

IBM Mobile Systems

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**ThinkPad 240 (2609)  
Hardware Maintenance Manual**

**May 1999**

Before using this information and the product it supports, be sure to read the general information under "Read This First" on page 19.

### **First Edition (May 1999)**

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## ***Related Publications***

The following product publications are available through IBM or your IBM Authorized Dealer.

<b>Publication</b>	<b>Part, Form Number</b>
Mobile Systems HMM Volume 1: Laptop, Notebook, Portable, and ThinkPad Computers (Models L40, CL57, N45, N51, P70/P75, ThinkPad 300, 350, 500, 510, 710T, Expansion Unit, Dock I, Dock II)	30H2356, S82G-1501-01
Mobile Systems HMM Volume 2: ThinkPad Computers (Models 340, 355, 360, 370, 700, 701, 720, 750, 755)	30H2357, S82G-1502-03
Mobile Systems HMM Volume 3: ThinkPad Computers (Models 365, 380, 385, 560, 760, SelectaDock)	84H8099, S82G-1503-05
Mobile Systems HMM Volume 4: ThinkPad Computers (Models 380, 385, 560, 760, 765)	05L1271, S05L-1270-01

## ***Related Diskettes***

The following diskettes are available through IBM or your IBM Authorized Dealer.

<b>Diskette</b>	<b>Part, Form Number</b>
ThinkPad 300 (2615) Advanced Diagnostics Diskette	33G9361, S33G-9361
ThinkPad 350, 350C, 425, 425C (2618) Advanced Diagnostics Diskette	A211000, GA21-1000
ThinkPad 365 (2625) Advanced Diagnostics Diskette	76H7578, S30H-2498
ThinkPad 380/385 (2635) Maintenance Diskette	06J0333, S06J-0333
ThinkPad 500 (2603) Advanced Diagnostics Diskette	71G3702, S71G-3702
ThinkPad 510 (2604) Advanced Diagnostics Diskette	83G8095, S83G-8095
ThinkPad 700 (9552) Reference Diskette	42G2017, S42G-2017
ThinkPad 700C (9552) Reference Diskette	42G2023, S42G-2023
ThinkPad 720/720C (9552) Reference Diskette	61G1194, S61G-1194
ThinkPad Hardware Maintenance Diskette (for all Models 355, 360, 560, 750, 755, 760)	78H5384, S78H-5384
ThinkPad Dock I (3545)	71G4140, S71G-4140
Docking Station (3550)	42G2428, S42G-2428
Data/Fax Modem	61G1556, S61G-1556
FaxConcentrator/A	84F8540, S84F-8540

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# Introduction

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## Important Service Information

### Important

Diskette fixes are customer installable. The diskette fixes are located on the PC Company Bulletin Board Service (BBS). The direct phone line for modem connection is 919-557-0001 or tieline 255-0001.

Advise customers to contact the PC Company HelpCenter at 800-772-2227 if they need assistance in obtaining or installing any diskette fixes.

Customers in Canada should call IBM HelpPC at 800-565-3344 for assistance or down-load information. The Canadian BBS phone numbers are:

<b>Montreal</b>	514-938-3022
<b>Toronto</b>	905-316-4255
<b>Vancouver</b>	604-664-6464
<b>Winnipeg</b>	204-934-2735

## FRU Replacement Strategy

### Before Replacing Parts

Ensure that all diskette fixes are installed prior to replacing any FRUs listed in this manual.

Use the following strategy to prevent unnecessary FRU replacement and service expense:

- **If you are instructed to replace a FRU and that does not correct the problem, reinstall the original FRU before you continue.**
- Some computers have both a processor board and a system board. If you are instructed to replace either the processor board or the system board, and the first board that you replaced does not correct the problem, reinstall the original board, then replace the other (processor or system) board.
- If an adapter or device consists of more than one FRU, an error code may be caused by any of the FRUs. Before replacing the adapter or device, remove the FRUs, one by one, to see if the symptoms change. Replace only the FRU that changed the symptoms.

### Attention

A customized setup configuration (other than default settings) may exist on the computer you are servicing. Running Automatic Configuration may alter those settings. Note the current configuration settings (using the View Configuration option) and verify that the settings are in place when service is complete.

## Hard Disk Drive Replacement Strategy:

Always try to run a low-level format before replacing a hard disk drive.

### Attention

The drive startup sequence in the computer you are servicing 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.

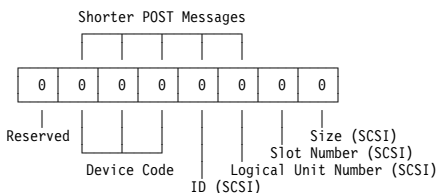
## How to Use Error Messages

Use the error codes displayed on the screen to diagnose failures. If more than one error code is displayed, begin the diagnosis with the first error code. The cause of the first error code can result in false error codes being displayed. If no error code is displayed, see if the error symptom is listed in the Symptom-to-FRU Index for the computer you are servicing.

## How to Read POST Error Messages

POST error messages are displayed on the screen as three, four, five, or eight digits. The error messages that can be displayed as shorter POST messages are highlighted in this index. Some digits will represent different information for SCSI errors versus non-SCSI errors.

The following example shows which digits display the shorter POST error messages and also defines the SCSI information in an eight-digit error message.



All SCSI devices are set to a different SCSI ID. Duplicate SCSI ID settings can generate a false error message. Use the SCSI ID to determine whether the error message is coming from an internal or an external device.



## Drive and Diskette Compatibility Matrix

The following table provides identification information for 3.5-inch drives.

Diskette Drive	Identifying Mark
3.5-Inch - 1.44MB	1.44 on the eject button
3.5-Inch - 2.88MB	2.88 on the eject button

The following table provides compatibility information for 3.5-inch diskettes and 3.5-inch diskette drives.

Diskette Capacity	1.44MB Drive	2.88MB Drive
1.0MB	Read/Write	Read/Write
2.0MB	Read/Write	Read/Write
4.0MB	Not Compatible	Read/Write

The following table provides identification information for 5.25-inch diskette drives.

Diskette Drive	Identifying Mark
5.25-Inch - 360KB (External)	Asterisk on bezel
5.25-Inch - 1.2MB (Internal)	1.2 on the eject button

The following table provides compatibility information for 5.25-inch diskettes and 5.25-inch diskette drives.

Diskette Capacity	360KB Drive	1.2MB Drive
360KB	Read/Write	Read/Write
1.2MB	Not Compatible	Read/Write

**Note:** A 360KB diskette written to or formatted on a 1.2MB drive can be read reliably only on a 1.2MB drive.

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## Safety Notices (Multi-lingual Translations)

In this manual, safety notices appear in English with a page number reference to the appropriate multi-lingual, translated safety notice found in this section.

The following safety notices are provided in English, French, German, Italian, and Spanish languages.

### Safety Notice 1

Before the computer is powered-on after FRU replacement, make sure all screws, springs, or other small parts are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical shorts.

Avant de remettre l'ordinateur sous tension après remplacement d'une unité en clientèle, vérifiez que tous les ressorts, vis et autres pièces sont bien en place et bien fixées. Pour ce faire, secouez l'unité et assurez-vous qu'aucun bruit suspect ne se produit. Des pièces métalliques ou des copeaux de métal pourraient causer un court-circuit.

Bevor nach einem FRU-Austausch der Computer wieder angeschlossen wird, muß sichergestellt werden, daß keine Schrauben, Federn oder andere Kleinteile fehlen oder im Gehäuse vergessen wurden. Der Computer muß geschüttelt und auf Klappergeräusche geprüft werden. Metallteile oder -splitter können Kurzschlüsse erzeugen.

Prima di accendere l'elaboratore dopo che é stata effettuata la sostituzione di una FRU, accertarsi che tutte le viti, le molle e tutte le altri parti di piccole dimensioni siano nella corretta posizione e non siano sparse all'interno dell'elaboratore. Verificare ciò scuotendo l'elaboratore e prestando attenzione ad eventuali rumori; eventuali parti o pezzetti metallici possono provocare cortocircuiti pericolosi.

Antes de encender el sistema despues de sustituir una FRU, compruebe que todos los tornillos, muelles y demás piezas pequeñas se encuentran en su sitio y no se encuentran sueltas dentro del sistema. Compruébelo agitando el sistema y escuchando los posibles ruidos que provocarían. Las piezas metálicas pueden causar cortocircuitos eléctricos.

## Safety Notice 2

Some standby batteries contain a small amount of nickel and cadmium. Do not disassemble it, recharge it, throw it into fire or water, or short-circuit it. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

Certaines batteries de secours contiennent du nickel et du cadmium. Ne les démontez pas, ne les rechargez pas, ne les exposez ni au feu ni à l'eau. Ne les mettez pas en court-circuit. Pour les mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la pile de sauvegarde ou celle de l'horloge temps réel, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. Une batterie ou une pile inappropriée risque de prendre feu ou d'exploser.

Die Bereitschaftsbatterie, die sich unter dem Diskettenlaufwerk befindet, kann geringe Mengen Nickel und Cadmium enthalten. Sie darf nur durch die Verkaufsstelle oder den IBM Kundendienst ausgetauscht werden. Sie darf nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Die Batterie kann schwere Verbrennungen oder Verätzungen verursachen. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Bereitschafts- oder Systembatterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

Alcune batterie di riserva contengono una piccola quantità di nichel e cadmio. Non smontarle, ricaricarle, gettarle nel fuoco o nell'acqua né cortocircuitarle. Smaltirle secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria dell'RTC (real time clock) o la batteria di supporto, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

Algunas baterías de reserva contienen una pequeña cantidad de níquel y cadmio. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

### Safety Notice 3

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations. Use only the battery in the appropriate parts listing when replacing the battery pack. Use of an incorrect battery can result in ignition or explosion of the battery.

La batterie contient du nickel. Ne la démontez pas, ne l'exposez ni au feu ni à l'eau. Ne la mettez pas en court-circuit. Pour la mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la batterie, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. En effet, une batterie inappropriée risque de prendre feu ou d'exploser.

Akkus enthalten geringe Mengen von Nickel. Sie dürfen nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

La batteria contiene piccole quantità di nichel. Non smontarla, gettarla nel fuoco o nell'acqua né cortocircuitarla. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). Quando si sostituisce la batteria, utilizzare soltanto i tipi inseriti nell'appropriato Catalogo parti. L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

Las baterías contienen pequeñas cantidades de níquel. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas al sustituir la batería. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

#### Safety Notice 4

The lithium battery can cause a fire, explosion, or severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

La pile de sauvegarde contient du lithium. Elle présente des risques d'incendie, d'explosion ou de brûlures graves. Ne la rechargez pas, ne retirez pas son connecteur polarisé et ne la démontez pas. Ne l'exposez pas à une température supérieure à 100°C, ne la faites pas brûler et n'en exposez pas le contenu à l'eau. Mettez la pile au rebut conformément à la réglementation en vigueur. Une pile inappropriée risque de prendre feu ou d'exploser.

