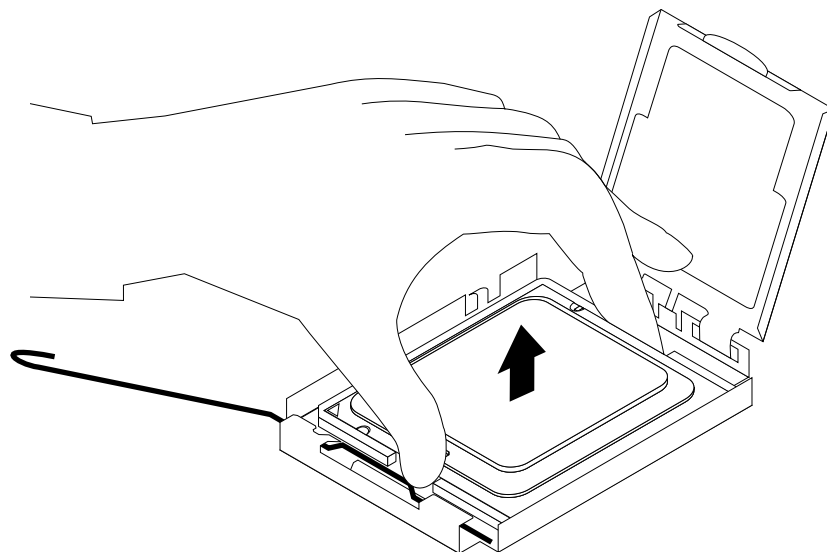
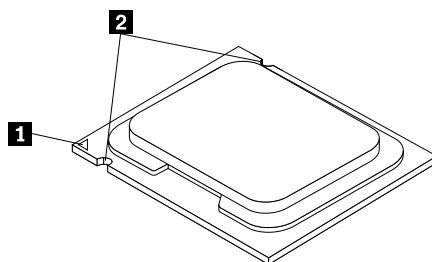


Figure 23. Removing the microprocessor

**Notes:**

- a. Your microprocessor and socket might look different from the one illustrated.
- b. Note the orientation of the microprocessor in the socket. You can either look for the small triangle **1** on one corner of the microprocessor or note the orientation of the notches **2** on the microprocessor. This is important when installing the new microprocessor on the system board.



- c. Touch only the edges of the microprocessor. Do not touch the gold contacts on the bottom.
  - d. Do not drop anything onto the microprocessor socket while it is exposed. The socket pins must be kept as clean as possible.
7. Make sure that the small handle is in the raised position and the microprocessor retainer is fully open.
  8. Remove the protective cover that protects the gold contacts of the new microprocessor.
  9. Hold the new microprocessor by its sides and align the small triangle on one corner of the new microprocessor with the corresponding small triangle on one corner of the microprocessor socket.
  10. Lower the new microprocessor straight down into the microprocessor socket on the system board.
  11. Close the microprocessor retainer and lock it into position with the small handle to secure the new microprocessor in the socket.
  12. Reinstall the heat sink and fan assembly. See “Replacing the heat sink and fan assembly” on page 88.
  13. Reconnect all cables that were disconnected from the system board.
  14. To complete the installation or replacement, go to “Completing the parts replacement” on page 99.

## Replacing the primary hard disk drive

**Attention:**

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

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

To replace the primary hard disk drive, do the following:

1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Remove the computer cover. See “Removing the computer cover” on page 78.
3. Locate the primary hard disk drive. See “Locating internal drives” on page 77.

**Note:** There is also a secondary hard disk drive bay for you to purchase and install a secondary hard disk drive by yourself. If you want to install a secondary hard disk drive, use the same way of installing the primary hard disk drive.

4. Disconnect the signal cable and the power cable from the hard disk drive.
5. Remove the four screws that secure the hard disk drive. Then, slide the hard disk drive out of the chassis.

