



ThinkCentre Hardware Maintenance Manual



ThinkThink**ThinkCentre**Think

Machine Types: 1982, 1983, 1985, 1986, 1987, 1990, 1992, 1993, 1994, 1995, 1996, 1997, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227

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 271.

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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>

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.

Chapter 2. Safety information

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

General safety

Follow these rules to ensure general safety:

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

Electrical safety



CAUTION:

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the 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.

Voltage-selection switch

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

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

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

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

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

Safety inspection guide

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

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

Consider these conditions and the safety hazards they present:

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

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

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
 - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
 - b. The power cord should be the appropriate type as specified in the parts listings.
 - c. Insulation must not be frayed or worn.
4. Remove the cover.

5. Check for any obvious alterations. Use good judgment as to the safety of any alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling electrostatic discharge-sensitive devices

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

Notes:

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

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people while handling the part.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

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

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

Grounding requirements

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

Safety notices (multi-lingual translations)

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

- English
- Arabic
- Brazilian/Portuguese
- Chinese (simplified)
- Chinese (traditional)

- French
- German
- Hebrew
- Italian
- Korean
- Spanish



DANGER

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

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following tables when installing, moving, or opening covers on this product or attached devices.**

To Connect	To Disconnect
1. Turn everything OFF. 2. First, attach all cables to devices. 3. Attach signal cables to connectors. 4. Attach power cords to outlet. 5. Turn device ON.	1. Turn everything OFF. 2. First, remove power cords from outlet. 3. Remove signal cables from connectors. 4. Remove all cables from devices.



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.



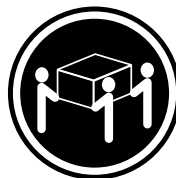
خطر

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

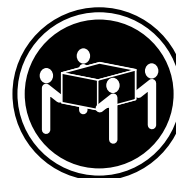
أشعة الليزر عند الفتح. لا تحقق إلى الإشعاع و لا تنظر إليه مباشرة بواسطة أي أجهزة مرئية وتجنب التعرض المباشر للإشعاع .



≥18 kg (37 lb)



≥32 kg (70.5 lb)



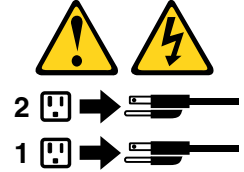
≥55 kg (121.2 lb)

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)

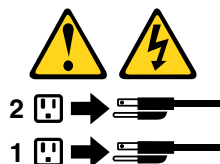
CUIDADO:

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
1. 切断所有电源。 2. 首先将所有电缆连接到设备。 3. 将信号电缆连接到接口。 4. 将电源线连接到插座。 5. 开启设备。	1. 切断所有电源。 2. 首先从插座上拔出电源线。 3. 从接口上拔出信号电缆。 4. 从设备上拔出所有电缆。



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)

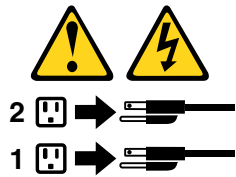


≥55 千克 (121.2 磅)

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
1. 關閉所有開關。 2. 首先，連接所有接線到裝置。 3. 連接信號線到接頭。 4. 連接電源線到插座。 5. 開啟裝置。	1. 關閉所有開關。 2. 首先，拔掉插座上的電源線。 3. 拔掉接頭上的信號線。 4. 拔掉裝置上所有接線。



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



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 :

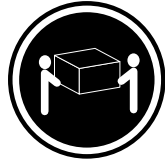
- Ne retirez pas le carter. En ouvrant l'unité de CD-ROM ou de DVD-ROM, vous vous exposez au rayonnement dangereux du laser. Aucune pièce de l'unité n'est réparable.
- Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les 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
1. Schalten Sie alle Einheiten AUS. 2. Schließen Sie erst alle Kabel an die Einheiten an. 3. Schließen Sie die Signalkabel an die Buchsen an. 4. Schließen Sie die Netzkabel an die Steckdose an. 5. Schalten Sie die Einheit EIN.	1. Schalten Sie alle Einheiten AUS. 2. Ziehen Sie zuerst alle Netzkabel aus den Netzsteckdosen. 3. Ziehen Sie die Signalkabel aus den Buchsen. 4. Ziehen Sie alle Kabel von den Einheiten ab.



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.



2  

1  



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:

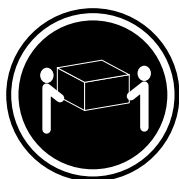
בעת התקנת מוצרי לייזר (כגון כונני תקליטורים ו-DVD, התקני סיב אופטי או משדרים), שימו לב לאזהרות הבאות:

- 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.

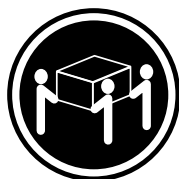


סכנה

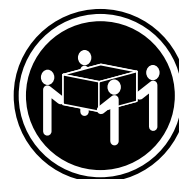
מוצרי ליזר מסוימים מכילים דיודת ליזר מסוג Class 3A או Class 3B. שימו לב לאזהרה הבאה:
כאשר הוא פתוח, המוצר פולט קרינת ליזר. אל תביטו ישירות בקרן, אל תביטו ישירות בעזרת ציוד אופטי,
והימנעו מחשיפה לקרן.



$18 \leq$ ק"ג (37 ליב')



$32 \leq$ ק"ג (70.5 ליב')



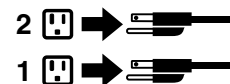
$55 \leq$ ק"ג (121.2 ליב')

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



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:
1. 모든 장치의 전원을 끄십시오. 2. 먼저 모든 케이블을 장치에 연결하십시오. 3. 커넥터에 신호 케이블을 연결하십시오. 4. 콘센트에 전원 코드를 연결하십시오. 5. 장치의 전원을 켜십시오.	1. 모든 장치의 전원을 끄십시오. 2. 먼저 콘센트에서 전원 코드를 분리하십시오. 3. 커넥터에서 신호 케이블을 분리하십시오. 4. 장치에서 모든 케이블을 분리하십시오.



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.

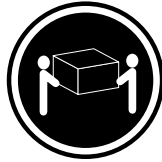
- 덮개를 열지 마십시오. 덮개를 열면 레이저 복사 에너지에 노출될 위험이 있습니다. 장치 내부에는 사용자가 조정하거나 수리할 수 있는 부품이 없습니다.
- 규정된 것 이외의 절차 수행, 제어 조정 등의 행위로 인해 해로운 레이저 복사에 노출될 수 있습니다.



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
1. APÁGUELO todo. 2. En primer lugar, conecte todos los cables a los dispositivos. 3. Conecte los cables de señal a los conectores. 4. Enchufe los cables de alimentación a las tomas de corriente. 5. Encienda el dispositivo.	1. APÁGUELO todo. 2. En primer lugar, desenchufe los cables de alimentación de las tomas de corriente. 3. Desconecte los cables de señal de los conectores. 4. Desconecte todos los cables de los dispositivos.



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)

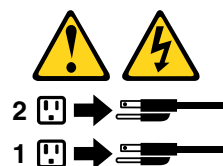
PRECAUCIÓN:

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.



Chapter 3. General information

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

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.

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	System Health and Diagnostics
ThinkVantage Password Manager	Password Vault
ThinkVantage Power Manager	Power Controls
ThinkVantage Rescue and Recovery®	Enhanced Backup and Restore
ThinkVantage System Update	Update and Drives

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.

For machine types: 1982, 1983, 1985, 1986, 1987, 1990, 1992, 1993, 1994, and 1995.

Dimensions

Width: 175 mm (6.89 inches)

Height: 414 mm (16.30 inches)

Depth: 442 mm (17.40 inches)

Weight

Maximum configuration as shipped: 11 kg (24.25 lb)

Environment

- Air temperature:

Operating: 10°C to 35°C (50°F to 95°F)

Storage: -40°C to 60°C (-40°F to 140°F) in original shipping package

Storage: -10°C to 60°C (14°F to 140°F) without package

- Humidity:

Operating: 20% to 80% (non-condensing)

Storage: 20% to 90% (non-condensing)

- Altitude:

Operating: -50 to 10 000 ft (-15.2 to 3 048 m)

Storage: -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

For machine types: 1996, 1997, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227.

Dimensions

Width: 338 mm (13.31 inches)

Height: 99.7 mm (3.93 inches)

Depth: 385.4 mm (15.17 inches)

Weight

Maximum configuration as shipped: 7.5 kg (16.53 lb)

Environment

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

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 267.

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 67.
 - If the computer displays a POST error, go to “POST error codes” on page 67.
 - 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 49.
 - If the test stops and you cannot continue, replace the last device tested.

Problem determination tips

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

- Machine type and model
- Processor or hard disk 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 Lenovo ThinkVantage Toolbox program to diagnose computer problems, if your computer is running the Microsoft® Windows® operating system.

Notes:

1. You can also download the PC-Doctor for DOS diagnostic program from <http://www.lenovo.com/support>. See “PC-Doctor for DOS” on page 39 for detailed information.
2. 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.

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.

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 41.

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
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- **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 49 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.

Important: 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.

Note: You have to enable the configuration change detection feature for the POST to detect the removal of the hard disk drive. To enable the configuration change detection feature, do the following:

1. Start the Setup Utility program.
2. From the Setup Utility program main menu, select **Security → Configuration Change Detection**, and press Enter.
3. Select **Enabled** and press Enter.
4. Press F10 to save changes and exit the Setup Utility program. Press Enter when prompted to confirm the exit.

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
- Hard Disk 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 and hard disk drive passwords are not case sensitive
- Not be your name or your user name
- Not be a common word or a common name
- Be significantly different from your previous 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.

Hard Disk Password

Setting a Hard Disk Password prevents unauthorized access to the data on the hard disk drive. When a Hard Disk Password is set, you are prompted to type a valid password each time you try to access the hard disk drive.

Notes:

- After you set a Hard Disk Password, your data on the hard disk drive is protected even if the hard disk drive is removed from one computer and installed in another.
- If the Hard Disk Password is forgotten, there is no way to reset the password or recover data from the hard disk drive.

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**, **Set Administrator Password**, or **Hard Disk 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 44.

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. Open the computer cover. See “Opening the computer cover” on page 121.
3. Locate the Clear CMOS /Recovery jumper on the system board. See “Locating parts on the system board” on page 77.
4. Move the jumper from the standard position (pin 1 and pin 2) to the maintenance position (pin 2 and pin 3).
5. Close the computer cover and connect the power cord. See “Completing the parts replacement” on page 112.
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 2.
8. Move the Clear CMOS /Recovery jumper back to the standard position (pin 1 and pin 2).
9. Close the computer cover and connect the power cord. See “Completing the parts replacement” on page 112.

Enabling or disabling a device

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

USB Setup	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.
SATA Controller	When this feature is set to Disable , all devices connected to the SATA connectors (such as hard disk drives or the optical drive) are disabled and 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 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 47.

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 Startup Device Menu 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 Startup Device Menu 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 Boot Sequence, the Automatic Boot Sequence, and the Error Boot 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 47.

Enabling ErP compliance mode

You can enable the energy-related products directive (ErP) compliance mode through the **Power** menu in the Setup Utility program to reduce the consumption of electricity when your computer is in standby or off mode.

To enable ErP compliance mode in the Setup Utility program, 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 **Power → Enhanced Power Saving Mode**, and press Enter.
3. Select **Enabled** and press Enter.
4. From the **Power** menu, select **Automatic Power On** and press Enter.
5. Select **Wake on Lan** and press Enter.
6. Select **Disabled** and press Enter.
7. Press F10 to save changes and exit the Setup Utility program. Press Enter when prompted to confirm the exit.

Note: When ErP compliance mode is enabled, you can wake up your computer by doing one of the following:

- Pressing the power switch
- Enabling the wake up on alarm feature

The wake up on alarm feature enables your computer to wake up at a set time. To enable the wake up on alarm feature, do the following:

1. Start the Setup Utility program.
 2. From the Setup Utility program main menu, select **Power → Automatic Power On**, and press Enter.
 3. Select **Wake Up on Alarm** and press Enter. Then follow the instructions on the screen.
 4. Press F10 to save changes and exit the Setup Utility program. Press Enter when prompted to confirm the exit.
- Enabling the after power loss feature

The after power loss feature enables your computer to wake up when the power supply resumes after a sudden loss of electricity. To enable the after power loss feature, do the following:

 1. Start the Setup Utility program.
 2. From the Setup Utility program main menu, select **Power → After Power Loss**, and press Enter.
 3. Select **Power On** and press Enter.
 4. Press F10 to save changes and exit the Setup Utility program. Press Enter when prompted to confirm the exit.

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 71.

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: 1. Attempt to back up the data on the failing hard disk drive. 2. Using the operating systems program, format the hard disk drive.
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: • Power cord • On/Off switch connector • On/Off switch power supply connector • System board power supply connectors • Microprocessor(s) connection	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.

Diagnostic Error Code	FRU/Action
000-000-XXX BIOS Test Passed	No action
000-002-XXX BIOS Timeout	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267. 2. System board
000-024-XXX BIOS Addressing test failure	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267. 2. System board
000-025-XXX BIOS Checksum Value error	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267. 2. System board
000-026-XXX FLASH data error	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267. 2. System board
000-027-XXX BIOS Configuration/Setup error	1. Run Setup 2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 3. System board
000-034-XXX BIOS Buffer Allocation failure	1. Reboot the system 2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 3. Run memory test 4. System board
000-035-XXX BIOS Reset Condition detected	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267. 2. System board
000-036-XXX BIOS Register error	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267. 2. System board
000-038-XXX BIOS Extension failure	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 2. Adapter card 3. System board
000-039-XXX BIOS DMI data error	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267. 2. System board
000-195-XXX BIOS Test aborted by user	Information only Re-start the test, if necessary
000-196-XXX BIOS test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
000-197-XXX BIOS test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
000-198-XXX BIOS test aborted	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 2. Flash the system and retest. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
000-199-XXX BIOS test failed, cause unknown	1. Go to “Undetermined problems” on page 71 2. Flash the system and re-test 3. Replace component under function test
000-250-XXX BIOS APM failure	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 2. System board
000-270-XXX BIOS ACPI failure	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 2. System board
001-000-XXX System Test Passed	No action
001-00X-XXX System Error	System board
001-01X-XXX System Error	System board
001-024-XXX System Addressing test failure	System board
001-025-XXX System Checksum Value error	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 2. System board
001-026-XXX System FLASH data error	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 2. System board
001-027-XXX System Configuration/Setup error	1. Run Setup 2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 3. System board
001-032-XXX System Device Controller failure	System board
001-034-XXX System Device Buffer Allocation failure	1. Reboot the system 2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 3. Run memory test 4. System board
001-035-XXX System Device Reset condition detected	System board
001-036-XXX System Register error	System board

Diagnostic Error Code	FRU/Action
001-038-XXX System Extension failure	1. Adapter card 2. System board
001-039-XXX System DMI data structure error	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 2. System board
001-040-XXX System IRQ failure	1. Power-off/on system and re-test 2. System board
001-041-XXX System DMA failure	1. Power-off/on system and re-test 2. System board
001-195-XXX System Test aborted by user	Information only Re-start the test, if necessary
001-196-XXX System test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
001-197-XXX System test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
001-198-XXX System test aborted	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 2. Flash the system and retest. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
001-199-XXX System test failed, cause unknown	1. Go to “Undetermined problems” on page 71 2. Flash the system and re-test 3. Replace component under function test
001-250-XXX System ECC error	System board
001-254-XXX 001-255-XXX 001-256-XXX 001-257-XXX System DMA error	System board
001-260-XXX 001-264-XXX System IRQ error	System board
001-268-XXX System IRQ1 failure	1. Device on IRQ1 2. System board
001-269-XXX System IRQ2 failure	1. Device on IRQ2 2. System board
001-270-XXX System IRQ3 failure	1. Device on IRQ3 2. System board
001-271-XXX System IRQ4 failure	1. Device on IRQ4 2. System board
001-272-XXX System IRQ5 failure	1. Device on IRQ5 2. System board

Diagnostic Error Code	FRU/Action
001-273-XXX System IRQ6 (diskette drive) failure	1. Diskette Cable 2. Diskette drive 3. System board
001-274-XXX System IRQ7 failure	1. Device on IRQ7 2. System board
001-275-XXX System IRQ8 failure	1. Device on IRQ8 2. System board
001-276-XXX System IRQ9 failure	1. Device on IRQ9 2. System board
001-277-XXX System IRQ10 failure	1. Device on IRQ10 2. System board
001-278-XXX System IRQ11 failure	1. Device on IRQ11 2. System board
001-279-XXX System IRQ12 failure	1. Device on IRQ12 2. System board
001-280-XXX System IRQ13 failure	1. Device on IRQ13 2. System board
001-281-XXX System IRQ14 (hard disk drive) failure	1. Hard disk drive cable 2. Hard disk drive 3. System board
001-282-XXX System IRQ15 failure	1. Device on IRQ15 2. System board
001-286-XXX 001-287-XXX 001-288-XXX System Timer failure	System board
001-292-XXX System CMOS RAM error	1. Run Setup and re-test 2. System board
001-293-XXX System CMOS Battery	1. CMOS battery 2. System board
001-298-XXX System RTC date/time update failure	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 2. System board
001-299-XXX System RTC periodic interrupt failure	System board
001-300-XXX System RTC Alarm failure	System board
001-301-XXX System RTC Century byte error	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 2. System board
005-000-XXX Video Test Passed	No action
005-00X-XXX Video error	1. Video card, if installed 2. System board
005-010-XXX 005-011-XXX 005-012-XXX 005-013-XXX Video Signal failure	1. Video card, if installed 2. System board

Diagnostic Error Code	FRU/Action
005-016-XXX Video Simple Pattern test failure	1. Video Ram 2. Video card, if installed 3. System board
005-024-XXX Video Addressing test failure	1. Video card, if installed 2. System board
005-025-XXX Video Checksum Value error	1. Video card, if installed 2. System board
005-027-XXX Video Configuration/Setup error	1. Run Setup 2. Video drivers update 3. Video card, if installed 4. System board
005-031-XXX Video Device Cable failure	1. Video cable 2. Monitor 3. Video card, if installed 4. System board
005-032-XXX Video Device Controller failure	1. Video card, if installed 2. System board
005-036-XXX Video Register error	1. Video card, if installed 2. System board
005-038-XXX System BIOS extension failure	1. Video card, if installed 2. System board
005-040-XXX Video IRQ failure	1. Video card, if installed 2. System board
005-195-XXX Video Test aborted by user	Information only Re-start the test, if necessary
005-196-XXX Video test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
005-197-XXX Video test warning	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 2. Re-run test 3. Replace the component called out in warning statement 4. Replace the component under test
005-198-XXX Video test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
005-199-XXX Video test failed, cause unknown	1. Go to “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test

Diagnostic Error Code	FRU/Action
005-2XX-XXX 005-3XX-XXX Video subsystem error	1. Video card, if installed 2. System board
006-000-XXX Diskette interface Test Passed	No action
006-0XX-XXX Diskette interface error	1. Diskette drive Cable 2. Diskette drive 3. System board
006-195-XXX Diskette interface Test aborted by user	Information only Re-start the test, if necessary
006-196-XXX Diskette interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
006-197-XXX Diskette interface test warning	1. If a component is called out, make sure it is connected and/or enabled 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
006-198-XXX Diskette interface test aborted	1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test. See "Updating (flashing) the BIOS from a disc" on page 267 3. Go to "Undetermined problems" on page 71
006-199-XXX Diskette interface test failed, cause unknown	1. Go to "Undetermined problems" on page 71 2. Flash the system and re-test 3. Replace component under function test
006-25X-XXX Diskette interface Error	1. Diskette drive cable 2. Diskette drive 3. System board
011-000-XXX Serial port Interface Test Passed	No action
011-001-XXX Serial port Presence	1. Remove external serial device, if present 2. Run setup, enable port 3. System board
011-002-XXX 011-003-XXX Serial port Timeout/Parity error	System board
011-013-XXX 011-014-XXX Serial port Control Signal/Loopback test failure	System board
011-015-XXX Serial port External Loopback failure	1. Wrap plug 2. System board
011-027-XXX Serial port Configuration/Setup error	1. Run Setup, enable port 2. Flash the system. See "Updating (flashing) the BIOS from a disc" on page 267 3. System board
011-03X-XXX 011-04X-XXX Serial port failure	System board
011-195-XXX Serial port Test aborted by user	Information only Re-start the test, if necessary

Diagnostic Error Code	FRU/Action
011-196-XXX Serial port test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
011-197-XXX Serial port test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
011-198-XXX Serial port test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
011-199-XXX Serial port test failed, cause unknown	1. Go to “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
011-2XX-XXX Serial port signal failure	1. External serial device 2. System board
014-000-XXX Parallel port Interface Test Passed	No action
014-001-XXX Parallel port Presence	1. Remove external parallel device, if present 2. Run setup, enable port 3. System board
014-002-XXX 014-003-XXX Parallel port Timeout/Parity error	System board
014-013-XXX 014-014-XXX Parallel port Control Signal/Loopback test failure	System board
014-015-XXX Parallel port External Loopback failure	1. Wrap plug 2. System board
014-027-XXX Parallel port Configuration/Setup error	1. Run Setup, enable port 2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 3. System board
014-03X-XXX 014-04X-XXX Parallel port failure	System board
014-195-XXX Parallel port Test aborted by user	Information only Re-start the test, if necessary
014-196-XXX Parallel port test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
014-197-XXX Parallel port test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
014-198-XXX Parallel port test aborted	1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
014-199-XXX Parallel port test failed, cause unknown	1. Go to “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
014-2XX-XXX 014-3XX-XXX Parallel port failure	1. External parallel device 2. System board
015-000-XXX USB port Interface Test Passed	No action
015-001-XXX USB port Presence	1. Remove USB device(s) and re-test 2. System board
015-002-XXX USB port Timeout	1. Remove USB device(s) and re-test 2. System board
015-015-XXX USB port External Loopback failure	1. Remove USB device(s) and re-test 2. System board
015-027-XXX USB port Configuration/Setup error	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 2. System board
015-032-XXX USB port Device Controller failure	System board
015-034-XXX USB port buffer allocation failure	1. Reboot the system 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Run memory test 4. System board
015-035-XXX USB port Reset condition detected	1. Remove USB device(s) and re-test 2. System board
015-036-XXX USB port Register error	System board
015-040-XXX USB port IRQ failure	1. Run setup and check for conflicts 2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 3. System board
015-195-XXX USB port Test aborted by user	Information only Re-start the test, if necessary

Diagnostic Error Code	FRU/Action
015-196-XXX USB port test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
015-197-XXX USB port test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
015-198-XXX USB port test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
015-199-XXX USB port test failed, cause unknown	1. Go to “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
018-000-XXX PCI Card Test Passed	No action
018-0XX-XXX PCI Card Failure	1. Riser card, if installed 2. System board
018-195-XXX PCI Card Test aborted by user	1. PCI card 2. Information only Re-start the test, if necessary
018-196-XXX PCI Card test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
018-197-XXX PCI Card test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
018-198-XXX PCI Card test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
018-199-XXX PCI Card test failed, cause unknown	1. Go to “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test

Diagnostic Error Code	FRU/Action
018-250-XXX PCI Card Services error	1. PCI card 2. Riser card, if installed 3. System board
020-000-XXX PCI Interface Test Passed	No action
020-0XX-XXX PCI Interface error	1. PCI card 2. Riser card, if installed 3. System board
020-195-XXX PCI Test aborted by user	Information only Re-start the test, if necessary
020-196-XXX PCI test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
020-197-XXX PCI test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
020-198-XXX PCI test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
020-199-XXX PCI test failed, cause unknown	1. Go to “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
020-262-XXX PCI system error	1. PCI card 2. Riser card, if installed 3. System board
025-000-XXX IDE interface Test Passed	No action
025-00X-XXX 025-01X-XXX IDE interface failure	1. IDE signal cable 2. Check power supply voltages 3. Reseat IDE signal cable 4. IDE device 5. System board
025-027-XXX IDE interface Configuration/Setup error	1. IDE signal cable 2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 3. Reseat IDE signal cable 4. IDE device 5. System board

Diagnostic Error Code	FRU/Action
025-02X-XXX 025-03X-XXX 025-04X-XXX IDE Interface failure	1. IDE signal cable 2. Check power supply 3. Reseat IDE signal cable 4. IDE device 5. System board
025-195-XXX IDE interface Test aborted by user	Information only Re-start the test, if necessary
025-196-XXX IDE interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
025-197-XXX IDE interface test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
025-198-XXX IDE interface test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
025-199-XXX IDE interface test failed, cause unknown	1. Go to “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
030-000-XXX SCSI interface Test Passed	No action
030-00X-XXX 030-01X-XXX SCSI interface failure	1. SCSI signal cable 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-027-XXX SCSI interface Configuration/Setup error	1. SCSI signal cable 2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-03X-XXX 030-04X-XXX SCSI interface error	1. SCSI signal cable 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-195-XXX SCSI interface Test aborted by user	Information only Re-start the test, if necessary

Diagnostic Error Code	FRU/Action
030-196-XXX SCSI interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
030-197-XXX SCSI interface test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
030-198-XXX SCSI interface test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
030-199-XXX SCSI interface test failed, cause unknown	1. Go to “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
035-000-XXX RAID interface Test Passed	No action
035-0XX-XXX RAID interface Failure	1. RAID signal cable 2. RAID device 3. RAID adapter card, if installed 4. System board
035-195-XXX RAID interface Test aborted by user	Information only Re-start the test, if necessary
035-196-XXX RAID interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
035-197-XXX RAID interface test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
035-198-XXX RAID interface test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
035-199-XXX RAID interface test failed, cause unknown	1. See “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
071-000-XXX Audio port Interface Test Passed	No action

Diagnostic Error Code	FRU/Action
071-00X-XXX 071-01X-XXX 071-02X-XXX Audio port error	1. Run Setup 2. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 3. System board
071-03X-XXX Audio port failure	1. Speakers 2. Microphone 3. Audio card, if installed 4. System board
071-04X-XXX Audio port failure	1. Run Setup 2. Audio card, if installed 3. System board
071-195-XXX Audio port Test aborted by user	Information only Re-start the test, if necessary
071-196-XXX Audio port test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
071-197-XXX Audio port test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
071-198-XXX Audio port test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
071-199-XXX Audio port test failed, cause unknown	1. See “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
071-25X-XXX Audio port failure	1. Speakers 2. Audio card, if installed 3. System board
080-000-XXX Game Port interface Test Passed	No action
080-XXX-XXX Game Port interface Error	1. Remove the game port device and re-test the system
080-195-XXX Game Port interface Test aborted by user	Information only Re-start the test, if necessary
080-196-XXX Game Port interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
080-197-XXX Game Port interface test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
080-198-XXX Game Port interface test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
080-199-XXX Game Port interface test failed, cause unknown	1. See “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
086-000-XXX Mouse Port interface Test Passed	No action
086-001-XXX Mouse Port interface Presence	1. Mouse 2. System board
086-032-XXX Mouse Port interface Device controller failure	1. Mouse 2. System board
086-035-XXX Mouse Port interface Reset	1. Mouse 2. System board
086-040-XXX Mouse Port interface IRQ failure	1. Run Setup 2. Mouse 3. System board
086-195-XXX Mouse Port interface Test aborted by user	Information only Re-start the test, if necessary
086-196-XXX Mouse Port interface test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
086-197-XXX Mouse Port interface test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
086-198-XXX Mouse Port interface test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71

Diagnostic Error Code	FRU/Action
086-199-XXX Mouse Port interface test failed, cause unknown	1. See “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
089-000-XXX Microprocessor Test Passed	No action
089-XXX-XXX Microprocessor failure	1. Microprocessor(s) 2. System board
089-195-XXX Microprocessor Test aborted by user	Information only Re-start the test, if necessary
089-196-XXX Microprocessor test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
089-197-XXX Microprocessor test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
089-198-XXX Microprocessor test aborted	1. Flash the system. See “Updating (flashing) the BIOS from a disc” on page 267 2. Go to “Undetermined problems” on page 71
089-199-XXX Microprocessor test failed, cause unknown	1. See “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
170-000-XXX Voltage Sensor(s) Test Passed	No action
170-0XX-XXX Voltage Sensor(s) failure	1. Flash system 2. System board
170-195-XXX Voltage Sensor(s) Test aborted by user	Information only Re-start the test, if necessary
170-196-XXX Voltage Sensor(s) test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
170-197-XXX Voltage Sensor(s) test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
170-198-XXX Voltage Sensor(s) test aborted	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 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71

Diagnostic Error Code	FRU/Action
170-199-XXX Voltage Sensor(s) test failed, cause unknown	1. See “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
170-250-XXX 170-251-XXX Voltage Sensor(s) Voltage limit error	1. Power supply 2. System board
170-254-XXX Voltage Sensor(s) Voltage Regulator Module error	1. Voltage Regulator Module (VRM) 2. Microprocessor 3. System board
175-000-XXX Thermal Sensor(s) Test Passed	No action
175-0XX-XXX Thermal Sensor(s) failure	1. Flash system 2. System board
175-195-XXX Thermal Sensor(s) Test aborted by user	Information only Re-start the test, if necessary
175-196-XXX Thermal Sensor(s) test halt, error threshold exceeded	1. Press F3 to review the log file 2. Re-start the test to reset the log file
175-197-XXX Thermal Sensor(s) test warning	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 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
175-198-XXX Thermal Sensor(s) test aborted	1. If a component is called out, make sure it is connected and/or enabled 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Go to “Undetermined problems” on page 71
175-199-XXX Thermal Sensor(s) test failed, cause unknown	1. See “Undetermined problems” on page 71 2. Flash the system and re-test. See “Updating (flashing) the BIOS from a disc” on page 267 3. Replace component under function test
175-250-XXX 175-251-XXX Thermal Sensor(s) limit error	1. Check fans 2. Check Power supply voltages 3. Microprocessor 4. System board
185-000-XXX Asset Security Test Passed	No action
185-XXX-XXX Asset Security failure	1. Flash system 2. System board
185-278-XXX Asset Security Chassis Intrusion	1. Assure Asset Security Enabled 2. C2 Cover Switch 3. System board
201-000-XXX System Memory Test Passed	No action

Diagnostic Error Code	FRU/Action
201-XXX-XXX System Memory error	1. Replace the memory module called out by the test 2. System board
202-000-XXX System Cache Test Passed	No action
202-XXX-XXX System Cache error	1. Cache, if removable 2. System board 3. Microprocessor
206-000-XXX Diskette Drive Test Passed	No action
206-XXX-XXX Diskette Drive error	1. Diskette Drive Cable 2. Check power supply voltages 3. Diskette drive 4. System board
215-000-XXX CD-ROM Drive Test Passed	No action
215-XXX-XXX CD-ROM Drive error	1. CD-ROM Drive Cable 2. Check power supply voltages 3. CD-ROM drive 4. System board
217-000-XXX Hard Disk Drive Test Passed	No action
217-25X-XXX 217-26X-XXX Hard Disk Drive (IDE) error	1. Hard Disk Drive Cable 2. Check power supply voltages 3. Reseat the hard disk drive cable 4. Hard Disk drive (IDE) 5. System board
217-28X-XXX 217-29X-XXX Hard Disk Drive (SCSI) error	1. Hard Disk Drive Cable 2. Check power supply voltages 3. Reseat the hard disk drive cable 4. Hard Disk drive (SCSI) 5. SCSI adapter card 6. System board
220-000-XXX Hi-Capacity Cartridge Drive Test Passed	No action
220-XXX-XXX Hi-Capacity Cartridge Drive error	1. Remove the Hi-Capacity Cartridge Drive and re-test the system
301-XXX-XXX Keyboard error	1. Keyboard 2. Check and test mouse 3. System board
301-000-XXX Keyboard Test Passed	No action
302-000-XXX Mouse Test Passed	No action
302-XXX-XXX Mouse error	1. Mouse 2. Check and test Keyboard 3. System board
303-000-XXX Joystick Test Passed	No action
303-XXX-XXX Joystick error	Remove the Joystick and re-test the system

Diagnostic Error Code	FRU/Action
305-000-XXX Monitor DDC Test Passed	No action
305-250-XXX Monitor DDC self test failure	1. Run Setup to enable DDC 2. Cable 3. Monitor 4. Video card 5. System board
415-000-XXX Modem Test Passed	No action
415-XXX-XXX 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
3 short beeps and 1 long beep Memory not detected	Perform the following actions in order: 1. Make sure the memory module(s) are properly seated in the connector(s). 2. Replace the memory module(s). 3. Replace the system board.
2 short beeps Common POST Error	Indicates that an error has occurred during the POST.

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 code	POST Error message	Description/Action
00CE	Machine Type or Serial Number is INVALID	This error message is displayed when the machine type or the serial number is invalid.
0210	Stuck key	This error message is displayed during the POST when a key is kept pressed for a long time.

POST Error code	POST Error message	Description/Action
0135	Fan failure	The system might be overheating. Press F1 to enter the Setup Utility program. Then press F10 to save and exit the Setup Utility program. Note: If the problem is caused by the microprocessor fan, pressing F10 will not solve the problem.
0211	Keyboard not found	This error message is displayed when there is no keyboard detected.
0164	Memory size decreased	This error message is displayed when the memory size has decreased. Press F1 to enter the Setup Utility program. Then press F10 to save and exit the Setup Utility program.
1762	SATA device configuration change has occurred	This error message is displayed when a hard disk drive or optical drive change has been made. Press F1 to enter the Setup Utility program. Then press F10 to save and exit the Setup Utility program.
1820	More than one external fingerprint reader is attached. Power off and remove all but the reader that you set up within your main operating system.	If more than one external fingerprint reader is connected to a computer, this error message will be displayed to inform you to remove all of the fingerprint keyboards except the one compatible with the fingerprint application on your computer.
1962	No operating system found. Press any key to repeat boot sequence.	This error occurs only after the POST is completed. Press any key to repeat boot sequence.
0162	Setup data integrity check failure	Press F1 to enter the Setup Utility program. Then press F10 to save and exit the Setup Utility program.
0175	System Security - Security data corrupted	This error indicates that the data stored in the Security EEPROM Block 6 is corrupted. Press F1 to enter the Setup Utility program. Then press F10 to save and exit the Setup Utility program.
0176	System Security - The system has been tampered with	This error message is displayed when the computer is turned on with the cover open or removed. Press F1 to enter the Setup Utility program. Then press F10 to save and exit the Setup Utility program.
0189	System Security - Can not read the Security EEPROM	This error message indicates that the Security EEPROM may be broken or removed. Press F1 to enter the Setup Utility program. Then press F10 to save and exit the Setup Utility program.