Die Systematterie ist eine Lithiumatterie. Sie kann sich entzünden, explodieren oder schwere Verbrennungen hervorrufen. Batterien dieses Typs dürfen nicht aufgeladen, zerlegt, über 100 C erhitzt oder verbrannt werden. Auch darf ihr Inhalt nicht mit Wasser in Verbindung gebracht oder der zur richtigen Polung angebrachte Verbindungsstecker entfernt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

La batteria di supporto è una batteria al litio e può incendiarsi, esplodere o procurare gravi ustioni. Evitare di ricaricarla, smontarne il connettore polarizzato, smontarla, riscaldarla ad una temperatura superiore ai 100 gradi centigradi, incendiarla o gettarla in acqua. Smaltirla secondo la normativa in vigore (DPR 915/82, successive disposizioni e disposizioni locali). L'impiego di una batteria non adatta potrebbe determinare l'incendio o l'esplosione della batteria stessa.

La batería de repuesto es una batería de litio y puede provocar incendios, explosiones o quemaduras graves. No la recargue, ni quite el conector polarizado, ni la desmonte, ni caliente por encima de los 100°C (212°F), ni la incinere ni exponga el contenido de sus celdas al agua. Deséchela tal como dispone la normativa local.

## Safety Notice 5

If the LCD breaks and the fluid from inside the LCD gets into your eyes or on your hands, immediately wash the affected areas with water for at least 15 minutes. Seek medical care if any symptoms from the fluid are present after washing.

Si le panneau d'affichage à cristaux liquides se brise et que vous recevez dans les yeux ou sur les mains une partie du fluide, rincez-les abondamment pendant au moins quinze minutes. Consultez un médecin si des symptômes persistent après le lavage.

Die Leuchtstoffröhre im LCD-Bildschirm enthält Quecksilber. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Der LCD-Bildschirm besteht aus Glas und kann zerbrechen, wenn er unsachgemäß behandelt wird oder der Computer auf den Boden fällt. Wenn der Bildschirm beschädigt ist und die darin befindliche Flüssigkeit in Kontakt mit Haut und Augen gerät, sollten die betroffenen Stellen mindestens 15 Minuten mit Wasser abgespült und bei Beschwerden anschließend ein Arzt aufgesucht werden.

Nel caso che caso l'LCD si dovesse rompere ed il liquido in esso contenuto entrasse in contatto con gli occhi o le mani, lavare immediatamente le parti interessate con acqua corrente per almeno 15 minuti; poi consultare un medico se i sintomi dovessero permanere.

Si la LCD se rompe y el fluido de su interior entra en contacto con sus ojos o sus manos, lave inmediatamente las áreas afectadas con agua durante 15 minutos como mínimo. Obtenga atención medica si se presenta algún síntoma del fluido despues de lavarse.

### Safety Notice 6

To avoid shock, do not remove the plastic cover that surrounds the lower portion of the inverter card.

Afin d'éviter tout risque de choc électrique, ne retirez pas le cache en plastique protégeant la partie inférieure de la carte d'alimentation.

Aus Sicherheitsgründen die Kunststoffabdeckung, die den unteren Teil der Spannungswandlerplatine umgibt, nicht entfernen.

Per evitare scosse elettriche, non rimuovere la copertura in plastica che avvolge la parte inferiore della scheda invertitore.

Para evitar descargas, no quite la cubierta de plástico que rodea la parte baja de la tarjeta invertida.

### Safety Notice 7

Though main batteries have low voltage, a shorted or grounded battery can produce enough current to burn combustible materials or personnel.

Bien que le voltage des batteries principales soit peu élevé, le court-circuit ou la mise à la masse d'une batterie peut produire suffisamment de courant pour brûler des matériaux combustibles ou causer des brûlures corporelles graves.

Obwohl Hauptbatterien eine niedrige Spannung haben, können sie doch bei Kurzschluß oder Erdung genug Strom abgeben, um brennbare Materialien zu entzünden oder Verletzungen bei Personen hervorzurufen.

Sebbene le batterie di alimentazione siano a basso voltaggio, una batteria in corto circuito o a massa può fornire corrente sufficiente da bruciare materiali combustibili o provocare ustioni ai tecnici di manutenzione.

Aunque las baterías principales tienen un voltaje bajo, una batería cortocircuitada o con contacto a tierra puede producir la corriente suficiente como para quemar material combustible o provocar quemaduras en el personal.

### Safety Notice 8

Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, remove the battery pack, then disconnect any interconnecting cables.

Avant de retirer une unité remplaçable en clientèle, mettez le système hors tension, débranchez tous les cordons d'alimentation des socles de prise de courant, retirez la batterie et déconnectez tous les cordons d'interface.

Die Stromzufuhr muß abgeschaltet, alle Stromkabel aus der Steckdose gezogen, der Akku entfernt und alle Verbindungskabel abgenommen sein, bevor eine FRU entfernt wird.

Prima di rimuovere qualsiasi FRU, spegnere il sistema, scollegare dalle prese elettriche tutti i cavi di alimentazione, rimuovere la batteria e poi scollegare i cavi di interconnessione.

Antes de quitar una FRU, apague el sistema, desenchufe todos los cables de las tomas de corriente eléctrica, quite la batería y, a continuación, desconecte cualquier cable de conexión entre dispositivos.



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## Safety Information

The following section contains the safety information that you need to be familiar with before servicing an IBM mobile 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.

**Attention:** 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

Observe the following rules when working on electrical equipment.

## Important

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

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

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has *exposed* electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.

**Attention:** 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.

**Attention:** There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
  - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

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

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts *with the power on* when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generators

and 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.**

## 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 non-IBM 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 non-IBM alterations. Use good judgment as to the safety of any non-IBM 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.
- 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.

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## Laser compliance statement

Some IBM Personal Computer models are equipped from the factory with a CD-ROM drive. CD-ROM drives are also sold separately as options. The CD-ROM drive is a laser product. The CD-ROM drive is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 and CENELEC EN 60 825 for Class 1 laser products.

When a CD-ROM drive is installed, note the following.



### **CAUTION:**

**Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

**O uso de controles, ajustes ou desempenho de procedimentos diferentes daqueles aqui especificados pode resultar em perigosa exposição à radiação.**

凡未在这里指明的任何控制用法、调整、行为，都会导致严重后果。

**Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites.**

**Werden Steuer- und Einstellelemente anders als hier festgesetzt verwendet, kann gefährliche Laserstrahlung auftreten.**

Az itt előírt eljárásoktól, beállításoktól és vezérlésektől eltérni a lézersugárzás veszélye miatt kockázatos !

**L'utilizzo di controlli, regolazioni o l'esecuzione di procedure diverse da quelle specificate possono provocare l'esposizione a**

Использование элементов настройки и выполнение процедур иных, чем указано здесь, может привести к опасному радиационному облучению.

Použitie kontrôl, úprav alebo iných vykonaní od iných výrobcov, ako je v tomto špecifikované, mohlo by mať za následok nebezpečenstvo vystavenia sa vyžiarovaniu.

**El uso de controles o ajustes o la ejecución de procedimientos distintos de los aquí especificados puede provocar la exposición a radiaciones peligrosas.**

Opening the CD-ROM drive could result in exposure to hazardous laser radiation. There are no serviceable parts inside the CD-ROM drive. **Do not open.**

Some CD-ROM drives contain an embedded Class 3A or Class 3B laser diode. Note the following.

**DANGER:**

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

**Radiação por raio laser ao abrir. Não olhe fixo no feixe de luz, não olhe diretamente por meio de instrumentos óticos e evite exposição direta com o feixe de luz.**

开启时会有激光发射时，请勿盯视激光光束，请勿直接查看视觉仪器，并且避免直接接触在激光光束之中。

**Rayonnement laser si carter ouvert. Évitez de fixer le faisceau, de le regarder directement avec des instruments optiques, ou de vous exposer au rayon.**

**Laserstrahlung bei geöffnetem Gerät. Nicht direkt oder über optische Instrumente in den Laserstrahl sehen und den Strahlungsbereich meiden.**

**Kinyitáskor lézersugár ! Ne nézzen bele se szabad szemmel, se optikai eszközökkel. Kerülje a sugárnyalábbal való érintkezést !**

**Aprendo l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici e evitare l'esposizione diretta al fascio.**

Открывая, берегитесь лазерного излучения. Не смотрите на луч, не разглядывайте его с помощью оптических инструментов, а также избегайте прямого воздействия лазерного луча.

Ked' je laserová jednotka otvorená. Vyhnite sa priamemu pohľadu a nehládte priamo s optickými nástrojmi do lúča a vyhnite sa priamemu vystaveniu lúčov.

**Radiación láser al abrir. No mire fijamente ni examine con instrumental óptico el haz de luz. Evite la exposición directa al haz.**





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# ThinkPad 240 Hardware Maintenance Manual

## *About This Manual*

This manual contains service and reference information for the IBM ThinkPad 240 products. Use this manual along with the advanced diagnostics tests to troubleshoot problems effectively.

The manual is divided into sections as follows:

- The introduction section provides general information, guidelines, and safety information required to service computers.
- The product-specific section includes service, reference, and product-specific parts information.

This manual is intended for trained servicers who are familiar with ThinkPad products. Use this manual along with the advanced diagnostics tests to troubleshoot problems effectively.

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## Read This First

Before you go to the checkout guide, be sure to read this section.

### Important Notes

- **Only certified trained personnel should service the computer.**
- Read the entire FRU service procedures before replacing any FRUs.
- **Use new nylon-coated screws when you replace FRUs.**
- **Be extremely careful during write operations such as copying, saving, or formatting.** Drives in the computer that you are servicing might have been rearranged or the drive startup sequence might have been altered. If you select an incorrect drive, data or programs might be overwritten.
- **Replace FRUs only for the correct model.** When you replace a FRU, make sure the model of the machine and FRU part number are correct by referring to the FRU parts list.
- **A FRU should not be replaced because of a single, unreproducible failure.** Single failures can occur for a variety of reasons that have nothing to do with a hardware defect, such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists. If this is suspected, clear the

error log and run the test again. Do not replace any FRUs if log errors do not reappear.

**Be careful not to replace a non-defective FRU.**

## What to Do First

The servicer must include the following in the parts exchange form or parts return form that is attached to the returned FRU:

1. Name and phone number of servicer
2. Date of service
3. Date when part failed
4. Date of purchase
5. Failure symptoms, error codes appearing on the display, and beep symptoms
6. Procedure index and page number in which the failing FRU was detected
7. Failing FRU name and part number
8. Machine type, model number and serial number
9. Customer's name and address

Before checking problems with the computer, determine whether or not the damage applies to the warranty by referring to the following:

**Note for Warranty:** During the warranty period, the customer may be responsible for repair costs if the computer damage was caused by misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by the customer. The following list provides some common items that are not covered under warranty and some symptoms that may indicate that the system was subjected to stresses beyond normal use:

The following is not covered under warranty:

- LCD panel cracked by applying excessive force or from being dropped
- Scratched (cosmetic) parts
- Cracked or broken plastic parts, broken latches, broken pins, or broken connectors caused by excessive force
- Damage caused by liquid spilled into the system
- Damage caused by the improper insertion of a PC Card or the installation of an incompatible card
- Damaged or bent PC Card eject button
- Fuses blown by attachment of a non-supported device
- Forgotten computer password (making the computer unusable)

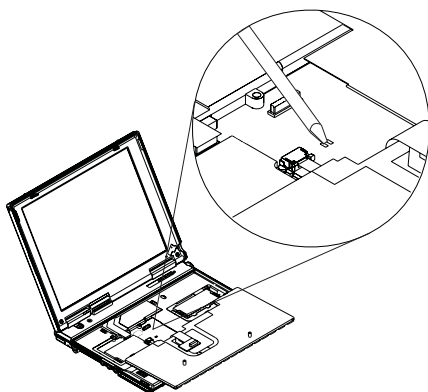
The following symptoms might indicate damage caused by non-warranted activities:

- Missing parts might be a symptom of unauthorized service or modification.
- HDD spindles can become noisy from being subjected to excessive force or from being dropped.