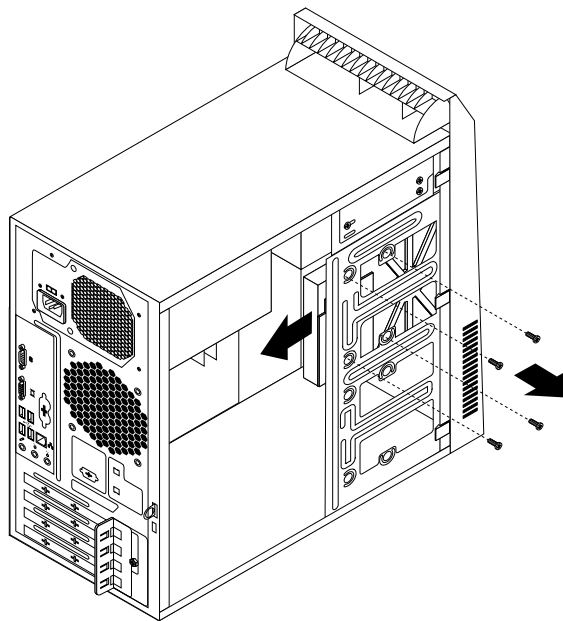


Figure 24. Removing the hard disk drive

- Slide the new hard disk drive into the hard disk drive bay and align the screw holes in the new hard disk drive with the corresponding holes in the drive bay. Then, install the four screws to secure the new hard disk drive in place.

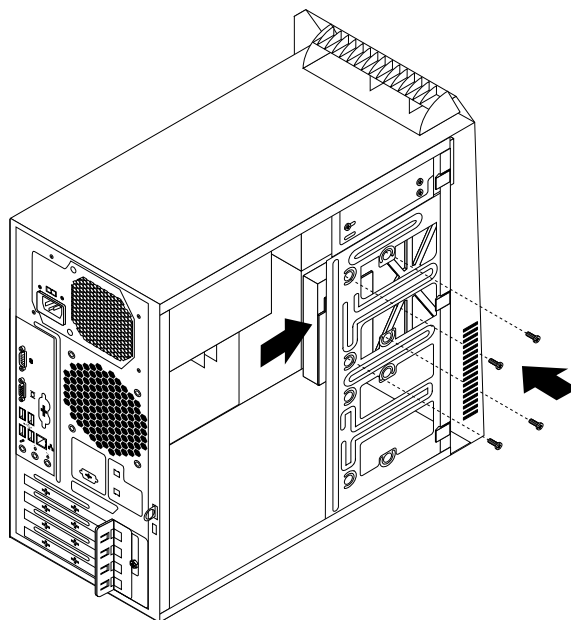


Figure 25. Installing the hard disk drive

- Connect one end of the signal cable to the rear of the new hard disk drive and the other end to an available SATA connector on the system board. See “Locating parts on the system board” on page 76. Then, locate an available five-wire power connector and connect it to the rear of the new hard disk drive.

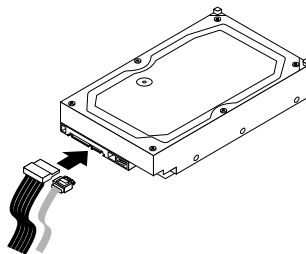


Figure 26. Connecting a SATA hard disk drive

- To complete the installation or replacement, go to “Completing the parts replacement” on page 99.

## Replacing the system board

### Attention:

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

This section provides instructions on how to replace the system board.

**CAUTION:**

The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

To replace the system board, do the following:

1. Remove all media from the drives and turn off all attached devices and the computer. Then, disconnect all power cords from electrical outlets and disconnect all cables that are connected to the computer.
2. Remove the computer cover. See “Removing the computer cover” on page 78.
3. Lay the computer on its side for easier access to the system board.
4. Remove the hard disk drive from the chassis. See “Replacing the primary hard disk drive” on page 94.
5. Remove all memory modules and PCI cards that are currently installed. See “Installing or replacing a memory module” on page 83 and “Installing or replacing a PCI card” on page 81.
6. Carefully take note of the locations of all cable connections on the system board and disconnect all the cables. See “Locating parts on the system board” on page 76.
7. Remove the heat sink and fan assembly from the failing system board. See “Replacing the heat sink and fan assembly” on page 88.
8. Remove the eight screws that secure the system board.

