IBM Mobile Systems S09N-1084-01

ThinkPad i Series 1400/1500 (2621, 2651)

Hardware Maintenance Manual

February 2000

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IBM

Before using this information and the product it supports, be sure to read the general information under "Introduction" on page 2, and "Read this first" on page 19.

First Edition (February 2000)

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Preface

About this manual

This manual contains service and reference information for IBM ThinkPad i Series 1400/1500 (2621) products. Use this manual along with the advanced diagnostic tests to troubleshoot problems effectively.

The manual is divided into sections as follows:

- Common sections provides general information, guidelines, and safety information required to service computers.
- Product-specific sections includes service, reference, and product-specific parts information.
  - Part I includes information on the models in Group-A and B. (See the 2621 model table on page iii.)
  - Part II includes information on the models in Group-C. (See the 2621 model table on page iii.)

Table 1 (Page 1 of 2). 2621– Model Table

	I: 12.1" TFT	**II: 14.1" TFT**	**III: 15.0" TFT**	**IV: 13.0" HPA**
Group-A	447, 44T/44C, 44H/44K, 44S/44X	480/48U, 460/46U, 484/464, 487/467, 48M/46M, 48A/46A, 48T/46T, 48C/46C, 48H/46H, 48K/46K, 48F/46F, 48S/46S, 48P/46P, 48X/46X, 560/567		420/42U, 424/42N, 427, 42A/42M, 42S/42F, 42D/42X, 540/547
Group-B	441/445, 448/4BA, 4BT/4BC, 4BH/4BY, 4BK/4BF, 4BS/4BP, 4BX, 541/548	465/4CM, 4CA/4CT, 4CC/4CH, 4CK/4CF		421/428, 425/43J, 4AA/4AM, 4AF/4AS, 4AP/4AX

Table 1 (Page 2 of 2). 2621– Model Table				
	I: 12.1" TFT	**II: 14.1" TFT**	**III: 15.0" TFT**	**IV: 13.0" HPA**
Group-C	442/4FT, 4FC/4FH, 4FK/4FF, 4FS/4FP, 4FX, 542/549, 5FF	482/489, 486/4GM, 4GA/4GT, 4GC/4GH, 4GK/4GF, 4GS/4GP, 4GX, 562/569	492/499, 496/49M, 49A/49T, 49C/49H, 49K/49F, 592	442/4E2, 429/4EM, 4EA/4EF, 4ES/4EP, 4EX

Important

This manual is intended for trained servicers who are familiar with ThinkPad products. Use this manual along with the advanced diagnostic tests to trouble-shoot problems effectively. Before servicing an IBM ThinkPad product, be sure to review the safety information under “Safety Notices (Multilingual Translations)” on page 4 and “Safety Information” on page 11.

Related publications

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

Publication	Part, Form Number
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.

Diskette	Part, Form Number
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 i Series 1400 (2611) Diagnostic and Utilities diskettes	01K4841, S01K-4841-00
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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ThinkPad i Series 1400/1500 Hardware Maintenance Manual

General Descriptions

This chapter includes descriptions for any ThinkPad model that has the PC-Doctor DOS diagnostics program. Some descriptions might not apply to your particular computer.

Introduction

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 download information. The Canadian BBS phone numbers are:

Montreal 514-938-3022

Toronto 905-316-4255

Vancouver 604-664-6464

Winnipeg 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 over-written 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.
POST

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.

Safety Notices (Multilingual Translations)

In this manual, safety notices appear in English with a page number reference to the appropriate multilingual, 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, muβ sichergestellt werden, daβ keine Schrauben, Federn oder andere Kleinteile fehlen oder im Gehäuse vergessen wurden. Der Computer muβ 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 provocarõan. 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 fÎr 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 temperature 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 Systembatterie ist eine Lithiumbatterie. 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 e una batteria al litio e puo 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 bateria de repuesto es una bateria 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 unitÒ rempla able 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.

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.

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. KerÎlje 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.