## How to Disable the Password

There are three passwords used at a typical customer site: the Supervisor Password, the HDD password, and the Power On password.

- Power On password:
  1. Power off the computer.
  2. Remove the battery pack and AC Adapter.
  3. Open the keyboard and disconnect the keyboard connector from the system board, see “1030 Keyboard” on page 44.
  4. Short the jumper JP1. See the following figure:



5. Close the keyboard.
  6. Power on the computer and wait until POST ends.
  7. Verify that the password prompt does not appear.
- Supervisor and HDD passwords:

The Supervisor Password and HDD password are security features that are used to protect the system and the hard disk drive data from unauthorized access. No overriding capability is provided, so it cannot be replaced if they are forgotten. If the customer forgets the Supervisor Password, the system board must be replaced. If the customer forgets the HDD password, the hard disk drive must be replaced.

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## Product Overview

The following shows an overview of the system features of the ThinkPad 240 computer.

Feature	Description
Processor	Intel** Celeron** processor 300 MHz, L2 cache
Bus architecture	PCI Bus
Memory	32/64 MB SDRAM onboard 32 MB, 64 MB or 128 MB DIMM card (max. 192 MB)
BIOS ROM	up to 512 Kbytes
Video	<ul style="list-style-type: none"><li>• 10.4–inch, 16M colors, 800x600 pixel TFT color LCD</li></ul>
Audio	<ul style="list-style-type: none"><li>• 16–bit audio</li><li>• Internal speaker</li><li>• Internal microphone</li><li>• Wavetable MIDI</li></ul>
Hard disk drive	<ul style="list-style-type: none"><li>• 3.2/6.4GB, 2.5–inch, IDE interface</li></ul>
I/O ports	<ul style="list-style-type: none"><li>• External monitor</li><li>• Headphone/line-out</li><li>• Line-in</li><li>• Microphone-in</li><li>• Mouse/keyboard</li><li>• Parallel</li><li>• Serial</li><li>• USB</li><li>• RJ11</li><li>• External FDD</li></ul>
Infrared transfer	IrDA 1.1
Internal modem	56Kbps (depends on the model)
PC Card (PCMCIA)	One Type II CardBus support
AC Adapter	56–Watt type

## Fn Key Combinations

The following table shows the Fn key and function key combinations and their corresponding functions.

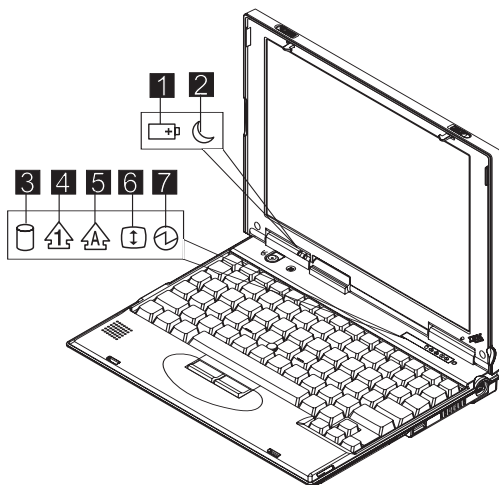
The Fn key works independently of the operating system. The operating system obtains the status through the system management interface to control the system.








Fn +	Result
F3	Standby mode
F4	Suspend mode

Fn +	Result
F5	Decrease brightness
F6	Increase brightness
F7	Switch between the LCD, the external monitor, and both the LCD and external monitor.
F8	Switch power mode
F9	Hibernation mode
F10	Print screen
F11	Scroll lock
F12	Pause
0 (zero)	Activates the system request function
- (minus)	Enables the numeric keypad
=	Signals a break
Up arrow	Page up
Down arrow	Page down
Left arrow	Home
Right arrow	End
Insert	Decreases the internal speaker volume
Delete	Increases the internal speaker volume
Back-space	Mutes the internal speaker

## Status Indicators

The system status LED indicators show the current computer status. The following shows the location of each indicator symbol and the meaning of each indicator.



Symbol	Color	Meaning
(1) Battery status 	Green	Enough battery power remains for operation.
	Blinking orange	The battery pack needs to be charged.
	Orange	The battery pack is being charged.
(2) Suspend mode 	Green	The computer is in suspend mode.
	Blinking green	The computer is entering suspend mode.
(3) Drive in use 	Orange	Data is being read from or written to the hard disk drive. Do not enter hibernation mode or power off the computer when this indicator is on.
(4) Numeric lock 	Green	The numeric keypad on the keyboard is enabled. You enable or disable the keypad by pressing and holding the <b>Fn</b> key, and pressing the <b>NumLk</b> key. For details, see the User's Reference.
(5) Caps lock 	Green	Caps Lock mode is enabled. All alphabetic characters (A-Z) are entered in capital letters without the <b>Shift</b> key being pressed. You enable or disable the Caps Lock mode by pressing and holding the <b>Fn</b> key, and pressing the <b>Caps Lock</b> key.
(6) Scroll lock 	Green	Scroll Lock mode is enabled. The <b>Arrow</b> keys can be used as screen-scroll function keys. The cursor cannot be moved with the <b>Arrow</b> keys. <i>Not all application programs support this function.</i> You enable or disable Scroll Lock mode by pressing and holding the <b>Fn</b> key, and pressing the <b>ScrLk</b> key.
(7) Power on 	Green	The computer is operational. This indicator is always on when the computer is on and not in suspend mode.

---

## Checkout Guide

Use the following procedure as a guide for computer problems.

**Note:** The diagnostic tests are intended to test only IBM products. Non-IBM products, prototype cards, or modified options can give false errors and invalid system responses.

1. Obtain the failing symptoms in as much detail as possible.
2. Verify the symptoms by attempting to recreate the failure by running the diagnostic test or by repeating the same operation.

**Note:** To run the diagnostics, refer to "Running the Diagnostics" on page 39

3. Use the following table with the verified symptom to determine which page to go to. Search the symptoms column and find the description that best matches your symptom; then go to the page shown in the "Go to" column.

Symptoms (Verified)	Go to
Power failure. (The power-on indicator does not go on or stay on.)	"Power System Checkout" on page 27, then use table in "Power-Related Symptoms" on page 36.
POST does not complete. No beeps or error codes/messages are indicated.	"Symptom-to-FRU Index" on page 32, then use table in "No Beep Symptoms" on page 34.
POST beeps, but no error codes are displayed.	"Symptom-to-FRU Index" on page 32.
POST detected an error and displayed numeric error codes.	"Symptom-to-FRU Index" on page 32, then use table in "Numeric Error Codes" on page 32.
The diagnostic test detected an error and displayed a FRU code.	"Running the Diagnostics" on page 39.
Other symptoms (such as LCD display problems).	"Symptom-to-FRU Index" on page 32.
Symptoms cannot be recreated (intermittent problems).	Use the customer-reported symptoms, and go to "Symptom-to-FRU Index" on page 32.

## Audio Checkout

Do as follows:

1. Boot from the diagnostics diskette and start the program.
2. Go to **Interactive Tests** on the main menu and select the **Internal Speaker** test.

3. If no sound is heard, replace the speaker.

## Fan ASM Checkout

To check the fan ASM, do the following:

1. Boot from the diagnostics diskette and start the program.
2. Go to **Diagnostics** on the main menu and select **Other Devices**.
3. Follow the description in the window. If the test detects a fan ASM problem, replace the fan.

## Keyboard and Auxiliary Input Device Checkout

**Note:** Remove the external keyboard if the internal keyboard is to be tested.

If the internal keyboard does not work or an unexpected character appears, make sure that the flexible cable extending from the keyboard is correctly seated on the connector.

If the keyboard cable connection is correct, run the Keyboard Test. See “Running the Diagnostics” on page 39 for details.

If the test detects a keyboard problem, do the following one at a time to correct the problem. Do not replace a non-defective FRU.

1. Replace the keyboard.
2. Replace the system board.

The following auxiliary input devices are supported for this computer:

- Numeric keypad
- Mouse (PS/2 compatible)
- External keyboard (with keyboard/mouse cable)

If any of these devices do not work, reseal the cable connector and repeat the failing operation.

If the problem does not reoccur, replace the device and then the planar board.

## Memory Checkout

DIMM are available for increasing memory capacity.

Onboard (MB)	Slot (MB)	Total Memory (MB)
32	0	32
32	32	64
32	64	96
32	128	160



Onboard (MB)	Slot (MB)	Total Memory (MB)
64	0	64
64	32	96
64	64	128
64	128	192

Memory errors might stop system operation, show error messages on the screen, or hang the system.

Use the following procedure to isolate memory problems:

1. Turn off the computer and remove any installed DIMM from its slot.
2. Boot from the diagnostics diskette and start the program.
3. Go to **Diagnostics** on the main menu and select **Memory Test**. If an error appears, replace the system board.
4. Turn off the computer and reinstall the DIMM; then turn on the computer. Verify the memory size; then test the memory. If an error appears, replace the DIMM.

**Note:** Make sure that the DIMM is properly installed into the connector. A loose connection can cause an error.

## Modem Board Checkout

Do the following to isolate the problem to the system internal modem:

1. Boot from the diagnostics diskette and start the program.
2. Go to **Diagnostics** on the main menu and select **Other Devices**.
3. Follow the description in the window.
4. If the test detects a modem problem, replace the modem card.

## Power System Checkout

To verify the symptom of the problem power on the computer using each of the following power sources:

1. Remove the battery ASM.
2. Connect the AC Adapter and check that power is supplied.
3. Disconnect the AC Adapter and install the charged battery ASM; then check that power is supplied by the battery ASM.

If you suspect a power problem, refer to the appropriate power supply check listed below:

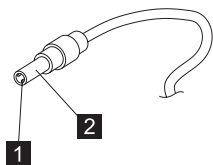
- “Checking the AC Adapter” on page 28

- “Checking the Operational Charging” on page 28
- “Checking the Battery ASM” on page 29

**Checking the AC Adapter:** You are here because the computer fails only when the AC Adapter is used:

- If the power-on indicator does not turn on, check the power cord of the AC Adapter for correct continuity and installation.
- If the operational charge does not work, go to “Checking the Operational Charging.”

Unplug the AC Adapter cable from the computer and measure the output voltage at the plug of the AC Adapter cable. See the following figure.



Pin	Voltage (V dc)
1	+15.5 to +17.0
2	Ground

If the voltage is not correct, replace the AC Adapter.

If the voltage is within the range, do the following:

- Replace the system board.
- If the problem is not corrected, go to “Undetermined Problems” on page 38

**Note:** An audible noise from the AC Adapter does not always indicate a defective adapter.

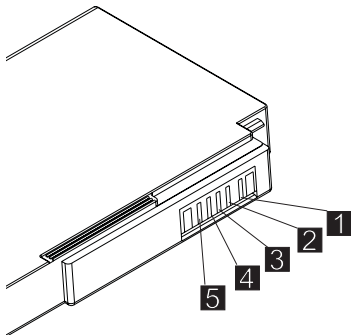
**Checking the Operational Charging:** To check operational charging, use a discharged battery pack (battery ASM) or a battery ASM that has less than 50% of the total power remaining when installed in the computer.