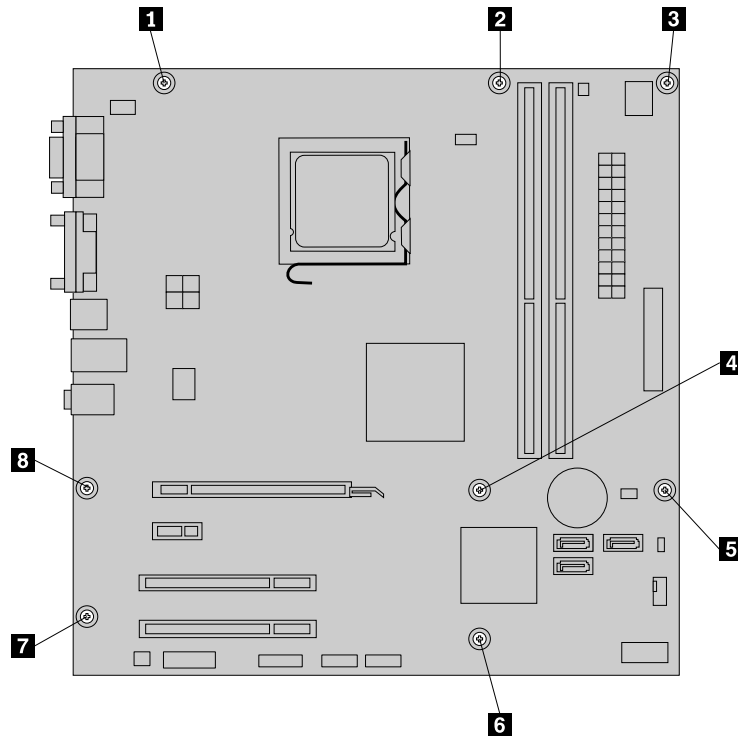


Figure 27. Removing the eight screws that secure the system board

9. Carefully slide the system board so that it can be released from the mounting studs that secure the system board in place.
10. Lift the system board out of the chassis.
11. Remove the microprocessor from the failing system board and install it on the new system board. See “Replacing the microprocessor” on page 91.

12. Install the new system board into the chassis by aligning the eight mounting studs in the chassis with the corresponding holes in the new system board. Carefully slide the new system board into the chassis until it is secured in place by the mounting studs. Then, install the eight screws to secure the system board.
13. Install the heat sink and fan assembly and connect the heat sink and fan assembly cable to the new system board. See “Replacing the heat sink and fan assembly” on page 88.
14. Install all memory modules and PCI cards removed from the failing system board on the new system board. See “Installing or replacing a memory module” on page 83 and “Installing or replacing a PCI card” on page 81.
15. Reconnect all remaining cables to the system board. See “Locating parts on the system board” on page 76.
16. Install the hard disk drive. See “Replacing the primary hard disk drive” on page 94.
17. To complete the installation or replacement, go to “Completing the parts replacement” on page 99.

The failing system board must be returned with a microprocessor socket cover to protect the pins during shipping and handling.

To install the microprocessor socket cover:

1. Make sure that the microprocessor has been removed from the microprocessor socket. See “Replacing the microprocessor” on page 91.
2. Close the microprocessor retainer and lock it into position with the small handle.
3. Insert the tabs **1** of the socket cover into the hinged side of the socket.

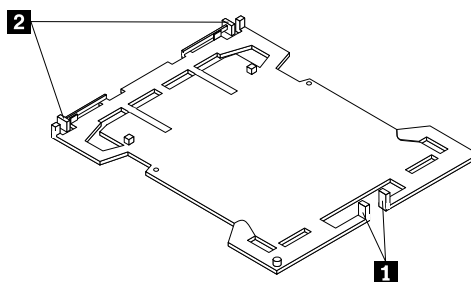


Figure 28. Tabs on the microprocessor socket cover (bottom view)

4. Press the other side of the socket cover downward until the tabs **2** snap into position.

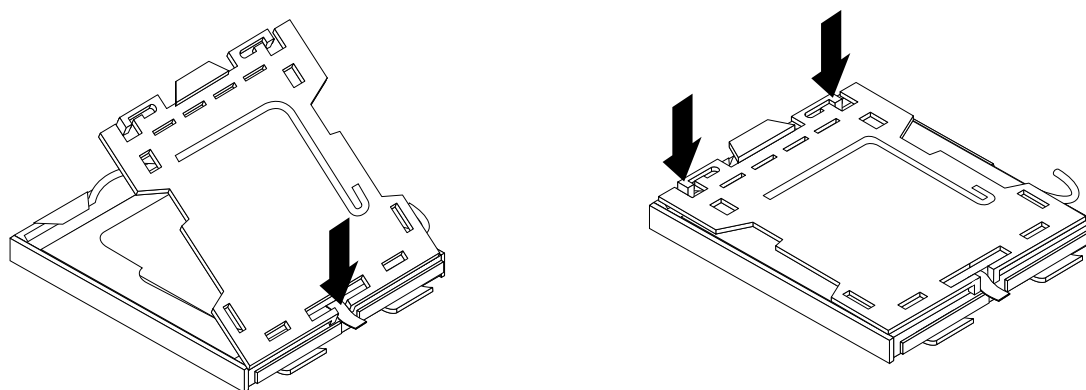


Figure 29. Installing the microprocessor socket cover

## Replacing the front audio and USB assembly

### Attention:

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkCentre User Guide*. To obtain a copy of the *ThinkCentre User Guide*, go to:  
<http://www.lenovo.com/support>