Keď je laserová jednotka otvorená. Vyhnite sa priamemu pohľadu a nehľadte priamo s optickými nástrojmi do ľúča a vyhnite sa priamemu vystaveniu ľúčov.

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

Read this first

Before you go to the check procedures, 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 could be overwritten.
- **Replace FRUs only for the correct model.** When you replace a FRU, make sure that 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 failure can occur for a variety of reasons that have nothing to do with a hardware defect, such as: cosmic radiation, electrostatic discharge, or software error. FRU replacement should be considered only when a recurring problem exists. In this case, clear the error log and run the test again. Do not replace 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 display, and beep symptoms
6. Procedure index and page number in which 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 the damage is covered under the warranty by referring to the following:

Note for Warranty:

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 the system was subjected to stresses beyond normal use.

The following is not covered under warranty:

- LCD panel cracked by applying excessive force or by 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 improperly inserting a PC Card or installation of an incompatible card.
- Damage caused by foreign material in the FDD.
- Diskette drive damage caused by pressing the diskette drive cover or inserting diskettes with multiple labels.
- Damaged or bent diskette drive eject button.
- CD-ROM/DVD-ROM drive damage caused by excessive force, shock, or by being dropped.
- Fuses blown by attaching a nonsupported device.
- Forgotten computer password (making the computer unusable).

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

- Missing parts may be a symptom of unauthorized service or modification.
- HDD spindles can become noisy if subjected to excessive force or by being dropped.
- I9990303 errors can be caused by exposure to strong magnetic fields.

FRU replacement notices

This section contains notices for removal and replacement. Read this section carefully before replacing any FRU.

LCD replacement notice

The TFT LCD for the computer contains many 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:

- SVGA (12.1"): 5 or more bright dots, 5 or more dark dots, or a total of 9 or more bright and dark dots.
- XGA (14.1"/15.0"): 8 or more bright dots, 8 or more dark dots, or a total of 9 or more bright and dark dots.

Screw notices

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.

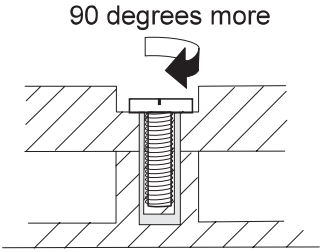
Do the following when you service this machine:

- Keep the screw kit (P/N 08K5877) in your tool bag.
- Always use new screws if you are instructed.
- Use a torque screwdriver if you have one.

Loose screws can cause a reliability problem. The IBM ThinkPad computer addresses this problem with nylon-coated screws. Tighten screws as follows:

- Plastic to plastic

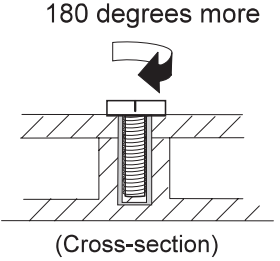
  Turn an additional **90 degrees** after the screw head touches the surface of the plastic part:



(Cross-section)

- Logic card to plastic

Turn an additional **180 degrees** after the screw head touches the surface of the plastic part:



- Torque driver

  If you have a torque driver, refer to the "Torque" column with each step.
- Make sure you use the correct screw, and tighten all screws firmly to the torque shown in the table if you have a torque screwdriver. **Never use a screw that you removed. Use a new one. Make sure the screws are tightened firmly.**

System board/Inverter replacement notice

Restoring the system unit serial number:

The EEPROM on the inverter contains vital product data (VPD), such as the system unit serial number and the system board serial number. You must restore the system unit serial number to its original number when the system board is replaced.

To restore the system unit serial number, do the following:

1. Install the ThinkPad CE Utility Diskette Version 1.60 and restart the computer.
2. Select **1. Set System Identification** from the main menu.
3. Select **2. Read S/N data from EEPROM**.

Each serial number is displayed with its device type. Write down the system unit serial number. The device type designations for each serial number are as follows:

- 20: System unit serial number
- 40: System board serial number

To restore the serial number after you have replaced the system board, do the following:

1. Install the ThinkPad CE Utility Diskette Version 1.60 and restart the computer.
2. Select **1. Set System Identification** from the main menu.
3. Select **1. Add S/N data from EEPROM**.