Perform operational charging. If the battery status indicator does not turn on, remove the battery ASM and let it return to room temperature. Reinstall the battery ASM.

If the charge indicator still does not turn on, replace the battery ASM. If the charge indicator still does not turn on, replace the system board. Then reinstall the battery ASM. If the reinstalled battery ASM is not charged, go to the next section.

## Checking the Battery ASM: Do the following:

1. Power off the computer.
2. Remove the battery ASM and measure the voltage between battery terminals 1(+) and 5(-). See the following figure:



**Note:** Signal lines, not used in these steps, are used for communications between the system and the battery.

3. If the voltage is less than 10.6V, the battery ASM has been discharged, recharge the battery ASM. If the voltage is still less than 10.6V, replace the battery.

## TrackPoint Checkout

If the external mouse is connected, the TrackPoint does not work. In this case, please detach the external mouse to check the TrackPoint.

If this does not correct the TrackPoint problem, continue with the following:

After you use the TrackPoint, the pointer drifts on the screen for a short time. This self-acting pointer movement can occur when a slight, steady pressure is applied to the TrackPoint pointer. This symptom is not a hardware problem. No service actions are necessary if the pointer movement stops in a short period of time.

If a click button problem or pointing stick problem occurs, do the following:

1. Boot from the diagnostics diskette and start the program.
2. Go to **Interactive Tests** on the main menu and select the **Mouse**.
3. Follow the instructions in the message window.

If either the pointing stick or the click button does not work, do the following actions one at a time to correct the problem. Do not replace a non-defective FRU.

1. Reseat the keyboard Touchbutton cables.

2. Replace the keyboard.
3. Replace the system board.

## Power Management Features

Three power management modes are available in the computer system to reduce power consumption and to prolong battery life.

**Standby Mode:** In standby mode, the following occurs:

- The LCD backlight turns off.
- The hard disk drive motor stops.

Events that cause the computer to enter standby mode:

- Standby mode requested by the Fn key (Fn+F3).

The computer exits standby and resumes operation when any key is pressed.

**Suspend Mode:** In suspend mode, the following occurs:

- The LCD is powered off.
- The hard disk drive is powered off.
- The CPU stops.

Events that cause the computer to enter suspend mode:

- Suspend mode requested by the Fn key (Fn+F4).
- The Lid is closed.
- The specified time has elapsed.
- Battery low occurs and hibernation conditions are insufficient.

**Note:** When battery is low, the battery status indicator blinks orange.

**Note:** In the IBM BIOS Setup Utility, the computer can be set to suspend when the lid is closed.

The following events cause the computer to resume operation from suspend mode:

- The Lid is opened.
- The real time clock alarm is signaled.
- The ring indicator (RI) is signaled by a PC Card device or the internal modem.
- The Fn key is pressed.
- Power switch is pressed.

The computer also exits suspend mode when the battery is critically low or timer conditions are satisfied for entering hibernation mode.

## **Hibernation Mode: For Windows NT user:**

A Windows NT user cannot create a hibernation file in a Windows NT system that uses the NTFS format system. If you want to use hibernation mode, you should reinstall Windows NT with a FAT format system. Also, if boot manager is installed, the computer cannot enter hibernation mode.

**Note:** Before using hibernation mode, you need a hibernation file.

In hibernation mode, the following occurs:

- The system status, RAM, VRAM, and setup data are stored on the hard disk.
- The system is powered off.

Events that cause the computer to enter hibernation mode:

- Hibernation mode requested by function key (Fn+F9).
- Timer conditions are satisfied in suspend mode when hibernate by timer is enabled.
- A critically low battery condition occurs.
- The power switch is pressed. (BIOS Setup)

The computer exits hibernation mode and resumes operation when the power-on switch is pressed. When power is turned on, the hibernation file in the boot record on the hard disk drive is read and the system status is restored from the hard disk drive.

The power switch must be pressed to cause the computer to resume operation from hibernation mode.

***How to Create the Hibernation Function:*** Do as follows:

- Turn off the computer.
- Insert the hibernation utility diskette into the diskette drive (you can create the diskette using the Diskette Factory).
- Turn on the computer.
- Follow the instructions on the screen.

**Note:** If you change the memory size, you need to recreate the hibernation file or partition. For partition-based hibernation, use the hibernation utility to delete the partition first before creating a new one.

---

## Symptom-to-FRU Index

The Symptom-to-FRU Index lists the symptoms and errors and the possible causes. The most likely cause is listed first.

**Note:** Perform the FRU replacement or actions in the sequence shown in the FRU/Action columns. If a FRU replacement does not solve the problem, put the original part back in the computer. Do not replace a non-defective FRU.

This index can also be used to help you decide the next possible FRUs to be replaced when servicing a computer.

Numeric error codes show the errors detected in POST or system operation (runtime). In the following error codes, X can be any number. If no codes are available, use narrative symptoms.

If the symptom is not listed, go to “Undetermined Problems” on page 38.

**Note:** For IBM devices not supported by diagnostic codes in this ThinkPad computer, see the manual for that device.

## Numeric Error Codes

The following is a list of the message that the BIOS can display. Most of them occur during POST. Some of them display information about a hardware device, e.g., the amount of memory installed. Others may indicate a problem with a device, such as the way it has been configured. Following the list are explanations of the messages and remedies for reported problems.

If the system fails after you make changes in the Setup menus, reset the computer, enter Setup and install Setup defaults or correct the error.

Symptom/Error	FRU/Action in Sequence
0200 Failure Fixed Disk	<ol style="list-style-type: none"><li>1. Reseat hard disk drive.</li><li>2. Load Setup Defaults in BIOS Setup Utility.</li><li>3. Hard disk drive</li><li>4. System board</li></ol>
0211 Stuck Key	Go to “Keyboard and Auxiliary Input Device Checkout” on page 26.
0211 Keyboard error	Go to “Keyboard and Auxiliary Input Device Checkout” on page 26.
0212 Keyboard Controller Failed	Go to “Keyboard and Auxiliary Input Device Checkout” on page 26.

<b>Symptom/Error</b>	<b>FRU/Action in Sequence</b>
0213 Keyboard locked — Unlock key switch	Unlock external keyboard.
0220 Monitor type does not match CMOS — Run Setup	Load Setup Defaults in BIOS Setup Utility.
0230 Shadow RAM Failed at offset:nnnn	System board
0231 System RAM Failed at offset:nnnn	<ol style="list-style-type: none"> <li>1. DIMM</li> <li>2. System board</li> </ol>
0232 Extended RAM Failed at offset:nnnn	<ol style="list-style-type: none"> <li>1. DIMM</li> <li>2. System board</li> </ol>
0250 System battery is dead	System board
0251 System CMOS checksum bad — Default con- figuration used	System board
0260 System timer error	<ol style="list-style-type: none"> <li>1. Run BIOS Setup Utility to reconfigure the system, then reboot the system.</li> <li>2. System board</li> </ol>
0270 Real time clock error	<ol style="list-style-type: none"> <li>1. Run BIOS Setup Utility to reconfigure the system, then reboot the system.</li> <li>2. System board</li> </ol>
0280 Previous boot incomplete — Default con- figuration used	<ol style="list-style-type: none"> <li>1. Load Setup Defaults in the BIOS Setup Utility.</li> <li>2. System board</li> </ol>
0281 Memory size found by POST dif- fered from CMOS	<ol style="list-style-type: none"> <li>1. Load Setup Defaults in the BIOS Setup Utility.</li> <li>2. DIMM</li> <li>3. System board</li> </ol>

Symptom/Error	FRU/Action in Sequence
02D0 System cache error — Cache disabled	System board
02F0 CPU ID:	System board
02F5 DMA Test Failed	1. DIMM 2. System board
02F6 Software NMI Failed	1. DIMM 2. System board
02F7 Fail-Safe Timer NMI Failed	1. DIMM 2. System board

## Error Messages

Symptom/Error	FRU/Action in Sequence
Device Address Conflict	1. Load Setup Defaults in BIOS Setup Utility. 2. System board
Allocation Error for: device	1. Load Setup Defaults in BIOS Setup Utility. 2. System board
Failing Bits: nnnn	1. DIMM 2. System board
Invalid System Configuration Data	System board
I/O device IRQ conflict	1. Load Setup Defaults in BIOS Setup Utility. 2. System board
Operating system not found	1. Enter BIOS Setup Utility and see if the hard disk drive and diskette drive A: are properly identified. 2. Hard disk drive 3. System board

## No Beep Symptoms

Symptom/Error	FRU/Action in Sequence
No beep, power-on indicator on, LCD blank, no POST	<ul style="list-style-type: none"> <li>• Ensure every connector is connected tightly and correctly.</li> <li>• DIMM</li> <li>• System board</li> </ul>



Symptom/Error	FRU/Action in Sequence
No beep, power-on indicator off, LCD blank during POST	<ul style="list-style-type: none"> <li>• Battery ASM</li> <li>• AC Adapter</li> <li>• System board</li> </ul>
No beep, power-on indicator on, LCD blank during POST	<ul style="list-style-type: none"> <li>• Reseat DIMM.</li> <li>• System board</li> </ul>
No beep during POST but system runs correctly.	Speaker

## LCD-Related Symptoms

Symptom/Error	FRU/Action in Sequence
LCD backlight not working LCD too dark LCD brightness cannot be adjusted LCD contrast cannot be adjusted	<ol style="list-style-type: none"> <li>1. Reseat the LCD connector.</li> <li>2. LCD FPC ASM</li> <li>3. LCD inverter</li> <li>4. LCD</li> <li>5. System board</li> </ol>
LCD screen unreadable Character missing Screen abnormal Wrong color displayed	<ol style="list-style-type: none"> <li>1. Reseat the LCD connector.</li> <li>2. LCD FPC ASM</li> <li>3. LCD inverter</li> <li>4. LCD</li> <li>5. System board</li> </ol>
LCD has extra horizontal or vertical lines displayed.	<ol style="list-style-type: none"> <li>1. LCD FPC ASM</li> <li>2. LCD inverter</li> <li>3. LCD</li> <li>4. System board</li> </ol>

## Keyboard-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Keyboard (one or more keys) doesn't work.	<ol style="list-style-type: none"> <li>1. Reseat the keyboard cable.</li> <li>2. Keyboard</li> <li>3. System board</li> </ol>

## Indicator-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Indicator incorrectly remains off or on, but system runs correctly.	<ol style="list-style-type: none"> <li>1. Reseat the LED cable.</li> <li>2. LED cable</li> <li>3. System board</li> </ol>

## Power-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Power shuts down during operation.	<ol style="list-style-type: none"><li>1. Battery</li><li>2. AC Adapter</li><li>3. System board</li></ol>
The system will not power on.	<ol style="list-style-type: none"><li>1. Battery ASM</li><li>2. AC Adapter</li><li>3. System board</li></ol>
The system will not power off.	<ol style="list-style-type: none"><li>1. System board</li></ol>
Battery can't be charged.	<ul style="list-style-type: none"><li>• Battery</li><li>• System board</li></ul>

## PC Card (PCMCIA)-Related Symptoms

Symptom/Error	FRU/Action in Sequence
System cannot detect the PC Card (PCMCIA)	<ol style="list-style-type: none"><li>1. PC Card (PCMCIA) slots assembly</li><li>2. System board</li></ol>