This section provides instructions on how to replace the front audio and USB assembly.

To replace the front audio and USB assembly, do the following:

1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Remove the computer cover. See “Removing the computer cover” on page 78.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 79.
4. Locate the front audio and USB assembly. See “Locating components” on page 75.
5. Disconnect the front audio and USB assembly cables from the system board. See “Locating parts on the system board” on page 76.

**Note:** Make sure you note the locations of the cables when you disconnect the cables from the system board.

6. Remove the screw that secures the front audio and USB assembly bracket to the chassis to remove the bracket from the chassis.

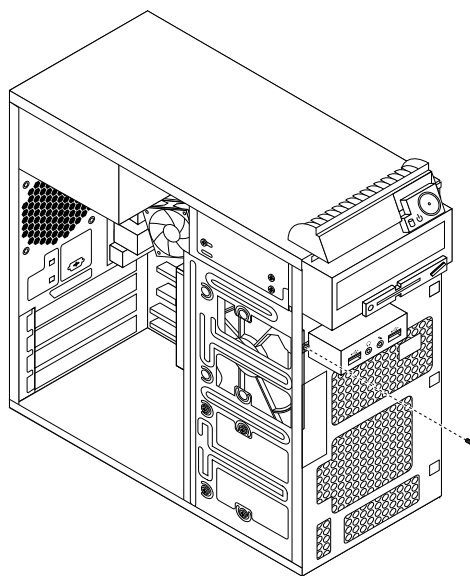


Figure 30. Removing the screw that secures the front audio and USB assembly to the chassis

7. Remove the two screws that secure the front audio and USB assembly to its bracket and remove the failing front audio and USB assembly from the bracket.
8. Install a new front audio and USB assembly into the bracket and install the two screws to secure the front audio and USB assembly to the bracket.
9. Install the front audio and USB assembly bracket into the chassis and align the screw hole in the bracket with the corresponding hole in the chassis.
10. Install the screw to secure the bracket to the chassis.
11. Reconnect the front audio and USB assembly cables to the front audio connector and the front USB connector on the system board. See “Locating parts on the system board” on page 76.

12. To complete the installation or replacement, go to “Completing the parts replacement” on page 99.

## Completing the parts replacement

After completing the installation or replacement for all parts, you need to reinstall the computer cover and reconnect cables. Depending on the parts you installed or replaced, you might need to confirm the updated information in the Setup Utility program. Refer to Chapter 6 “Using the Setup Utility program” on page 43.

To reinstall the computer cover and reconnect cables to your computer, do the following:

1. Make sure that all components have been reassembled correctly and that no tools or loose screws are left inside your computer. See “Locating components” on page 75 for the locations of various components in your computer.
2. If you have removed the front bezel, reinstall it. See “Removing and reinstalling the front bezel” on page 79.
3. Make sure that the cables are routed correctly before reinstalling the computer cover. Keep cables clear of the hinges and sides of the computer chassis to avoid interference with reinstalling the computer cover.
4. Position the computer cover on the chassis so that the rail guides on the bottom of the computer cover engage the rails on the chassis. Then, push the cover to the front of the computer until it snaps into position.