POST Error code	POST Error message	Description/Action
0197	System Security - Unauthorized security data change detected	Press F1 to enter the Setup Utility program. Then press F10 to save and exit the Setup Utility program.
0198	System Security - Unauthorized BIOS update attempted	Press F1 to enter the Setup Utility program. Then press F10 to save and exit the Setup Utility program.
0190	System Security - Invalid security change requested	Press F1 to enter the Setup Utility program. Then press F10 to save and exit the Setup Utility program.
0199	System Security - Security password retry count exceeded	Press F1 to enter the Setup Utility program. Then press F10 to save and exit the Setup Utility program.

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 49.	1. Power Switch 2. System Board 3. Riser card, if installed
Computer will <i>not</i> RPL from server	1. Ensure that network is in startup sequence as first device or first device after diskette 2. Ensure that network adapter is enabled for RPL 3. Network adapter (Advise network administrator of new MAC address)
Computer will <i>not</i> perform a Wake on LAN (if applicable)	1. Check power supply and signal cable connections to network adapter 2. Ensure that the operating system settings are set to enable Wake on LAN 3. Ensure Wake on LAN feature is enabled in Setup/Configuration (see "Starting the Setup Utility program" on page 43) 4. Ensure network administrator is using correct MAC address 5. Ensure no interrupt or I/O address conflicts 6. Network adapter (advise network administrator of new MAC address)
Dead computer. See "Hard disk drive boot error" on page 49.	1. Power Supply 2. System Board
Diskette drive in-use light remains on or does not light when drive is active.	1. Diskette Drive 2. System Board 3. Diskette Drive Cable
Flashing cursor with an otherwise blank display.	1. System Board 2. Primary Hard Disk Drive 3. Hard Disk Drive Cable

Message/Symptom	FRU/Action
Incorrect memory size during POST	1. Run the Memory tests 2. Memory Module 3. System Board
"Insert a Diskette" icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	1. System Board 2. Diskette Drive Cable 3. Network Adapter
Intensity or color varies from left to right of characters and color bars	1. Display 2. Video adapter (if present) 3. System Board
No power or fan not running	1. See "Hard disk drive boot error" on page 49.
Non-system disk or disk error-type message with a known-good diagnostic diskette.	1. Diskette Drive 2. System Board 3. Diskette Drive Cable
Other display symptoms not listed above (including blank or illegible display)	1. Display 2. System Board
Power-on indicator or hard disk drive in-use light not on, but computer works correctly	1. Power switch/LED assembly 2. System Board
Printer problems	1. Printer 2. System Board
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive	1. Run Setup and check Startup sequence. 2. Diskette Drive 3. Diskette Drive Cable 4. System Board 5. Power Supply
RPL computer cannot access programs from its own hard disk.	1. If network administrator is using LCCM Hybrid RPL, check startup sequence: a. First device - network b. Second device - hard disk 2. Hard disk drive
RPL computer does not RPL from server	1. Check startup sequence 2. Check the network adapter LED status
Serial or parallel port device failure (system board port)	1. External Device Self-Test OK? 2. External Device 3. Cable 4. System Board

Message/Symptom	FRU/Action
Serial or parallel port device failure (adapter port)	1. External Device Self-Test OK? 2. External Device 3. Cable 4. Alternate Adapter 5. System Board
Some or all keys on the keyboard do not work	1. Keyboard 2. Keyboard Cable 3. System Board

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 110 or “Replacing the system board” on page 158.

Chapter 8. Replacing FRUs (Machine Types: 1982, 1983, 1985, 1986, 1987, 1990, 1992, 1993, 1994, and 1995.)

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 74 shows the locations of the connectors, controls, and indicators on the front of your computer.

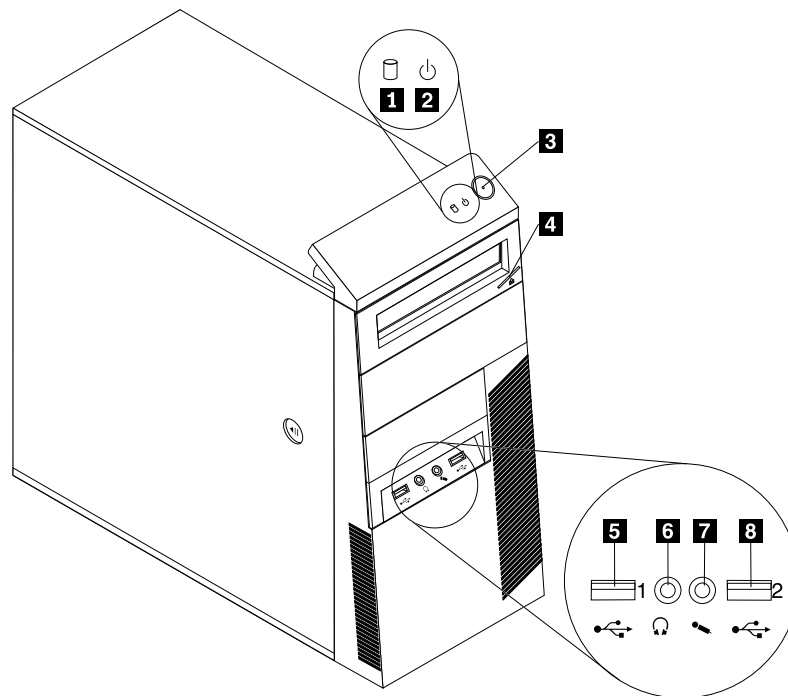


Figure 1. Front connector, control, and indicator locations

- 1** Hard disk drive activity indicator
- 2** Power indicator
- 3** Power switch
- 4** Optical drive eject/close button

- 5** USB connector (USB port 1)
- 6** Headphone connector
- 7** Microphone connector
- 8** USB connector (USB port 2)

Locating connectors on the rear of your computer

Figure 2 “Rear connector locations” on page 75 shows the locations of the connectors 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.

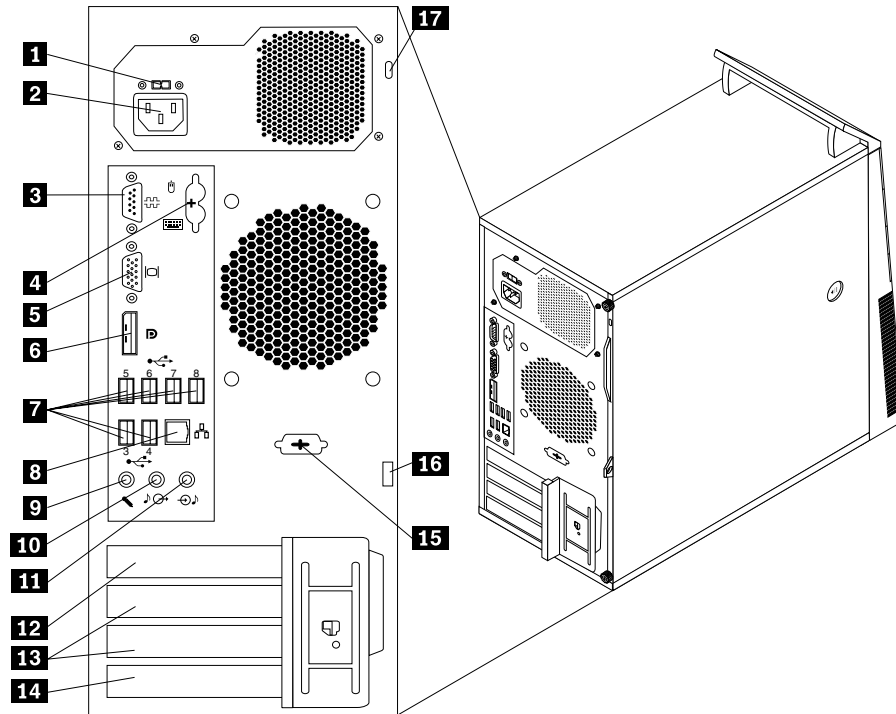


Figure 2. Rear connector locations

- | | |
|--|--|
| 1 Voltage-selection switch (some models) | 10 Audio line-out connector |
| 2 Power cord connector | 11 Audio line-in connector |
| 3 Serial port (Serial port 1) | 12 PCI Express x16 graphics card slot |
| 4 PS/2 keyboard and mouse connectors (optional) | 13 PCI Express x1 card slots (2) |
| 5 VGA monitor connector | 14 PCI card slot |
| 6 DisplayPort connector | 15 Optional serial port (Serial port 2) |
| 7 USB connectors (USB ports 3 to 8) | 16 Padlock loop |
| 8 Ethernet connector | 17 Integrated cable lock (Kensington lock) slot |
| 9 Microphone connector | |

Locating components

Figure 3 “Component locations” on page 76 shows the locations of the various components in your computer. To remove the computer cover, see “Removing the computer cover” on page 79.

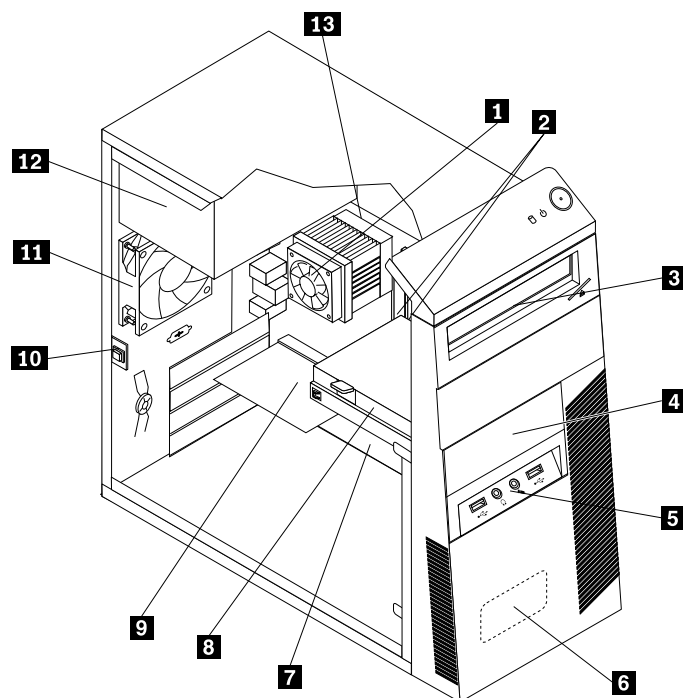


Figure 3. Component locations

- | | |
|--|--|
| 1 Heat sink and fan assembly | 8 Hard disk drive |
| 2 Memory modules | 9 PCI card (installed in some models) |
| 3 Optical drive | 10 Cover presence switch (also called intrusion switch) |
| 4 Card reader (installed in some models) | 11 Rear fan |
| 5 Front audio and USB assembly | 12 Power supply assembly |
| 6 Internal speaker (installed in some models) | 13 Microprocessor |
| 7 System board | |

Locating parts on the system board

Figure 4 “System board part locations” on page 77 shows the locations of the parts on the system board.

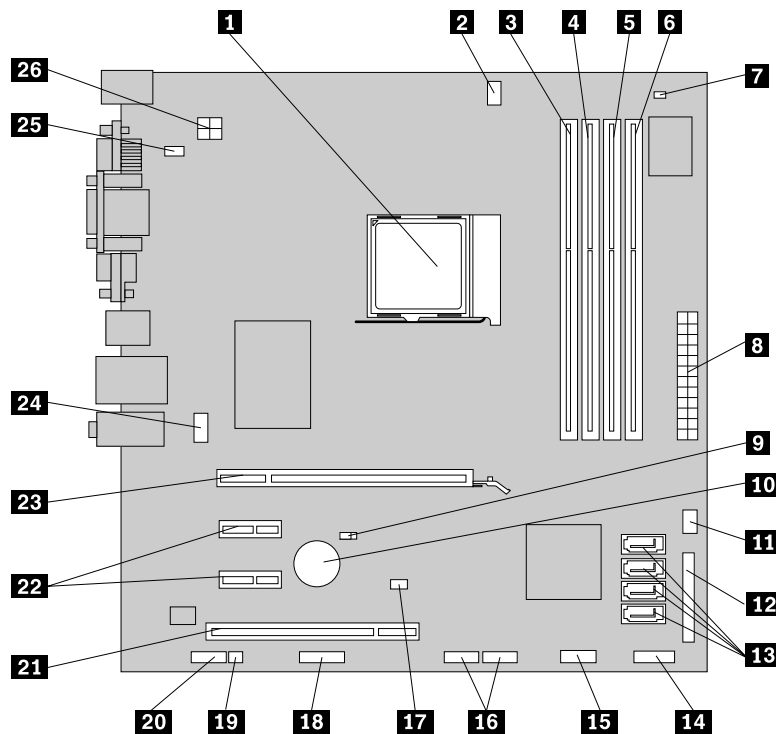


Figure 4. System board part locations

- | | |
|--|---|
| 1 Microprocessor | 14 Front panel connector (for connecting LED indicators and power switch) |
| 2 Microprocessor fan connector | 15 Front USB connector 1 (for connecting USB ports 1 and 2 on the front bezel) |
| 3 Memory slot 1 (DIMM1) | 16 Front USB connectors 2 and 3 (for connecting additional USB devices) |
| 4 Memory slot 2 (DIMM3) | 17 Cover presence switch connector (Intrusion switch connector) |
| 5 Memory slot 3 (DIMM2) | 18 Serial (COM2) connector |
| 6 Memory slot 4 (DIMM4) | 19 Internal speaker connector |
| 7 Thermal sensor connector | 20 Front audio connector |
| 8 24-pin power connector | 21 PCI card slot |
| 9 Clear CMOS (Complementary Metal Oxide Semiconductor) /Recovery jumper | 22 PCI Express x1 card slots (2) |
| 10 Battery | 23 PCI Express x16 graphics card slot |
| 11 Power fan connector | 24 System fan connector |
| 12 Parallel connector | 25 PS/2 keyboard and mouse connector |
| 13 SATA 3.0 connectors (4) | 26 4-pin power 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 79 for instructions on how to install or replace internal drives for your computer.

Figure 5 “Drive bay locations” on page 78 shows the locations of the drive bays.

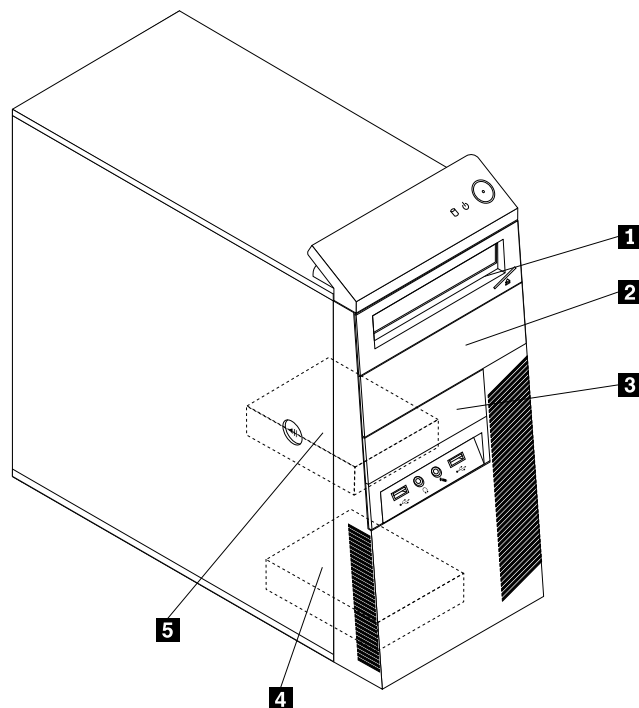


Figure 5. Drive bay locations

- 1** Bay 1 - Optical drive bay (with an optical drive installed in some models)
- 2** Bay 2 - Optical drive bay
- 3** Bay 3 - Card reader drive bay
- 4** Bay 4 - Secondary SATA hard disk drive bay
- 5** Bay 5 - 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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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 74 and “Locating connectors on the rear of your computer” on page 75.
4. Remove any locking device that secures the computer cover, such as a padlock or an integrated cable lock.

5. Remove any screws that secure the computer cover.
6. Press the cover-release button on the side of the computer and slide the cover to the rear of the computer to remove the cover.

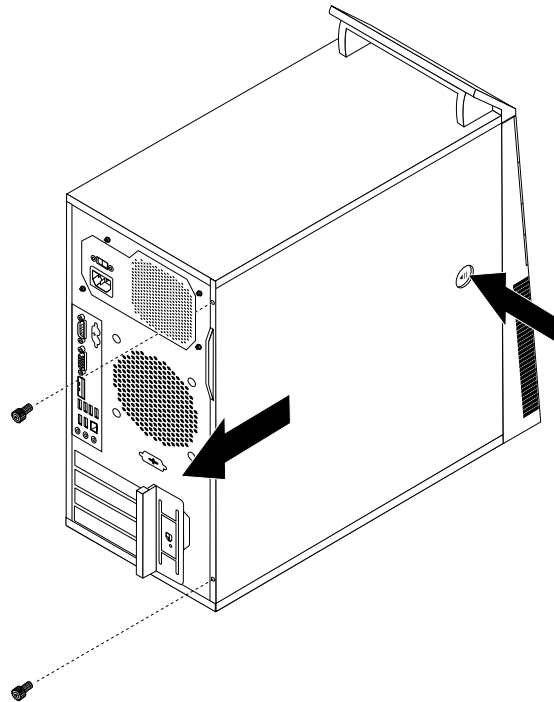


Figure 6. Removing the computer cover

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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 79.

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

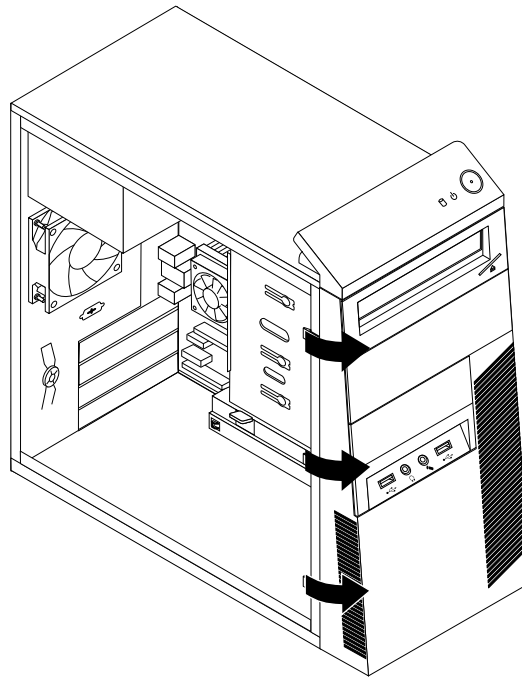


Figure 7. Removing the front bezel

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.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

This section provides instructions on how to install or replace a PCI card. Your computer has one standard PCI card slot, two PCI Express x1 card slots, 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 79.

3. At the rear of the computer, press the release button **1** to open the card latch **2**.

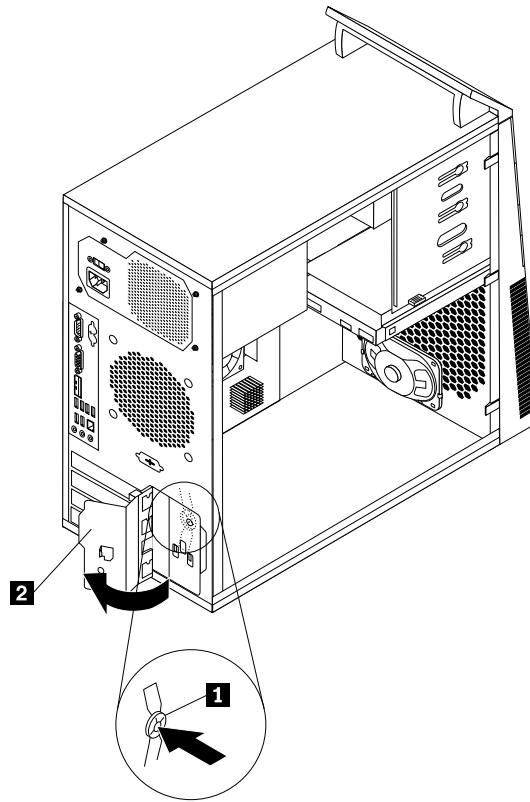


Figure 8. Opening the PCI card latch

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.

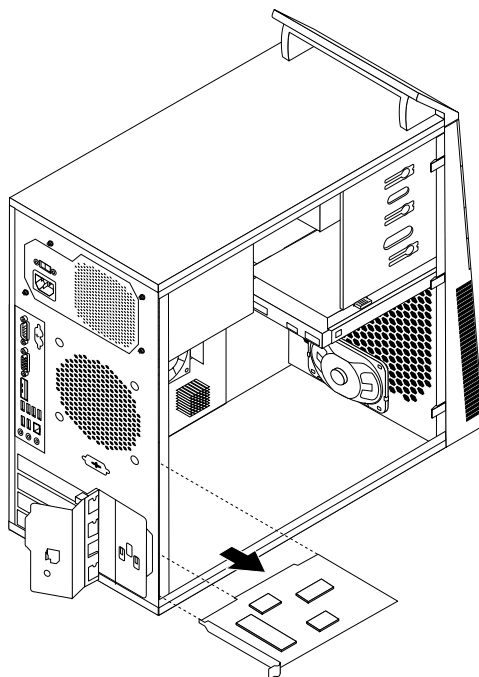
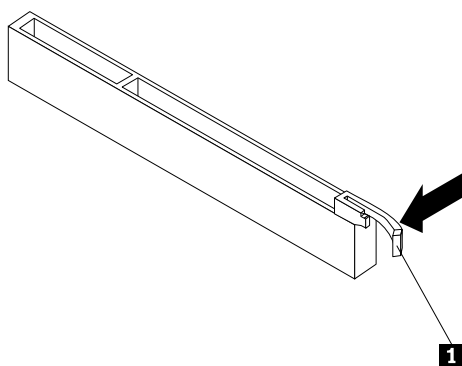


Figure 9. Removing a PCI card

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 77.

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.

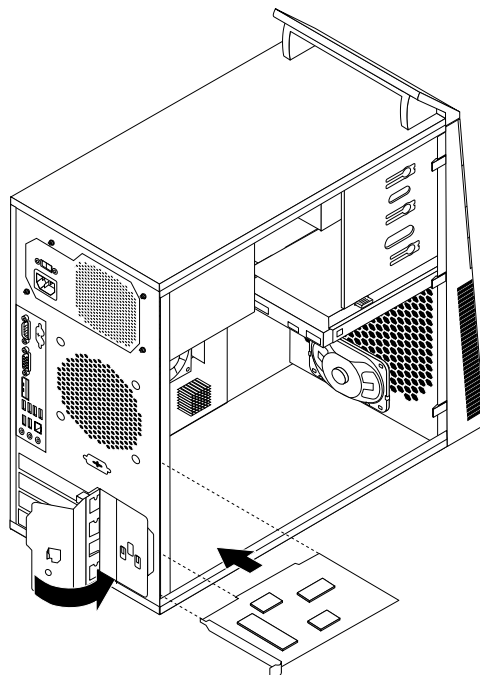


Figure 10. Installing a PCI card

8. To complete the replacement, go to “Completing the parts replacement” on page 112.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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

Your computer has four slots for installing or replacing DDR3 UDIMMs that provide up to a maximum of 16 GB system memory. When installing or replacing a memory module, use 2 GB or 4 GB DDR3 UDIMMs in any combination up to a maximum of 16 GB.

The following table provides information about the memory module installation rules that you should consider when installing or removing a memory module. The “X” mark indicates the memory slot(s) into which the memory module(s) should be installed in different situations. The numbers 1, 2, 3, and 4 indicate the installation sequence. To locate the memory module slots, see “Locating parts on the system board” on page 77.

UDIMM	DIMM 1	DIMM 2	DIMM 3	DIMM 4
One UDIMM			X	
Two UDIMMs			X, 1	X, 2
Three UDIMMs	X, 3		X, 1	X, 2
Four UDIMMs	X, 3	X, 4	X, 1	X, 2

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 79.
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 77.
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.

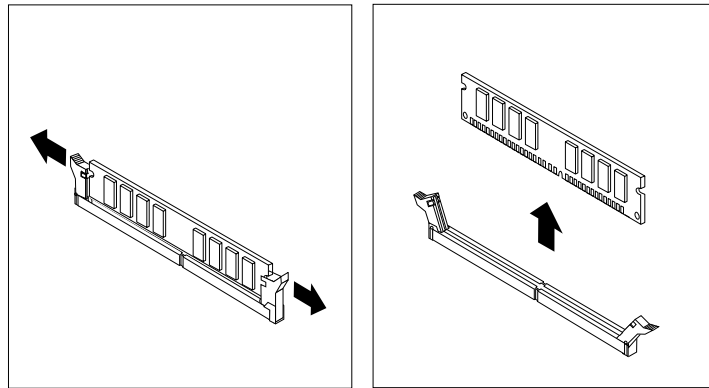


Figure 11. Removing a memory module

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

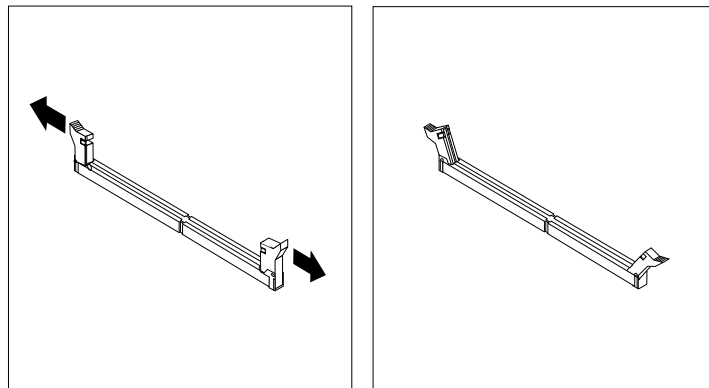


Figure 12. Opening the retaining clips

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.

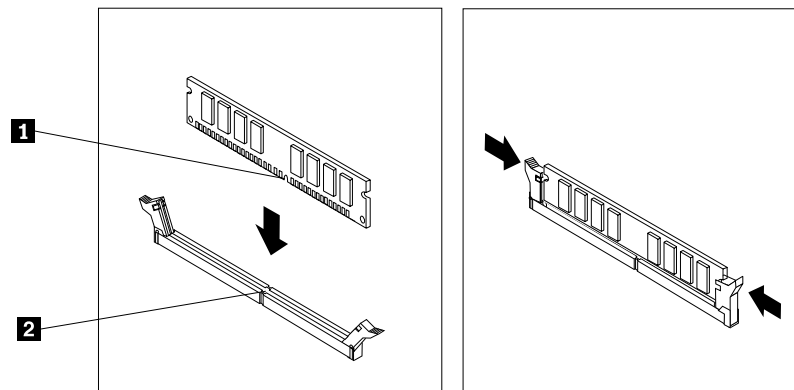


Figure 13. Installing a memory module

8. Reinstall the PCI Express x16 graphics card if you have removed it.
9. To complete the replacement, go to “Completing the parts replacement” on page 112.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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 79.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 80.
4. Depending on whether you are installing or replacing an optical drive, do one of the following:
 - If you are installing a secondary optical drive, remove the plastic panel in the front bezel for the drive bay you want to use. If there is a metal static shield installed in the drive bay, remove the metal static shield.

- If you are replacing an optical drive, disconnect the signal cable and the power cable from the rear of the optical drive, press the blue release button, and then slide the optical drive out of the front of the computer.

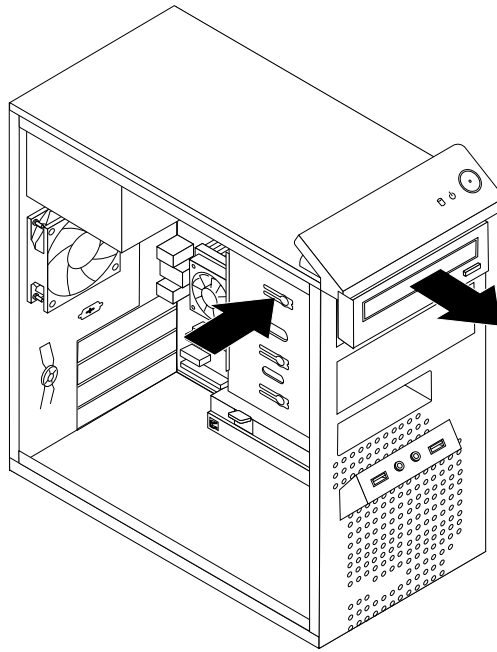


Figure 14. Removing the optical drive

5. Install the optical drive retainer on the side of the new optical drive.

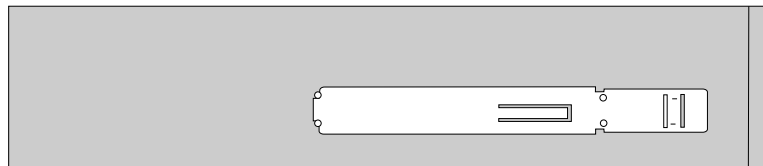


Figure 15. Installing the optical drive retainer

- Slide the new optical drive into the drive bay from the front of the computer until the optical drive snaps into position.

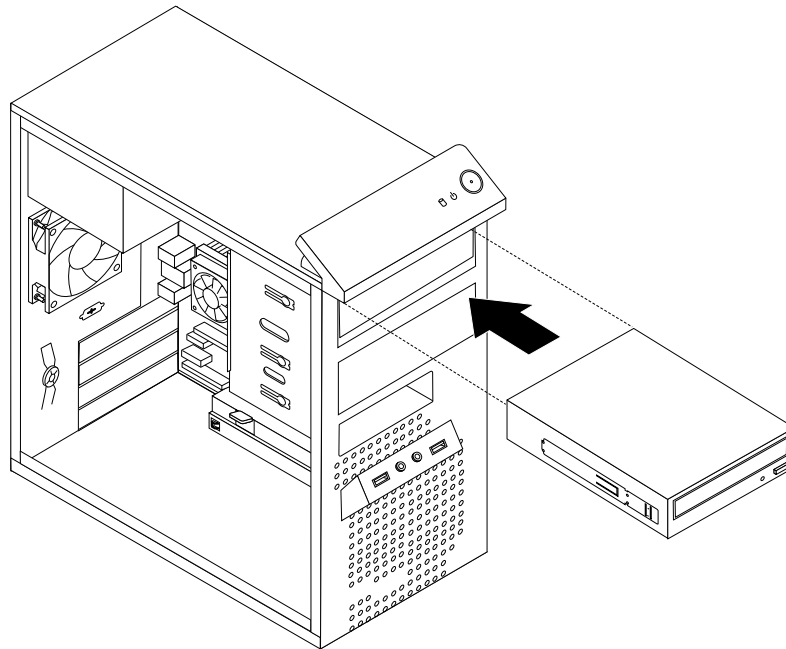


Figure 16. Installing the optical drive

- Connect the signal cable and the power cable to the new optical drive.

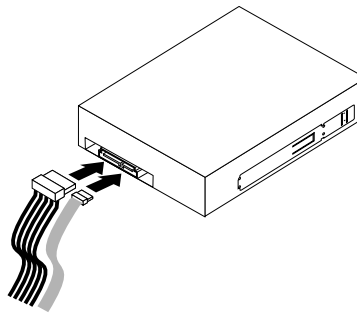


Figure 17. Connecting the optical drive

- Reinstall the front bezel. See “Removing and reinstalling the front bezel” on page 80.
- To complete the replacement, go to “Completing the parts replacement” on page 112.

Installing or replacing the card reader

Attention:

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

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

Note: The card reader is only available in some models. For new installation, see “Installing the card reader” on page 129. For replacement, see “Replacing the card reader” on page 131.

Installing the card reader

To install the card reader, 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 79.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 80.
4. Locate the card reader drive bay. See “Locating internal drives” on page 78.
5. Pivot the card reader retainer to the left and slide it out of the chassis.

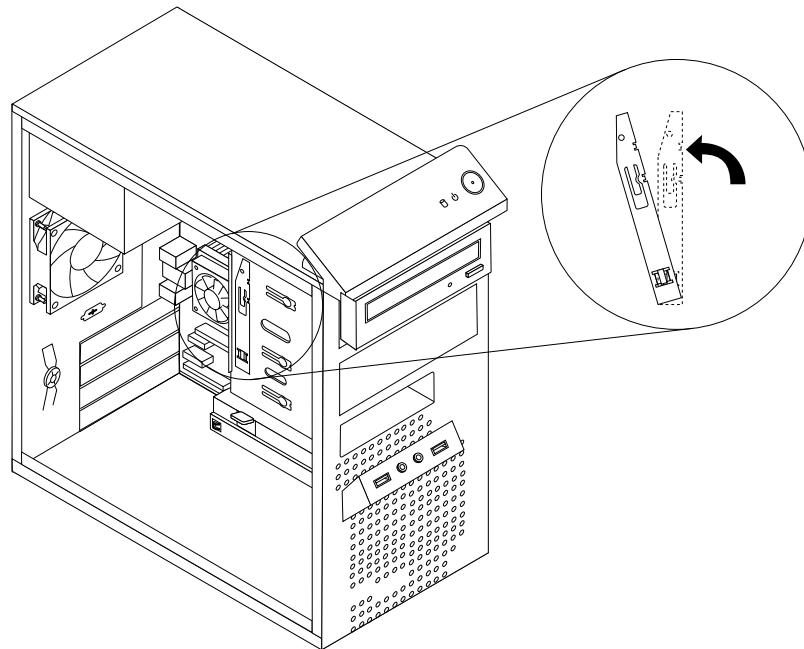


Figure 18. Removing the card reader retainer

6. Install the card reader retainer on the side of the new card reader.

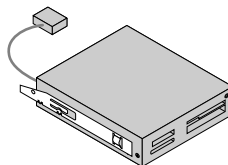


Figure 19. Installing the card reader retainer

- Slide the card reader with retainer into the card reader drive bay until it snaps into position.