## Speaker-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Speakers make noise or no sound comes from system.	<ol style="list-style-type: none"><li>1. Speaker</li><li>2. System board</li></ol>
In DOS or Windows multimedia programs, no sound comes from the computer.	<ol style="list-style-type: none"><li>1. Speaker</li><li>2. System board</li></ol>

## Power Management-Related Symptoms

Symptom/Error	FRU/Action in Sequence
The system will not enter hibernation mode.	<ol style="list-style-type: none"><li>1. Keyboard (if control is from the keyboard)</li><li>2. Hard disk drive</li><li>3. System board</li></ol>
The system will not wake up from hibernation mode.	<ol style="list-style-type: none"><li>1. Keyboard (if control is from the keyboard)</li><li>2. Hard disk drive</li><li>3. System board</li></ol>
The system will not enter suspend mode after closing the LCD.	<ol style="list-style-type: none"><li>1. LED Card ASM (R)</li><li>2. System board</li></ol>

Symptom/Error	FRU/Action in Sequence
Battery fuel-gauge does not go higher than 90%.	<ol style="list-style-type: none"> <li>1. Remove battery ASM and let it cool for 2 hours.</li> <li>2. Refresh battery (continue using battery in BIOS Setup mode until power off, then charge battery).</li> <li>3. Battery</li> <li>4. System board</li> </ol>
System configuration does not match the installed devices.	<ol style="list-style-type: none"> <li>1. Load Setup Defaults and reboot the system.</li> </ol>
System hangs intermittently.	<ol style="list-style-type: none"> <li>1. Fan ASM</li> <li>2. System board</li> </ol>

## Peripheral-Device-Related Symptom

Symptom/Error	FRU/Action in Sequence
External display does not work correctly.	System board
USB does not work correctly.	System board
Print problems	<ul style="list-style-type: none"> <li>• Run printer self-test.</li> <li>• Printer driver</li> <li>• Printer cable</li> <li>• System board</li> </ul>
Serial or parallel port device problems	<ul style="list-style-type: none"> <li>• Device driver</li> <li>• Device cable</li> <li>• Device</li> <li>• System board</li> </ul>

**Note:** If you cannot find a symptom or an error in this list and the problem remains, see “Undetermined Problems” on page 38.

## Intermittent Problems

Intermittent system hang problems can be caused by a variety of reasons that have nothing to do with a hardware defect, such as cosmic radiation, electronic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists.

When analyzing an intermittent problem, do the following:

1. Run the diagnostic test for the system board in loop mode at least 10 times.
2. If no error is detected, do not replace any FRUs.
3. If any error is detected, replace the FRU shown by the FRU code. Rerun the test to verify that no more errors exist.

## Undetermined Problems

You are here because the diagnostic tests did not identify which adapter or device failed, which installed devices are incorrect, whether a short circuit is suspected, or whether the system is inoperative. Follow these procedures to isolate the failing FRU (do not isolate non-defective FRUs).

Verify that the power supply being used at the time of the failure is operating correctly. (See “Power System Checkout” on page 27.)

1. Power off the computer.
2. Visually check for damage. If any problems are found, replace the FRU.
3. Remove or disconnect all of the following devices:
  - a. Non-IBM devices
  - b. Printer, mouse, and other external devices
  - c. Battery ASM
  - d. Hard disk drive
  - e. DIMM
  - f. PC Cards (PCMCIA)
4. Power on the computer.
5. Determine if the problem has changed.
6. If the problem does not recur, reconnect the removed devices one at a time until you find the failing FRU.
7. If the problem remains, replace the following FRUs one at a time. Do not replace a non-defective FRU.
  - a. System board
  - b. LCD panel ASM

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## CE Utility Program Diskette

### Writing the VPD Data

The EEPROM on the system board contains the Vital Product Data (VPD) — that is, a system unit serial number and a system board serial number. When you replace the system board, restore the system unit serial number using the VPD Data Utility in the ThinkPad CE Utility Diskette. The serial number label is attached to the computer.

### Flash UUID

The EEPROM on the system board contains the Universal Unique ID (UUID) — that is, for Microsoft or Internet use. When you replace the planar board using the Flash UUID Utility in the ThinkPad CE Utility Diskette. The UUID utility will automatically assign the UUID via Windows.

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## Running the Diagnostics

Use either the TrackPoint or the cursor move keys to interact with the tests.

1. Connect the external floppy disk drive to the computer.
2. Insert the PC Doctor Startup disk into the FDD.
3. Power-on the computer.
4. From the PC DOS 7.0 Startup Menu, select **2. CONFIG for TP-240 Audio Test** to run the audio test.
5. After the audio test, you will be prompted to insert the PC Doctor for DOS Disk 2. Follow the instructions on the screen and proceed to the main menu.
6. At the main menu, select the test to run.
7. Press **Enter** to run the test selected.
8. After starting a test, do not press any key until prompted, then follow the instructions on the screen.
9. When the test is completed, press **Esc** to return to the main menu.
10. Select **Quit/Exit Diags** to exit the diagnostics utility.

---

## FRU Removals and Replacements

This section contains information about removals and replacements.

- Do not damage any parts. Only certified and trained personnel should service the computer.
- The arrows in this section show the direction of movement to remove a FRU, or to turn a screw to release the FRU. The arrows are marked in numeric order, in square callouts, to show the correct sequence of removal.
- When other FRUs must be removed before the failing FRU is removed, they are listed at the top of the page.
- To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement.
- When replacing a FRU, use the correct screw size, as shown in the procedures.

### Safety Notice 1: Translation on page 4

Before the computer is powered-on after FRU replacement, make sure all screws, springs, or other small parts, are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.

### Safety Notice 3: Translation on page 6

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations.

### Safety Notice 8: Translation on page 10

Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

An electrostatic discharge (ESD) strap (P/N 6405959) must be used to establish personal grounding.

## FRU Service Procedures

Review the following procedures before replacing any FRU.

**LCD FRU Replacement Notice:** The TFT LCD for the notebook computer contains over 2,359,296 thin-film transistors (TFTs). A small number of missing, discolored, or lighted dots (on all the time) is characteristic of TFT LCD technology, but excessive pixel problems can

cause viewing concerns. The LCD should be replaced if the number of missing, discolored, or lighted dots in any background is 8 or more.

**Replacing the System Board:** When you replace the System board, restore the system unit serial number using the VPD Data Utility and reassign the UUID using the Flash UUID Utility in the ThinkPad 240 CE Utility Diskette.

**Note:** Do not power off the computer while restoring the VPD.

#### Important Notice

This computer uses special nylon-coated screws with the following characteristics:

- They maintain tight connections.
- They do not easily come loose, even with shock or vibration.
- They need additional force to tighten.
- They should be used only once.

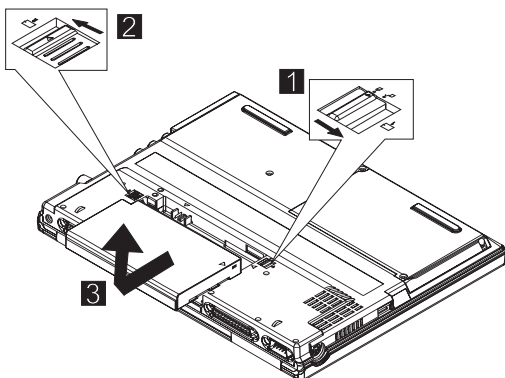
Do the following when you service this machine:

- Have a screw kit (10L1956) available.
- Always use new screws if you are instructed.
- Use a torque screwdriver if you have one.

## 1010 Battery ASM

To remove the battery ASM:

1. Slide the release lock as shown.



2. Slide the release latch as shown.
3. Remove the battery ASM.

Reverse the steps described above when installing a new battery pack.



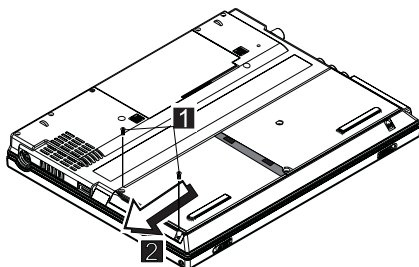
## 1020 Hard Disk Drive

### Warning

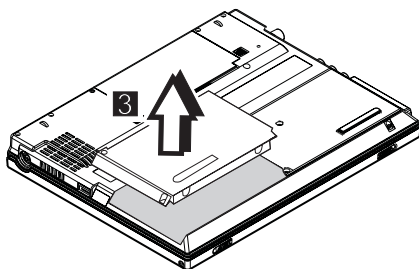
- Do not drop or apply any shock to the hard disk drive. The hard disk drive is sensitive to physical shock. Incorrect handling can cause damage and permanent loss of data on the drive.
- Before removing the drive, have the user make a backup copy of all the information on the drive if possible.
- Never remove the drive while the system is operating or is in suspend mode.

To remove the hard disk drive:

1. Remove the two screws from the hard disk cover.



2. Slide the hard disk drive module as shown.



3. Lift as shown to remove the hard disk drive module.

Step	Size (Quantity)	Head & Color	Torque
1	M2.5 x 7L (2)	Flat head, black	2.5 kgf-cm

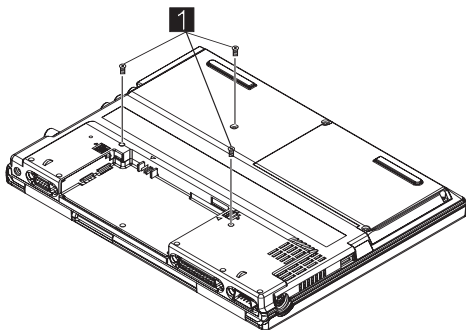
**Note:** Make sure you use the correct screw for replacement.

## 1030 Keyboard

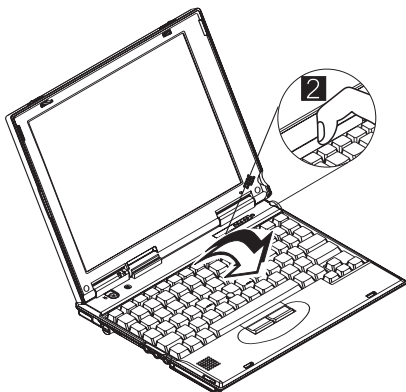
- 1010 Battery ASM

To remove the keyboard:

1. Remove the three screws securing the keyboard.



2. Turn the notebook over; then lift the keyboard as shown.



3. Remove the keyboard stopper sheet screw.
4. Disconnect the keyboard connector from the system board. Remove the keyboard from the lower case.



Step	Size (Quantity)	Head & Color	Torque
1	M2.0 x 9L (3)	Flat head, black	2.5 kgf-cm
3	M2.5 x 6L (1)	Flat head, black	2.5 kgf-cm

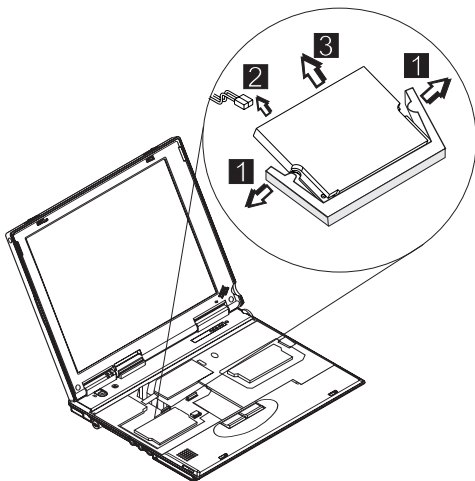
**Note:** Make sure you use the correct screw for replacement.