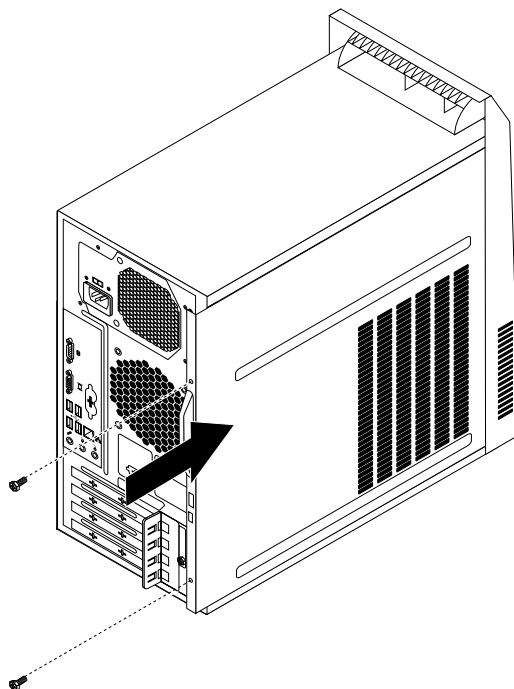


Figure 31. Reinstalling the computer cover

5. Install the screws to secure the computer cover.
6. If there is a padlock available, lock the computer cover.
7. If there is an integrated cable lock available, lock the computer.
8. Reconnect the external cables and power cords to the computer. See “Locating connectors and parts on the rear of your computer” on page 73.
9. To update your configuration, refer to Chapter 6 “Using the Setup Utility program” on page 43.

**Note:** In most areas of the world, Lenovo requires the return of the defective Field Replaceable Units (FRUs). Information about this will come with the new FRUs or will come a few days after you receive the new FRUs.



## Chapter 9. FRU lists

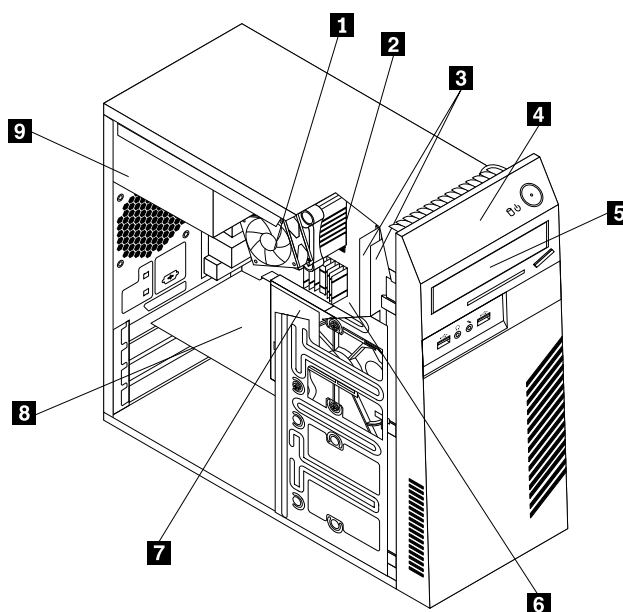
This chapter lists the information on the field replaceable units (FRUs).

**Attention:** Be sure to read and understand all the safety information before replacing any FRUs.

**Note:** In the following tables, a customer replaceable unit (CRU) is identified as either "1", "2", or "N" in the **CRU** column. "N" means that the part is not a CRU, "1" means that the part is a Self-service CRU, and "2" means that the part is an Optional-service CRU.

### Overall: 1899, 1928, 1932, and 1934

The following replaceable components are available for the 1899, 1928, 1932, and 1934 machine type models.



Item #	FRUs	FRU #	CRU
1	Intel 95W heat sink • MT 1934: all models	43N9897	2
2	Microprocessor, E7400 2.8GHz 1066M 3M R0 (ViiV, EIST, EM64T, EDB) 65W • MT 1934:	53Y6653	2
2	Microprocessor, E7500 2.93GHz 1066M 3M R0 (ViiV, EIST, EM64T, EDB) 65W • MT 1934: A3Q A8Q A9Q	53Y6654	2
2	Microprocessor, E5700 3.0G 800MHz- 2MB R0 • MT 1934: A1Q A7Q	03T6007	2
2	Microprocessor, E5800 3.2G 800MHz- 2MB R0 • MT 1934: A2Q A4Q A5Q A6Q	03T9010	2