Follow the instructions on the screen.

Note: The system unit serial number is written in the label attached on bottom of the computer.

Bios Levels

An incorrect level of BIOS can cause false error 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.

- Current Level BIOS information.
  1. Power-on the computer.
  2. Press F1 at the IBM log screen to enter Setup.
  3. Click on System Information and press Enter.
  4. The System BIOS version will be displayed.
- Sources for determining the latest level of BIOS available.
  1. IBM PC Company Home Page **www.ibm.com/pc/us/**
  2. PC PartnerInfo-Technical Database
  3. RETAIN
- Sources for obtaining the latest level BIOS available.
  1. IBM PC Company Home Page **www.ibm.com/pc/us/**
  2. PC PartnerInfo-Technical Database

To update the BIOS, see “Flash (BIOS) update procedure.”

Flash (BIOS) update procedure

1. Insert the System Program Service Diskette into the diskette drive.
2. Power-on the computer
3. Select Update System Programs from the menu and follow the instructions displayed on the screen.

Related service information

This section provides information about the following:

- “Power button as reset switch”
- “Running a low-level format”
- “Service Web site”
- “Passwords”
- “Power management features” on page 26
- “Fn key combinations” on page 27

Power button as reset switch

The power button acts as a reset switch when pressed for more than 4 seconds. This resets the system (regardless of the microcode status) and forces the power off. Use this only when power is not completely off or the microcode is in a hung state.

Running a low-level format

Attention: Make sure the drive address to be formatted is correct. This procedure erases all information on the disk.

To format the hard disk, use the **Full Erase Hard Drive** or **Quick Erase Hard Drive** in Utility of the PC-Doctor DOS program. Refer to “Testing the computer” on page 28.

Service Web site

When the latest maintenance diskette and system program service diskette are available, they are posted on:

Maintenance diskette:
http://www.pc.ibm.com/partner/infotips

System program service diskette:
http://www.pc.ibm.com/partner/infotips

Passwords

When the power-on password (POP), hard disk password (HDP), and setup password (SUP) (the same function as supervisor password) are used, the following situations may occur:

- **If the POP is the same as the HDP**, the POP prompt appears, but the HDP prompt does not appear.
- **If the POP is not the same as the HDP**, both prompts appear.

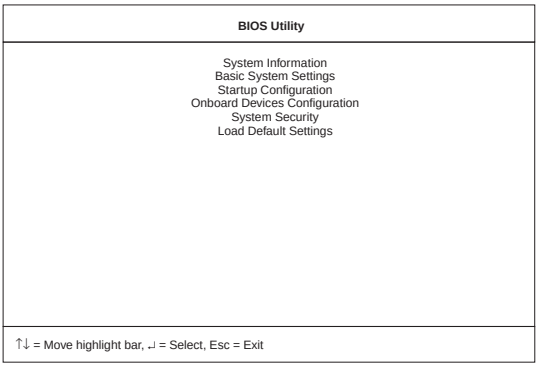
Hard disk password: Hard disk password is a security feature that is used to protect the hard disk data from unauthorized access. No overriding capability is provided, so it can not be replaced if it is forgotten. If the customer forgets the hard disk password, the hard disk drive must be replaced.

Removing the power-on and setup passwords:

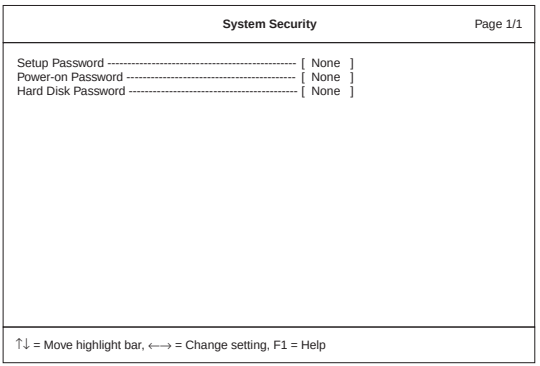
Removing the power-on and setup passwords:

Do the following to remove the passwords::

1. Power off the computer.
2. Remove the battery and the AC Adapter.
3. Remove the keyboard, see **"Keyboard"** on page 60.
4. Change DIP switch position (Pin 6) to **"Check Password Disabled"**, see **"Switch Locations"** on page 43.
5. Put back keyboard.
6. Connect the AC Adapter.
7. Power on the computer and press F1 to enter the BIOS Utility menu.
8. The main screen displays as below:



9. Using the up or down arrow key, select System Security.
10. Press the Enter Key. The password selection window appears:



11. Move the highlight bar to Power-on Password.
12. Select **None**.
13. Move the highlight bar to Setup Password.

14. Select **None**.
15. Save the changes, and exit the BIOS Utility menu.
16. Power off the computer.
17. Disconnect the AC Adapter.
18. Remove the keyboard.
19. Change DIP switch position (Pin 6) to **"Check Password Enabled"**.
20. Put back the keyboard.

Power management features

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

Standby mode: When in standby mode, the following occurs:

- The LCD backlight turns off.
- The hard disk motor either spins down or stops (controlled by OS).
- CPU enters stop-grant mode.

Events that cause the computer to enter standby mode:

Note: These events depend on the **Power buttons** settings (options set to standby mode) in the "Advanced" page of the "Power Management Properties" screen.

- Standby requested by the Sleep button (Fn+F4)
- Standby requested by the power button
- Standby requested by closing the lid.

Events that cause the computer to exit standby mode:

- RTC alarm
- Power-on switch is operated
- Any key or Easy Launch button operation
- The LCD is opened (if the system entered standby mode from closing the lid).

  Note: This is true if **When I close the lid of my portable computer:** is set to **Standby** in the "Advanced" page of the "Power Management Properties" screen
- Plug-in or plug-out of USB devices
- A serial or PC Card device signals the modem ring indicator

  Note: The modem ring wakeup function is effective only on embedded PC Card modem devices.
- The battery power is at a critical level.

Hibernation mode: When 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:

Note: These events depend on the **Power buttons** settings (options set to hibernation mode) in the "Advanced" page of the "Power Management Properties" screen.

- Hibernation requested by the Sleep button (Fn+F4)
- Hibernation requested by the power button
- Hibernation requested by closing the lid.

Events that cause the computer to exit hibernation mode:

- RTC alarm
- Power-on switch is operated

When power is turned on, the hibernation history in the boot record on the hard disk is recognized and the system status is restored from the hard disk to resume operation.

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 key	Function
Fn+F1	Launch Control at a glance.
Fn+F2	Launch Power Management Properties.
Fn+F4	Sleep button
Fn+F7	Switch display output location.
Fn+Home	Brightness up
Fn+End	Brightness down
Fn+Ins	Contrast up (HPA LCD models only)
Fn+Del	Contrast down (HPA LCD models only)

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.

Testing the computer

The ThinkPad computer has a test program called PC-Doctor DOS (hereafter called *PC-Doctor*). You can detect errors by running the diagnostics test of PC-Doctor. This section is an overview on detecting the problem. Refer to “Product overview” on page 44 for details that depend on model-unique functions.

To run the test, do the following:

Note: In the following procedure, you can select an item not only with the arrow keys, but also with the TrackPoint. Instead of pressing **Enter**, you can click the left click button.

1. Insert the PC-Doctor DOS Disk into the diskette drive; then power on the computer.

   If the computer cannot be powered on, go to “Power systems checkout” on page 30 and check the power sources.

   If an error code appears, go to “Symptom-to-FRU Index” on page 33.

   The PC-Doctor main panel appears.
2. Select **Diagnostics** with the arrow keys, and press **Enter**.

   A pull-down menu appears:

   Note: The pull-down menu differs depending on the model.
3. Run the applicable function test.
4. Follow the instructions on the screen. If there is a problem, PC-Doctor shows some messages.
5. Reseat the cable or connector of the detected FRU and run the test again.

   If the error recurs, replace the FRU that caused the error.