## 1040 Modem Card

- 1010 Battery ASM
- 1030 Keyboard

To remove the modem card:

1. Carefully release the latches on both sides of the modem card.



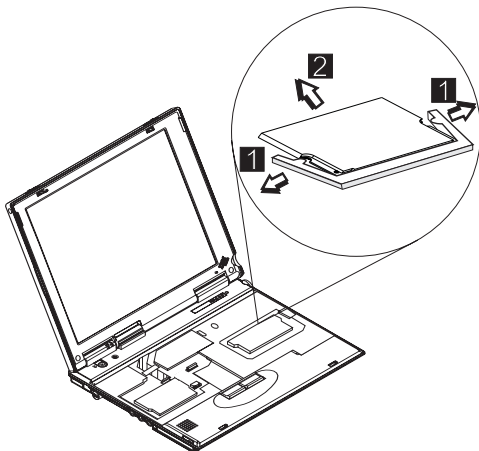
2. Disconnect the modem cable from the connector.
3. Gently remove the modem card.

## 1050 DIMM Card

- 1010 Battery ASM
- 1030 Keyboard

To remove the memory card:

1. Carefully release the latches on both sides of the memory card.



2. Gently remove the memory card.

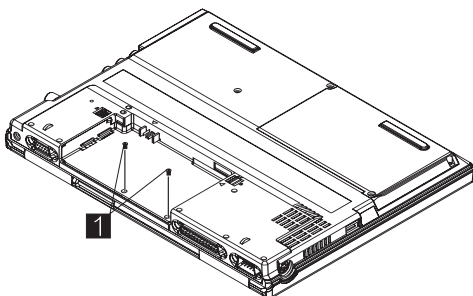
## 1060 LCD Unit ASM

- 1010 Battery ASM
- 1030 Keyboard

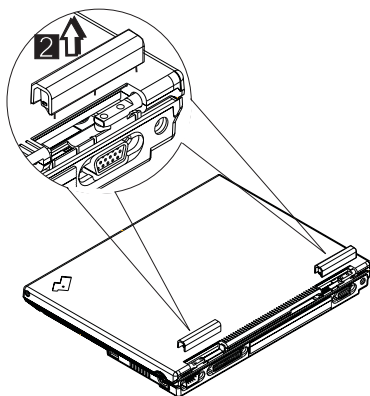
**Note:** The Cu tape must be reseated firmly after the LCD unit ASM is replaced **3**.

To remove the LCD unit ASM:

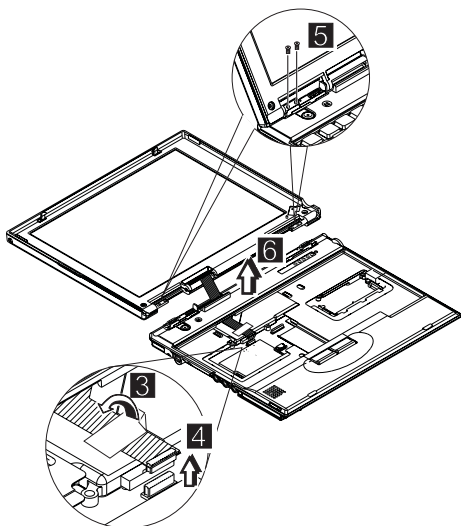
1. Remove the screws as shown.



2. Turn the notebook over; then remove the hinge covers.



3. Remove the Cu tape from the FPC cable.
4. Disconnect the LCD FPC cable from the system board.
5. Remove the LCD hinge screws.
6. Raise the upper cover enough to remove the FPC cable. Remove the LCD unit.



Step	Size (Quantity)	Head & Color	Torque
1	M2.0 x 4L (2)	Flat head, black	2.5 kgf-cm
5	M2.5 x 6 L (4)	Flat head, black	3.5 kgf-cm

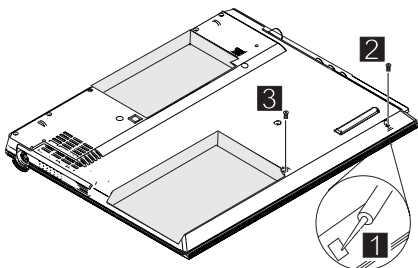
**Note:** Make sure you use the correct screw for replacement.

## 1070 Upper Cover ASM

- 1010 Battery ASM
- 1020 Hard Disk Drive
- 1030 Keyboard
- 1060 LCD Unit ASM

To remove the upper cover ASM:

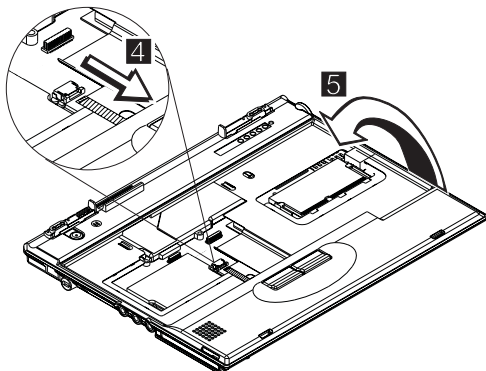
1. Remove the screw cover.
2. Remove the screw.
3. Remove the other screw as shown.



Step	Size (Quantity)	Head & Color	Torque
2	M2.0 x 4L (1)	Flat head, black	2.5 kgf-cm
3	M2.5 x 7L (1)	Flat head, black	2.5 kgf-cm

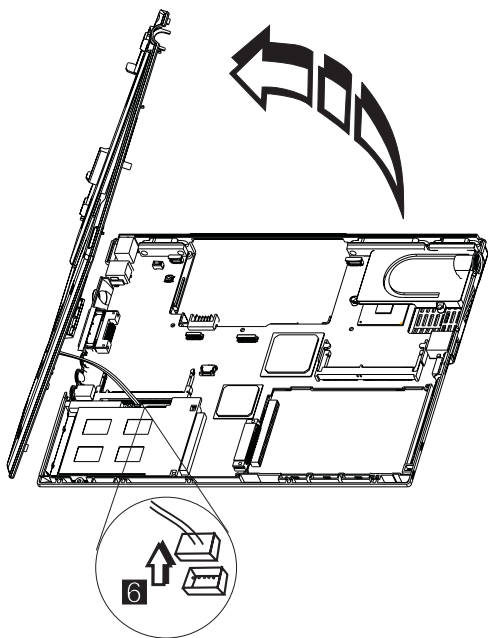
**Note:** Make sure you use the correct screw for replacement.

4. Turn the notebook over; then disconnect the Touchbutton cable from the system board.



5. Carefully lift the upper cover to expose the speaker connector as shown.
6. Disconnect the speaker cable from the main unit. Now you can remove the upper cover ASM from the base cover ASM.



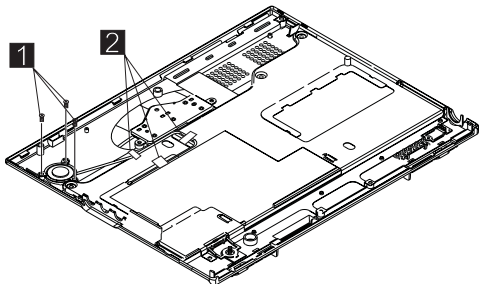


## 1080 Speaker ASM

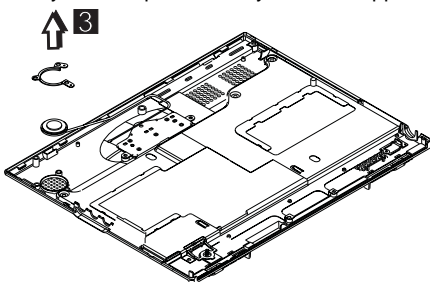
- 1010 Battery ASM
- 1020 Hard Disk Drive
- 1030 Keyboard
- 1060 LCD Unit ASM
- 1070 Upper Cover ASM

To remove the speaker:

1. Remove the three screws securing the speaker.



2. Remove the securing tape from the cable.
3. Gently lift the speaker away from the upper cover.



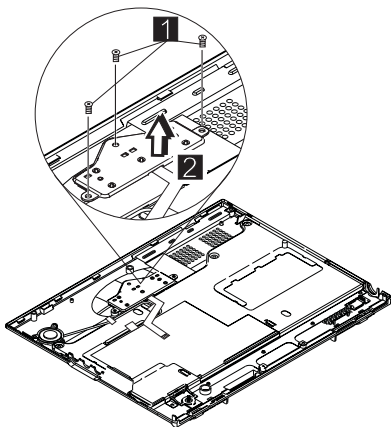
Step	Size (Quantity)	Head & Color	Torque
1	M2.0 x 3L (3)	Flat head, silver	2.5 kgf-cm
<b>Note:</b> Make sure you use the correct screw for replacement.			

## 1085 Select Button ASM

- 1010 Battery ASM
- 1020 Hard Disk Drive
- 1030 Keyboard
- 1060 LCD Unit ASM
- 1070 Upper Cover ASM

To remove the select button ASM:

1. Remove the three screws as shown.
2. Remove the select button ASM from the top cover ASM.



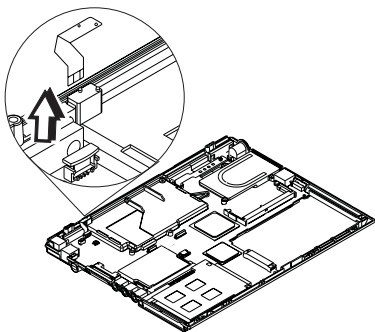
Step	Size (Quantity)	Head & Color	Torque
1	M2.5 x 2.5L (3)	Flat head, silver	2.0 kgf-cm
<b>Note:</b> Make sure you use the correct screw for replacement.			

## 1090 Cable ASM and Cable ASM LED-R

- 1010 Battery ASM
- 1020 Hard Disk Drive
- 1030 Keyboard
- 1060 LCD Unit ASM
- 1070 Upper Cover ASM

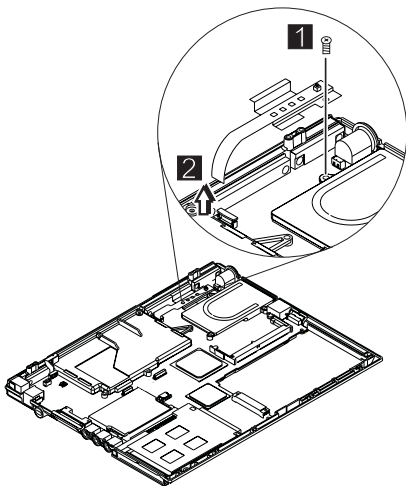
To remove the hinge LED cable:

1. Disconnect the LED cable, then lift it as shown. (The cable is fixed with double-sided tape.)



To remove the cable ASM LED-R:

1. Remove the screw.
2. Disconnect the LED board, then lift it as shown.



Step	Size (Quantity)	Head & Color	Torque
1	M2.0 x 7L (1)	Flat head, silver	2.0 kgf-cm

**Note:** Make sure you use the correct screw for replacement.

## 1100 Fan ASM

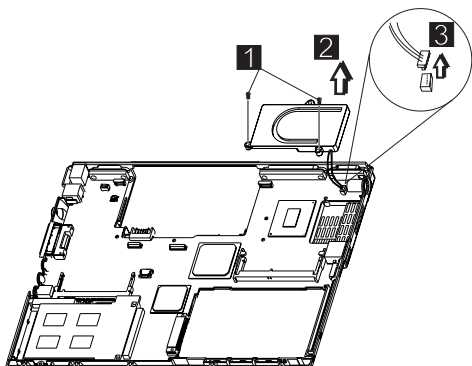
- 1010 Battery ASM
- 1020 Hard Disk Drive
- 1030 Keyboard
- 1060 LCD Unit ASM
- 1070 Upper Cover ASM
- 1090 Cable ASM and Cable ASM LED-R

### Warning

Do not apply pressure on the fan blades or hub assembly; doing so can damage the fan bearings.