Item #	FRUs	FRU #	CRU
2	Microprocessor, E6300 2.8G 1066MHz-2MB 65W R-0 • MT 1934:	71Y3484	2
2	Microprocessor, E6500 2.93GHZ 1066 MHz-2MB 65W R0 • MT 1934:	71Y6250	2
2	Microprocessor, E6600 3.06GHZ/1066MHZ/2M 65W R0 • MT 1934:	89Y0198	2
2	Microprocessor, E6700 3.2GHZ/1066MHZ/2M 65W R0 • MT 1934:	03T6009	2
2	Microprocessor, E6800 3.33GHZ/1066MHZ/2M 65W R0 • MT 1934:	03T6006	2
2	Microprocessor, E1500 2.2GHz 800MHz 512KB (EIST,EM64T,EDB) M0 65W • MT 1934:	53Y9051	2
2	Microprocessor, E3500 2.7GHZ 800 MHz-1MB 65W R0 • MT 1934:	03T6008	2
2	Microprocessor, E3300 2.5GHZ 800 MHz-1MB 65W R0 • MT 1934:	71Y6252	2
2	Microprocessor, E3200 2.4GHZ 800 MHz-1MB 65W R0 • MT 1934:	71Y6251	2
2	Microprocessor, E3400 2.6GHZ/800MHZ/1M 65W R0 • MT 1934:	89Y0207	2
2	Microprocessor, 440 2.0GHz 800MHz FSB 512K 35W • MT 1934:	43C1965	2
2	Microprocessor, 450 2.2GHz 800MHz FSB 512K 35W • MT 1934:	46R9514	2
3	Memory module, 1GB PC3-8500 1066MHz DDR3 UDIMM • MT 1934:	46R3322	1
3	Memory module, 1GB PC3-8500 1066MHz DDR3 UDIMM • MT 1934:	64Y6648	1
3	Memory module, 2GB PC3-8500 1066MHz DDR3 UDIMM • MT 1934: A1Q A2Q A3Q A4Q A5Q A6Q A7Q A8Q A9Q	46R3323	1
3	Memory module, 4GB PC3-10600 1333MHz DDR3 UDIMM (1066MHz performance) • MT 1934:	89Y9224	1
4	Front main bezel assembly • MT 1934: all models	03T9501	2
5	Optical drive, DVD-ROM drive - 16x/48x - SATA (with DVD PB SW or without SW) • MT 1934: A2Q A8Q	71Y5543	2

Item #	FRUs	FRU #	CRU
5	Optical drive, DVD recorder rambo 8 - SATA 12XRAM write (with DVD PB SW or without SW) • MT 1934: A1Q A5Q A6Q A7Q A9Q	71Y5545	2
6	System board, Intel G41 DDR3 mATX (GA) • MT 1934: A1Q A2Q A3Q A4Q A5Q A6Q A7Q A8Q A9Q	71Y6942	N
7	Hard disk drive, 250 GB 7200rpm SATA • MT 1934: A1Q A5Q A6Q A7Q A8Q A9Q	40Y9036	2
7	Hard disk drive, 250 GB 7200rpm SATA • MT 1934: A1Q A5Q A6Q A7Q A8Q A9Q	45K0408	2
7	Hard disk drive, 250 GB 7200rpm SATA • MT 1934: A1Q A5Q A6Q A7Q A8Q A9Q	03T7039	2
7	Hard disk drive, 320 GB 7200rpm SATA • MT 1934: A2Q A3Q A4Q	87H4891	2
7	Hard disk drive, 320 GB 7200rpm SATA • MT 1934: A2Q A3Q A4Q	45K0409	2
7	Hard disk drive, 320 GB 7200rpm SATA • MT 1934: A2Q A3Q A4Q	03T7040	2
9	Power supply, ATX 180W power supply • MT 1934: A1Q A2Q A3Q A4Q A5Q A6Q A7Q A8Q A9Q	54Y8835	2
9	Power supply, ATX 180W power supply • MT 1934:	54Y8847	2

## Mechanical FRUs

The FRUs listed in the following tables are not illustrated.

Mechanical	FRU #	CRU
FRU, battery 3V - lithium • MT 1934: A1Q A2Q A3Q A4Q A5Q A6Q A7Q A8Q A9Q	45C1566	1
FRU, thermal grease - ShinEtsu 7783D, 1g syringe • MT 1934: all models	91P8835	2
FRU, intrusion switch assembly tower 475mm --optional • MT 1934: all models	39K5022	2
FRU, internal speaker 400mm • MT 1934: all models	43N9091	2
FRU, cable lock • MT 1934: all models	03T9593	2