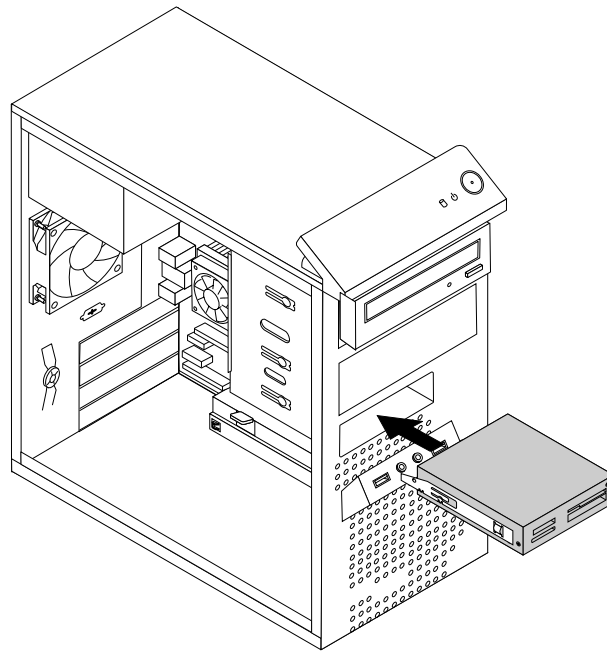


Figure 20. Installing the card reader

- Connect the card reader cable to Front USB connector 2 on the system board. See “Locating parts on the system board” on page 77.
- Reinstall the front bezel. See “Removing and reinstalling the front bezel” on page 80.

Note: You might have to remove the card reader cover **2** from the front bezel. To remove the card reader cover, pivot the two retaining clips **1** that secure the card reader cover outwards and then completely disengage the card reader cover from the front bezel.

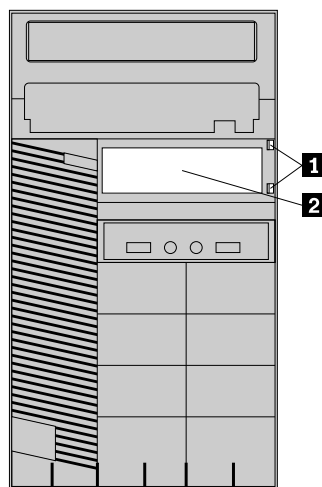


Figure 21. Removing the card reader cover

- To complete the replacement, go to “Completing the parts replacement” on page 112.

Replacing the card reader

Attention:

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

To replace the card reader, 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 79.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 80.
4. Locate the card reader. See “Locating components” on page 76.
5. Disconnect the card reader cable from the USB connector on the system board. See “Locating parts on the system board” on page 77.
6. Press the blue retaining clip to remove the card reader out of the chassis.

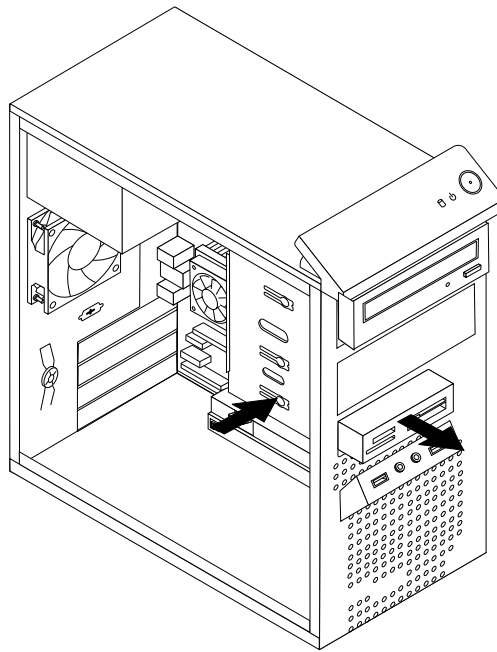


Figure 22. Removing the card reader

7. Install the card reader retainer on the side of the new card reader.

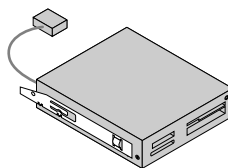


Figure 23. Installing the card reader retainer

- Slide the new card reader into the drive bay until it snaps into position.

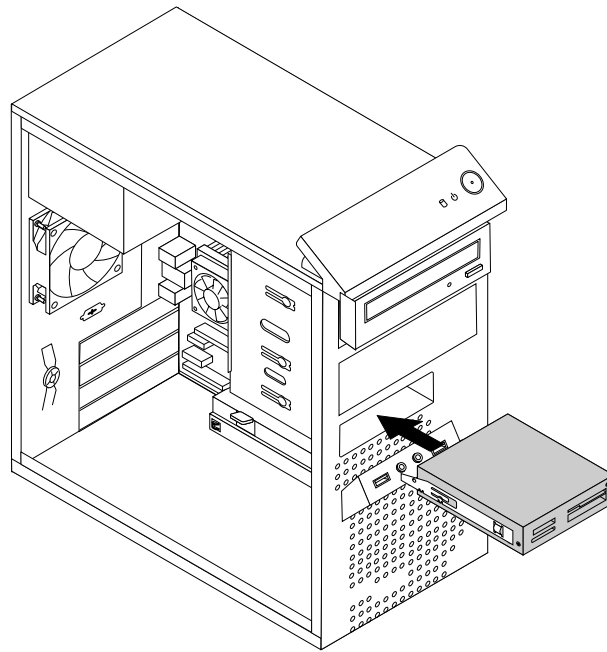


Figure 24. Installing the card reader

- Reconnect the card reader cable to Front USB connector 2 on the system board. See “Locating parts on the system board” on page 77.
- Reinstall the front bezel. See “Removing and reinstalling the front bezel” on page 80.
- To complete the replacement, go to “Completing the parts replacement” on page 112.

Replacing the battery

Attention:

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

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:

- Turn off the computer and disconnect all power cords from electrical outlets.
- Remove the computer cover. See “Removing the computer cover” on page 79.

3. Locate the battery. See “Locating parts on the system board” on page 77.
4. Remove the old battery.

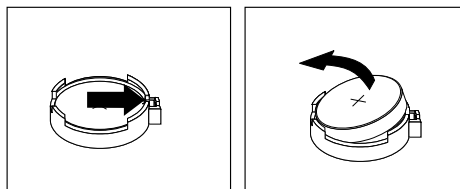


Figure 25. Removing the old battery

5. Install a new battery.

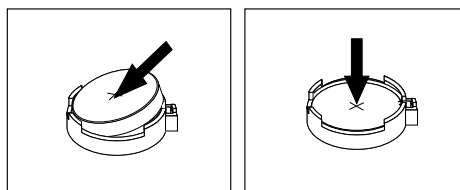


Figure 26. Installing a new battery

6. Reinstall the computer cover and connect the cables. See “Completing the parts replacement” on page 112.

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 replacement, go to “Completing the parts replacement” on page 112.

Replacing the power supply assembly

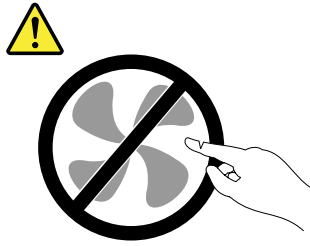
Attention:

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<http://support.lenovo.com>

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 79.
3. Disconnect the power supply assembly cables from the system board and all drives. See “Locating parts on the system board” on page 77.
4. Release the power supply assembly cables from the cable clips and ties in the chassis.

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

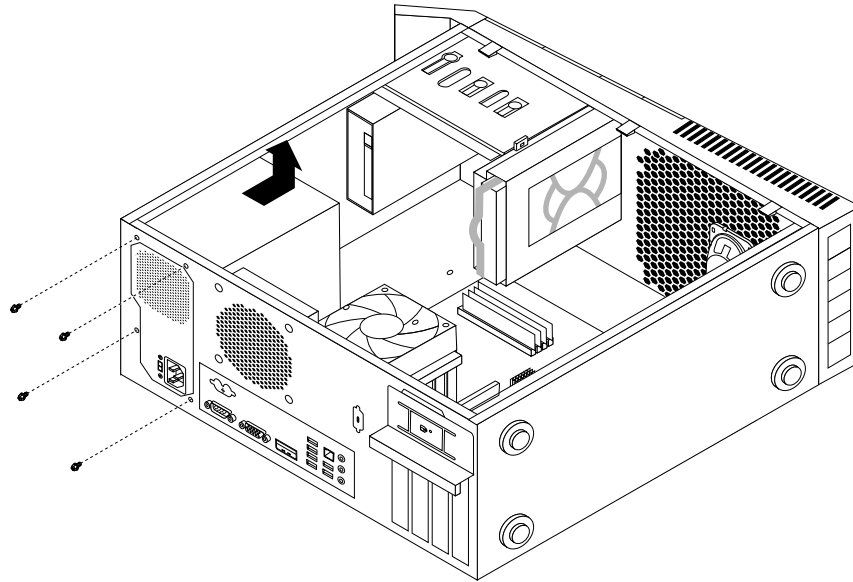


Figure 27. Removing the screws for the power supply assembly

6. Slide the power supply assembly to the front of the computer and then lift it out of the chassis.
7. Ensure that the new power supply assembly is the correct replacement.
8. 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.
9. Install and tighten the four screws to secure the power supply assembly.

Note: Use only screws provided by Lenovo.

10. Reconnect the power supply assembly cables to the system board and each of the drives.
11. Secure the power supply assembly cables with the cable clips and ties in the chassis.
12. To complete the replacement, go to “Completing the parts replacement” on page 112.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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 79.
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 77.
5. Disconnect any cables that might prevent your access to the heat sink and fan assembly.
6. 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 77.
7. Pivot the handle **1** to release the heat sink and fan assembly clamp and then disengage the clamp from the plastic retention bracket.

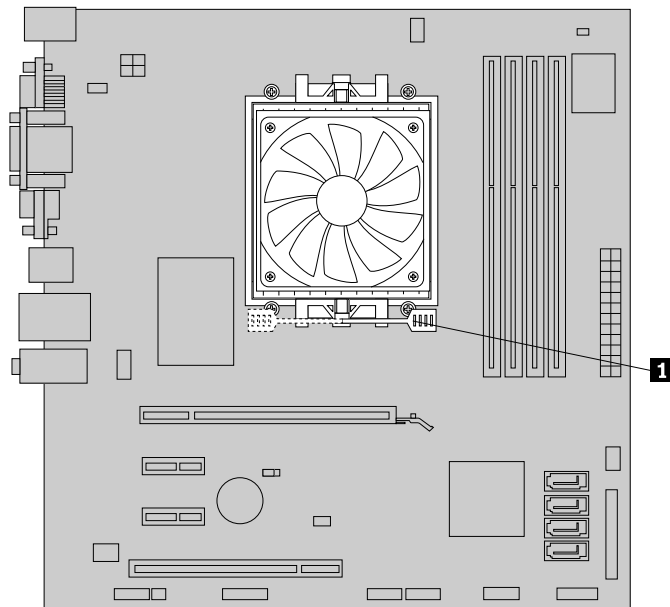


Figure 28. Removing the heat sink and fan assembly

8. 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. When handling the heat sink and fan assembly, do not touch the thermal grease on the bottom of it.

9. Position the new heat sink and fan assembly on the microprocessor socket and then position the clamp on the plastic retention bracket. Pivot the handle **1** to clamp the heat sink and fan assembly to the plastic retention bracket.

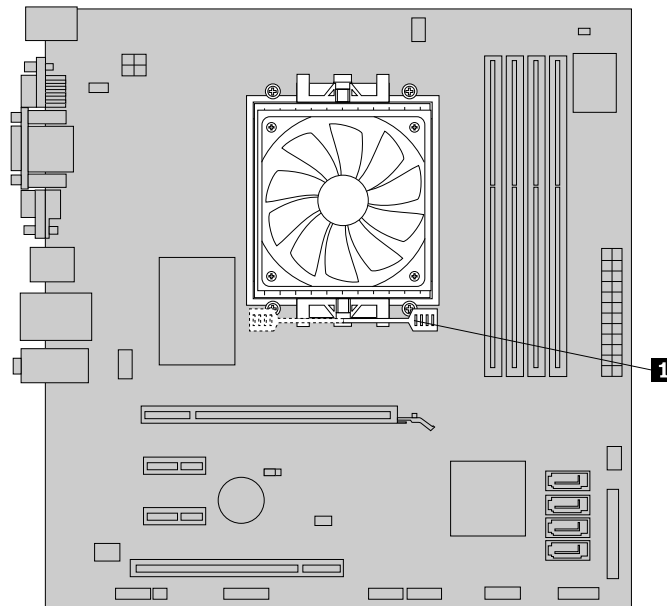


Figure 29. Reinstalling the heat sink and fan assembly

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 77.
11. Reconnect any cables that have been removed.
12. To complete the replacement, go to “Completing the parts replacement” on page 112.

Replacing the microprocessor

Attention:

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

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 79.
3. Lay the computer on its side for easier access to the system board.

4. Locate the system board and disconnect all cables connected to the system board. See “Locating parts on the system board” on page 77.
5. Remove the heat sink and fan assembly. See “Replacing the heat sink and fan assembly” on page 95.

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.

6. Lift the small handle **1** to release the microprocessor **2** secured on the system board.

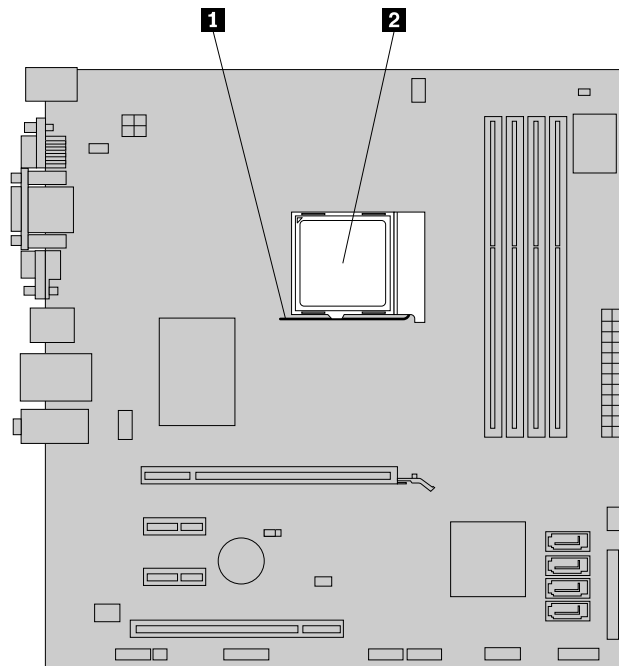


Figure 30. Accessing the microprocessor

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

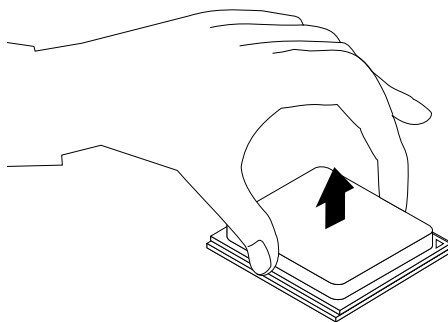
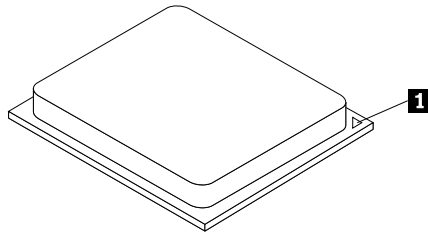


Figure 31. Removing the microprocessor

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 look for the small triangle **1** on one corner of 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.
8. Make sure that the small handle is in the raised position.
9. Remove the protective cover that protects the gold contacts of the new microprocessor.
10. 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.
11. Lower the new microprocessor straight down into the microprocessor socket on the system board.
12. Lower the small handle to secure the new microprocessor in the socket.
13. Reinstall the heat sink and fan assembly. See “Replacing the heat sink and fan assembly” on page 95.
14. Reconnect all cables that were disconnected from the system board.
15. To complete the replacement, go to “Completing the parts replacement” on page 112.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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 79.
3. Locate the primary hard disk drive. See “Locating internal drives” on page 78.
4. Disconnect the signal cable and the power cable from the hard disk drive.

5. Press the blue release tab **1** down, slide the hard disk drive cage **2** to the rear of the computer, and then pivot it outward.

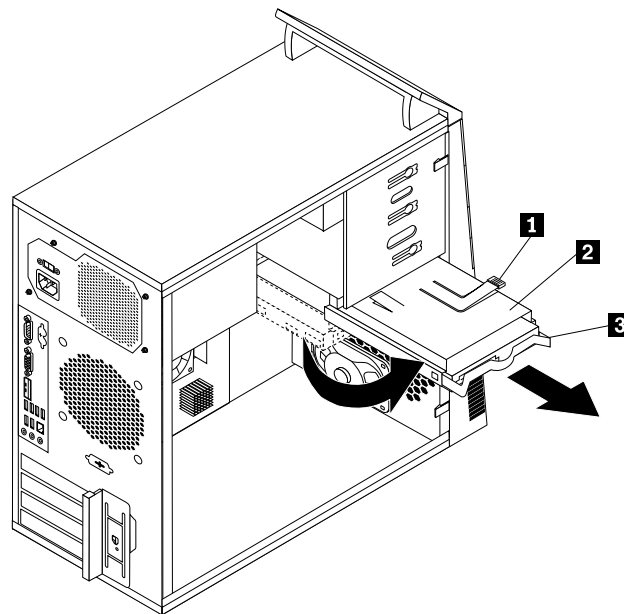


Figure 32. Removing the primary hard disk drive

6. Remove the hard disk drive cage from the chassis by sliding it outward.
7. Pull on the blue handle **3** to release and remove the hard disk drive from the drive cage.
8. Flex the sides of the blue bracket to remove the hard disk drive from the bracket.
9. To install a new hard disk drive into the blue bracket, flex the bracket and align pin **1**, pin **2**, pin **3**, and pin **4** on the bracket with the corresponding holes in the hard disk drive. Do not touch the circuit board **5** on the bottom of the hard disk drive.

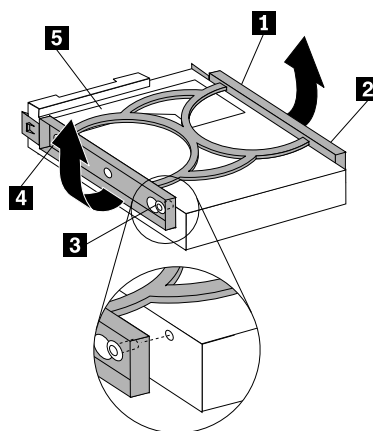


Figure 33. Installing the hard disk drive into the bracket

10. Slide the new hard disk drive into the drive cage until it snaps into position.
11. Align the drive cage pivot pin with the slot **1** in the upper drive cage and slide the hard disk drive cage into the chassis.

12. Connect the signal cable and the power cable to the new hard disk drive.
13. Press down on the metal latch **2** and pivot the drive cage into place, and then slide it to the front of the computer until it snaps into position.

Note: There are two arrows, one on the upper drive cage and one on the hard disk drive cage. The arrows are aligned when the hard disk drive is in the proper position.

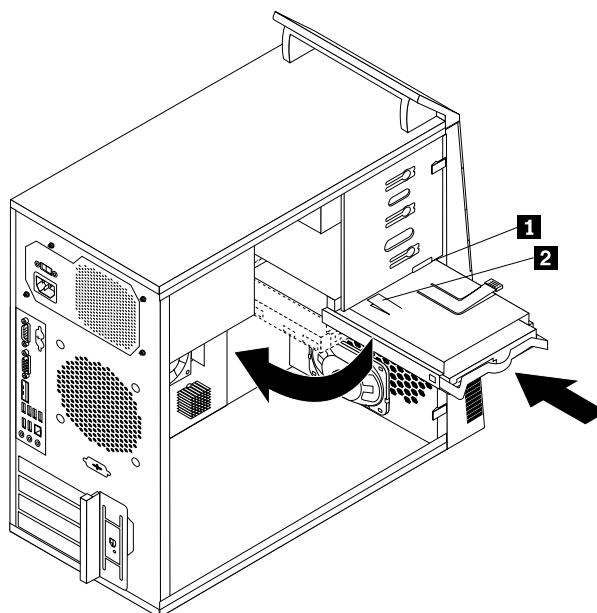


Figure 34. Installing the primary hard disk drive

14. To complete the replacement, go to “Completing the parts replacement” on page 112.

Replacing the secondary hard disk drive

Attention:

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

Note: Depending on your model type, your computer might come with a secondary hard disk drive bay for installing or replacing a secondary hard disk drive.

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

To replace the secondary 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 79.
3. Locate the secondary hard disk drive. See “Locating internal drives” on page 78.
4. Disconnect the signal cable and the power cable from the hard disk drive.

5. Press the blue release button to release the hard disk drive cage from the chassis.

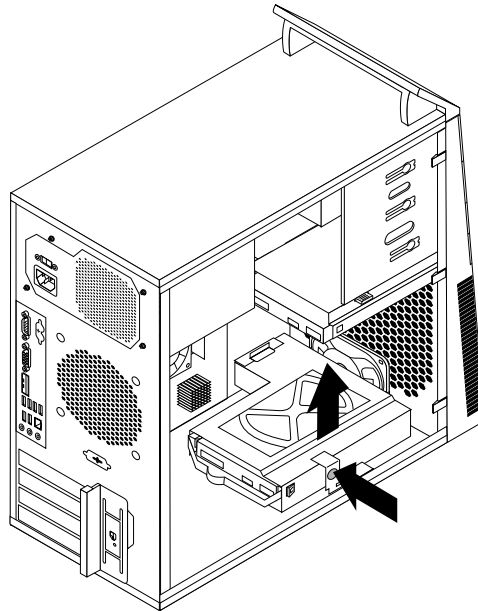


Figure 35. Removing the secondary hard disk drive

6. Remove the hard disk drive cage from the chassis by simply sliding it outward.
7. Pull on the blue handle to release and remove the hard disk drive from the hard disk drive cage.
8. Flex the sides of the blue bracket to remove the hard disk drive from the bracket.
9. To install a new hard disk drive into the blue bracket, flex the bracket and align pin **1**, pin **2**, pin **3**, and pin **4** on the bracket with the corresponding holes in the hard disk drive. Do not touch the circuit board **5** on the bottom of the hard disk drive.

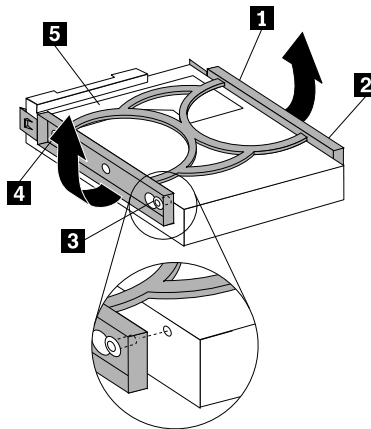


Figure 36. Installing the hard disk drive into the bracket

10. Slide the new hard disk drive into the hard disk drive cage until it snaps into position.

11. Install the hard disk drive cage into the chassis until it snaps into position underneath the metal tab. Make sure that the hard disk drive cage release button is secured in the chassis.

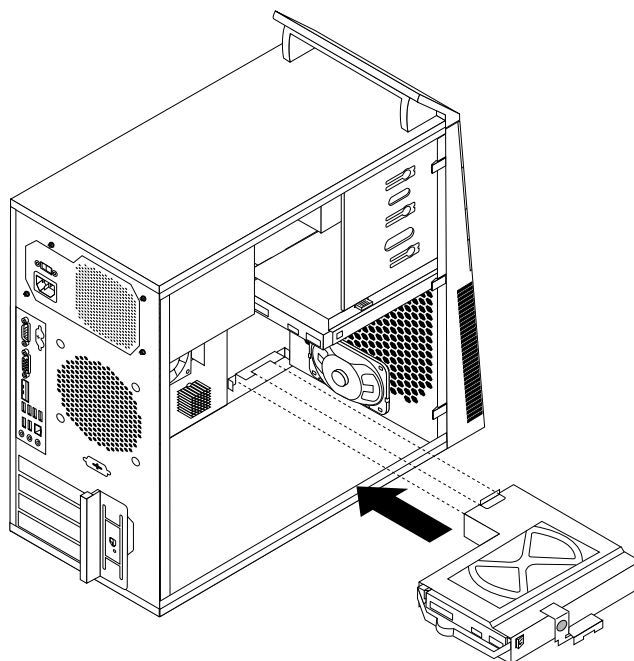


Figure 37. Installing the secondary hard disk drive

12. Connect the signal cable and the power cable to the new hard disk drive.
13. To complete the replacement, go to “Completing the parts replacement” on page 112.

Replacing the front fan assembly

Attention:

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

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

Note: The front fan assembly is only available in some models.

To replace the front 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 79.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 80.
4. Disconnect the front fan assembly cable from the power fan connector on the system board. See “Locating parts on the system board” on page 77.

5. Release the two tabs **1** that attach the front fan assembly to the chassis as shown and then completely remove the front fan assembly from the chassis.

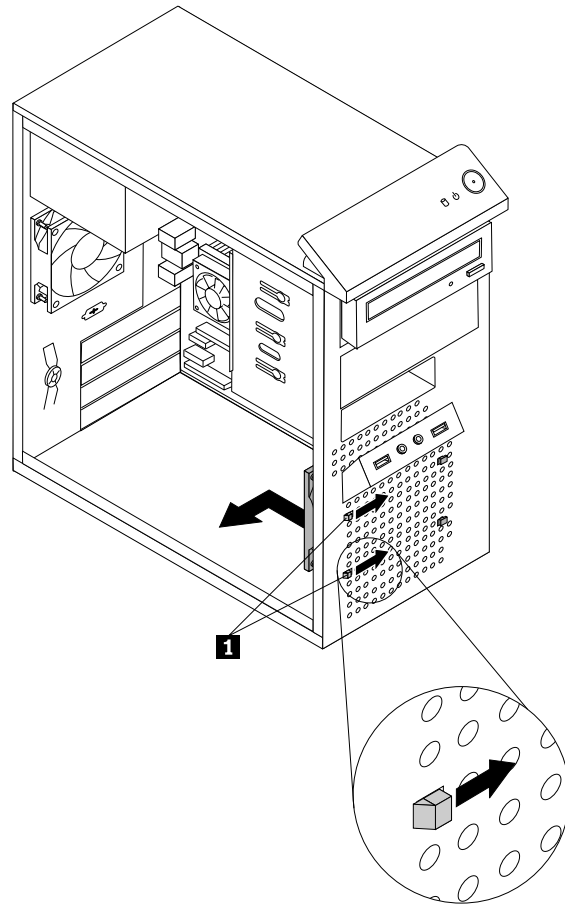


Figure 38. Removing the front fan assembly

6. Insert the two tabs **2** of the new front fan assembly into the corresponding holes in the chassis, and press the other two tabs **1** through the holes until the front fan assembly is secured in place.

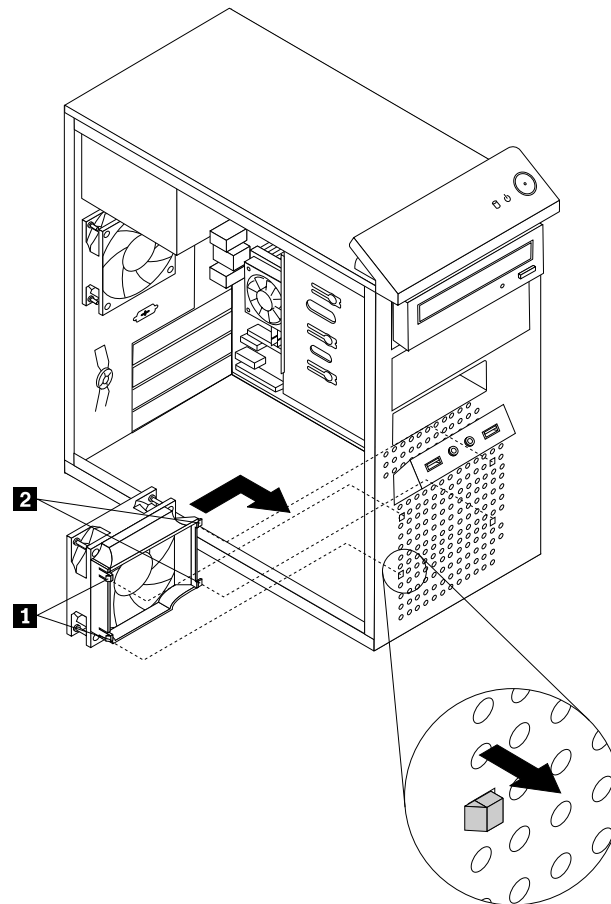


Figure 39. Installing the front fan assembly

7. Connect the front fan assembly cable to the power fan connector on the system board.
8. To complete the replacement, go to “Completing the parts replacement” on page 112.

Replacing the rear fan

Attention:

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

This section provides instructions on how to replace the rear fan.

To replace the rear fan, 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 79.
3. Locate the rear fan. See “Locating components” on page 76.
4. Disconnect the rear fan cable from the system fan connector on the system board. See “Locating parts on the system board” on page 77.

5. The rear fan is attached to the chassis by four rubber mounts. Remove the rear fan by breaking or cutting the rubber mounts and gently pulling the rear fan out of the chassis.

Note: The new rear fan will have four new rubber mounts attached.

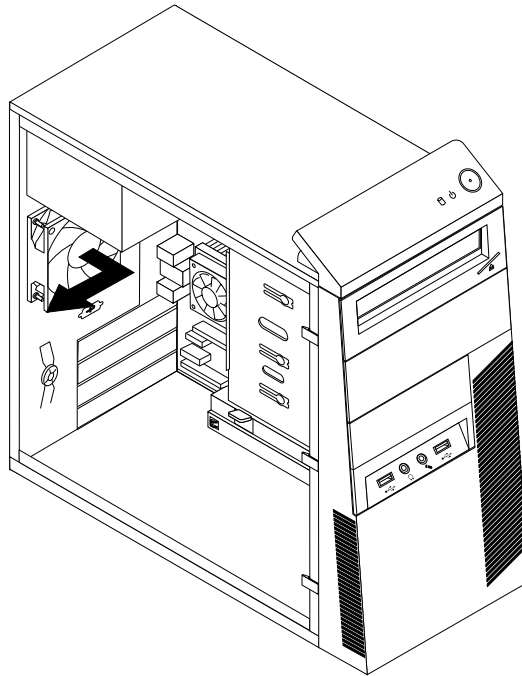


Figure 40. Removing the rear fan

6. Install the new rear fan by aligning the new rubber mounts with the corresponding holes in the chassis and push the rubber mounts through the holes.

7. Pull on the tips of the rubber mounts until the rear fan is secured in place.

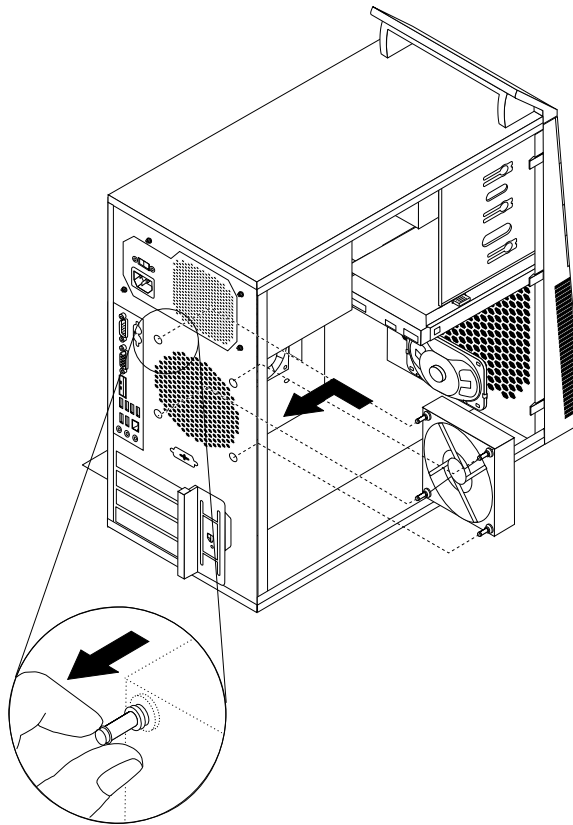


Figure 41. Installing the rear fan

8. Connect the rear fan cable to the system fan connector on the system board.
9. To complete the replacement, go to “Completing the parts replacement” on page 112.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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 79.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 80.
4. Locate the front audio and USB assembly. See “Locating components” on page 76.
5. Disconnect the front audio and USB assembly cables from the system board. See “Locating parts on the system board” on page 77.

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.