To remove the fan ASM:

1. Remove the two screws securing the fan ASM.
2. Carefully lift the fan ASM.
3. Disconnect the cable from the system board.



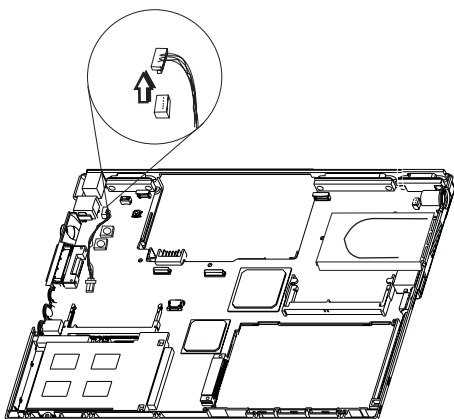
Step	Size (Quantity)	Head & Color	Torque
1	M2.0 x 7L (2)	Flat head, silver	2.0 kgf-cm
<b>Note:</b> Make sure you use the correct screw for replacement.			

## 1110 Modem Cable ASM

- 1010 Battery ASM
- 1020 Hard Disk Drive
- 1030 Keyboard
- 1060 LCD Unit ASM
- 1070 Upper Cover ASM

To remove the modem cable ASM:

- Disconnect the modem cable from the system board. Remove the cable as shown.

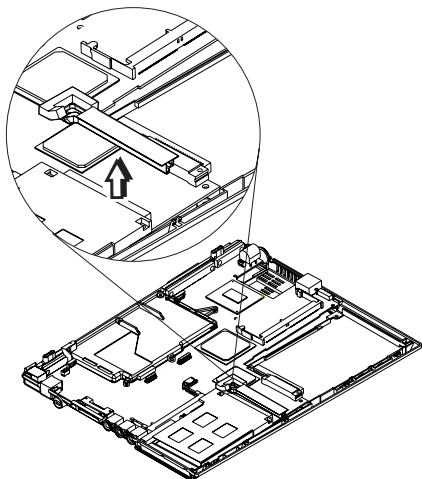


## 1120 Water Channel ASM

- 1010 Battery ASM
- 1020 Hard Disk Drive
- 1030 Keyboard
- 1060 LCD Unit ASM
- 1070 Upper Cover ASM

To remove the water channel ASM:

- Remove the water channel ASM as shown.

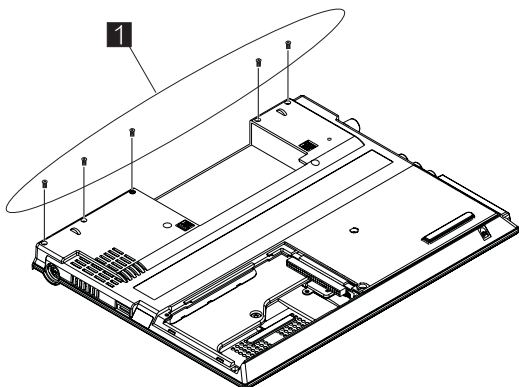


## 1130 System Board

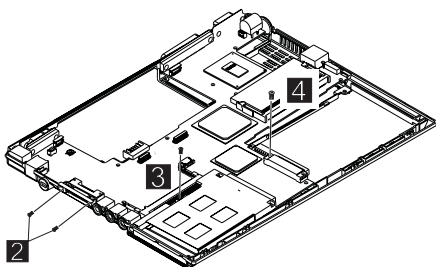
- 1010 Battery ASM
- 1020 Hard Disk Drive
- 1030 Keyboard
- 1060 LCD Unit ASM
- 1070 Upper Cover ASM
- 1090 Cable ASM and Cable ASM LED-R
- 1100 Fan ASM
- 1120 Water Channel ASM

**Note:** See “Replacing the System Board” on page 41 before proceeding.

1. Remove the screws as shown.

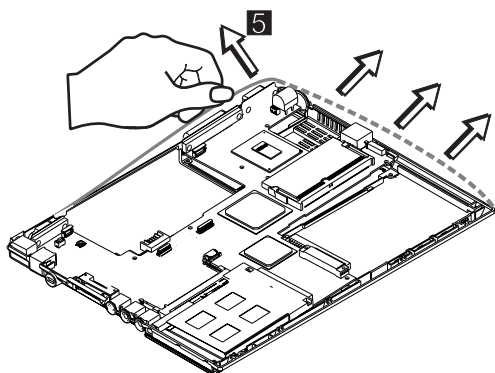


2. Turn the notebook over; remove the two screws from the FDD connector.

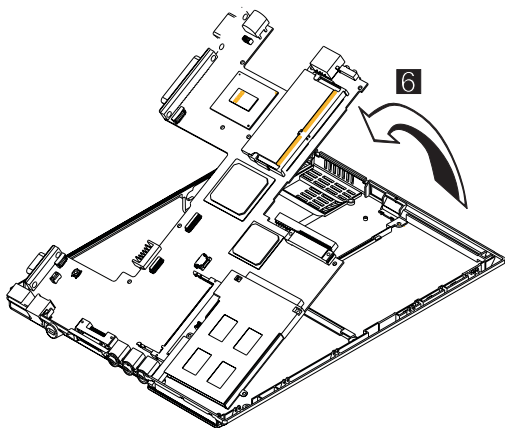


3. Remove the screw from the PCMCIA slot.
4. Remove the battery terminal screw.
5. Gripping firmly as shown, separate the base cover around the sides from the system board.





6. Remove the system board from the base cover ASM.



Step	Size (Quantity)	Head & Color	Torque
1	M2.0 x 4L (5)	Flat head, black	2.5 kgf-cm
2	M2.0 x 6L (2)	Flat head, black	2.0 kgf-cm
3	M2.0 x 4L (1)	Flat head, black	2.0 kgf-cm
4	M2.0 x 8L (1)	Flat head, black	2.0 kgf-cm

**Note:** Make sure you use the correct screw for replacement.

## 1140 PCMCIA Slots

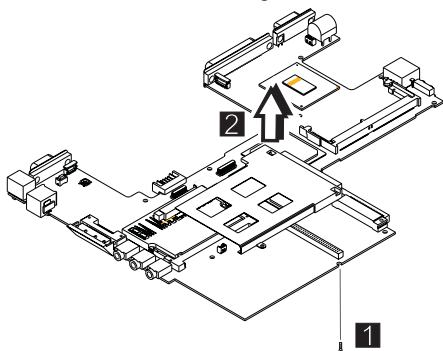
- 1010 Battery ASM
- 1020 Hard Disk Drive
- 1030 Keyboard
- 1060 LCD Unit ASM
- 1070 Upper Cover ASM
- 1090 Cable ASM and Cable ASM LED-R
- 1100 Fan ASM
- 1120 Water Channel ASM
- 1130 System Board

### Warning

Special care must be taken when disconnecting the PCMCIA card not to cause a short or damage the connector.

To remove the PCMCIA slots:

1. Remove the screw securing the PCMCIA slot board.



2. Use a flat-bladed screwdriver to disconnect the PCMCIA card from the connector.
3. Carefully remove the PCMCIA card.

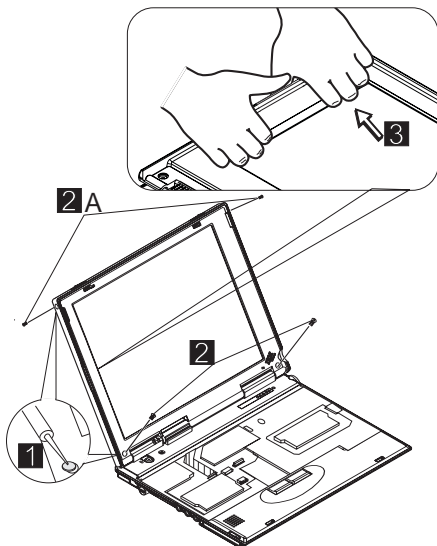
Step	Size (Quantity)	Head & Color	Torque
1	M2.0 x 7L (1)	Flat head, silver	2.0 kgf-cm

**Note:** Make sure you use the correct screw for replacement.

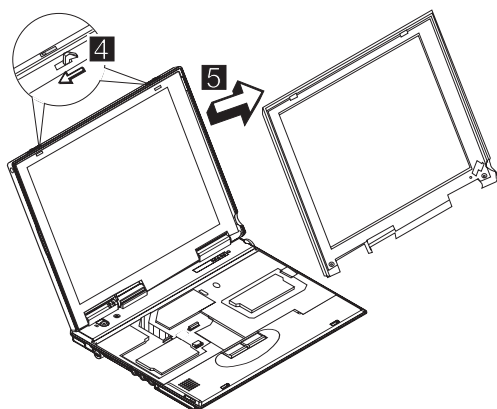
## 1150 LCD Bezel ASM

- 1010 Battery ASM

1. Remove the screw cap covers.
2. Remove the screws as shown.



3. Gripping as shown, remove the LCD bezel.
4. The LCD latches must be opened as shown to remove the bezel.



5. Remove the bezel from the LCD unit.

Step	Size (Quantity)	Head & Color	Torque
2	M2.5 x 5L (2)	Flat head, black	2.5 kgf-cm
2A	M2.5 x 5L (2)	Flat head, black	1.5 kgf-cm

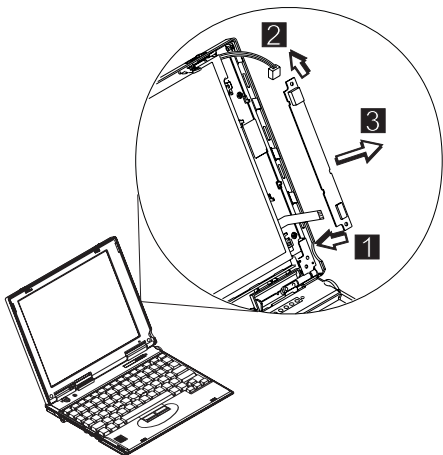
Step	Size (Quantity)	Head & Color	Torque
<b>Note:</b> Make sure you use the correct screw for replacement.			

## 1160 LCD Inverter ASM

- 1010 Battery ASM
- 1150 LCD Bezel ASM

To remove the LCD inverter ASM:

1. Disconnect the flex cable from the inverter card.
2. Disconnect the FPC cable from the inverter card.



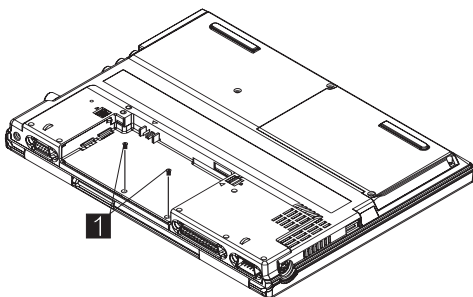
3. Remove the inverter card. (The inverter card is fixed to the rear cover with double-sided tape.)