<b>Mechanical</b>	<b>FRU #</b>	<b>CRU</b>
FRU, cabel - SATA 250mm (RoHS) 2 Latching for 1st hard disk driver • MT 1934: all models	54Y9929	2
FRU, cabel - SATA 420mm (RoHS) for optical disk driver 2 latching, right angle • MT 1934: all models	54Y9948	2
FRU, temperature sense cable (6 pin 300 mm) • MT 1934: all models	54Y9919	2
FRU, front I/O cable_R (20L_A610_U480) • MT 1934: all models	54Y9907	2
FRU, LED/switch cable (20L_PCB_760mm) • MT 1934: all models	54Y9913	2
FRU, non-optical disk driver model kit • MT 1934: all models	03T9502	2
FRU, card reader kit • MT 1934: all models	03T9503	2
FRU, C2 intrusion switch and bracket assembly • MT 1934: all models	03T9504	2
FRU, slot cover, metal • MT 1934: all models	03T9515	2
FRU, rear I/O shield, ATX, G41 DDR3, FOF, punch • MT 1934: all models	45K6366	2
FRU, chassis assembly • MT 1934: all models	03T9648	2
FRU, 321CT card reader blank bezel • MT 1934: all models	03T9688	2
FRU, rear fan -4 pin for Tower 2 (removed fan grill) • MT 1934: all models	43N9908	2

## Keyboard and Mouse

<b>Keyboard (Lenovo Preferred Pro USB -- without hub)</b>	<b>FRU #</b>	<b>CRU</b>
India • MT 1934: A1Q A2Q A3Q A4Q A5Q A6Q A7Q A8Q A9Q	54Y8381	1

<b>Keyboard (Lenovo Preferred Pro PS/2 Full Size)</b>	<b>FRU #</b>	<b>CRU</b>
India • MT 1934:	54Y8382	1

<b>Mice</b>	<b>FRU #</b>	<b>CRU</b>
Optical wheel mouse (400DPI, USB) • MT 1934: A1Q A2Q A3Q A4Q A5Q A6Q A7Q A8Q A9Q	41U3013	1
Optical wheel mouse (400DPI, USB) • MT 1934: A1Q A2Q A3Q A4Q A5Q A6Q A7Q A8Q A9Q	41U3030	1
Enhanced optical USB mouse (Edge) • MT 1934:	45J4889	1

## Adapters and miscellaneous FRUs

<b>Adapters and miscellaneous</b>	<b>FRU #</b>	<b>CRU</b>
IEEE 1394 firewire adapter ATX • MT 1934:	41D2781	1
IEEE 1394 firewire adapter ATX -PCIe • MT 1934:	89Y1712	1
Soft modem V.90/V.44 ATX • MT 1934:	46R4220	1
Modem phone cable • MT 1934:	39K5120	2
LI300mm rear USB 2ports II HP® • MT 1934:	42Y8005	2
LI350mm rear com2 cable II mini® • MT 1934:	41R8548	2
Rear PS/2 cable for Tower and SFF • MT 1934:	43N9149	2
LPT cable for Tower • MT 1934:	43N9022	2
BTL external speaker • MT 1934:	41A5334	2

## Power Cords

<b>Power Cords -- primary</b>	<b>FRU #</b>	<b>CRU</b>
Line Cord - India • MT 1934: A1Q A2Q A3Q A4Q A5Q A6Q A7Q A8Q A9Q	41R3341	1

<b>Power Cords -- secondary</b>	<b>FRU #</b>	<b>CRU</b>
Line Cord - India • MT 1934: A1Q A2Q A3Q A4Q A5Q A6Q A7Q A8Q A9Q	41R3213	1

---

## Recovery discs

### Windows 7 Professional 32 SP1 Recovery CD

Windows 7 Professional 32 SP1	FRU #	CRU
India English • MT 1934: A2Q A6Q A7Q A8Q A9Q	03T1007	1

### Windows 7 Home Basic 32 SP1 Recovery CD

Windows 7 Home Basic 32 SP1	FRU #	CRU
India English • MT 1934:	03T1006	1

### Windows 7 Starter SP1 Recovery CD

Windows 7 Starter SP1	FRU #	CRU
India English • MT 1934:	03T1005	1

### Windows XP Recovery CD

**Note:** The Windows XP Professional recovery DVDs are available only for models with a valid Microsoft Windows XP Professional certificate of authenticity (COA) affixed to the system. Due to a Microsoft licensing limitation, if a model came with Windows XP Professional preinstalled from the factory, but has either a Windows 7 or Windows Vista COA affixed to the system, that model is eligible only for recovery DVDs that match the operating system specified on the COA.