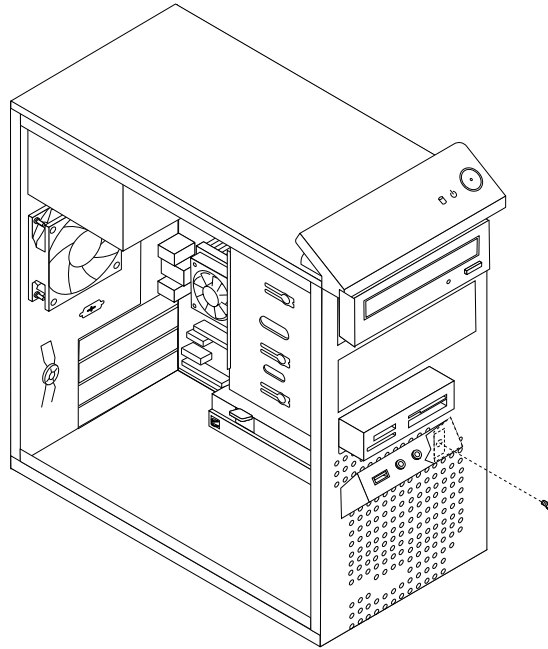


Figure 42. Removing the screw that secures the front audio and USB assembly to the chassis

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 77.
12. To complete the replacement, go to “Completing the parts replacement” on page 112.

Replacing the internal speaker

Attention:

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

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

Note: The internal speaker is only available in some models.

To replace the internal speaker, 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 79.
3. Locate the internal speaker connector on the system board. See “Locating parts on the system board” on page 77.
4. Disconnect the internal speaker cable from the system board.
5. Push the metal tab **1** on the top of the internal speaker outward and slide the internal speaker upward to completely remove it from the chassis.

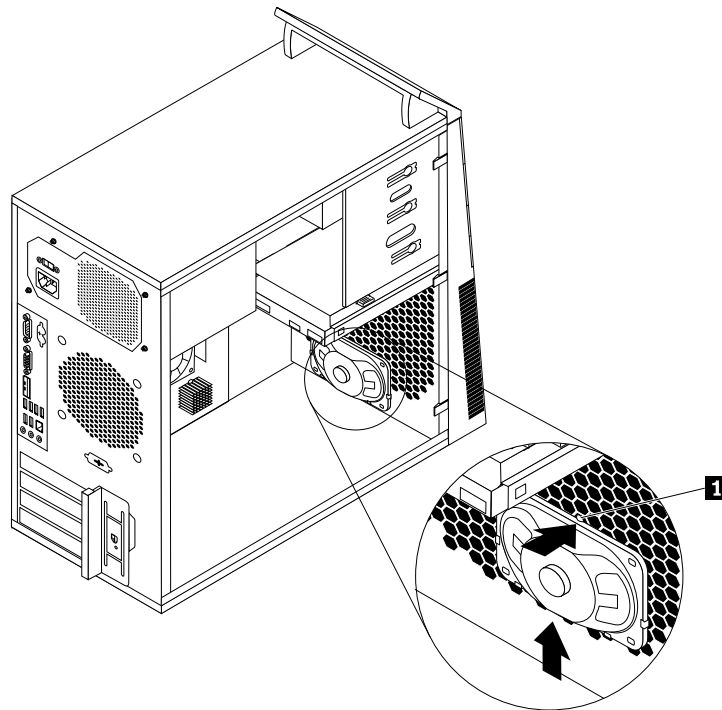


Figure 43. Removing the old internal speaker

6. Position the new internal speaker into the four metal clips **1** and push the internal speaker downward until it is secured in place.

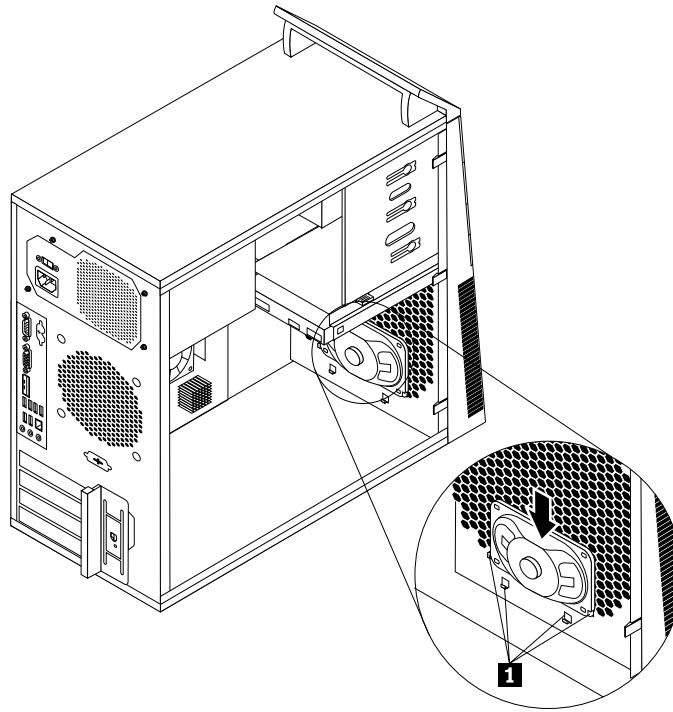


Figure 44. Installing a new internal speaker

7. Connect the internal speaker cable to the system board. See “Locating parts on the system board” on page 77.
8. To complete the replacement, go to “Completing the parts replacement” on page 112.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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 79.
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 99. Remove the secondary hard disk drive if your model has one. See “Replacing the secondary hard disk drive” on page 101.
5. Remove all memory modules and PCI cards that are currently installed. See “Installing or replacing a memory module” on page 84 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 77.
7. Remove the heat sink and fan assembly from the failing system board. See “Replacing the heat sink and fan assembly” on page 95.
8. Remove the eight screws that secure the system board.

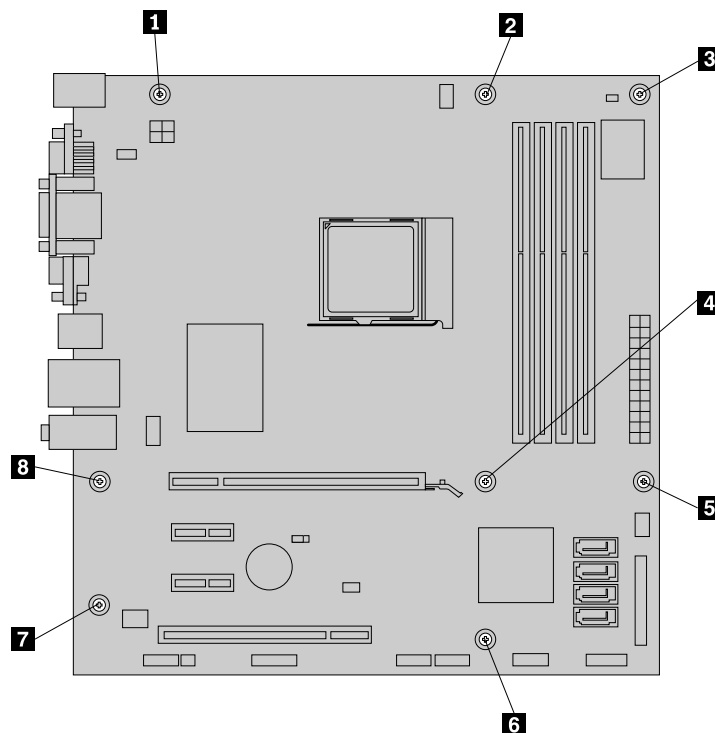


Figure 45. Removing the eight screws that secure the system board

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 97.
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 95.
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 84 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 77.
16. Install the hard disk drive. See “Replacing the primary hard disk drive” on page 99 and See “Replacing the secondary hard disk drive” on page 101.
17. To complete the replacement, go to “Completing the parts replacement” on page 112.

Note: If required, return the failing system board to Lenovo.

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 76 for the locations of various components in your computer.
2. If you have removed the front bezel, reinstall it.
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.

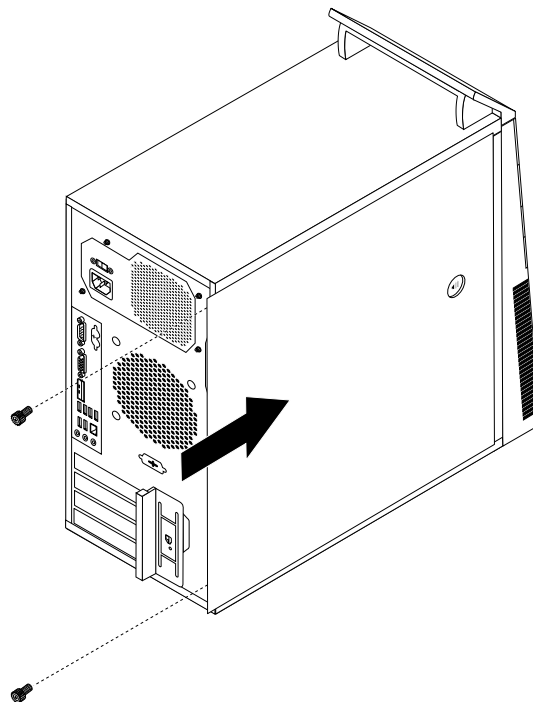


Figure 46. Reinstalling the computer cover

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 on the rear of your computer” on page 75.
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. Replacing FRUs (Machine Types: 1996, 1997, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227.)

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 47 “Front connector, control, and indicator locations” on page 116 shows the locations of the connectors, controls, and indicators on the front of your computer.

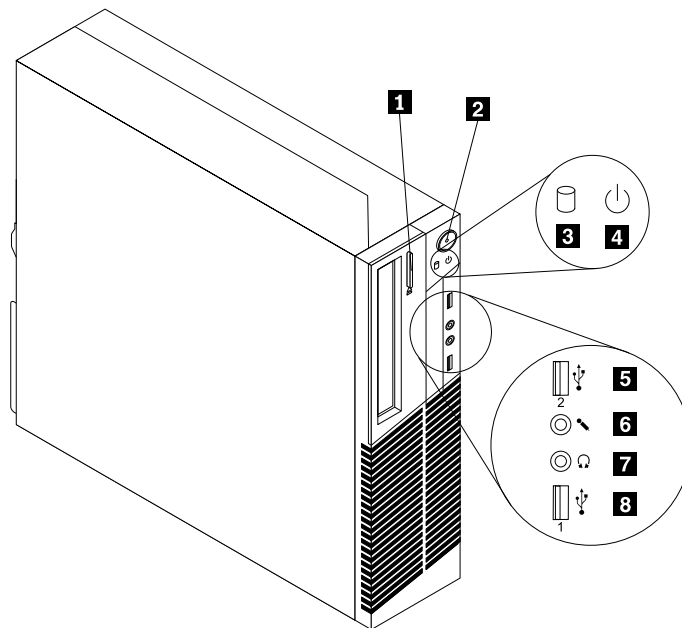


Figure 47. Front connector, control, and indicator locations

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

Locating connectors on the rear of your computer

Figure 48 “Rear connector locations” on page 117 shows the locations of the connectors 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.

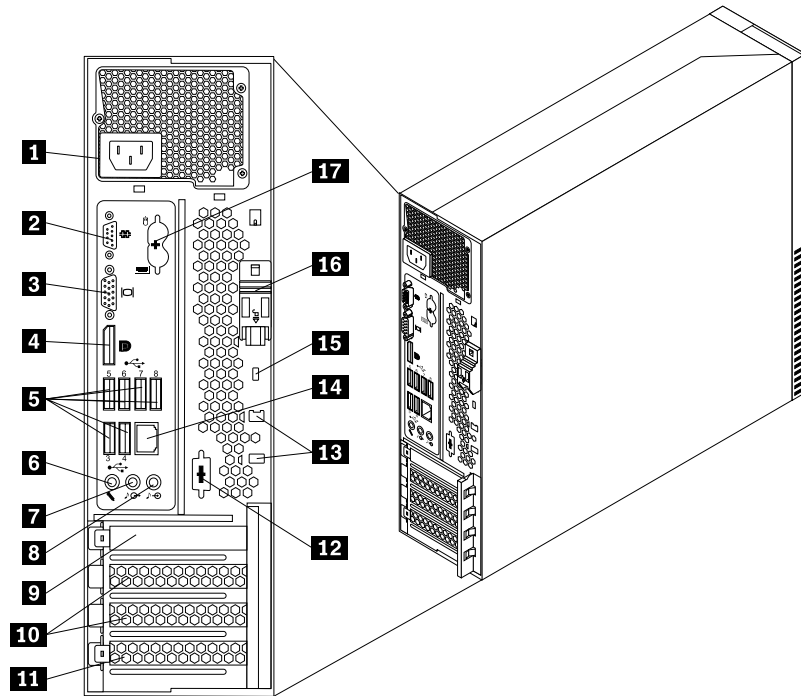


Figure 48. Rear connector locations

- | | |
|---|---|
| 1 Power cord connector | 10 PCI Express x1 card slots (2) |
| 2 Serial port (Serial port 1) | 11 PCI card slot |
| 3 VGA monitor connector | 12 Optional serial port (Serial port 2) |
| 4 DisplayPort connector | 13 Cable lock slots (2) |
| 5 USB connectors (USB ports 3 to 8) | 14 Ethernet connector |
| 6 Microphone connector | 15 Integrated cable lock (Kingston lock) slot |
| 7 Audio line-out connector | 16 Cover-release button |
| 8 Audio line-in connector | 17 PS/2 keyboard and mouse connectors (optional) |
| 9 PCI Express x16 graphics card slot | |

Locating components

Figure 49 “Component locations” on page 118 shows the locations of the various components in your computer. To open the computer cover, see “Opening the computer cover” on page 121.

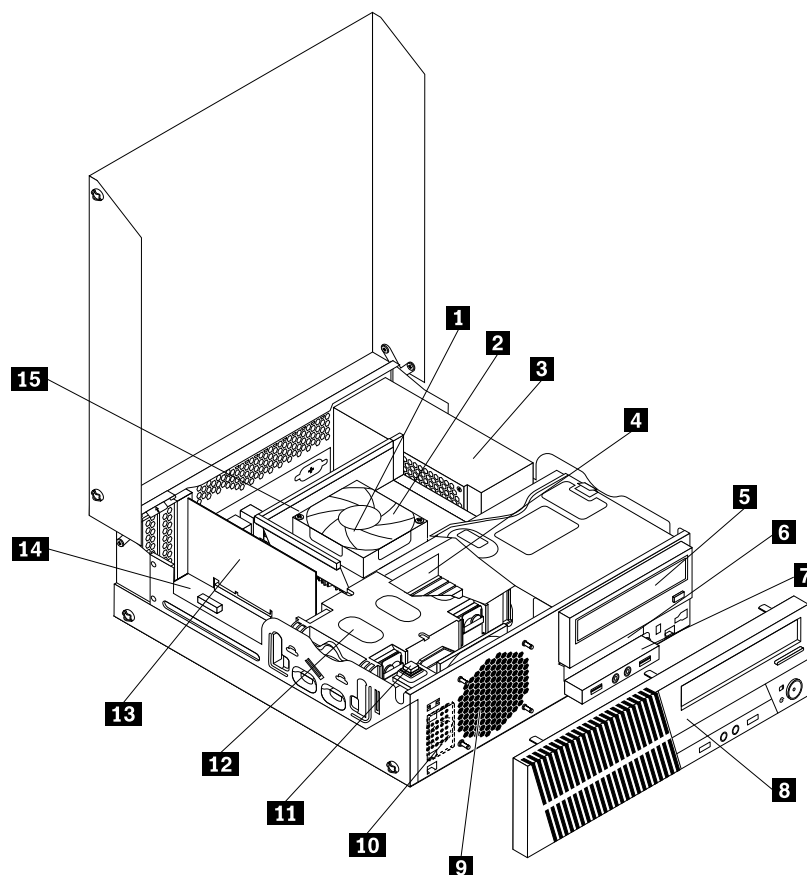


Figure 49. Component locations

- | | |
|---|--|
| 1 Heat sink and fan assembly | 9 System fan |
| 2 Microprocessor | 10 Internal speaker (installed in some models) |
| 3 Power supply assembly | 11 Cover presence switch (also called intrusion switch) |
| 4 Memory module | 12 Hard disk drive |
| 5 Optical drive | 13 PCI card (installed in some models) |
| 6 Card reader (installed in some models) | 14 System board |
| 7 Front audio and USB assembly | 15 Heat sink fan duct |
| 8 Front bezel | |

Locating parts on the system board

Figure 50 “System board part locations” on page 119 shows the locations of the parts on the system board.

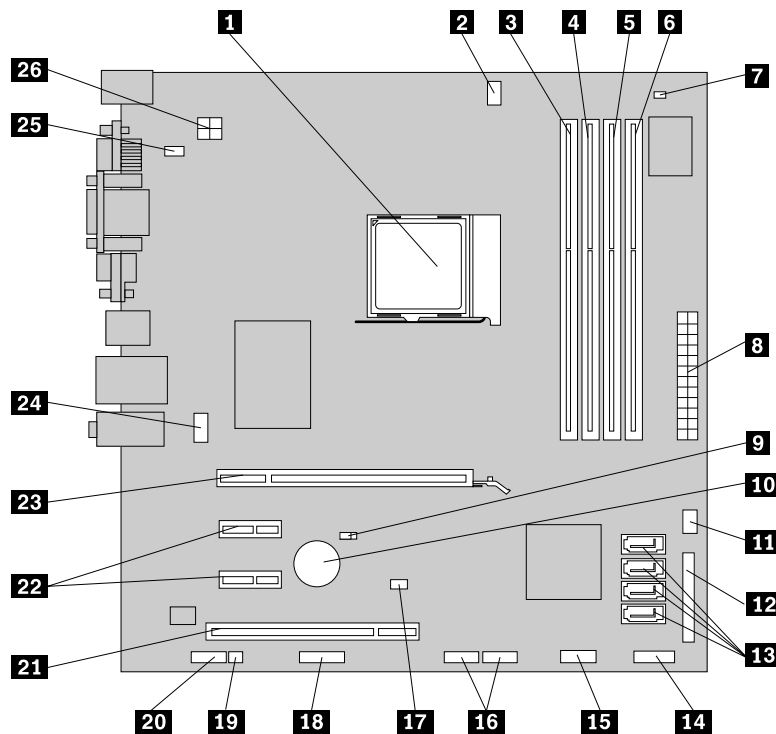


Figure 50. System board part locations

- | | |
|--|---|
| 1 Microprocessor | 14 Front panel connector (for connecting LED indicators and power switch) |
| 2 Microprocessor fan connector | 15 Front USB connector 1 (for connecting USB ports 1 and 2 on the front bezel) |
| 3 Memory slot 1 (DIMM1) | 16 Front USB connectors 2 and 3 (for connecting additional USB devices) |
| 4 Memory slot 2 (DIMM3) | 17 Cover presence switch connector (Intrusion switch connector) |
| 5 Memory slot 3 (DIMM2) | 18 Serial (COM2) connector |
| 6 Memory slot 4 (DIMM4) | 19 Internal speaker connector |
| 7 Thermal sensor connector | 20 Front audio connector |
| 8 24-pin power connector | 21 PCI card slot |
| 9 Clear CMOS (Complementary Metal Oxide Semiconductor) /Recovery jumper | 22 PCI Express x1 card slots (2) |
| 10 Battery | 23 PCI Express x16 graphics card slot |
| 11 Power fan connector | 24 System fan connector |
| 12 Parallel connector | 25 PS/2 keyboard and mouse connector |
| 13 SATA 3.0 connectors (4) | 26 4-pin power 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. Your computer comes with the following factory-installed drives:

- An optical drive in bay 1
- A 3.5-inch hard disk drive in bay 3

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 121 for instructions on how to install or replace internal drives for your computer.

Figure 51 “Drive bay locations” on page 120 shows the locations of the drive bays.

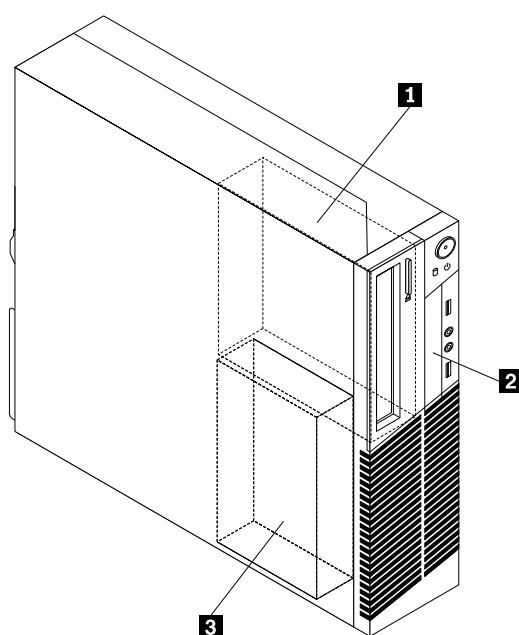


Figure 51. Drive bay locations

- 1** Bay 1 - Optical drive bay (with an optical drive installed)
- 2** Bay 2 - Card reader drive bay
- 3** Bay 3 - SATA hard disk drive bay (with a 3.5-inch 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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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.

Opening the computer cover

Attention:

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

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

CAUTION:



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

To open 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 116 and “Locating connectors on the rear of your computer” on page 117.
4. Remove any locking device that secures the computer cover, such as an integrated cable lock.

5. Press the cover-release button on the back of the computer and pivot the computer cover upward.

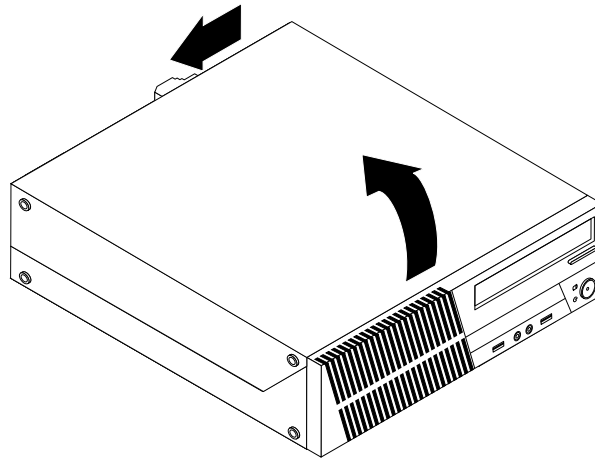


Figure 52. Opening the computer cover

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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

To remove and reinstall the front bezel, 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. Open the computer cover. See “Opening the computer cover” on page 121.

3. Remove the front bezel by releasing the three plastic tabs on the top of the front bezel and pivoting the front bezel outward to remove it from the computer.

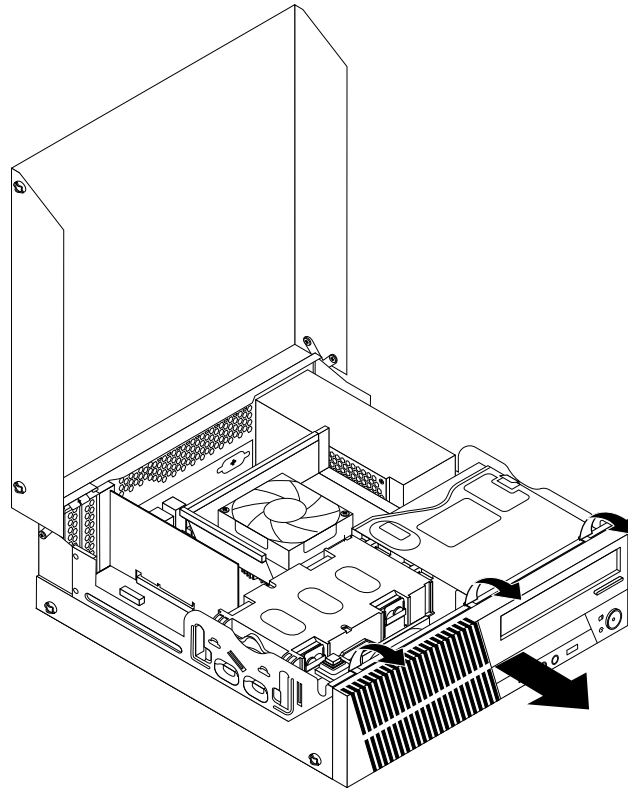


Figure 53. Removing the front bezel

4. To reinstall the front bezel, align the other three plastic tabs on the bottom of the front bezel with the corresponding holes in the chassis, then pivot the front bezel inward until it snaps into position.

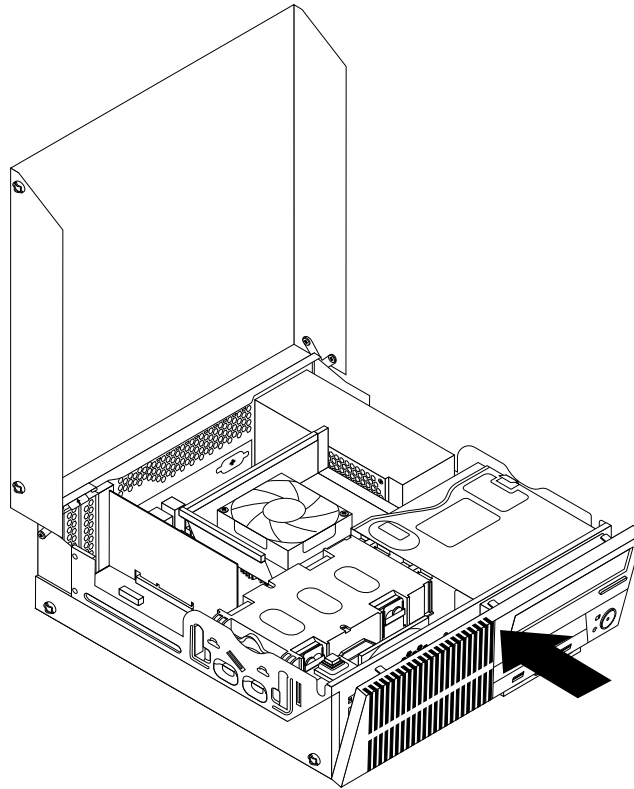


Figure 54. Reinstalling the front bezel

Accessing the system board components and drives

Attention:

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

This section provides instructions on how to access the system board components and drives.

To access the system board components and drives, 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. Open the computer cover. See “Opening the computer cover” on page 121.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 122.
4. Remove the heat sink fan duct. See “Replacing the heat sink and fan assembly” on page 140.
5. Remove the hard disk drive. See “Replacing the hard disk drive” on page 135.
6. Pivot the optical drive bay upward to access the system board components and the cables. See “Replacing the optical drive” on page 138.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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

Your computer has four slots for installing or replacing DDR3 UDIMMs that provide up to a maximum of 16 GB system memory. When installing or replacing a memory module, use 2 GB or 4 GB DDR3 UDIMMs in any combination up to a maximum of 16 GB.

The following table provides information about the memory module installation rules that you should consider when installing or removing a memory module. The “X” mark indicates the memory slot(s) into which the memory module(s) should be installed in different situations. The numbers 1, 2, 3, and 4 indicate the installation sequence. To locate the memory module slots, see “Locating parts on the system board” on page 119.

UDIMM	DIMM 1	DIMM 2	DIMM 3	DIMM 4
One UDIMM			X	
Two UDIMMs			X, 1	X, 2
Three UDIMMs	X, 3		X, 1	X, 2
Four UDIMMs	X, 3	X, 4	X, 1	X, 2

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

1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Open the computer cover. See “Opening the computer cover” on page 121.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 122.
4. Remove the heat sink fan duct. See “Replacing the heat sink and fan assembly” on page 140.
5. Remove the hard disk drive. See “Replacing the hard disk drive” on page 135.
6. Pivot the optical drive bay upward to gain access to the memory slots. See “Replacing the optical drive” on page 138.
7. Locate the memory slots. See “Locating parts on the system board” on page 77.
8. Remove any parts that might prevent access to the memory slots.
9. 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.

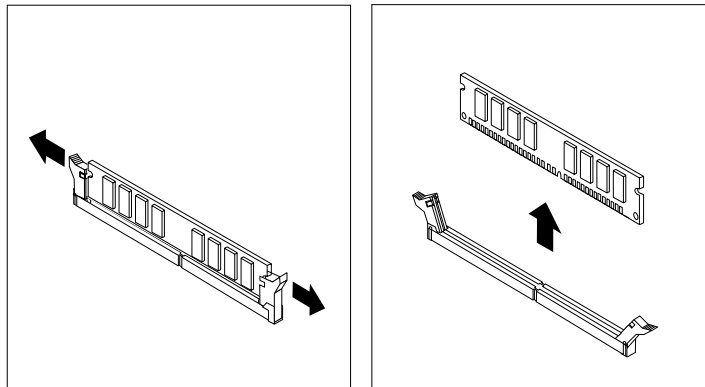


Figure 55. Removing a memory module

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

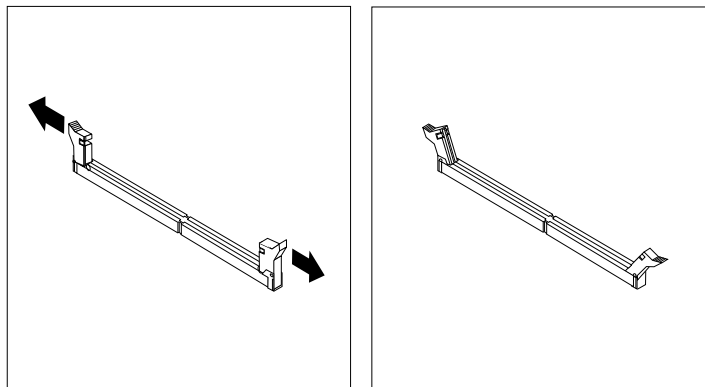


Figure 56. Opening the retaining clips

10. 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.

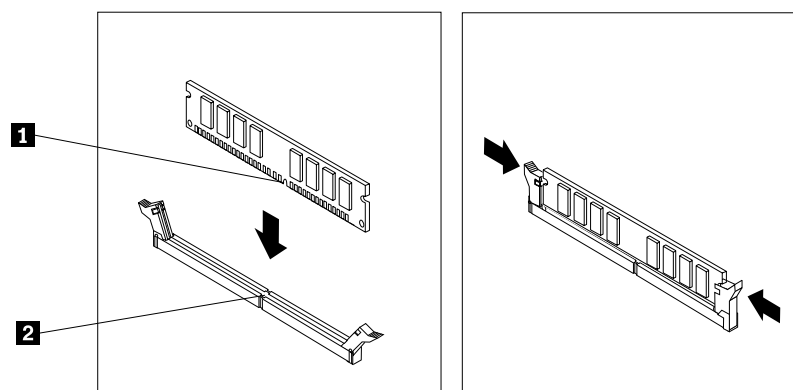


Figure 57. Installing a memory module

11. To complete the installation or replacement, go to “Completing the parts replacement” on page 160.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

This section provides instructions on how to install or replace a PCI card. Your computer has one standard PCI card slot, two PCI Express x1 card slots, 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. Open the computer cover. See “Opening the computer cover” on page 121.
3. Rotate the PCI card retainer to the open position.
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.

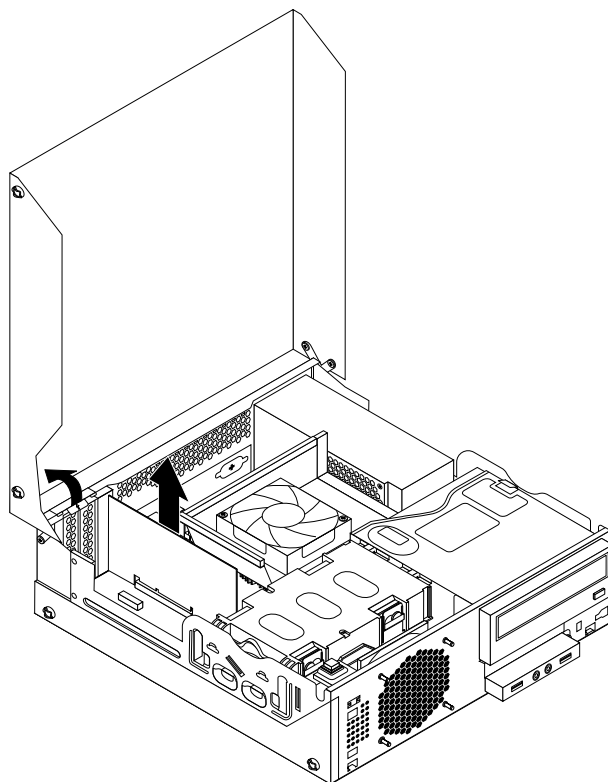
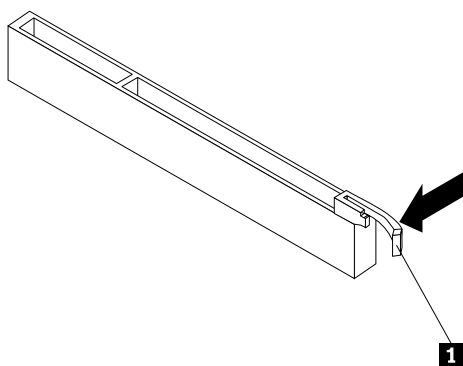


Figure 58. Removing a PCI card

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 card slot on the system board and rotate the card retainer to the closed position. See “Locating parts on the system board” on page 77.

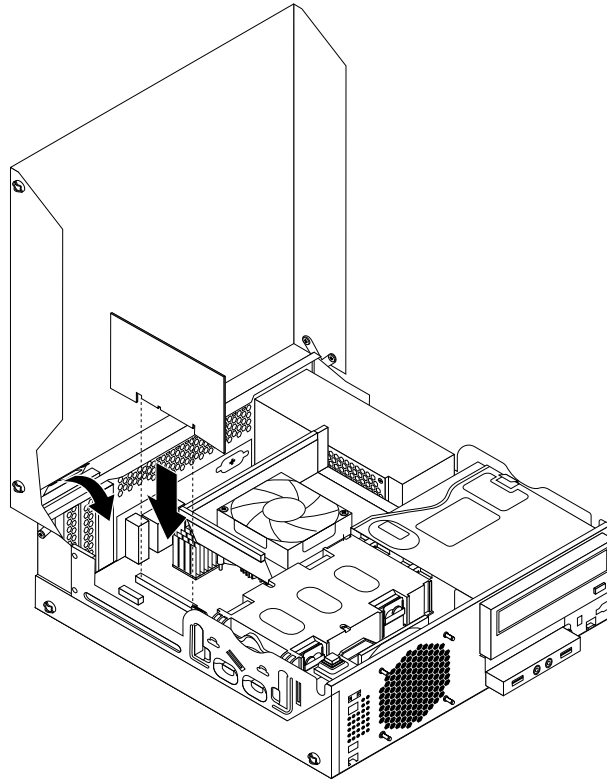


Figure 59. Installing the PCI card

7. To complete the installation or replacement, go to “Completing the parts replacement” on page 160.

Installing or replacing the card reader

Attention:

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

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

Note: The card reader is only available in some models. For new installation, see “Installing the card reader” on page 129. For replacement, see “Replacing the card reader” on page 131.