   Note: With some FRUs, especially the system board, the problem might be caused by peripheral FRUs. Verify that each peripheral

FRU, such as the flexible cable, has no problem by doing the following:

a. Replace each peripheral FRU one at a time, and run the test again.

b. If the peripheral FRUs have no problem, replace the main FRU itself.

To see the FRU structure of each model, refer to “Product overview” on page 44.

6. To exit the test, select **Quit – Exit Diag**.

To cancel the test, press **Esc**.

The following table lists the options on the test menu.

Diagnostics	Interactive Tests
• Run Normal Test • Run Quick Test • CPU/Coprocessor • System board • Video Adapter • Serial Ports • Fixed Disks • Diskette Drives • Other Devices • Memory Test – Full • Memory Test – Quick	• Keyboard • Video • Internal Speaker • Mouse • Joystick • Diskette • System Load • CD-ROM/DVD • Stereo Speaker
Note: In **Keyboard** test within **Interactive Tests**, the **Fn** key is scanned only once. Each key should be pressed for at least 2 seconds; otherwise, it cannot be sensed.	

Related service information

PC-Doctor can detect the following system information:

Hardware Info:

- System Configuration
- Memory Contents
- Physical Disk Drive
- Logical Disk Drive
- VGA Information
- IDE Drive Information
- PCI Information
- PNPISA Information
- SMBIOS Information
- FRU Information

Utility:

- Run External Tests
- Surface Scan Hard Disk
- Benchmark System

- DOS Shell
- Tech Support Form
- Battery Rundown
- View Test Log
- Print Log
- Save Log
- Full Erase Hard Drive
- Quick Erase Hard Drive

Power systems checkout

To verify the symptom of the power problem on the computer, do the following:

1. Power off the computer.
2. Remove the battery pack.
3. Connect the AC Adapter.
4. Check that power is supplied when you power on the computer.
5. Power off the computer.
6. Disconnect the AC Adapter and install the charged battery pack.
7. Check that power is supplied by the battery pack when you power on the computer.

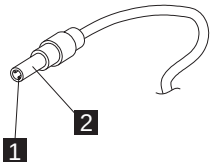
If you suspect a power problem, refer the appropriate power supply check listed below:

- "Checking the AC Adapter"
- "Checking operational charging" on page 31
- "Checking the Battery ASM" on page 31

Checking the AC Adapter: You care 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 operational charging" on page 31.

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	15.5V — 17.0V
2	Ground

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

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

- Replace the DC-DC & BATT board.
- Replace the system board.
- If the problems still persist, go to “Undetermined Problems” on page 38.

Note: An audible noise from the AC Adapter does not always indicate a defect.

Checking 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 or icon does not turn on or does not show orange color, remove the Battery ASM and let it return to room temperature. Reinstall the Battery ASM. If the charge indicator or icon still does not turn on or still does not show orange color, replace the Battery ASM.

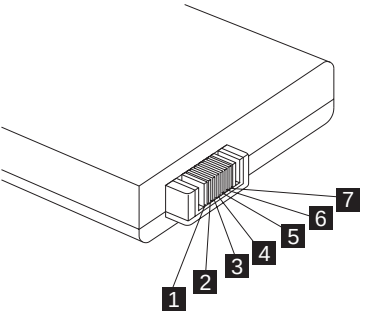
If the charge indicator still does not turn on, replace the DC-DC & BATT board, then the system board. Then reinstall the Battery ASM. If the reinstalled Battery ASM is not charged, go to the next section.

Checking the Battery ASM: After the battery is fully charged, charger can not charge battery until the Fuel Gauge shows that less than 95% of total power remains; with this condition the battery pack can charge to 100% of its capacity. This protects the Battery ASM from being overcharged or from having a shortened life.

Note: The Battery ASM might not be able to charged when it is hot. In that case, remove it from the computer and leave it at room temperature for a while. After it cools down, reinstall it and recharge it.

Do the following:

1. Power off the computer.
2. Remove the battery pack and measure the voltage between battery terminals 1 (+) and 7 (-). See the following figure.