Windows XP	FRU #	CRU
US English • MT 1934:	03T1004	1

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## Chapter 10. Additional service information

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

---

### Security features

Security features in this section include the following:

- Passwords
- Vital Product Data

### Hardware-controlled passwords

Use the Setup Utility program to set the hardware controlled passwords. For more information about passwords, see “Using passwords” on page 43.

### Operating system password

**Note:** This section applies only to computer models that have an operating system preinstalled from Lenovo.

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 correct 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 “Updating (flashing) the BIOS from a disc” on page 107.

---

### 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 program.
  - See **BIOS Revision Level** on the Main setup screen.
- 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 “Updating (flashing) the BIOS from a disc” on page 107.

---

### Updating (flashing) the BIOS from a disc

This section provides instructions on how to update (flash) the BIOS from a disc.

**Note:** You can download a self-starting bootable disc image (known as an ISO image) with the system program updates to create a system-program-update disc. Go to:  
<http://www.lenovo.com/support>

To update (flash) the BIOS from a disc, do the following:

1. Turn off your computer.
2. Repeatedly press and release the F12 key when turning on the computer. When the **Startup Device Menu** opens, release the F12 key.
3. On the **Startup Device Menu**, select the desired optical drive as the startup device. Then, insert the disc into this optical drive and press Enter. The update begins.
4. When prompted to change the serial number, it is suggested that you do not make this change by pressing N. However, if you do want to change the serial number, press Y, then type in the serial number and press Enter.
5. When prompted to change the machine type and model, it is suggested that you do not make this change by pressing N. However, if you do want to change the machine type and model, press Y, then type in the machine type and model and press Enter.
6. Follow the instructions on the screen to complete the update. After the update is completed, remove the disc from the optical drive.

---

## Updating (flashing) the BIOS from your operating system

**Note:** Because Lenovo makes constant improvements to its Web sites, the Web page contents are subject to change without notice, including the contents referenced in the following procedure.

To update (flash) the BIOS from your operating system, do the following:

1. Go to <http://www.lenovo.com/support>.
2. Do the following to locate the downloadable files for your machine type:
  - a. Click **Download & Drivers**.
  - b. In the left pane, click **Downloads and drivers**.
  - c. From the **Brand** drop-down list box, select **Desktops**.
  - d. From the **Family** drop-down list box, select the family name.
  - e. Click **Continue**.
  - f. From the **Refine results** drop-down list box, select **BIOS**.
  - g. Click the BIOS update link.
3. Click the TXT file that contains the instructions for updating (flashing) the BIOS from your operating system.
4. Print these instructions. This is very important because these instructions will not be displayed on the screen after the download begins.
5. Follow the printed instructions to download, extract, and install the update.

---

## Recovering from a POST and BIOS update failure

If the power to your computer is interrupted while the POST and BIOS is being updated, your computer might not restart correctly. If this happens, perform the following procedure to recover from the POST and BIOS update failure. This procedure is commonly called Boot-block Recovery.

1. Remove all media from the drives and turn off all attached devices and the computer. Then, disconnect all power cords from electrical outlets and disconnect all cables that are connected to the computer.
2. Remove the computer cover. See "Removing the computer cover" on page 78.



3. Locate the Clear CMOS /Recovery jumper on the system board. See “Locating parts on the system board” on page 76.
4. Remove any parts and disconnect any cables that might prevent your access to the Clear CMOS /Recovery jumper.
5. Move the jumper from the standard position (pin 1 and pin 2) to the maintenance position (pin 2 and pin 3).
6. Reinstall any parts and reconnect any cables that have been removed or disconnected.
7. Reinstall the computer cover and reconnect the power cords for the computer and monitor. See “Completing the parts replacement” on page 99.
8. Turn on the computer and then insert the POST and BIOS update (flash update) disc into the optical drive. Wait a few minutes. Then, the recovery session begins. The recovery session will take two to three minutes. During this time, you will hear a series of beeps.
9. After the recovery session is completed, there will be no video, the series of beeps will end, and the system will automatically turn off.
10. Repeat step 1 through step 4.
11. Move the jumper back to the standard position (pin 1 and pin 2).
12. Reinstall any parts and reconnect any cables that have been removed or disconnected.
13. Reinstall the computer cover and reconnect power cords and all other external cables. See “Completing the parts replacement” on page 99.
14. Turn on the computer and remove the disc from the optical drive.

---

## 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.

## Advanced 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.

- **RTC resume:** 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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