Installing the card reader

To install the card reader, 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. Open the computer cover. See “Opening the computer cover” on page 121.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 122.
4. Locate the card reader drive bay. See “Locating internal drives” on page 120.

Note: You might have to remove the metal cover of the card reader drive bay.

5. Install the new card reader into the card reader bracket. Then install the two screws to secure the card reader to the bracket.
6. Install the card reader bracket to the chassis. Then push the bracket to the left to align the screw hole in the bracket with the corresponding hole in the chassis.

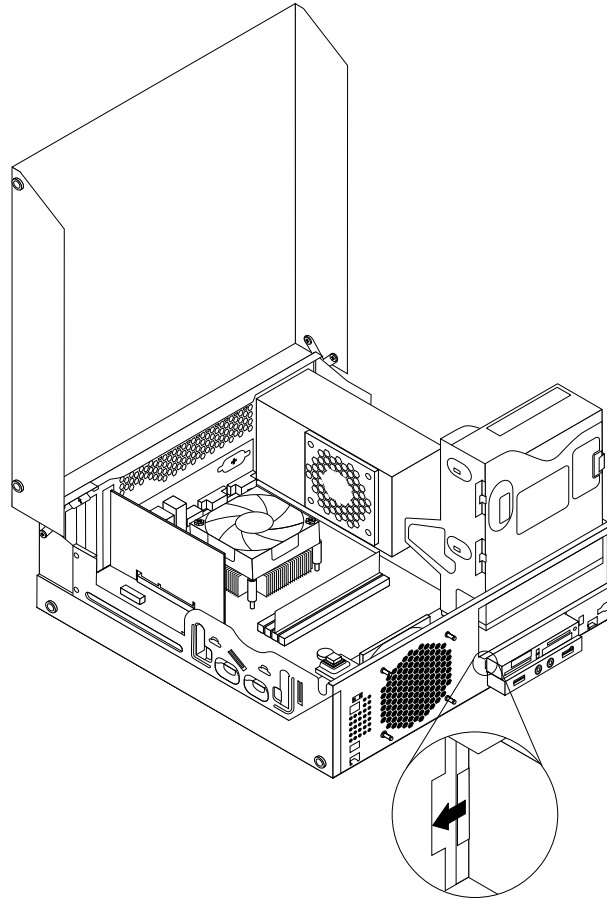


Figure 60. Installing the card reader

7. Install the screw to secure the card reader bracket to the chassis.

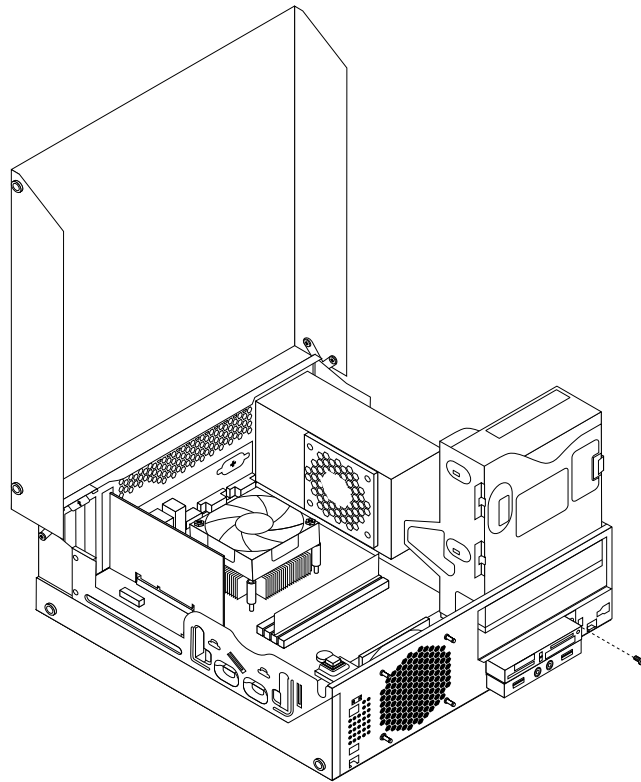


Figure 61. Installing the screw that secures the card reader

8. Pivot the optical drive bay upward and connect the card reader cable to one of the USB connectors on the system board. See “Locating parts on the system board” on page 77.
9. Reinstall the front bezel. See “Removing and reinstalling the front bezel” on page 122.

Note: You might have to remove the card reader cover **2** from the front bezel. To remove the card reader cover, pivot the two retaining clips **1** that secure the card reader cover outwards and then completely disengage the card reader cover from the front bezel.

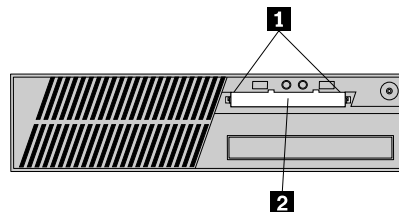


Figure 62. Removing the card reader cover

10. To complete the installation or replacement, go to “Completing the parts replacement” on page 160.

Replacing the card reader

To replace the card reader, 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. Open the computer cover. See “Opening the computer cover” on page 121.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 122.
4. Locate the card reader drive bay. See “Locating internal drives” on page 120.
5. Pivot the optical drive bay upward and disconnect the card reader cable from the USB connector on the system board. See “Locating parts on the system board” on page 77.
6. Remove the screw that secures the card reader bracket. Then, remove the card reader bracket from the chassis.

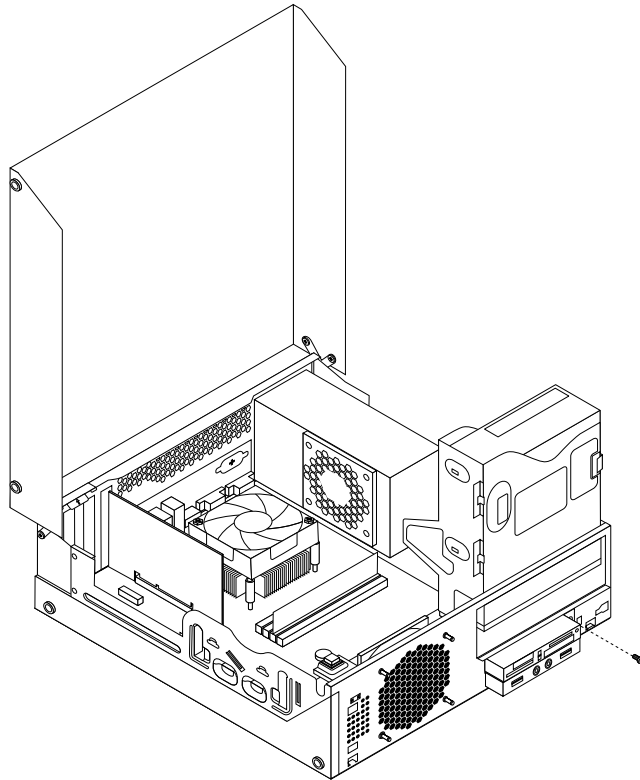


Figure 63. Removing the screw that secures the card reader

7. Remove the two screws that secure the card reader to its bracket. Then remove the failing card reader from the bracket.
8. Install a new card reader into the bracket and install the two screws to secure the card reader to the bracket.

9. Install the card reader bracket to the chassis. Then push the bracket to the left to align the screw hole in the bracket with the corresponding hole in the chassis.

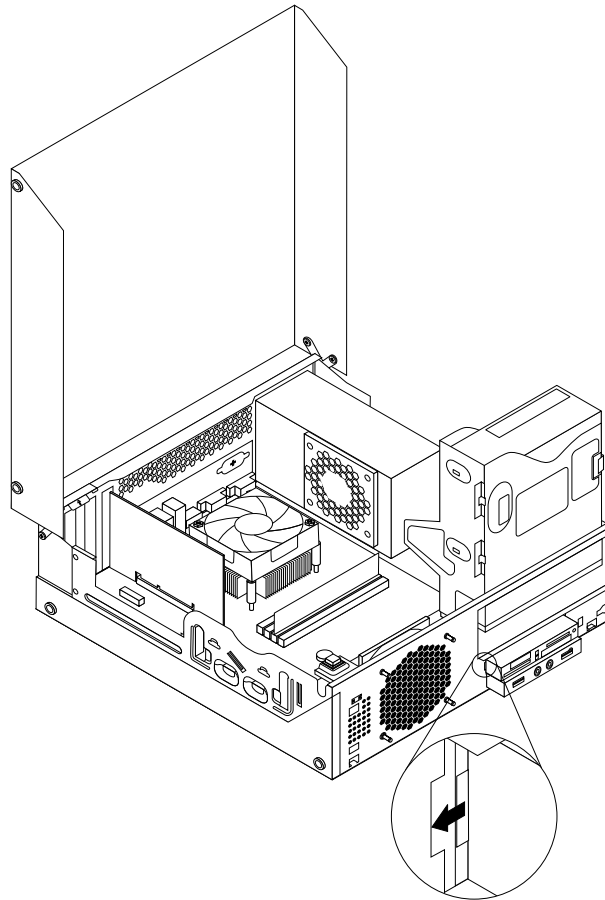


Figure 64. Installing the card reader

10. Install the screw to secure the card reader bracket to the chassis.

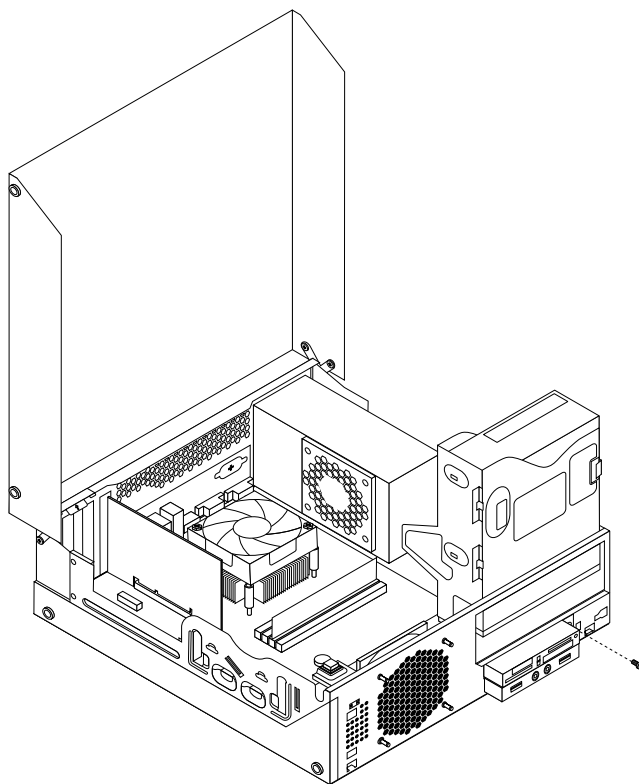


Figure 65. Installing the screw that secures the card reader

11. Pivot the optical drive bay upward and reconnect the card reader cable to one of the USB connectors on the system board. See “Locating parts on the system board” on page 77.
12. Reinstall the front bezel. See “Removing and reinstalling the front bezel” on page 122.
13. To complete the installation or replacement, go to “Completing the parts replacement” on page 160.

Replacing the battery

Attention:

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

Your computer has a special type of memory that maintains the date, time, and configuration information for built-in features. The 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.

Before performing the following procedure, be sure to read and understand the information about replacing and disposing of the battery in the “Batteries” and “Lithium battery notice” sections of the *ThinkCentre Safety and Warranty Guide*.

To replace the battery, 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. Open the computer cover. See “Opening the computer cover” on page 121.
3. Locate the battery. See “Locating parts on the system board” on page 119.
4. Remove any parts and disconnect any cables that might prevent your access to the battery.
5. Remove the old battery.

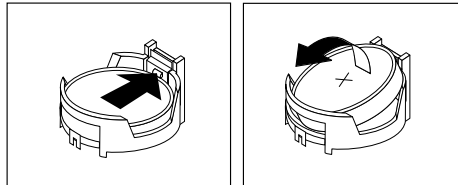


Figure 66. Removing the old battery

6. Install the new battery.

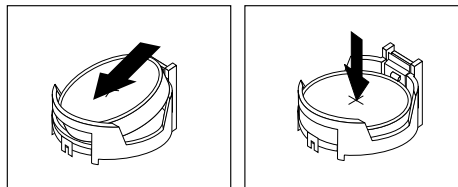


Figure 67. Installing the new battery

7. Reinstall any parts and reconnect any cables that have been removed or disconnected.
8. Close the computer cover and reconnect all external cables. See “Completing the parts replacement” on page 160.
9. Turn on the computer and all attached devices.

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.

10. Use the Setup Utility program to set the date, time, passwords, and any other configuration information. See Chapter 6 “Using the Setup Utility program” on page 43.

Replacing the hard disk drive

Attention:

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

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

To replace the hard disk drive, do the following:

1. Turn off the computer and disconnect all power cords from electrical outlets.

2. Open the computer cover. See “Opening the computer cover” on page 121.
3. Locate the hard disk drive. See “Locating components” on page 76.
4. Pull on the handle of the hard disk drive bracket as shown and then lift the hard disk drive bracket up from the optical drive bay.

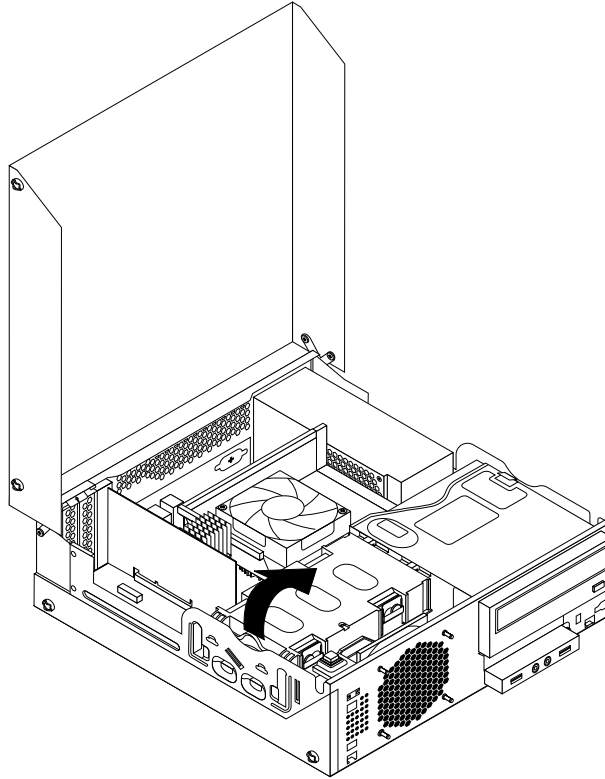


Figure 68. Removing the hard disk drive

5. Disconnect the signal cable and the power cable from the hard disk drive to completely remove the hard disk drive from the chassis.
6. Flex the retaining clips as shown to remove the hard disk drive from the bracket.

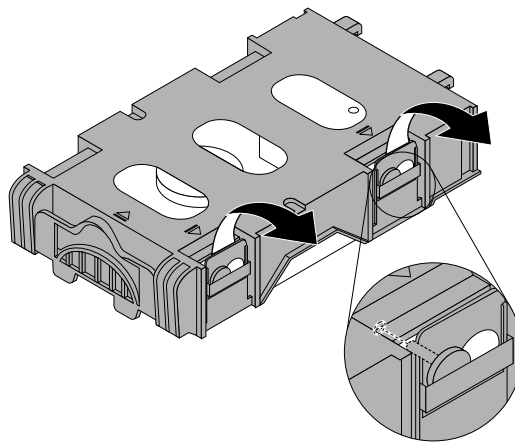
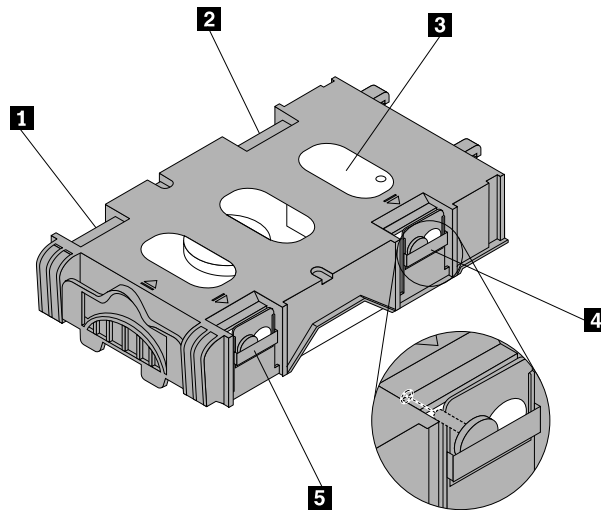


Figure 69. Removing the hard disk drive from the bracket

7. To install a new hard disk drive into the bracket, flex the bracket and align pin **1**, pin **2**, pin **4**, and pin **5** on the bracket with the corresponding holes in the hard disk drive.

Important: Do not touch the circuit board **3** on the bottom of the hard disk drive.



8. Connect the signal cable and the power cable to the new hard disk drive.
9. Insert the two retaining clips **1** of the hard disk drive bracket into the corresponding holes in the side of the optical drive bay, and then pivot the hard disk drive and bracket downwards until the hard disk drive bracket snaps into position.

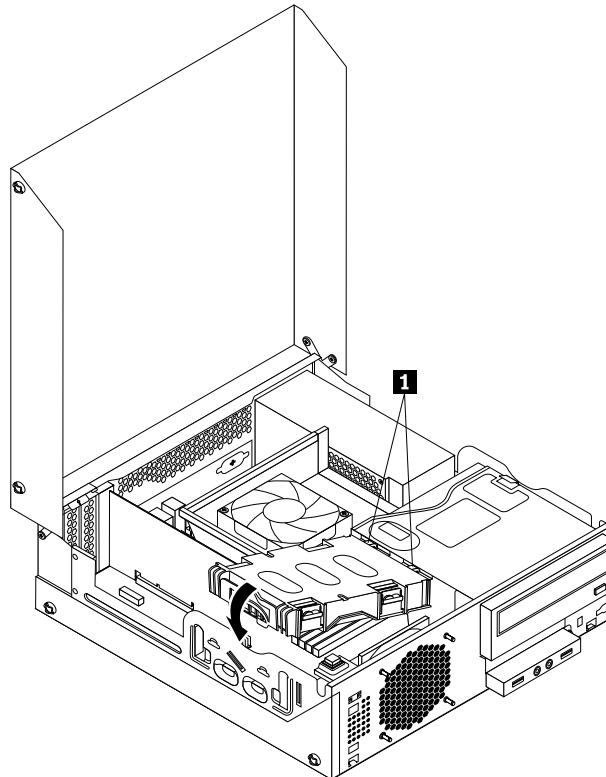


Figure 70. Installing the hard disk drive

10. To complete the replacement, go to “Completing the parts replacement” on page 160.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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

To replace the optical drive, do the following:

1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Open the computer cover. See “Opening the computer cover” on page 121.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 122.
4. Remove the hard disk drive. See “Replacing the hard disk drive” on page 135.
5. Press the blue retaining clip to pivot the optical drive bay upward.

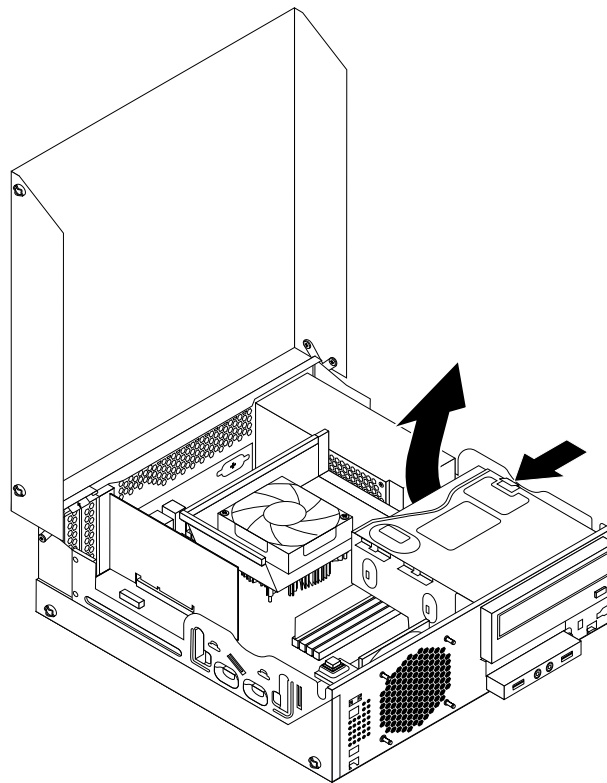


Figure 71. Pivoting the optical drive bay

6. Disconnect the signal cable and the power cable from the rear of the optical drive.

7. Press the optical drive lock **1** and slide the optical drive out of the rear of the drive bay assembly.

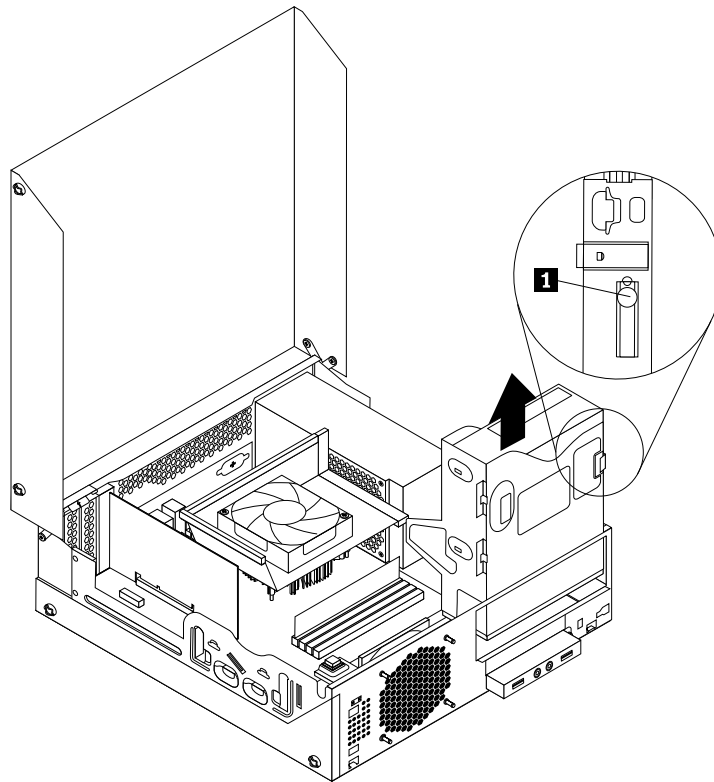


Figure 72. Removing the old optical drive

8. Install the optical drive retainer on the side of the new optical drive.

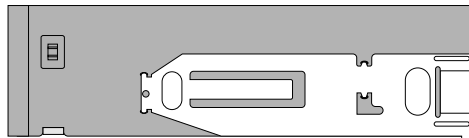


Figure 73. Installing the optical drive retainer

- Slide the new optical drive into the drive bay until it snaps into position.

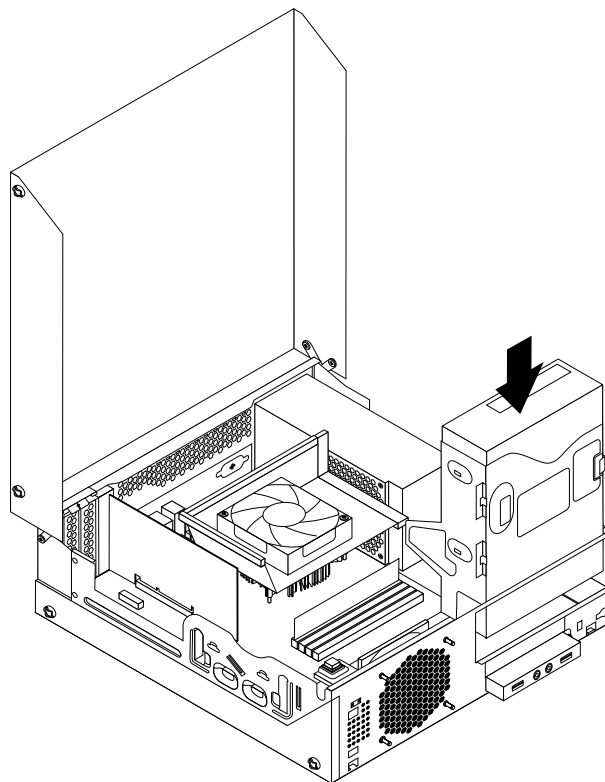


Figure 74. Installing a new optical drive

- Connect the signal cable and the power cable to the rear of the optical drive.
- To complete the installation or replacement, go to “Completing the parts replacement” on page 160.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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:

- 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.
- Open the computer cover. See “Opening the computer cover” on page 121.

3. 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 77.
4. 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.

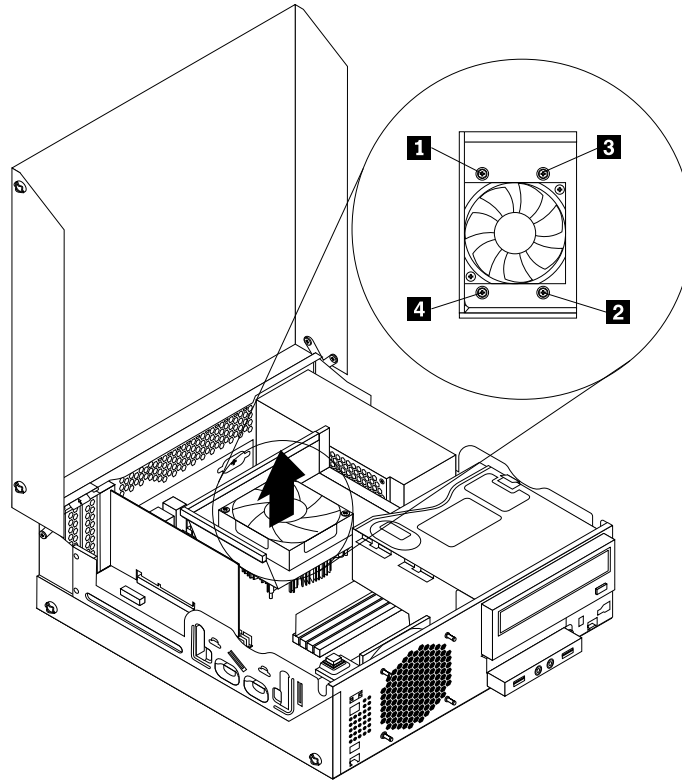


Figure 75. Screws that secure the heat sink and fan assembly

5. Lift the heat sink and fan assembly with the fan duct 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. When handling the heat sink and fan assembly, do not touch the thermal grease on the bottom of the heat sink and fan assembly.

6. Remove the two screws that secure the heat sink fan duct. Then remove the heat sink fan duct from the failing heat sink and fan assembly.

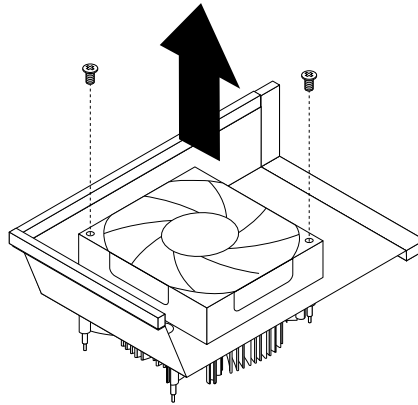


Figure 76. Removing the heat sink fan duct

7. Place the new heat sink and fan assembly on the system board so that the four screws are aligned with the corresponding holes in the system board. Make sure that you properly place the new heat sink and fan assembly so that you can easily connect the new heat sink and fan assembly cable to the microprocessor fan connector on the system board.
8. Follow this sequence to install the four screws to secure the new heat sink and fan assembly, as shown in Figure 75 “Screws that secure the heat sink and fan assembly” on page 141:
 - 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**.
9. Connect the new heat sink and fan assembly cable to the microprocessor fan connector on the system board. See “Locating parts on the system board” on page 77.

10. Lower and position the heat sink fan duct on the top of the heat sink and fan assembly until the two screw holes in the heat sink fan duct are aligned with those in the heat sink and fan assembly. Install the two screws to secure the heat sink fan duct.

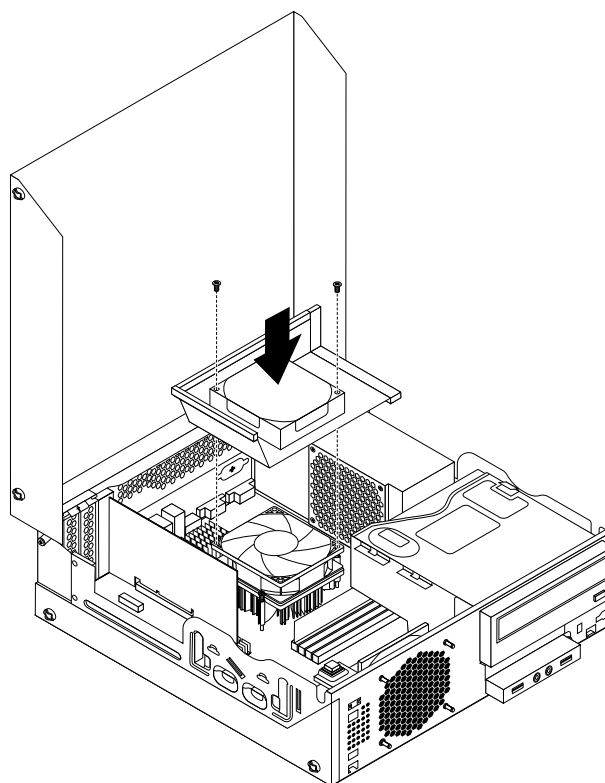


Figure 77. Installing the heat sink fan duct

11. To complete the installation or replacement, go to “Completing the parts replacement” on page 160.

Replacing the power supply assembly

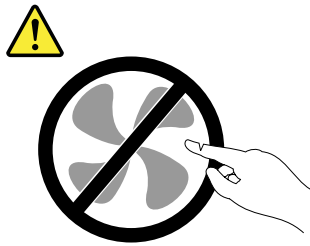
Attention:

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

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. 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. Open the computer cover. See “Opening the computer cover” on page 121.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 122.
4. Remove the hard disk drive. See “Replacing the hard disk drive” on page 135.

5. Remove the two screws that secure the heat sink fan duct, and then lift the heat sink fan duct out of the chassis.

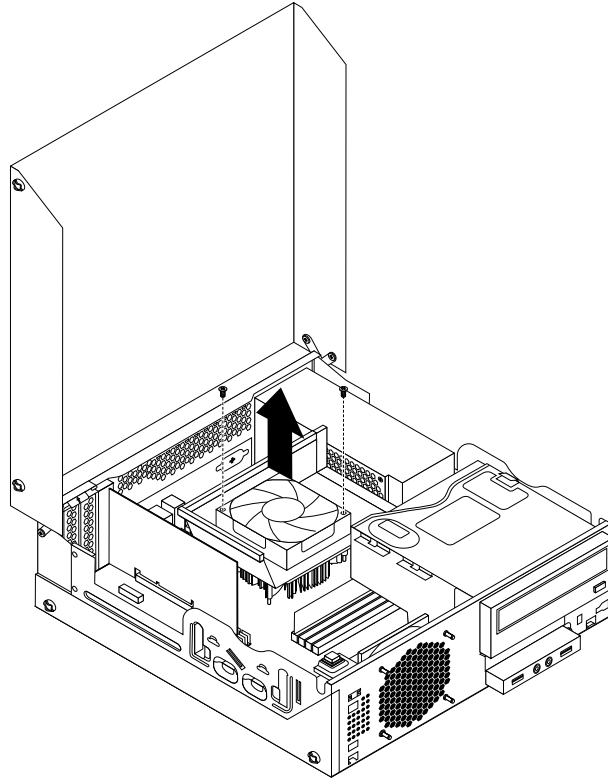


Figure 78. Removing the heat sink fan duct

6. Pivot the optical drive upward and disconnect the power supply assembly cables from all drives and from power connectors **1** and **2** on the system board.

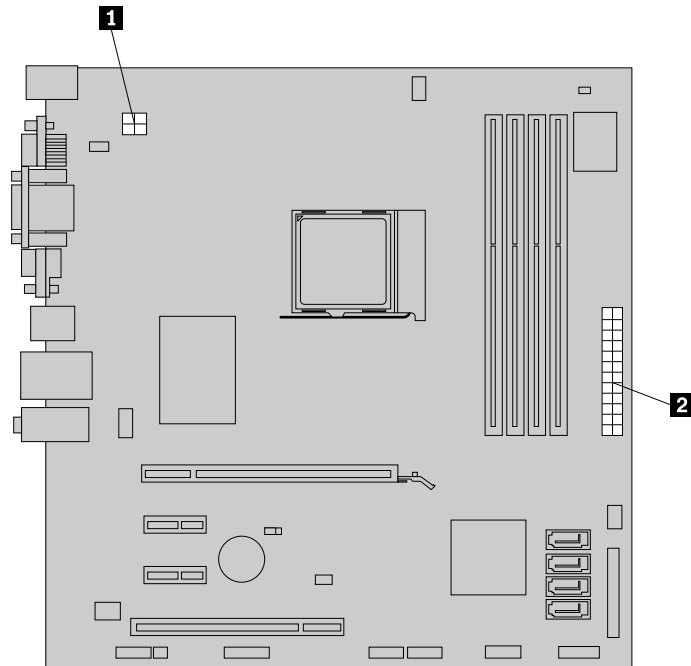


Figure 79. Power connectors on the system board

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. Make sure that you note the cable routing before disconnecting the cables.