## 1170 LCD Panel ASM

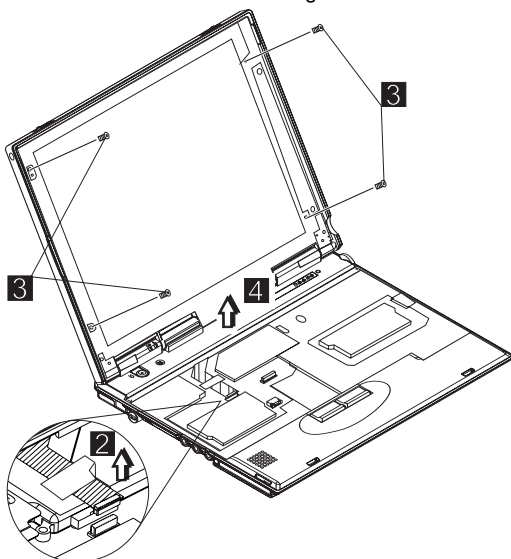
- 1010 Battery ASM
- 1030 Keyboard
- 1150 LCD Bezel ASM
- 1160 LCD Inverter ASM

To remove the LCD Panel:

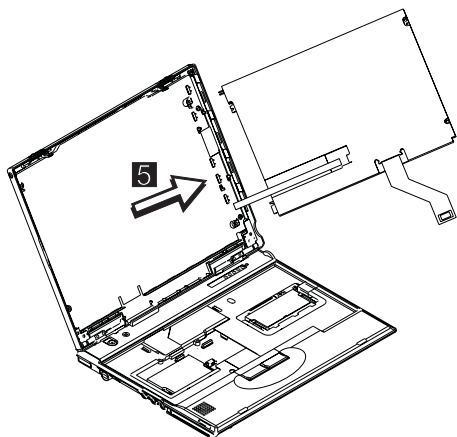
1. Remove the screws as shown.



2. Turn the notebook over; remove the CU tape and disconnect the FPC cable.
3. remove the four screws securing the LCD Panel.



4. Lift the top cover enough to pass the FPC connector through.



5. Remove the LCD panel.

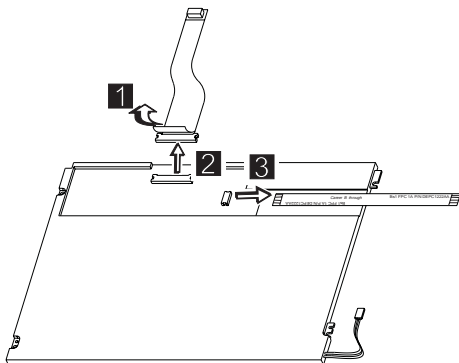
Step	Size (Quantity)	Head & Color	Torque
3	M2.5 x 4L (4)	Flat head, silver	3.0 kgf-cm
<b>Note:</b> Make sure you use the correct screw for replacement.			

## 1180 LCD FPC ASM

- 1010 Battery ASM
- 1030 Keyboard
- 1060 LCD Unit ASM
- 1150 LCD Bezel ASM
- 1160 LCD Inverter ASM

**Note:** When replacing the flex cable in the following procedure, the labelled face of the cable must face away from the LCD panel.

1. Remove the tape from the FPC cable.
2. Disconnect the FPC connector from the LCD panel.

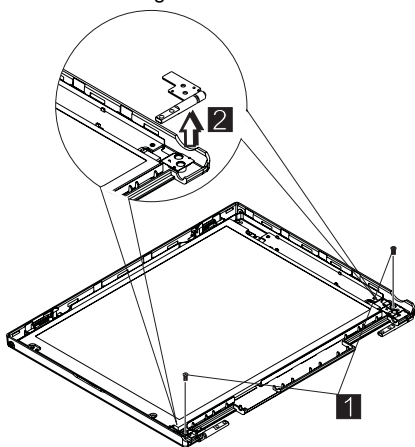


3. Disconnect the flex cable from the LCD panel.



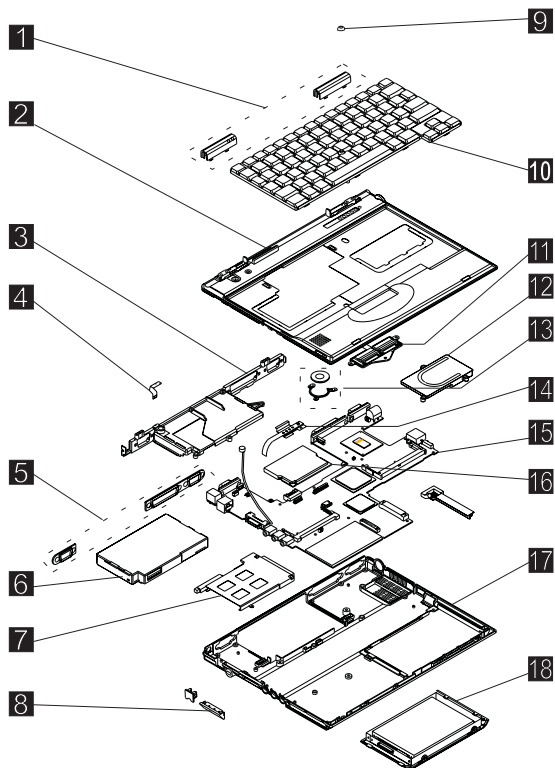
## 1190 Hinge ASM

- 1010 Battery ASM
  - 1030 Keyboard
  - 1060 LCD Unit ASM
  - 1150 LCD Bezel ASM
1. Remove the screws as shown.
  2. Remove the hinge ASM.



Step	Size (Quantity)	Head & Color	Torque
1	M2.5 x 4L (2)	Flat head, silver	3.5 kgf-cm
<b>Note:</b> Make sure you use the correct screw for replacement.			

## System Unit Parts Listing



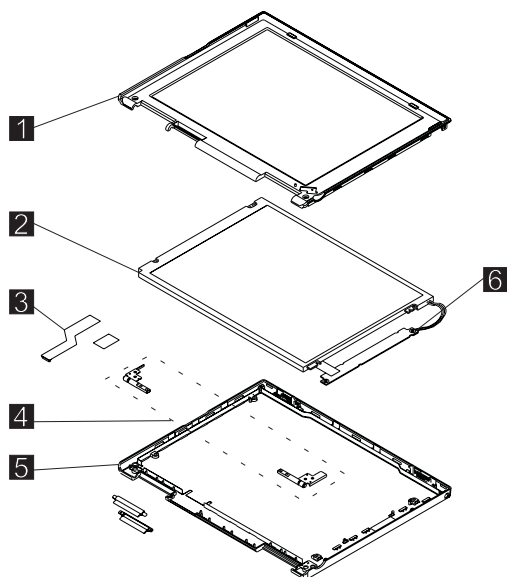
Index	Description	FRU Number
1	HINGE CAP L/R	10L1954
2	UPPER COVER ASM	10L1944
3	REAR BRACKET	10L1952
4	LED CARD ASM (L)	10L1303
5	SERIAL/VGA CAP	10L1951
6	STD BATTERY PACK	02K6606
7	PCMCIA SLOT	10L1945
8	FDD CONNECTOR LID	10L1953
9	TRACKPOINT CAP	84G6536
10	See Keyboard list	
11	SELECT BUTTON ASM	10L1958
12	FAN ASM	10L1957
13	SPEAKER ASM	02K6307
14	LED CARD ASM (R)	10L1304
15	System BOARD ASM 32 MB (Model 1)	10L1302

Index	Description	FRU Number
	System BOARD ASM 64 MB (Model 2)	10L1312
16	MODEM CARD ASM	10L1305
17	BASE COVER ASM	10L1946
	BASE COVER ASM PRC	10L1948
	BASE COVER ASM Korea	10L1949
18	HDD ASM 3.2 GB (Model 1)	05K9117
	HDD ASM 6.4 GB (Model 2)	05K9119
	HDD DOOR	10L1950

Description	FRU Number
<b>AC ADAPTER</b>	
AC Adapter 56W (2 PIN)	02K6554
AC Adapter 56W (2 PIN)	02K6548
AC Adapter 56W (3 PIN)	02K6555
AC Adapter 56W (3 PIN)	02K6550
<b>KEYBOARD</b>	
KBD ASM US English	02K6302
KBD ASM Japanese	02K6303
KBD ASM Traditional Chinese	02K6304
KBD ASM Korean	02K6305
KBD ASM Canadian French	02K6306
KBD ASM UK English	02K4938
KBD ASM German	02K4939
KBD ASM French	02K4940
<b>Miscellaneous</b>	
Screw Kit	10L1956
MODEM CABLE ASM INTERNAL	05K2860
TELEPHONE CABLE US	27L0478
TELEPHONE CABLE Australia	27L0479
TELEPHONE CABLE UK	27L0480
TELEPHONE CABLE Germany	27L0481
TELEPHONE CABLE France	27L0482
32 MB DIMM	42H2819
64 MB DIMM	10L1313
128 MB DIMM	01K1153
EXTERNAL FDD CABLE	12J1711
EXTERNAL FDD ASM	05K8989 05K8990
LARGE BATTERY	02K6607

Description	FRU Number
MISC PARTS MODEM DOOR FPC HOLDER (upper) FPC HOLDER (lower) HOOK KNOB - R HOOK KNOB - L SPRING-HOOK SPRING SHUTTER SHUTTER (PCMCIA) WATER CHANNEL	10L1955
<b>Others</b>	
Power cord (Japan 2 PIN)	13H5273
Power cord (Argentina, Australia, Papua New Guinea, New Zealand, Paraguay, Uruguay)	76H3514
Power cord (Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands, Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), U.S.A., Venezuela)	76H3516
Power cord (Austria, Belgium, Bulgaria, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Turkey, former Yugoslavia)	76H3518
Power cord (Denmark)	76H3520
Power cord (Bangladesh, Pakistan, South Africa, Sri Lanka)	76H3522
Power cord (Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom)	76H3524
Power cord (Switzerland)	76H3528
Power cord (Israel)	76H3532
Power cord (Chile, Italy)	76H3530
Power cord (Korea)	76H3535
Power cord (PRC)	02K0539

## LCD Unit Parts Listing



Index	System Unit	FRU Number
1	LCD BEZEL ASM	10L1941
	LCD BEZEL ASM Korea	10L1942
2	LCD UNIT-TFT 10.4-inch	05K9523
3	LCD CABLE ASM	05K2859
4	HINGE ASM L/R	10L1943
5	LCD REAR COVER ASM	10L1939
	LCD REAR COVER ASM Korea	10L1940
6	INVERTER CARD ASM	10L1306

## Service Tools

Description	FRU No.
Diagnostic Diskette	N/A
CE Utility Diskette	N/A
Tri-Connector Wrap Plug	72X8546
PC Test Card	35G4703
Audio Wrap Cable	66G5180
Screwdriver Kit	95F3598
USB Parallel Test Cable	05K2580
Torque Screwdriver	05K4695
5 mm Socket Wrench	05K4694
Screwdriver	27L8126

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