7. At the rear of the computer, remove the three screws that secure the power supply assembly. Press the power supply clip **1** downward to release the power supply assembly and then slide the power supply assembly to the front of the computer. Lift the power supply assembly out of the computer.

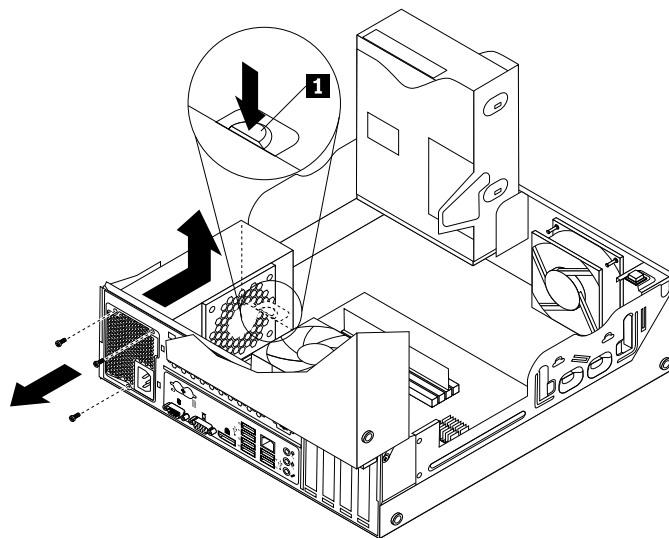


Figure 80. Removing the power supply assembly

8. Make sure that the new power supply assembly is the correct replacement.
9. Install the new power supply assembly into the chassis so that the screw holes in the new power supply assembly are aligned with the corresponding holes in the rear of the chassis. Then, install the three screws to secure the new power supply assembly in place.

Note: Use only screws provided by Lenovo.

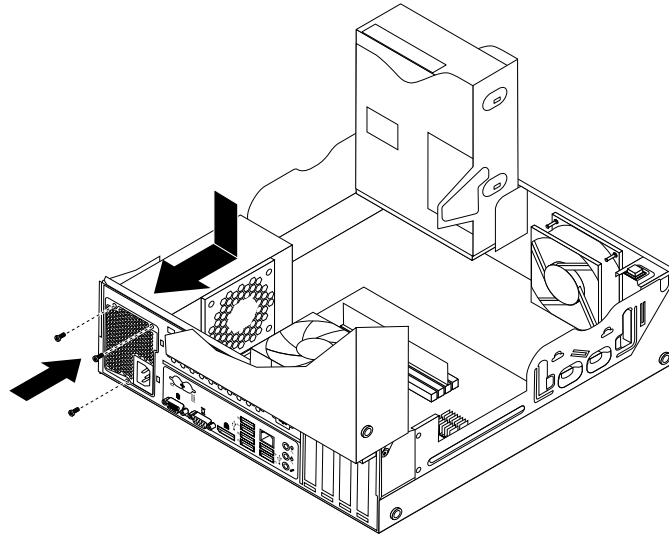


Figure 81. Installing the power supply assembly

10. Connect the new power supply assembly cables to all drives and the system board. See “Locating parts on the system board” on page 77.

11. Lower and position the heat sink fan duct on the top of the heat sink and fan assembly until the two screw holes in the heat sink fan duct are aligned with those in the heat sink and fan assembly. Install the two screws to secure the heat sink fan duct.

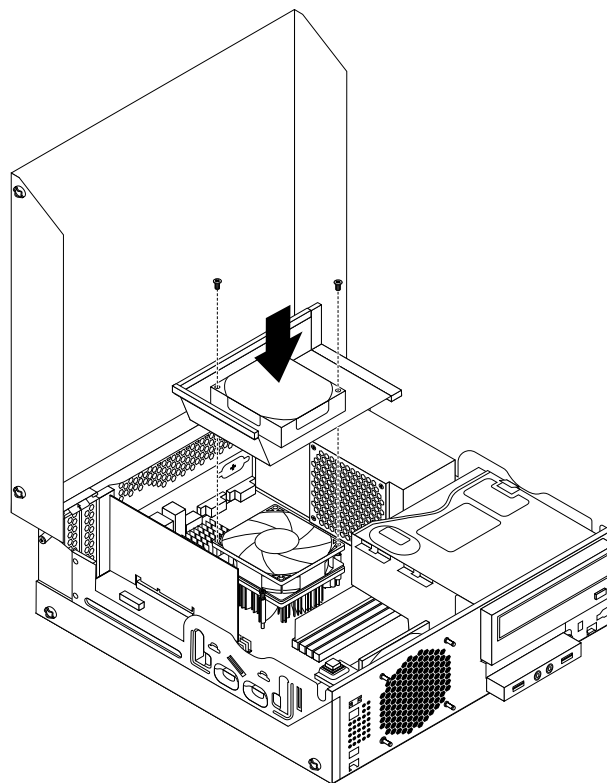


Figure 82. Installing the heat sink fan duct

12. To complete the installation or replacement, go to “Completing the parts replacement” on page 160.

Replacing the microprocessor

Attention:

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

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. Open the computer cover. See “Opening the computer cover” on page 121.

3. Locate the system board and disconnect all cables connected to the system board. See “Locating parts on the system board” on page 77.
4. Remove the heat sink and fan assembly with the fan duct. See “Replacing the heat sink and fan assembly” on page 140.

Note: Do not let the thermal grease on the bottom of the heat sink and fan assembly get in contact with anything.

5. Lift the small handle **1** to release the microprocessor **2** secured on the system board.

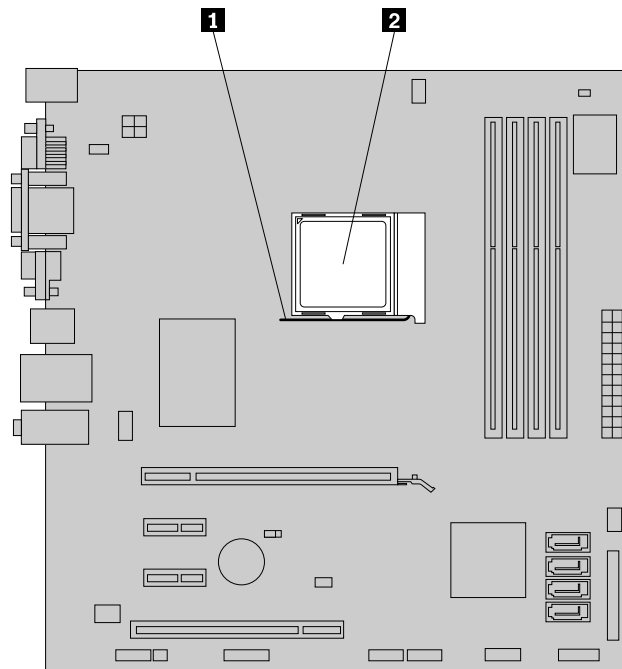


Figure 83. Accessing the microprocessor

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

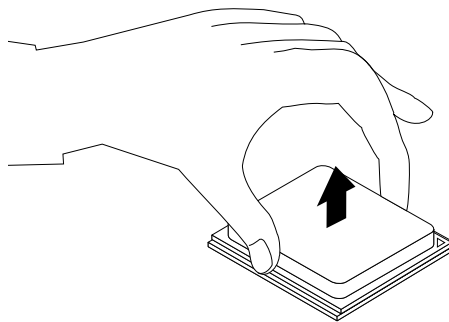
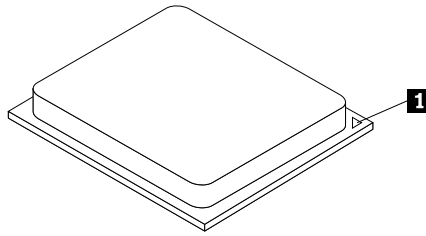


Figure 84. Removing the microprocessor

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 look for the small triangle **1** on one corner of 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. Lower the small handle to secure the new microprocessor in the socket.
12. Reinstall the heat sink and fan assembly with the fan duct as shown. See “Replacing the heat sink and fan assembly” on page 140.

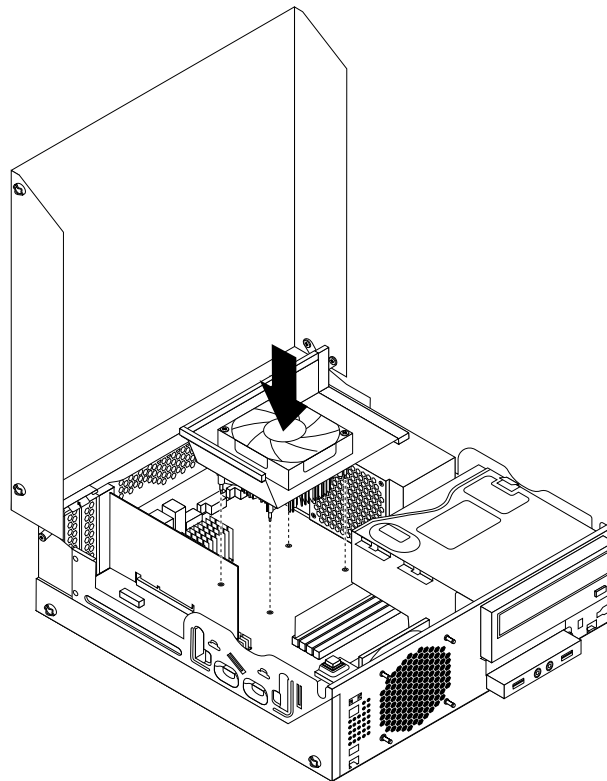


Figure 85. Reinstalling the heat sink and fan assembly with the fan duct

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 160.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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. 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. Open the computer cover. See “Opening the computer cover” on page 121.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 122.
4. Pivot the optical drive bay upward and disconnect the front audio and USB assembly cables from the system board and note the cables routing. See “Locating parts on the system board” on page 77.
5. Remove the screw that secures the front audio and USB assembly bracket. Then remove the front audio and USB assembly bracket from the chassis.

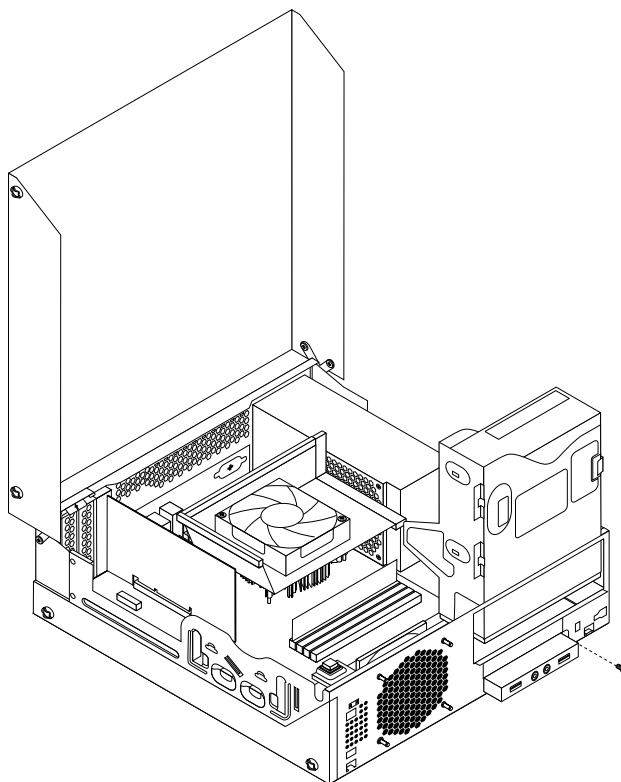


Figure 86. Removing the front audio and USB assembly

6. Remove the two screws that secure the front audio and USB assembly to its bracket. Then remove the failing front audio and USB assembly from the bracket.

7. 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.
8. Install the front audio and USB assembly bracket to the chassis and align the screw hole in the bracket with the corresponding hole in the chassis.
9. Install the screw to secure the front audio and USB assembly bracket to the chassis.
10. Reconnect the front USB and front audio cables to the system board. See “Locating parts on the system board” on page 77.
11. Reinstall the front bezel. See “Removing and reinstalling the front bezel” on page 122.
12. To complete the installation or replacement, go to “Completing the parts replacement” on page 160.

Replacing the system fan

Attention:

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

This section provides instructions on how to replace the system fan assembly.

To replace the system fan assembly, do the following:

1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Open the computer cover. See “Opening the computer cover” on page 121.
3. Remove the hard disk drive. See “Replacing the hard disk drive” on page 135.
4. Locate the system fan assembly. See “Locating components” on page 118.
5. Disconnect the system fan assembly cable from the system fan connector on the system board. See “Locating parts on the system board” on page 77.

6. The system fan assembly is attached to the chassis by four rubber mounts. Remove the system fan assembly by cutting the rubber mounts and lifting the system fan assembly out of the chassis.

Note: The new system fan assembly will have four new rubber mounts attached.

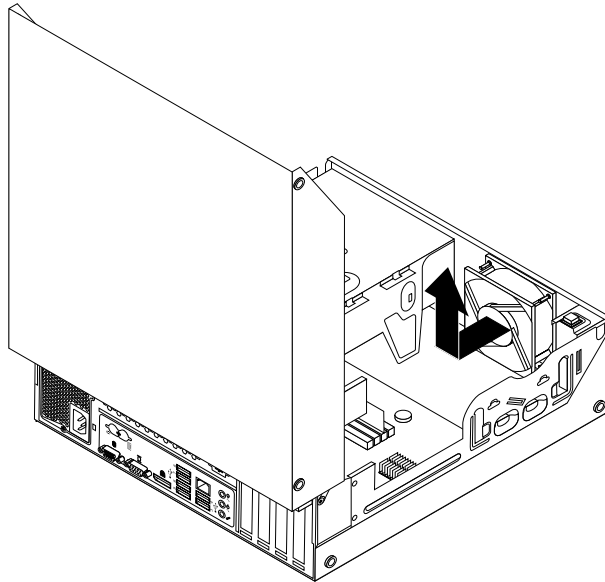


Figure 87. Removing the system fan assembly

7. Install the new system fan assembly by aligning the new rubber mounts that came with the new system fan assembly with the corresponding holes in the chassis, and then push the rubber mounts through the holes. Then, carefully pull on the tips of the rubber mounts from the bottom until the new system fan assembly is secured in place.

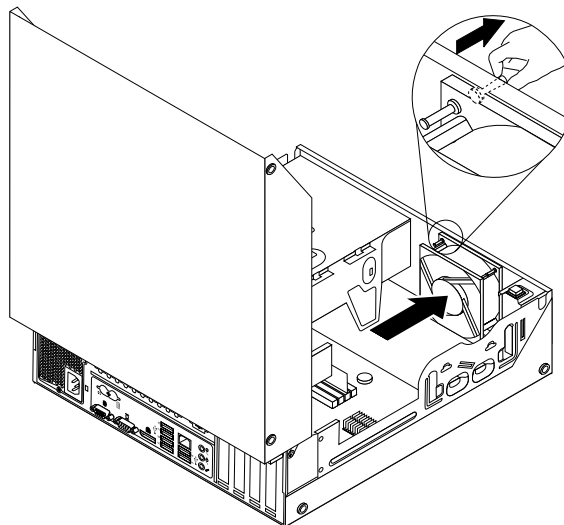


Figure 88. Installing the system fan assembly

8. Connect the new system fan assembly cable to the system fan connector on the system board. See “Locating parts on the system board” on page 77.

9. Reinstall the hard disk drive. See “Replacing the hard disk drive” on page 135.
10. To complete the installation or replacement, go to “Completing the parts replacement” on page 160.

Replacing the internal speaker

Attention:

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

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

Note: The internal speaker is only available in some models.

To replace the internal speaker, do the following:

1. Turn off the computer and disconnect all power cords from electrical outlets.
2. Open the computer cover. See “Opening the computer cover” on page 121.
3. Remove the front bezel by releasing the three plastic tabs and pivoting the front bezel outward.

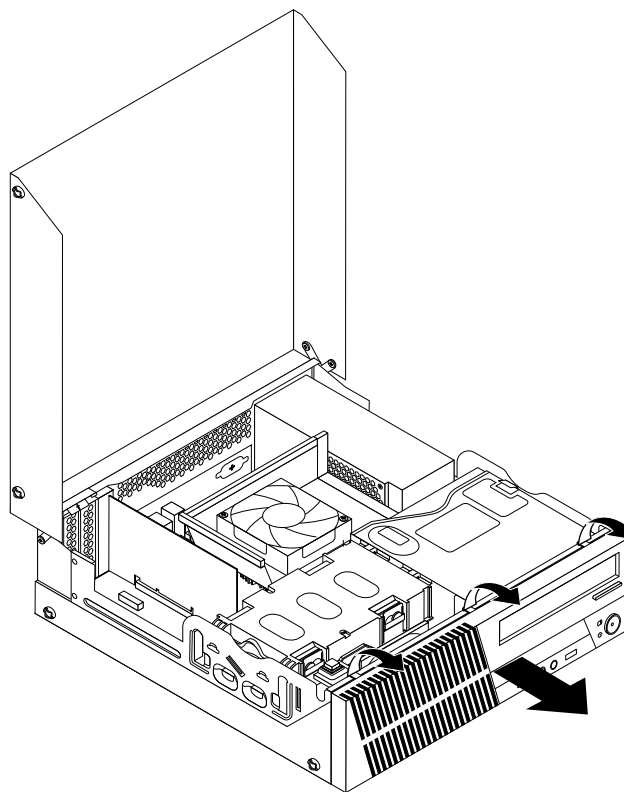


Figure 89. Removing the front bezel

4. Remove the hard disk drive. See “Replacing the hard disk drive” on page 135.
5. Locate the cover presence switch (intrusion switch) and the internal speaker. See “Locating components” on page 118.
6. Disconnect the internal speaker cable from the internal speaker connector on the system board. See “Locating parts on the system board” on page 77.

7. Remove the screw that secures the cover presence switch (intrusion switch) and remove the cover presence switch from the chassis.

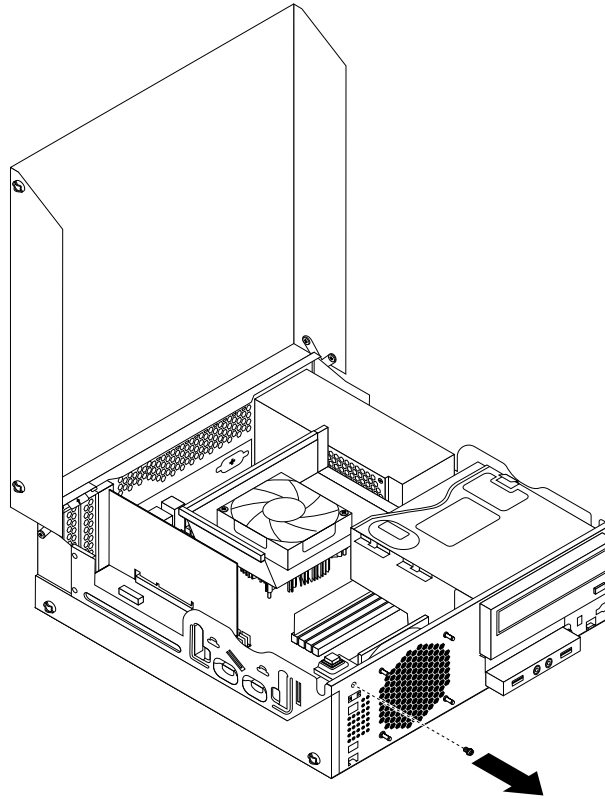


Figure 90. Removing the cover presence switch

8. Push the internal speaker outward through the hole **1** to disengage it from the two metal tabs on the chassis. Then, slide the internal speaker to the right to remove it from the chassis.

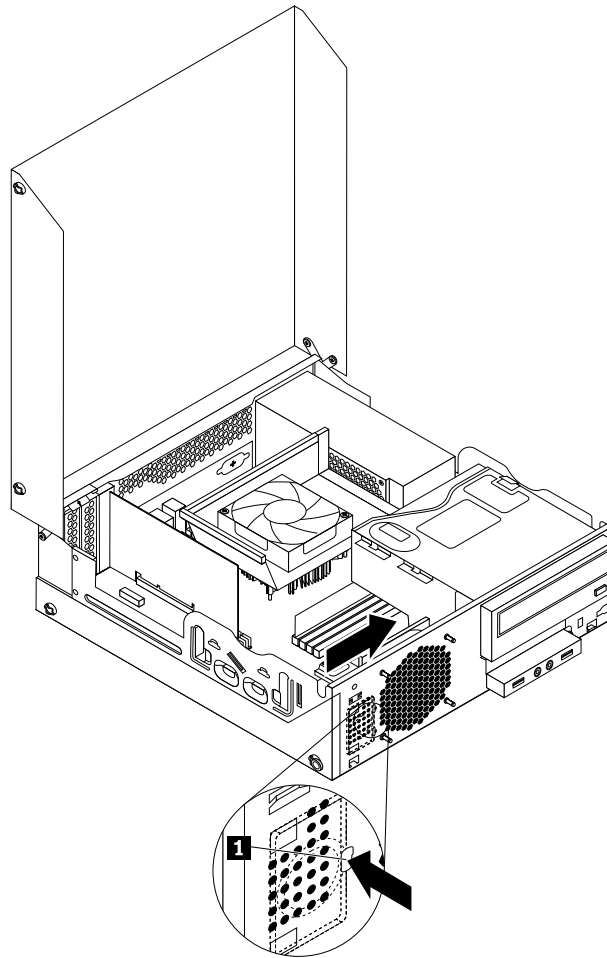


Figure 91. Removing the internal speaker

9. Align the new internal speaker with the two metal clips on the chassis, and then slide the speaker as shown until it snaps into position.

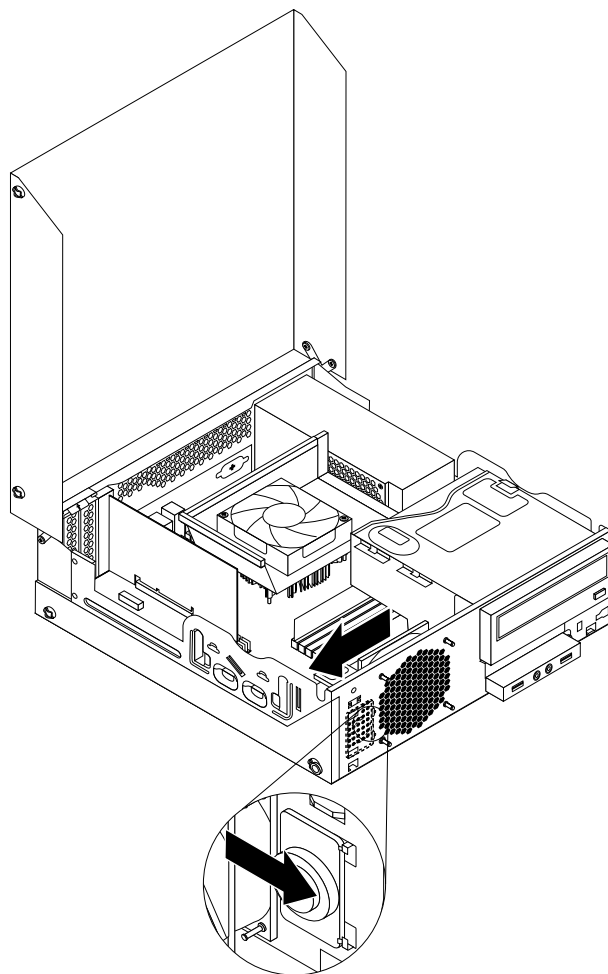


Figure 92. Installing the new internal speaker

10. Reconnect the internal speaker cable to the system board. See “Locating parts on the system board” on page 77.
11. Position the cover presence switch so that the screw hole in the cover presence switch is aligned with the corresponding hole in the chassis.

12. Install the screw to secure the cover presence switch to the chassis.

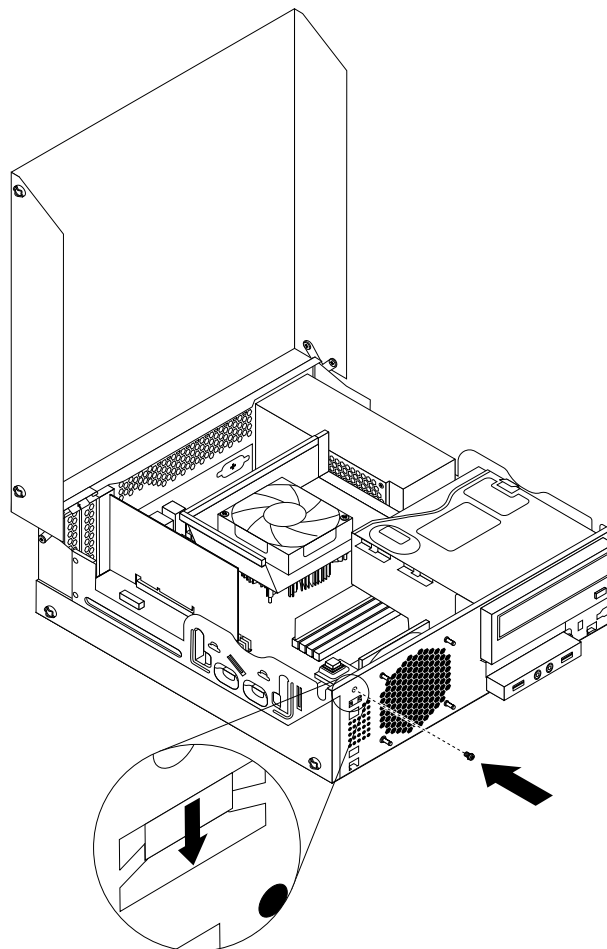


Figure 93. Reinstalling the cover presence switch

13. To reinstall the front bezel, align the three tabs on the front bezel with the corresponding holes in the chassis and pivot the front bezel inwards until it snaps into position.
14. To complete the installation or replacement, go to “Completing the parts replacement” on page 160.

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 Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkCentre Safety and Warranty Guide*, go to:
<http://support.lenovo.com>

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. Open the computer cover. See “Opening the computer cover” on page 121.
3. Remove the front bezel. See “Removing and reinstalling the front bezel” on page 122.
4. Remove the hard disk drive. See “Replacing the hard disk drive” on page 135.
5. Pivot the optical drive bay assembly upward to gain access to the system board. See “Accessing the system board components and drives” on page 124.
6. Remove all memory modules and PCI cards that are currently installed. See “Installing or replacing a memory module” on page 125 and “Installing or replacing a PCI card” on page 127.
7. Remove the heat sink and fan assembly from the failing system board. See “Replacing the heat sink and fan assembly” on page 140.
8. Carefully take note of the location of all cable connections on the system board and disconnect all the cables. See “Locating parts on the system board” on page 119.
9. Remove the eight screws that secure the system board.

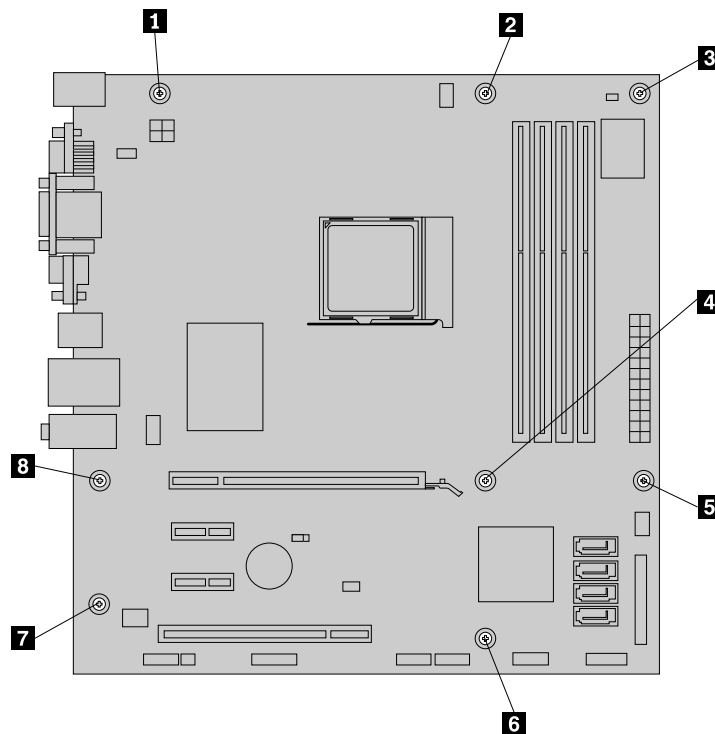


Figure 94. Removing the eight screws that secure the system board

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 148.
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. 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 140.

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 125 and “Installing or replacing a PCI card” on page 127.
15. Reconnect all remaining cables to the system board. See “Locating parts on the system board” on page 119.
16. Lower the optical drive bay assembly. See “Accessing the system board components and drives” on page 124.
17. Install the hard disk drive. See “Replacing the hard disk drive” on page 135.
18. To complete the replacement, go to “Completing the parts replacement” on page 160.

Note: If required, return the failing system board to Lenovo.

Completing the parts replacement

After completing the installation or replacement for all parts, you need to close 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 close 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 118 for the locations of various components in your computer.
2. If you have removed the front bezel, reinstall it. To reinstall the front bezel, align the three tabs on the front bezel with the corresponding holes in the chassis and pivot the front bezel inwards until it snaps into position.
3. Make sure that the cables are routed correctly. Keep cables clear of the hinges and sides of the computer chassis to avoid interference with closing the computer cover.
4. Lower the optical drive bay.
5. Close the computer cover.
6. If there is an integrated cable lock available, lock the computer.
7. Reconnect the external cables and power cords to the computer. See “Locating connectors on the rear of your computer” on page 117.
8. To update your configuration, see 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 10. FRU lists

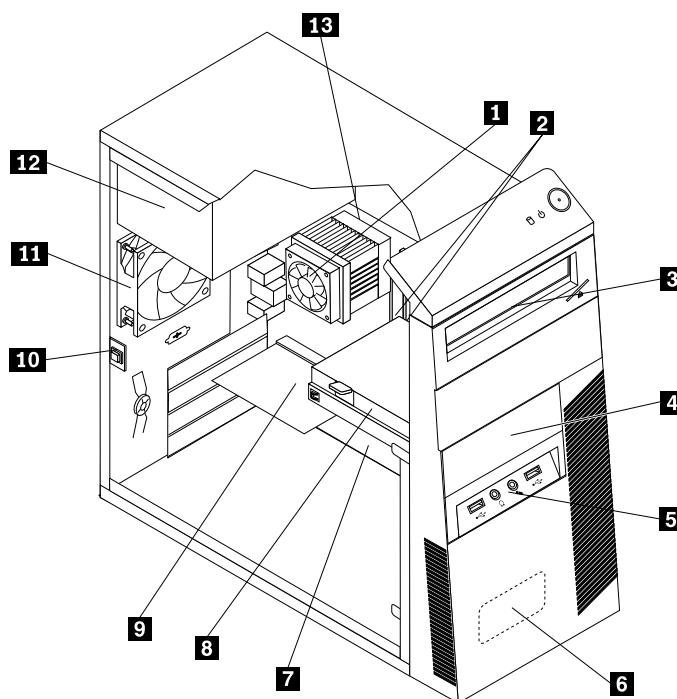
This chapter lists the information on the field replaceable units (FRUs).

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: 1982, 1983, 1985, 1986, 1987, 1990, 1992, 1993, 1994, and 1995

The following replaceable components are available for the 1982, 1983, 1985, 1986, 1987, 1990, 1992, 1993, 1994, and 1995 machine type models.



Item #	FRUs	FRU #	CRU
2	Memory modules, 2GB PC3-10600 1333MHz DDR3 UDIMM - MT 1982: CTO A1A A1T A2A A2T A3A A3T A4U A4F A4S A6G B3Q B4Q B5A B5T B6G B7G D5G D6G D8G - MT 1983: CTO - MT 1990: CTO A1H A2H A3A A3T A4A A4T A5A A5T A6U A6F A6S A7G A8Q A9Q B1V B2V B3V B4V B5A B5T B9J D1J D2G D3V D4V D5V D6V D7V - MT 1995: CTO	64Y6649	1
2	Memory modules, 4GB PC3-10600 1333MHz DDR3 UDIMM - MT 1982: CTO A5U A5F A5S A7G A8G A9G B1G B2G B8G B9G D1G D2G D3G D4G D7G - MT 1983: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J	89Y9224	1

Item #	FRUs	FRU #	CRU
	- MT 1990: CTO B6U B6F B6S B7J B8J - MT 1995: CTO A1U A1F A1S		
3	Optical drive, DVD-ROM drive - 16x/48x - SATA (with DVD PB SW or W/O SW) - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO A1H B1V B2V B3V B8J D1J - MT 1995: CTO	71Y5543	2
3	Optical drive, DVD recorder rambo 8 - SATA 12XRAM write (with DVD PB SW or W/O SW) - MT 1982: CTO A1A A1T A2A A2T A3A A3T A4U A4F A4S A5U A5F A5S A6G A7G A8G A9G B1G B2G B3Q B4Q B5A B5T B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G - MT 1983: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R - MT 1990: CTO A2H A3A A3T A4A A4T A5A A5T A6U A6F A6S A7G A8Q A9Q B4V B5A B5T B6U B6F B6S B7J B9J D2G D3V D4V D5V D6V D7V - MT 1995: CTO A1U A1F A1S	71Y5545	2
4	USB 2.0 media card reader, 25 in 1 ROHS - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	45R8139	2
6	System board, AMD® 980G mATX GA (4 DIMMs/TPM) WW - MT 1982: CTO A1A A1T A2A A2T A3A A3T A4U A4F A4S A5U A5F A5S A6G A7G A8G A9G B1G B2G B3Q B4Q B5A B5T B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G - MT 1983: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J - MT 1990: CTO A1H A2H A3A A3T A4A A4T A5A A5T A6U A6F A6S A7G A8Q A9Q B1V B2V B3V B4V B5A B5T B6U B6F B6S B7J B8J B9J D1J D2G D3V D4V D5V D6V D7V - MT 1995: CTO A1U A1F A1S	03T6227	N
7	Hard disk drive, SATAIII 250GB 7200RPM/6Gb/16M - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO A3A A3T - MT 1995: CTO	03T7039	1
7	Hard disk drive, SATAIII 320GB 7200RPM/6Gb/16M - MT 1982: CTO A1A A1T A2A A2T A3A A3T A4U A4F A4S A6G A7G B2G B3Q B4Q B5A B5T B6G B7G D5G - MT 1983: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J - MT 1990: CTO A1H A4A A4T A5A A5T A6U A6F A6S A7G A8Q A9Q B1V B5A B5T B9J D1J D2G - MT 1995: CTO	03T7040	1

Item #	FRUs	FRU #	CRU
7	Hard disk drive, SATAIII 500GB 7200RPM/6Gb/16M - MT 1982: CTO A5U A5F A5S A8G A9G B1G B8G B9G D1G D2G D3G D4G D6G D7G D8G - MT 1983: CTO - MT 1990: CTO A2H B2V B3V B4V B6U B6F B6S B7J B8J D3V D4V D5V D6V D7V - MT 1995: CTO A1U A1F A1S	03T7041	1
7	Hard disk drive, SATAIII 1TB 7200RPM/6Gb/32M - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	03T7042	1
7	Hard disk drive, 2.5" SATA INT Postville refresh 160G solid state drive - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	45K0616	1
11	Power supply assembly, 320 watt ATX power supply (90 plus) - MT 1982: CTO A1A A1T A2A A2T A3A A3T A4U A4F A4S A5U A5F A5S A6G A7G A8G A9G B1G B2G B3Q B4Q B5A B5T B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G - MT 1983: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J - MT 1990: CTO A1H A2H A3A A3T A4A A4T A5A A5T A6U A6F A6S A7G A8Q A9Q B1V B2V B3V B4V B5A B5T B6U B6F B6S B7J B8J B9J D1J D2G D3V D4V D5V D6V D7V - MT 1995: CTO A1U A1F A1S	54Y8841	2
11	Power supply assembly, 280W watt ATX power supply (85plus)-standard, robust, Japan - MT 1982: CTO A1A A1T A2A A2T A3A A3T A4U A4F A4S A5U A5F A5S A6G A7G A8G A9G B1G B2G B3Q B4Q B5A B5T B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G - MT 1983: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J - MT 1990: CTO A1H A2H A3A A3T A4A A4T A5A A5T A6U A6F A6S A7G A8Q A9Q B1V B2V B3V B4V B5A B5T B6U B6F B6S B7J B8J B9J D1J D2G D3V D4V D5V D6V D7V - MT 1995: CTO A1U A1F A1S	45J9431	2

Item #	FRUs	FRU #	CRU
11	Power supply assembly, ATX 280W power supply; robust; for all countries except for Japan • MT 1982: CTO A1A A1T A2A A2T A3A A3T A4U A4F A4S A5U A5F A5S A6G A7G A8G A9G B1G B2G B3Q B4Q B5A B5T B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R • MT 1990: CTO A1H A2H A3A A3T A4A A4T A5A A5T A6U A6F A6S A7G A8Q A9Q B1V B2V B3V B4V B5A B5T B6U B6F B6S D2G D3V D4V D5V D6V D7V • MT 1995: CTO A1U A1F A1S	45J9436	2
12	Microprocessor, AMD Sempron™ 180/1/AM3/45 C3 microprocessor • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03T7054	2
12	Microprocessor, Sempron 150 (2.9GHz, 1M total cache, AM3, 45W) C3 45nm • MT 1982: CTO A6G D5G • MT 1983: CTO • MT 1990: CTO B1V • MT 1995: CTO	03T6023	2
12	Microprocessor, Athlon™ II X2 B24 (3.0GHz, 2M total cache, AM3, 65W) C3 45nm • MT 1982: CTO A1A A1T A4U A4F A4S A7G B4Q D6G • MT 1983: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J • MT 1990: CTO A1H A2H A3A A3T A6U A6F A6S A8Q B2V D3V • MT 1995: CTO	71Y5431	2
12	Microprocessor, Athlon II X2 B26 (3.2GHz, 2M total cache, AM3, 65W) C3 45nm • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03T7014	2
12	Microprocessor, Athlon II X2 255 (3.1GHz, 2M total cache, AM3, 65W) C3 45nm • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03T7015	2
12	Microprocessor, Athlon II X2 260 (3.2GHz, 2M total cache, AM3, 65W) C3 45nm • MT 1982: CTO B8G B9G D1G D2G • MT 1983: CTO • MT 1990: CTO D5V • MT 1995: CTO	03T7016	2

Item #	FRUs	FRU #	CRU
12	Microprocessor, Athlon II X2 220 (2.8GHz, 1MB total cache, AM3 65W) C3 45nm • MT 1982: CTO B6G B7G • MT 1983: CTO • MT 1990: CTO B9J D1J • MT 1995: CTO	03T7043	2
12	Microprocessor, Athlon II X4 645 (3.1GHz, 2MB total cache, AM3, 95W) C3 45nm • MT 1982: CTO B5A B5T D3G D4G D8G • MT 1983: CTO • MT 1990: CTO B5A B5T B6U B6F B6S B7J B8J D6V D7V • MT 1995: CTO A1U A1F A1S	03T6229	2
12	Microprocessor, Phenom™ II X4 B97 (3.2GHz, 8M total cache, AM3, 95W) C3 45nm • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03T7023	2
12	Microprocessor, Phenom II X2 B53 (2.8GHz, 7M total cache, AM3, 80W) C3 45nm • MT 1982: CTO A2A A2T A5U A5F A5S A8G A9G B1G B2G B3Q D7G • MT 1983: CTO • MT 1990: CTO A5A A5T A7G A9Q B3V B4V D2G D4V • MT 1995: CTO	TBD	2

Mechanical FRUs

The FRUs listed in the following tables are not illustrated.

FRUs	FRU #	CRU
Battery, 3V-lithium • MT 1982: CTO A1A A1T A2A A2T A3A A3T A4U A4F A4S A5U A5F A5S A6G A7G A8G A9G B1G B2G B3Q B4Q B5A B5T B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J • MT 1990: CTO A1H A2H A3A A3T A4A A4T A5A A5T A6U A6F A6S A7G A8Q A9Q B1V B2V B3V B4V B5A B5T B6U B6F B6S B7J B8J B9J D1J D2G D3V D4V D5V D6V D7V • MT 1995: CTO A1U A1F A1S	45C1566	1
Cable-SATA 250mm (RoHS) • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	54Y9929	2

FRUs	FRU #	CRU
LED/switch cable_R (PCB_760mm_25L) kit • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	45J9577	2
Front I_O cable_NC_ESD_R (25L_A660_U280) • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	45J9573	2
Sensor cable (460mm) kit w/ bracket • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	45J9495	2
Cabel-SATA 420mm with 2 latch • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	54Y9948	2
Speaker cable_R_9*5_400mm • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	43N9091	2
SATA cable_R_250mm with dual latch used for 2nd hard disk drive • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	54Y9929	2
New optional hard disk drive bracket assembly for cable routing improve • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	41R6106	2
Floppy disk drive/card reader blank bezel • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	45K6261	2

FRUs	FRU #	CRU
Floppy disk drive/cared reader bezel • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	45K6262	2
Blank optical drive bezel • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	45K6263	2
L1- models dual optical drive kit - tower IV • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	45K6265	2
Second serial port cable 250mm (with level shift IC) • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	71Y6217	2
C2 intrusion switch kit (cable + bracket + screws) • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	41R6116	2
C2 intrusion switch cable (included in the kit 41R6115) • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	39K5022	2
PS2 cable_R_170mm_knockout (with screw) • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	43N9149	2
Rear USB 2 ports II HP • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	42Y8005	1

FRUs	FRU #	CRU
Parallel cable 280mm ROHS (optional) - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	43N9022	2
Front fan used for 2*500G\1TB - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	43N9599	1
AMD 89W 4 pin cooler kit for AMD 65W 95W 80W 45W microprocessor - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	43N9886	1
ShinEtsu 7783D;1g syringe - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	91P8835	1
Tower 9225 rear system fan with rubber nail - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	45K6340	1
2.5 hard disk drive to 3.5 hard disk drive conversion kit, no bezel - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	43N9593	1
SATA cable_R_370mm_no latch - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	43N9134	1
side cover - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	41N8050	2

FRUs	FRU #	CRU
Hard disk drive tray, tower - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	41R6291	2
Front bezel base - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	45K6258	2
Top handle assembly - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	45K6259	2
USB cover - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	45K6260	2
1st optical drive cover assembly - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	45K6264	2
Rear IO shield, ATX, Q57, FOF, with USB number - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	43N9846	2
Tower chassis primary hard disk drive cage - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	45K6272	2
Tower rubber foot (for acoustic improvement) - MT 1982: all models - MT 1983: all models - MT 1990: all models - MT 1995: all models	45K6278	2

FRUs	FRU #	CRU
Front bezel with 1st optical drive bezel assembly • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	45K6367	2
Retainer, card reader/optical drive/floppy disk drive, tower IV • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	45K6378	2
Mechanical kit/tower IV • MT 1982: all models • MT 1983: all models • MT 1990: all models • MT 1995: all models	45K6377	2

Keyboard and Mouse

Keyboard - preferred pro PS/2	FRU #	CRU
US English • MT 1982: CTO • MT 1983: CTO A1U A1F A1L A1Q A1A A1H A1R A1E • MT 1990: CTO • MT 1995: CTO	41A5039	1
Arabic • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5040	1
Arabic/French • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	41A5041	1
Belgium French • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5042	1

Keyboard - preferred pro PS/2	FRU #	CRU
Belgium English • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5043	1
Brazilian Portuguese • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	41A5044	1
Bulgarian • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5045	1
Chinese/US • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	41A5046	1
Czech (ABB) • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5047	1
Danish • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5048	1
Dutch • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5049	1
French • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5050	1

Keyboard - preferred pro PS/2	FRU #	CRU
French Canadian • MT 1982: CTO • MT 1983: CTO A1F • MT 1990: CTO • MT 1995: CTO	41A5051	1
French Canadian • MT 1982: CTO • MT 1983: CTO A1F • MT 1990: CTO • MT 1995: CTO	41A5052	1
German • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5053	1
Greek • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5054	1
Greek/US • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5080	1
Hebrew • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5055	1
Hungarian • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5056	1
Iceland • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5057	1

Keyboard - preferred pro PS/2	FRU #	CRU
Italy • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5058	1
Japanese • MT 1982: CTO • MT 1983: CTO A1J • MT 1990: CTO • MT 1995: CTO	41A5059	1
Korean • MT 1982: CTO • MT 1983: CTO A1K • MT 1990: CTO • MT 1995: CTO	41A5060	1
LA Spanish • MT 1982: CTO • MT 1983: CTO A1S A1D A1Y • MT 1990: CTO • MT 1995: CTO	41A5061	1
Norwegian • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5062	1
Polish • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5063	1
Portuguese • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5064	1
Romanian • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5065	1

Keyboard - preferred pro PS/2	FRU #	CRU
Russian/Cyrillic • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5066	1
Serbian/Cyrillic • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5067	1
Slovak • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5068	1
Spanish • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5069	1
Swedish/Finnish • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5070	1
Swiss French/German • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO •	41A5071	1
Thailand • MT 1982: CTO • MT 1983: CTO A1T • MT 1990: CTO • MT 1995: CTO	41A5072	1
Turkish • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5073	1

Keyboard - preferred pro PS/2	FRU #	CRU
Turkish • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5074	1
UK English • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5075	1
US European • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5076	1
Slovenian • MT 1982: CTO • MT 1983: CTO A1G • MT 1990: CTO • MT 1995: CTO	41A5077	1
India • MT 1982: CTO • MT 1983: CTO A1Q • MT 1990: CTO • MT 1995: CTO	54Y8382	1

Keyboard - preferred pro fullsize	FRU #	CRU
US English/Chinese-Simplified • MT 1982: CTO A1A A2A A3A A4U A5U B3Q B4Q B5A • MT 1983: CTO • MT 1990: CTO A1H A2H A3A A4A A5A A6U A8Q A9Q B5A B6U • MT 1995: CTO A1U	41A5289	1
Arabic • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5290	1

Keyboard - preferred pro fullsize	FRU #	CRU
Arabic/French • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	41A5291	1
Belgium French • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5292	1
Belgium English • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5293	1
Brazilian Portuguese • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	41A5294	1
Bulgarian • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5295	1
Chinese/US • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO B1V B2V B3V B4V D3V D4V D5V D6V D7V • MT 1995: CTO	41A5296	1
Czech (ABB) • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5297	1

Keyboard - preferred pro fullsize	FRU #	CRU
Danish • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5298	1
Dutch • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5299	1
French • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5300	1
French Canadian • MT 1982: CTO A4F A5F • MT 1983: CTO • MT 1990: CTO A6F B6F • MT 1995: CTO A1F	41A5301	1
French Canadian • MT 1982: CTO A4F A5F • MT 1983: CTO • MT 1990: CTO A6F B6F • MT 1995: CTO A1F	41A5302	1
German • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5303	1
Greek • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5304	1

Keyboard - preferred pro fullsize	FRU #	CRU
Greek/US • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5305	1
Hebrew • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5306	1
Hungarian • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5307	1
Iceland • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5308	1
Italy • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5309	1
Japanese • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO B7J B8J B9J D1J • MT 1995: CTO	41A5310	1
Korean • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	41A5311	1

Keyboard - preferred pro fullsize	FRU #	CRU
LA Spanish • MT 1982: CTO A4S A5S • MT 1983: CTO • MT 1990: CTO A6S B6S • MT 1995: CTO A1S	41A5312	1
Norwegian • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5313	1
Polish • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5314	1
Portuguese • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5315	1
Romanian • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5317	1
Romanian • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5316	1
Russian/Cyrillic • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5318	1

Keyboard - preferred pro fullsize	FRU #	CRU
Serbian/Cyrillic • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5319	1
Slovak • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5320	1
Spanish • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5321	1
Swedish/Finnish • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5322	1
Swiss French/German • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5323	1
Thailand • MT 1982: CTO A1T A2T A3T B5T • MT 1983: CTO • MT 1990: CTO A3T A4T A5T B5T • MT 1995: CTO	41A5324	1
Turkish • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5325	1

Keyboard - preferred pro fullsize	FRU #	CRU
Turkish • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5326	1
UK English • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5327	1
US European • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5328	1
Slovenian • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	41A5329	1
Arabic (new) • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	45J4880	1
Lithuanian • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A7G D2G • MT 1995: CTO	45J4896	1

Keyboard - preferred pro fullsize	FRU #	CRU
Estonia - MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G - MT 1983: CTO - MT 1990: CTO A7G D2G - MT 1995: CTO	51J0059	1
India - MT 1982: CTO B3Q B4Q - MT 1983: CTO - MT 1990: CTO A8Q A9Q - MT 1995: CTO	54Y8381	1

Keyboard - fingerprint	FRU #	CRU
US English China - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	03X8001	1
Arabic - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	03X8002	1
Arabic/French - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	03X8003	1
Belgium French - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	03X8004	1
Belgium English - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	03X8005	1

Keyboard - fingerprint	FRU #	CRU
Brazilian Portuguese • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8006	1
Bulgarian • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8007	1
Chinese/US • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8008	1
Czech (ABB) • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8009	1
Danish • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8010	1
Dutch • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8011	1
French • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8012	1
French Canadian • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8013	1

Keyboard - fingerprint	FRU #	CRU
French Canadian • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8014	1
German • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8015	1
Greek • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO •	03X8016	1
Greek/US • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8017	1
Hebrew • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8018	1
Hungarian • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8019	1
Iceland • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8020	1
Italy • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8021	1

Keyboard - fingerprint	FRU #	CRU
Japanese • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8022	1
Korean • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8023	1
LA Spanish • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8024	1
Norwegian • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8025	1
Polish • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8026	1
Portuguese • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8027	1
Romanian • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8038	1
Romanian • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8039	1

Keyboard - fingerprint	FRU #	CRU
Russian/Cyrillic • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8028	1
Serbian/Cyrillic • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8040	1
Slovak • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8029	1
Spanish • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8030	1
Swedish/Finnish • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8031	1
Swiss French/German • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8032	1
Thailand • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8033	1
Turkish • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03X8041	1

Keyboard - fingerprint	FRU #	CRU
Turkish - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	03X8034	1
UK English - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	03X8035	1
US European - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	03X8036	1
Slovenian - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	03X8037	1

Mice	FRU #	CRU
Lenovo enhanced optical USB mouse - MT 1982: CTO A1A A1T A2A A2T A3A A3T A4U A4F A4S A5U A5F A5S A6G A7G A8G A9G B1G B2G B3Q B4Q B5A B5T B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G - MT 1983: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J - MT 1990: CTO A1H A2H A6U A6F A6S A7G A8Q A9Q B1V B2V B3V B4V B5A B5T B6U B6F B6S B7J B8J B9J D1J D2G D3V D4V D5V D6V D7V - MT 1995: CTO A1U A1F A1S	45J4889	1
Optical wheel mouse PS/2 - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	51J0061	1

Adapters and miscellaneous FRUs

Adapters and miscellaneous FRUs	FRU #	CRU
HD6450 DVI+DP ATX • MT 1982: CTO A9G B1G B2G B3Q B5A B5T D3G D4G D8G • MT 1983: CTO • MT 1990: CTO D7V • MT 1995: CTO	03T8148	2
DVI_I(M)-VGA(F) adapter • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	54Y8255	2
HD5450 DVI+DP ATX • MT 1982: CTO A3A A3T A8G D1G D2G • MT 1983: CTO • MT 1990: CTO A4A A4T A7G • MT 1995: CTO	89Y6151	2
NVIDIA QUADRO NVS300 512MB 64BIT DMS59 ATX • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03T8152	2
DMS59 to dual DVI dongle • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	41X6398	2
Modem phone cable • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	39K5120	2
PCIE IEEE 1394 firewire adapter (ATX) • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	89Y1712	2

Adapters and miscellaneous FRUs	FRU #	CRU
BTL external speaker • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	41A5334	2
Speaker power brick • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	89P8571	2
Liteon Concorde PCIE modem HP • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	03T8151	2
DP to DVI dongle 200mm • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO B7J B8J B9J D1J • MT 1995: CTO	43N9160	2

Power Cords

Power Cords --primary	FRU #	CRU
Line cord-US, (Thailand) • MT 1982: CTO A1A A1T A2A A2T A3A A3T A4U A4F A4S A5U A5F A5S B5A B5T • MT 1983: CTO A1U A1F A1S A1L A1D A1A A1T • MT 1990: CTO A3A A3T A4A A4T A5A A5T A6U A6F A6S B5A B5T B6U B6F B6S • MT 1995: CTO A1U A1F A1S	41R3184	1
Line cord-China • MT 1982: CTO • MT 1983: CTO A1C • MT 1990: CTO • MT 1995: CTO	41R3256	1
Line cord-Japan • MT 1982: CTO • MT 1983: CTO A1E A1J • MT 1990: CTO B7J B8J B9J D1J • MT 1995: CTO	41R3248	1

Power Cords --primary	FRU #	CRU
Line cord-Brazil • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	45J9595	1
Line cord-Latin America (high voltage) Argentina, Paraguay and Uruguay • MT 1982: CTO • MT 1983: CTO A1Y A1L • MT 1990: CTO • MT 1995: CTO	41R3176	1
Line cord-Australia, New Zealand • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	41R3196	1
Line cord-Korea • MT 1982: CTO • MT 1983: CTO A1K A1R • MT 1990: CTO • MT 1995: CTO	41R3260	1
Line cord-Hong Kong, Singapore, Malaysia, Brunei • MT 1982: CTO A1A A2A A3A A6G A7G A8G A9G B1G B2G B5A B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A1H A2H A3A A4A A5A A7G B5A D2G • MT 1995: CTO	41R3224	1
Line cord-Taiwan • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO B1V B2V B3V B4V D3V D4V D5V D6V D7V • MT 1995: CTO	41R3278	1
Line cord-Italy • MT 1982: CTO A4S A5S A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A6S A7G B6S D2G • MT 1995: CTO	41R3232	1
Line cord-Indonesia, Laos, Cambodia and Vietnam • MT 1982: CTO • MT 1983: CTO A1G A1A A1B A1H • MT 1990: CTO • MT 1995: CTO	41R3208	1

Power Cords --primary	FRU #	CRU
Line cord-Denmark • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO A1G • MT 1990: CTO A7G D2G • MT 1995: CTO	41R3212	1
Line cord-Switzerland • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO A1G • MT 1990: CTO A7G D2G • MT 1995: CTO	41R3228	1
Line cord-Israel • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO A1G • MT 1990: CTO A7G D2G • MT 1995: CTO	41R3236	1
Line cord-South Africa • MT 1982: CTO A1A A2A A3A A6G A7G A8G A9G B1G B2G B5A B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO A1G A1A • MT 1990: CTO A3A A4A A5A A7G B5A D2G • MT 1995: CTO	41R3220	1
Line cord-India • MT 1982: CTO B3Q B4Q • MT 1983: CTO A1Q • MT 1990: CTO A8Q A9Q • MT 1995: CTO	41R3341	1
Line cord-Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden • MT 1982: CTO A1A A2A A3A B5A • MT 1983: CTO A1A • MT 1990: CTO A3A A4A A5A B5A • MT 1995: CTO	41R3208	1

Power Cords --primary	FRU #	CRU
Line cord-UK, Ireland • MT 1982: CTO • MT 1983: CTO A1G A1A • MT 1990: CTO • MT 1995: CTO	41R3224	1
Line cord-Thailand • MT 1982: CTO B5T • MT 1983: CTO A1T • MT 1990: CTO B5T • MT 1995: CTO	43N9029	1

Power Cords --secondary	FRU #	CRU
Line cord-US, (Thailand) • MT 1982: CTO A1A A1T A2A A2T A3A A3T A4U A4F A4S A5U A5F A5S B5A B5T • MT 1983: CTO A1U A1F A1S A1L A1D A1A A1T • MT 1990: CTO A3A A3T A4A A4T A5A A5T A6U A6F A6S B5A B5T B6U B6F B6S • MT 1995: CTO A1U A1F A1S	41R3185	1
Line cord-China • MT 1982: CTO • MT 1983: CTO A1C • MT 1990: CTO • MT 1995: CTO	41R3257	1
Line cord-Japan • MT 1982: CTO • MT 1983: CTO A1E A1J • MT 1990: CTO B7J B8J B9J D1J • MT 1995: CTO	41R3249	1
Line cord-Brazil • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	41R3271	1
Line cord-Latin America (high voltage) Argentina, Paraguay and Uruguay • MT 1982: CTO • MT 1983: CTO A1Y A1L • MT 1990: CTO • MT 1995: CTO	41R3177	1

Power Cords --secondary	FRU #	CRU
Line cord-Australia, New Zealand • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	41R3197	1
Line cord-Korea • MT 1982: CTO • MT 1983: CTO A1K A1R • MT 1990: CTO • MT 1995: CTO	41R3261	1
Line cord-Hong Kong, Singapore, Malaysia, Brunei • MT 1982: CTO A1A A2A A3A A6G A7G A8G A9G B1G B2G B5A B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A1H A2H A3A A4A A5A A7G B5A D2G • MT 1995: CTO	41R3225	1
Line cord-Taiwan • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO B1V B2V B3V B4V D3V D4V D5V D6V D7V • MT 1995: CTO	41R3279	1
Line cord-Italy • MT 1982: CTO A4S A5S A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO • MT 1990: CTO A6S A7G B6S D2G • MT 1995: CTO	41R3233	1
Line cord-Indonesia, Laos, Cambodia and Vietnam • MT 1982: CTO • MT 1983: CTO A1G A1A A1B A1H • MT 1990: CTO • MT 1995: CTO	41R3209	1
Line cord-Denmark • MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G • MT 1983: CTO A1G • MT 1990: CTO A7G D2G • MT 1995: CTO	41R3213	1

Power Cords --secondary	FRU #	CRU
Line cord-Switzerland - MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	41R3229	1
Line cord-Israel - MT 1982: CTO A6G A7G A8G A9G B1G B2G B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	41R3237	1
Line cord-South Africa - MT 1982: CTO A1A A2A A3A A6G A7G A8G A9G B1G B2G B5A B6G B7G B8G B9G D1G D2G D3G D4G D5G D6G D7G D8G - MT 1983: CTO A1G A1A - MT 1990: CTO A3A A4A A5A A7G B5A D2G - MT 1995: CTO	41R3221	1
Line cord-India - MT 1982: CTO B3Q B4Q - MT 1983: CTO A1Q - MT 1990: CTO A8Q A9Q - MT 1995: CTO	41R3175	1
Line cord-Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden - MT 1982: CTO A1A A2A A3A B5A - MT 1983: CTO A1A - MT 1990: CTO A3A A4A A5A B5A - MT 1995: CTO	41R3209	1
Line cord-UK, Ireland - MT 1982: CTO - MT 1983: CTO A1G A1A - MT 1990: CTO - MT 1995: CTO	41R3225	1
Line cord-Thailand - MT 1982: CTO B5T - MT 1983: CTO A1T - MT 1990: CTO B5T - MT 1995: CTO	43N9030	1

Recovery discs

Windows 7 Home Basic 32 Recovery CD

Windows 7 Home Basic 32 Recovery CD	FRU #	CRU
English • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Spanish • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Brazilian Portuguese • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1

Windows 7 Home Premium 32 Recovery CD

Windows 7 Home Premium 32 Recovery CD	FRU #	CRU
English • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Chinese-Traditional (Hong Kong) • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Japanese • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1

Windows 7 Home Premium 32 Recovery CD	FRU #	CRU
Spanish • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
French • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Italian • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
German • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
C&L EMEA (EN FR GR IT NL) • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
C&L Nordics (EN DK FI NO SV) • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Chinese-Traditional (Taiwan) • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Russian • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1

Windows 7 Home Premium 32 Recovery CD	FRU #	CRU
Korean • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Hebrew • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Portuguese • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1

Windows 7 Home Premium 64 Recovery CD

Windows 7 Home Premium 64 Recovery CD	FRU #	CRU
English • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
French • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1

Windows 7 Professional 32 Recovery CD

Windows 7 Professional 32 Recovery CD	FRU #	CRU
English • MT 1982: CTO A1A A1T A2A A2T A3A A3T B1G B3Q B5A B5T B6G B8G D1G D3G D5G D6G D7G D8G • MT 1983: CTO A1U A1F A1L A1G A1Q A1A A1H A1R A1E • MT 1990: CTO A1H A2H A3A A3T A4A A4T A5A A5T A7G A8Q B5A B5T D2G • MT 1995: CTO	TBD	1
Chinese-Traditional (Hong Kong) • MT 1982: CTO • MT 1983: CTO A1B • MT 1990: CTO	TBD	1

Windows 7 Professional 32 Recovery CD	FRU #	CRU
MT 1995: CTO		
Japanese - MT 1982: CTO - MT 1983: CTO A1J - MT 1990: CTO B9J D1J - MT 1995: CTO	TBD	1
Spanish - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1
French - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G A1F - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1
Italian - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1
Brazilian Portuguese - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	TBD	1
German - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1
C&L EMEA (EN FR GR IT NL) - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1
C&L Nordics (EN DK FI NO SV) - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1

Windows 7 Professional 32 Recovery CD	FRU #	CRU
Arabic - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1
Chinese-Simplified - MT 1982: CTO - MT 1983: CTO A1C - MT 1990: CTO - MT 1995: CTO	TBD	1
Chinese-Traditional (Taiwan) - MT 1982: CTO - MT 1983: CTO A1V - MT 1990: CTO B1V B2V B3V B4V D3V D4V D5V D6V D7V - MT 1995: CTO	TBD	1
Russian - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1
Polish - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1
Korean - MT 1982: CTO - MT 1983: CTO A1K - MT 1990: CTO - MT 1995: CTO	TBD	1
Hebrew - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1
Greek - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1

Windows 7 Professional 32 Recovery CD	FRU #	CRU
Turkish • MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G • MT 1983: CTO A1G • MT 1990: CTO A7G D2G • MT 1995: CTO	TBD	1
Slovenian • MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G • MT 1983: CTO A1G • MT 1990: CTO A7G D2G • MT 1995: CTO	TBD	1
Romanian • MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G • MT 1983: CTO A1G • MT 1990: CTO A7G D2G • MT 1995: CTO	TBD	1
Hungarian • MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G • MT 1983: CTO A1G • MT 1990: CTO A7G D2G • MT 1995: CTO	TBD	1
Czech • MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G • MT 1983: CTO A1G • MT 1990: CTO A7G D2G • MT 1995: CTO	TBD	1
Slovakian • MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G • MT 1983: CTO A1G • MT 1990: CTO A7G D2G • MT 1995: CTO	TBD	1
Serbian-Latin • MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G • MT 1983: CTO A1G • MT 1990: CTO A7G D2G • MT 1995: CTO	TBD	1

Windows 7 Professional 32 Recovery CD	FRU #	CRU
Portuguese - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1
English for Russia - MT 1982: CTO B1G B6G B8G D1G D3G D5G D6G D7G D8G - MT 1983: CTO A1G - MT 1990: CTO A7G D2G - MT 1995: CTO	TBD	1

Windows 7 Professional 64 Recovery CD

Windows 7 Professional 64 Recovery CD	FRU #	CRU
English - MT 1982: CTO A4U A5U A6G A7G A8G A9G B2G B7G B9G D2G D4G - MT 1983: CTO - MT 1990: CTO A6U B6U - MT 1995: CTO A1U	TBD	1
Chinese-Traditional (Hong Kong) - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	TBD	1
Japanese - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO B7J B8J - MT 1995: CTO	TBD	1
Spanish - MT 1982: CTO A6G A7G A8G A9G B2G B7G B9G D2G D4G - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	TBD	1
French - MT 1982: CTO A4F A5F A6G A7G A8G A9G B2G B7G B9G D2G D4G - MT 1983: CTO - MT 1990: CTO A6F B6F - MT 1995: CTO A1F	TBD	1

Windows 7 Professional 64 Recovery CD	FRU #	CRU
Italian • MT 1982: CTO A6G A7G A8G A9G B2G B7G B9G D2G D4G • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Brazilian Portuguese • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
German • MT 1982: CTO A6G A7G A8G A9G B2G B7G B9G D2G D4G • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
C&L EMEA (EN FR GR IT NL) • MT 1982: CTO A6G A7G A8G A9G B2G B7G B9G D2G D4G • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
C&L Nordics (EN DK FI NO SV) • MT 1982: CTO A6G A7G A8G A9G B2G B7G B9G D2G D4G • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Chinese-Traditional (Taiwan) • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1
Korean • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1

Windows 7 Professional 64 Recovery CD	FRU #	CRU
Hebrew - MT 1982: CTO A6G A7G A8G A9G B2G B7G B9G D2G D4G - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	TBD	1
Portuguese - MT 1982: CTO A6G A7G A8G A9G B2G B7G B9G D2G D4G - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	TBD	1

Windows 7 Ultimate 32 Recovery CD

Windows 7 Ultimate 32 Recovery CD	FRU #	CRU
English - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	TBD	1

Windows 7 Ultimate 64 Recovery CD

Windows 7 Ultimate 64 Recovery CD	FRU #	CRU
English - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	TBD	1

Windows XP Professional 32 Recovery CD

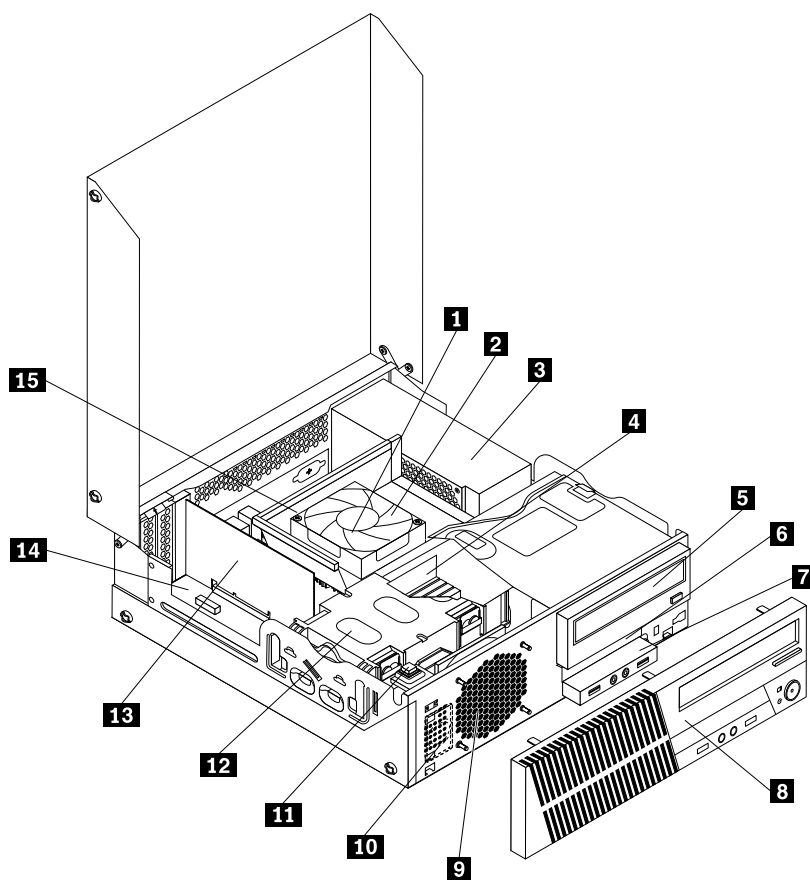
Windows XP Professional 32 Recovery CD	FRU #	CRU
English - MT 1982: CTO - MT 1983: CTO - MT 1990: CTO - MT 1995: CTO	TBD	1

Windows Vista Business 32 Recovery CD

Windows Vista Business 32 Recovery CD	FRU #	CRU
English • MT 1982: CTO • MT 1983: CTO • MT 1990: CTO • MT 1995: CTO	TBD	1

Overall: MT 1996, 1997, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227

The following replaceable components are available for the 1996, 1997, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227 machine type models.



Item #	FRUs	FRU #	CRU
2	Microprocessor, AMD Sempron 180/1/AM3/45 C3 microprocessor • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T7054	2
2	Microprocessor, Sempron 150 (2.9GHz, 1M total cache, AM3, 45W) C3 45nm • MT 1996: CTO A4G B5G • MT 1997: CTO • MT 2010: CTO A3J A4J • MT 2209: CTO A8V B6J B7J • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T6023	2
2	Microprocessor, Athlon II X2 B24 (3.0GHz, 2M total cache, AM3, 65W) C3 45nm • MT 1996: CTO A2U A2F A2S A5G A6G B1Q B6G • MT 1997: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J • MT 2010: CTO • MT 2209: CTO A1H A4U A4F A4S A6A A6Q A6T A7Q A9H A9V A6G B8V • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	71Y5431	2
2	Microprocessor, Athlon II X2 B26 (3.2GHz, 2M total cache, AM3, 65W) C3 45nm • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T7014	2
2	Microprocessor, Athlon II X2 255 (3.1GHz, 2M total cache, AM3, 65W) C3 45nm • MT 1996: CTO B3Q • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T7015	2

Item #	FRUs	FRU #	CRU
2	Microprocessor, Athlon II X2 260 (3.2GHz, 2M total cache, AM3, 65W) C3 45nm • MT 1996: CTO D1G D2G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO D1V • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T7016	2
2	Microprocessor, Athlon II X2 220 (2.8GHz, 1MB total cache, AM3 65W) C3 45nm • MT 1996: CTO B8G B9G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T7043	2
2	Microprocessor, Athlon II X4 645(3.1GHz, 2MB total cache, AM3, 95W) C3 45nm • MT 1996: CTO B4A B4T D3G D4G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO B2A B2T B3U B3F B3S D2V D3V • MT 2227: CTO A1U A1F A1S • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T6229	2
2	Microprocessor, Phenom II X4 B97 (3.2GHz, 8M total cache, AM3, 95W) C3 45nm • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T7023	2
2	Microprocessor, Phenom II X2 B53 (2.8GHz, 7M total cache, AM3, 80W) C3 45nm • MT 1996: CTO A1A A1T A3U A3F A3S A7G A8G B7G D5G • MT 1997: CTO • MT 2010: CTO A1J A2J • MT 2209: CTO A3A A3T B1V B4J B5J B9V • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	2

Item #	FRUs	FRU #	CRU
3	Power supply assembly, TFX 240W active PFC power supply for 11L---all countries • MT 1996: CTO A1A A1T A2U A2F A2S A3U A3F A3S A4G A5G A6G A7G A8G A9G B1Q B2Q B3Q B4A B4T B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J • MT 2010: CTO A1J A2J A3J A4J • MT 2209: CTO A1H A2A A2T A3A A3T A4U A4F A4S A5G A6A A6Q A6T A7Q A8V A9H A9V B1V A6G B2A B2T B3U B3F B3S B4J B5J B6J B7J B8V B9V D1V D2V D3V • MT 2227: CTO A1U A1F A1S • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y8846	2
3	Power supply assembly, TFX 240W 85+ power supply for 11L---all countries • MT 1996: CTO A1A A1T A2U A2F A2S A3U A3F A3S A4G A5G A6G A7G A8G A9G B1Q B2Q B3Q B4A B4T B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J • MT 2010: CTO A1J A2J A3J A4J • MT 2209: CTO A1H A2A A2T A3A A3T A4U A4F A4S A5G A6A A6Q A6T A7Q A8V A9H A9V B1V A6G B2A B2T B3U B3F B3S B4J B5J B6J B7J B8V B9V D1V D2V D3V • MT 2227: CTO A1U A1F A1S • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y8824	2
4	Memory modules, 2GB PC3-10600 1333MHz DDR3 UDIMM • MT 1996: CTO A1A A1T A2U A2F A2S A4G B1Q B2Q B3Q B4A B4T B5G B6G B8G B9G D1G D2G D5G • MT 1997: CTO • MT 2010: CTO A1J A2J A3J A4J • MT 2209: CTO A1H A2A A2T A3A A3T A4U A4F A4S A5G A6A A6Q A6T A7Q A8V A9H A9V B1V A6G B2A B2T B4J B5J B6J B7J B8V B9V D1V D2V D3V • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	64Y6649	1
4	Memory modules, 4GB PC3-10600 1333MHz DDR3 UDIMM • MT 1996: CTO A3U A3F A3S A5G A6G A7G A8G A9G B7G D3G D4G • MT 1997: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J • MT 2010: CTO • MT 2209: CTO B3U B3F B3S • MT 2227: CTO A1U A1F A1S • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	89Y9224	1

Item #	FRUs	FRU #	CRU
5	Optical drive, DVD-ROM drive - 16x/48x - SATA (with DVD PB SW or W/O SW) • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO A2J A4J • MT 2209: CTO A8V A9H A9V B5J B7J • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	71Y5543	2
5	Optical drive, DVD recorder rambo 8 - SATA 12XRAM write (with DVD PB SW or W/O SW) • MT 1996: CTO A1A A1T A2U A2F A2S A3U A3F A3S A4G A5G A6G A7G A8G A9G B1Q B2Q B3Q B4A B4T B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J • MT 2010: CTO A1J A3J • MT 2209: CTO A1H A4U A4F A4S A5G A6A A6Q A6T A7Q B1V A6G B2A B2T B3U B3F B3S B4J B6J B8V B9V D1V D2V D3V • MT 2227: CTO A1U A1F A1S • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	71Y5545	2
6	USB 2.0 media card reader, 25 in 1, ROHS, slim • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	46R1529	2
11	Hard disk drive, SATAIII 250GB 7200RPM/6Gb/16M • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO A3J A4J • MT 2209: CTO A3A A3T B6J B7J • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T7039	1
11	Hard disk drive, SATAIII 320GB 7200RPM/6Gb/16M • MT 1996: CTO A1A A1T A2U A2F A2S A4G A5G A9G B1Q B2Q B3Q B4A B4T B5G B6G B8G B9G • MT 1997: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J • MT 2010: CTO A1J A2J • MT 2209: CTO A2A A2T A4U A4F A4S A5G A6A A6Q A6T A8V A6G B2A B2T B4J B5J • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T7040	1

Item #	FRUs	FRU #	CRU
11	Hard disk drive, SATAIII 500GB 7200RPM/6Gb/16M - MT 1996: CTO A3U A3F A3S A6G A7G A8G B7G D1G D2G D3G D4G D5G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO A1H A7Q A9H A9V B1V B3U B3F B3S B8V B9V D1V D2V D3V - MT 2227: CTO A1U A1F A1S - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T7041	1
11	Hard disk drive, SATAIII 1TB 7200RPM/6Gb/32M - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T7042	1
11	Hard disk drive, 2.5" SATA INT Postville refresh 160G solid state drive - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	45K0616	1
13	System board, AMD 980G mATX GA (4 DIMMs/TPM) WW - MT 1996: CTO A1A A1T A2U A2F A2S A3U A3F A3S A4G A5G A6G A7G A8G A9G B1Q B2Q B3Q B4A B4T B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G - MT 1997: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J - MT 2010: CTO A1J A2J A3J A4J - MT 2209: CTO A1H A2A A2T A3A A3T A4U A4F A4S A5G A6A A6Q A6T A7Q A8V A9H A9V B1V A6G B2A B2T B3U B3F B3S B4J B5J B6J B7J B8V B9V D1V D2V D3V - MT 2227: CTO A1U A1F A1S - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T6227	N

Mechanical FRUs

The FRUs listed in the following tables are not illustrated.

FRUs	FRU #	CRU
Battery, 3V-lithium - MT 1996: CTO A1A A1T A2U A2F A2S A3U A3F A3S A4G A5G A6G A7G A8G A9G B1Q B2Q B3Q B4A B4T B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G - MT 1997: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J - MT 2010: CTO A1J A2J A3J A4J - MT 2209: CTO A1H A2A A2T A3A A3T A4U A4F A4S A5G A6A A6Q A6T A7Q A8V A9H A9V B1V A6G B2A B2T B3U B3F B3S B4J B5J B6J B7J B8V B9V D1V D2V D3V - MT 2227: CTO A1U A1F A1S - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	45C1566	1
Temperature sense cable 400mm _6 pin (with holder) - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y9922	2
Front I_O cable_R (11L_A495_U390) - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y9910	2
SATA cable 400mm, angel, 1 latching - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y9941	2
SATA cable 400mm, angel, 1 latching - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y9942	2

FRUs	FRU #	CRU
LED/switch cable (11L_420mm) • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y9916	2
System fan- for 11L (included in mechanical kit) • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	45K6530	1
Cabel -SATA for 1st optical drive or 2nd hard disk drive 420mm with 2 latch • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y9948	2
323BT optical bezel assembly • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9596	1
Optical drive retainer, 607DT • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9597	2

FRUs	FRU #	CRU
Non card reader bezel kit - 323BT - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9601	2
400mm 40*28.5 internal speaker cable - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y8252	2
No optical bezel kit (include bezel + EMC shield) - 323BT - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9598	1
Card reader bracket assembly - Foxconn - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9599	1
Card reader bezel, 323BT - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9600	1

FRUs	FRU #	CRU
Second serial port cable 250mm (with level shift IC) • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	71Y6217	2
Assembly bracket for CII switch • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9595	1
C2 intrusion switch (475mm) • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	39K5022	2
Parallel cable, LP, 280mm_R • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	45J9598	2
PS/2 cable (170mm) • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	43N9149	2

FRUs	FRU #	CRU
Rear USB cable_R_200mm_LP - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	42Y8006	2
Vertical air deflector (Japan only) - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9604	1
Vertical stand - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9605	1
AMD AM2/AM3 65W cooler kit for AMD 65W 45W microprocessor - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	45K6550	1
Fan duct for AMD 65W 45W microprocessor/95W 80W microprocessor - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9525	1

FRUs	FRU #	CRU
Cooler kit to cover 95W 80W microprocessor, no fan grill - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	43N9934	1
ShinEtsu 7783D;1g syringe - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	91P8835	1
2.5 hard disk drive to 3.5 hard disk drive conversion kit, EC for 5.25 bay no bezel, - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	43N9593	1
Mechanical kit - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9585	2
Mechanical chassis without front bezel - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9586	2

FRUs	FRU #	CRU
Front bezel • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9587	2
Hard disk drive tray assembly • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9588	2
Optical drive cage assembly • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9589	2
IO plate assembly • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	43N9846	2
Top cover assembly • MT 1996: all models • MT 1997: all models • MT 2010: all models • MT 2209: all models • MT 2227: all models • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9591	2

FRUs	FRU #	CRU
Cable lock - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9593	2
Vertical rubber foot assembly - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9594	2
Slim optical drive bracket with bezel assembly - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9602	2
Second hard disk drive bracket with bezel assembly - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9603	2
Universal 2nd hard disk drive bezel - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9608	2

FRUs	FRU #	CRU
Vertical stand, 322 SFF 11L - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	45K6566	2
Open button - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9606	2
Cable clip assembly - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9607	2
Bottom assembly - MT 1996: all models - MT 1997: all models - MT 2010: all models - MT 2209: all models - MT 2227: all models - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T9592	2

Keyboard and Mouse

Keyboard - preferred pro PS/2	FRU #	CRU
US English - MT 1996: CTO - MT 1997: CTO A1U A1F A1L A1Q A1A A1H A1R A1E - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5039	1
Arabic - MT 1996: CTO - MT 1997: CTO A1G	41A5040	1

Keyboard - preferred pro PS/2	FRU #	CRU
• MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB		
Arabic/French • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5041	1
Belgium French • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5042	1
Belgium English • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5043	1
Brazilian Portuguese • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5044	1
Bulgarian • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5045	1

Keyboard - preferred pro PS/2	FRU #	CRU
Chinese/US • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5046	1
Czech (ABB) • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5047	1
Danish • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5048	1
Dutch • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5049	1
French • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5050	1

Keyboard - preferred pro PS/2	FRU #	CRU
French Canadian • MT 1996: CTO • MT 1997: CTO A1F • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5051	1
French Canadian • MT 1996: CTO • MT 1997: CTO A1F • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5052	1
German • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5053	1
Greek • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5054	1
Greek/US • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5080	1

Keyboard - preferred pro PS/2	FRU #	CRU
Hebrew • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5055	1
Hungarian • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5056	1
Iceland • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5057	1
Italy • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5058	1
Japanese • MT 1996: CTO • MT 1997: CTO A1J • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5059	1

Keyboard - preferred pro PS/2	FRU #	CRU
Korean • MT 1996: CTO • MT 1997: CTO A1K • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5060	1
LA Spanish • MT 1996: CTO • MT 1997: CTO A1S A1D A1Y • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5061	1
Norwegian • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5062	1
Polish • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5063	1
Portuguese • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5064	1

Keyboard - preferred pro PS/2	FRU #	CRU
Romanian • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5065	1
Russian/Cyrillic • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5066	1
Serbian/Cyrillic • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5067	1
Slovak • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5068	1
Spanish • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5069	1

Keyboard - preferred pro PS/2	FRU #	CRU
Swedish/Finnish • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5070	1
Swiss French/German • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5071	1
Thailand • MT 1996: CTO • MT 1997: CTO A1T • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5072	1
Turkish • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5073	1
Turkish • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5074	1

Keyboard - preferred pro PS/2	FRU #	CRU
UK English • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5075	1
US European • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5076	1
Slovenian • MT 1996: CTO • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5077	1
India • MT 1996: CTO • MT 1997: CTO A1Q • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y8382	1

Keyboard - preferred pro fullsize	FRU #	CRU
US English/Chinese-Simplified • MT 1996: CTO A1A A2U A3U B1Q B2Q B3Q B4A • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A1H A2A A3A A4U A6A A6Q A7Q A9H B2A B3U • MT 2227: CTO A1U • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5289	1
Arabic • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO	41A5290	1

Keyboard - preferred pro fullsize	FRU #	CRU
• MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB		
Arabic/French • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5291	1
Belgium French • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5292	1
Belgium English • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5293	1
Brazilian Portuguese • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5294	1
Bulgarian • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5295	1

Keyboard - preferred pro fullsize	FRU #	CRU
Chinese/US • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A8V A9V B1V B8V B9V D1V D2V D3V • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5296	1
Czech (ABB) • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5297	1
Danish • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5298	1
Dutch • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5299	1
French • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5300	1

Keyboard - preferred pro fullsize	FRU #	CRU
French Canadian • MT 1996: CTO A2F A3F • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A4F B3F • MT 2227: CTO A1F • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5301	1
French Canadian • MT 1996: CTO A2F A3F • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A4F B3F • MT 2227: CTO A1F • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5302	1
German • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5303	1
Greek • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5304	1
Greek/US • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5305	1

Keyboard - preferred pro fullsize	FRU #	CRU
Hebrew - MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5306	1
Hungarian - MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5307	1
Iceland - MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5308	1
Italy - MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5309	1
Japanese - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO A1J A2J A3J A4J - MT 2209: CTO B4J B5J B6J B7J - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5310	1

Keyboard - preferred pro fullsize	FRU #	CRU
Korean • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5311	1
LA Spanish • MT 1996: CTO A2S A3S • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A4S B3S • MT 2227: CTO A1S • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5312	1
Norwegian • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5313	1
Polish • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5314	1
Portuguese • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5315	1

Keyboard - preferred pro fullsize	FRU #	CRU
Romanian • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5317	1
Romanian • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5316	1
Russian/Cyrillic • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5318	1
Serbian/Cyrillic • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5319	1
Slovak • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5320	1

Keyboard - preferred pro fullsize	FRU #	CRU
Spanish • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5321	1
Swedish/Finnish • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5322	1
Swiss French/German • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5323	1
Thailand • MT 1996: CTO A1T B4T • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A2T A3T A6T B2T • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5324	1
Turkish • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5325	1

Keyboard - preferred pro fullsize	FRU #	CRU
Turkish • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5326	1
UK English • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5327	1
US European • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5328	1
Slovenian • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5329	1
Arabic (New) • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	45J4880	1

Keyboard - preferred pro fullsize	FRU #	CRU
Lithuanian - MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	45J4896	1
Estonia - MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	51J0059	1
India - MT 1996: CTO B1Q B2Q B3Q - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO A6Q A7Q - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y8381	1

Keyboard - fingerprint	FRU #	CRU
US English China - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8001	1
Arabic - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8002	1

Keyboard - fingerprint	FRU #	CRU
Arabic/French • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8003	1
Belgium French • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8004	1
Belgium English • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8005	1
Brazilian Portuguese • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8006	1
Bulgarian • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8007	1

Keyboard - fingerprint	FRU #	CRU
Chinese/US • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8008	1
Czech (ABB) • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8009	1
Danish • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8010	1
Dutch • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8011	1
French • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8012	1

Keyboard - fingerprint	FRU #	CRU
French Canadian • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8013	1
French Canadian • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8014	1
German • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8015	1
Greek • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8016	1
Greek/US • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8017	1

Keyboard - fingerprint	FRU #	CRU
Hebrew • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8018	1
Hungarian • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8019	1
Iceland • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8020	1
Italy • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8021	1
Japanese • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8022	1

Keyboard - fingerprint	FRU #	CRU
Korean • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8023	1
LA Spanish • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8024	1
Norwegian • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8025	1
Polish • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8026	1
Portuguese • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8027	1

Keyboard - fingerprint	FRU #	CRU
Romanian • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8038	1
Romanian • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8039	1
Russian/Cyrillic • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8028	1
Serbian/Cyrillic • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8040	1
Slovak • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8029	1

Keyboard - fingerprint	FRU #	CRU
Spanish • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8030	1
Swedish/Finnish • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8031	1
Swiss French/German • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8032	1
Thailand • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8033	1
Turkish • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8041	1

Keyboard - fingerprint	FRU #	CRU
Turkish - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8034	1
UK English - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8035	1
US European - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8036	1
Slovenian - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03X8037	1

Mice	FRU #	CRU
Lenovo enhanced optical USB mouse - MT 1996: CTO A1A A1T A2U A2F A2S A3U A3F A3S A4G A5G A6G A7G A8G A9G B1Q B2Q B3Q B4A B4T B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G - MT 1997: CTO A1U A1F A1S A1L A1D A1Y A1G A1Q A1A A1T A1C A1B A1H A1V A1K A1R A1E A1J - MT 2010: CTO A1J A2J A3J A4J - MT 2209: CTO A1H A2A A2T A3A A3T A4U A4F A4S A5G A6A A6Q A6T A7Q A8V A9H A9V B1V A6G B2A B2T B3U B3F B3S B4J B5J B6J B7J B8V B9V D1V D2V D3V - MT 2227: CTO A1U A1F A1S - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	45J4889	1
Optical wheel mouse PS/2 - MT 1996: CTO - MT 1997: CTO	51J0061	1

Mice	FRU #	CRU
- MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB		

Adapters and miscellaneous FRUs

Adapters and miscellaneous FRUs	FRU #	CRU
HD6450 DVI+DP LP - MT 1996: CTO A7G A8G A9G D3G D4G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO D3V - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T8149	2
DVI_I(M)-VGA(F) adapter - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	54Y8255	2
HD5450 DVI+DP LP - MT 1996: CTO A6G B4A B4T B7G D5G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO A2A A2T - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	89Y6152	2
DP to DVI dongle 200mm - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO B4J B5J B6J B7J - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	43N9160	2

Adapters and miscellaneous FRUs	FRU #	CRU
Modem phone cable • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	39K5120	2
PCI-E IEEE 1394 firewire adapter (LP) • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	89Y1712	2
BTL external speaker • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41A5334	2
Speaker power brick • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	89P8571	2
Liteon Concorde PCIE modem LP • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	03T8150	2

Power Cords

Power Cords --primary	FRU #	CRU
Line cord-US, (Thailand) • MT 1996: CTO A1A A1T A2U A2F A2S A3U A3F A3S B4A B4T • MT 1997: CTO A1U A1F A1S A1L A1D A1A A1T • MT 2010: CTO • MT 2209: CTO A2A A2T A3A A3T A4U A4F A4S A6A A6T A7Q B2A B2T B3U B3F B3S • MT 2227: CTO A1U A1F A1S • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3184	1
Line cord-China • MT 1996: CTO • MT 1997: CTO A1C • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3256	1
Line cord-Japan • MT 1996: CTO • MT 1997: CTO A1E A1J • MT 2010: CTO A1J A2J A3J A4J • MT 2209: CTO B4J B5J B6J B7J • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3248	1
Line cord-Brazil • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	45J9595	1
Line cord-Latin American (high voltage) Argentina, Paraguay and Uruguay • MT 1996: CTO • MT 1997: CTO A1Y A1L • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3176	1

Power Cords --primary	FRU #	CRU
Line cord-Australia, New Zealand • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3196	1
Line cord-Korea • MT 1996: CTO • MT 1997: CTO A1K A1R • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3260	1
Line cord-Hong Kong, Singapore, Malaysia, Brunei • MT 1996: CTO A1A A4G A5G A6G A7G A8G A9G B4A B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A1H A5G A9H A6G B2A • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3224	1
Line cord-Taiwan • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A8V A9V B1V B8V B9V D1V D2V D3V • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3278	1
Line cord-Italy • MT 1996: CTO A2S A3S A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A4S A5G A6G B3S • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3232	1

Power Cords --primary	FRU #	CRU
Line cord-Indonesia, Laos, Cambodia and Vietnam • MT 1996: CTO • MT 1997: CTO A1G A1A A1B A1H • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3208	1
Line cord-Denmark • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3212	1
Line cord-Switzerland • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3228	1
Line cord-Israel • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3236	1
Line cord-South Africa • MT 1996: CTO A1A A4G A5G A6G A7G A8G A9G B4A B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO A1G A1A • MT 2010: CTO • MT 2209: CTO A2A A3A A5G A6G B2A • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3220	1

Power Cords --primary	FRU #	CRU
Line cord-India - MT 1996: CTO B1Q B2Q B3Q - MT 1997: CTO A1Q - MT 2010: CTO - MT 2209: CTO A6Q - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3341	1
Line cord-Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden - MT 1996: CTO A1A B4A - MT 1997: CTO A1A - MT 2010: CTO - MT 2209: CTO A2A A3A B2A - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3208	1
Line cord-UK, Ireland - MT 1996: CTO B4A - MT 1997: CTO A1G A1A - MT 2010: CTO - MT 2209: CTO A2A A3A B2A - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3224	1
Line cord-Thailand - MT 1996: CTO B4T - MT 1997: CTO A1T - MT 2010: CTO - MT 2209: CTO B2T - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	43N9029	1
Power Cords --secondary	FRU #	CRU
Line cord-US, (Thailand) - MT 1996: CTO A1A A1T A2U A2F A2S A3U A3F A3S B4A B4T - MT 1997: CTO A1U A1F A1S A1L A1D A1A A1T - MT 2010: CTO - MT 2209: CTO A2A A2T A3A A3T A4U A4F A4S A6A A6T A7Q B2A B2T B3U B3F B3S - MT 2227: CTO A1U A1F A1S - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3185	1
Line cord-China - MT 1996: CTO - MT 1997: CTO A1C - MT 2010: CTO	41R3257	1

Power Cords --secondary	FRU #	CRU
• MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB		
Line cord-Japan • MT 1996: CTO • MT 1997: CTO A1E A1J • MT 2010: CTO A1J A2J A3J A4J • MT 2209: CTO B4J B5J B6J B7J • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3249	1
Line cord-Brazil • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3271	1
Line cord-Latin America (high voltage) Argentina, Paraguay and Uruguay • MT 1996: CTO • MT 1997: CTO A1Y A1L • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3177	1
Line cord-Australia, New Zealand • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3197	1
Line cord-Korea • MT 1996: CTO • MT 1997: CTO A1K A1R • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3261	1

Power Cords --secondary	FRU #	CRU
Line cord-Hong Kong, Singapore, Malaysia, Brunei • MT 1996: CTO A1A A4G A5G A6G A7G A8G A9G B4A B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A1H A5G A9H A6G B2A • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3225	1
Line cord-Taiwan • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A8V A9V B1V B8V B9V D1V D2V D3V • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3279	1
Line cord-Italy • MT 1996: CTO A2S A3S A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A4S A5G A6G B3S • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3233	1
Line cord-Indonesia, Laos, Cambodia and Vietnam • MT 1996: CTO • MT 1997: CTO A1G A1A A1B A1H • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3209	1
Line cord-Denmark • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3213	1

Power Cords --secondary	FRU #	CRU
Line cord-Switzerland • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3229	1
Line cord-Israel • MT 1996: CTO A4G A5G A6G A7G A8G A9G B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3237	1
Line cord-South Africa • MT 1996: CTO A1A A4G A5G A6G A7G A8G A9G B4A B5G B6G B7G B8G B9G D1G D2G D3G D4G D5G • MT 1997: CTO A1G A1A • MT 2010: CTO • MT 2209: CTO A2A A3A A5G A6G B2A • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3221	1
Line cord-India • MT 1996: CTO B1Q B2Q B3Q • MT 1997: CTO A1Q • MT 2010: CTO • MT 2209: CTO A6Q • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3175	1
Line cord-Austria, Belgium, Croatia, Czechoslovakia, Finland, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden • MT 1996: CTO A1A B4A • MT 1997: CTO A1A • MT 2010: CTO • MT 2209: CTO A2A A3A B2A • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3209	1

Power Cords --secondary	FRU #	CRU
Line cord-UK, Ireland • MT 1996: CTO B4A • MT 1997: CTO A1G A1A • MT 2010: CTO • MT 2209: CTO A2A A3A B2A • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	41R3225	1
Line cord-Thailand • MT 1996: CTO B4T • MT 1997: CTO A1T • MT 2010: CTO • MT 2209: CTO B2T • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	43N9030	1

Recovery discs

Windows 7 Home Basic 32 Recovery CD

Windows 7 Home Basic 32 Recovery CD	FRU #	CRU
English • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Spanish • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Brazilian Portuguese • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Home Premium 32 Recovery CD

Windows 7 Home Premium 32 Recovery CD	FRU #	CRU
English • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Chinese-Traditional (Hong Kong) • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Japanese • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Spanish • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
French • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Home Premium 32 Recovery CD	FRU #	CRU
Italian • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
German • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
C&L EMEA (EN FR GR IT NL) • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
C&L Nordics (EN DK FI NO SV) • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Chinese-Traditional (Taiwan) • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Home Premium 32 Recovery CD	FRU #	CRU
Russian • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Korean • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Hebrew • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Portuguese • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Home Premium 64 Recovery CD

Windows 7 Home Premium 64 Recovery CD	FRU #	CRU
English • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
French • MT 1996: CTO • MT 1997: CTO	TBD	1

Windows 7 Home Premium 64 Recovery CD	FRU #	CRU
• MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB		

Windows 7 Professional 32 Recovery CD

Windows 7 Professional 32 Recovery CD	FRU #	CRU
English • MT 1996: CTO A1A A1T A8G B1Q B2Q B4A B4T B5G B6G B7G B8G D1G D3G D5G • MT 1997: CTO A1U A1F A1L A1G A1Q A1A A1H A1R A1E • MT 2010: CTO • MT 2209: CTO A1H A2A A2T A3A A3T A5G A6A A6Q A6T A9H A6G B2A B2T • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Chinese-Traditional (Hong Kong) • MT 1996: CTO • MT 1997: CTO A1B • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Japanese • MT 1996: CTO • MT 1997: CTO A1J • MT 2010: CTO A1J A2J A3J A4J • MT 2209: CTO B4J B5J B6J B7J • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Spanish • MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Professional 32 Recovery CD	FRU #	CRU
French • MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G • MT 1997: CTO A1G A1F • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Italian • MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Brazilian Portuguese • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
German • MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
C&L EMEA (EN FR GR IT NL) • MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Professional 32 Recovery CD	FRU #	CRU
C&L Nordics (EN DK FI NO SV) - MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G - MT 1997: CTO A1G - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Arabic - MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G - MT 1997: CTO A1G - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Chinese-Simplified - MT 1996: CTO - MT 1997: CTO A1C - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Chinese-Traditional (Taiwan) - MT 1996: CTO - MT 1997: CTO A1V - MT 2010: CTO - MT 2209: CTO A8V A9V B1V B8V B9V D1V D2V D3V - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Russian - MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G - MT 1997: CTO A1G - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Professional 32 Recovery CD	FRU #	CRU
Polish • MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Korean • MT 1996: CTO • MT 1997: CTO A1K • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Hebrew • MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Greek • MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Turkish • MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G • MT 1997: CTO A1G • MT 2010: CTO • MT 2209: CTO A5G A6G • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Professional 32 Recovery CD	FRU #	CRU
Slovenian - MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G - MT 1997: CTO A1G - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Romanian - MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G - MT 1997: CTO A1G - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Hungarian - MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G - MT 1997: CTO A1G - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Czech - MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G - MT 1997: CTO A1G - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Slovakian - MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G - MT 1997: CTO A1G - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Professional 32 Recovery CD	FRU #	CRU
Serbian-Latin - MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G - MT 1997: CTO A1G - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Portuguese - MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G - MT 1997: CTO A1G - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
English for Russia - MT 1996: CTO A8G B5G B6G B7G B8G D1G D3G D5G - MT 1997: CTO A1G - MT 2010: CTO - MT 2209: CTO A5G A6G - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Professional 64 Recovery CD

Windows 7 Professional 64 Recovery CD	FRU #	CRU
English - MT 1996: CTO A2U A3U A4G A5G A6G A7G A9G B9G D2G D4G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO A4U B3U - MT 2227: CTO A1U - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Chinese-Traditional (Hong Kong) - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Professional 64 Recovery CD	FRU #	CRU
Japanese • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Spanish • MT 1996: CTO A4G A5G A6G A7G A9G B9G D2G D4G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
French • MT 1996: CTO A2F A3F A4G A5G A6G A7G A9G B9G D2G D4G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO A4F B3F • MT 2227: CTO A1F • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Italian • MT 1996: CTO A4G A5G A6G A7G A9G B9G D2G D4G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Brazilian Portuguese • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Professional 64 Recovery CD	FRU #	CRU
German • MT 1996: CTO A4G A5G A6G A7G A9G B9G D2G D4G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
C&L EMEA (EN FR GR IT NL) • MT 1996: CTO A4G A5G A6G A7G A9G B9G D2G D4G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
C&L Nordics (EN DK FI NO SV) • MT 1996: CTO A4G A5G A6G A7G A9G B9G D2G D4G • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Chinese-Traditional (Taiwan) • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Korean • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Professional 64 Recovery CD	FRU #	CRU
Hebrew - MT 1996: CTO A4G A5G A6G A7G A9G B9G D2G D4G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1
Portuguese - MT 1996: CTO A4G A5G A6G A7G A9G B9G D2G D4G - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Ultimate 32 Recovery CD

Windows 7 Ultimate 32 Recovery CD	FRU #	CRU
English - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows 7 Ultimate 64 Recovery CD

Windows 7 Ultimate 64 Recovery CD	FRU #	CRU
English - MT 1996: CTO - MT 1997: CTO - MT 2010: CTO - MT 2209: CTO - MT 2227: CTO - MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows XP Professional 32 Recovery CD

Windows XP Professional 32 Recovery CD	FRU #	CRU
English • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Windows Vista Business 32 Recovery CD

Windows Vista Business 32 Recovery CD	FRU #	CRU
English • MT 1996: CTO • MT 1997: CTO • MT 2010: CTO • MT 2209: CTO • MT 2227: CTO • MT 1996, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227_SB	TBD	1

Chapter 11. 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 .

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 .

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://support.lenovo.com>

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 window opens, release the F12 key.
3. From the Startup Device Menu window, 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://support.lenovo.com>.
2. Do the following to locate the downloadable files for your machine type:
 - a. In the **Enter a product number** field, type your machine type and click **Go**.
 - b. Click **Downloads and drivers**.
 - c. Select **BIOS** from the **Refine results** drop-down list box to easily locate all the BIOS related links.
 - d. 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 or open the computer cover. For machine types 1982, 1983, 1985, 1986, 1987, 1990, 1992, 1993, 1994, and 1995, see "Removing the computer cover" on page 79. For machine types 1996, 1997, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227, see "Opening the computer cover" on page 121.
3. Locate the Clear CMOS /Recovery jumper on the system board. See "Locating parts on the system board" on page 77.

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 or close the computer cover and reconnect the power cords for the computer and monitor. For machine types 1982, 1983, 1985, 1986, 1987, 1990, 1992, 1993, 1994, and 1995, see “Completing the parts replacement” on page 112. For machine types 1996, 1997, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227, see “Completing the parts replacement” on page 160.
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, a warning message will be displayed and no action is needed from you.
9. After the recovery session is completed, there will be no video, and your computer 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 or close the computer cover and reconnect power cords and all other external cables. For machine types 1982, 1983, 1985, 1986, 1987, 1990, 1992, 1993, 1994, and 1995, see “Completing the parts replacement” on page 112. For machine types 1996, 1997, 2002, 2010, 2208, 2209, 2221, 2224, 2226, and 2227, see “Completing the parts replacement” on page 160.
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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