Terminal	Signal / Voltage (V dc)
1	BT-
2	BT-SENSE
3	BT-SCLK
4	BT-SDATA
5	BT-TH
6	BT+SENSE
7	BT+

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

3. First, discharge the battery, until the voltage is less than 10.8V (LiIon) or 9.6V (NiMH). Then, charge the battery for 30 minutes. Now, check the voltage. If the voltage is still less than 10.8V (Li-Ion) or 9.6V (NiMH), replace the battery.
4. If the voltage is more than 10.8V (LiIon) or 9.6V (NiMH), measure the resistance between battery terminals 5 and 7. The resistance must be 390Ω (Li-Ion) or 10KΩ (NiMH). If the resistance is not correct, replace the Battery ASM. If the resistance is correct, replace the DC-DC & BATT board, then the system board.

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 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 which FRUs should be available 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 any IBM device not supported by the diagnostic codes in this ThinkPad computer, see the manual for that device.

Numeric Error Codes and Messages

Error Code	Message	FRU/Action in Sequence
006	Equipment Configuration Error	Enter BIOS Utility and execute "Load Setup Default Settings"; then reboot the system.
040	Diskette Drive Controller Error	• Go to “FRU tests” on page 48. • Diskette drive • System board
070	Real Time Clock Error 1	• Backup battery (RTC battery) • Enter BIOS Utility and execute "Load Setup Default Settings"; then reboot the system. • System board
071	CMOS Battery Bad 4	• Backup battery (RTC battery) • Enter BIOS Utility and execute "Load Setup Default Settings"; then reboot the system. • System board

Error Code	Message	FRU/Action in Sequence
072	CMOS Checksum Error 1	Enter BIOS Utility and execute "Load Setup Default Settings"; then reboot the system.
110	Incorrect Password Specified. System Halted 1	• Set SWZ1 Pin 6 (Check Password) to "0". • Enter BIOS Utility and clear password. • Set SWZ1 Pin 6 (Check Password) to "1".
252	VPD Checksum Error	• Run CE Utility. • Input correct data.
	Operating system not found	Boot from system diskette.

LCD-Related Symptoms

LCD FRU Replacement Notice

The TFT LCD for the computer contains many 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:

- SVGA (12.1"): 5 or more bright dots, 5 or more dark dots, or a total of 9 or more bright and dark dots.
- XGA (14.1"/15.0"): 8 or more bright dots, 8 or more dark dots, or a total of 9 or more bright and dark dots.

Symptom/Error	FRU/Action in Sequence
LCD backlight does not work. LCD is too dark. LCD brightness cannot be adjusted. LCD contrast cannot be adjusted (HPA LCD models only).	• Keyboard (if contrast and brightness function keys do not work) • Reseat LCD connector • Check LCD inverter ID • LCD FPC ASM • LCD inverter • LCD • System board

Symptom/Error	FRU/Action in Sequence
Unreadable LCD screen. Missing pels in characters. Abnormal screen Wrong color displayed.	• Reseat LCD connector • Check LCD inverter ID • LCD FPC ASM • LCD inverter • LCD • System board
LCD has extra horizontal or vertical lines displayed.	• Check LCD inverter ID • LCD FPC ASM • LCD inverter • LCD • System board

Keyboard/TrackPoint-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Keyboard (one or more keys) doesn't work.	• Go to “FRU tests” on page 48. • Reseat keyboard cable. • Keyboard • System board
TrackPoint does not work.	• Go to “FRU tests” on page 48. • Reseat keyboard cable. • Keyboard • System board

Indicator-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Indicator incorrectly remains off or on, but system runs correctly.	• Reseat LED board. • LED board • System board

Power-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Power shuts down during operation.	• Go to “Power systems checkout” on page 30. • AC Adapter • Battery pack • DC/DC & Charge board • System board

Symptom/Error	FRU/Action in Sequence
The system doesn't power on.	• Go to “Power systems checkout” on page 30. • AC Adapter • Battery • DC/DC & Charge board • System board
The system doesn't power off.	• Go to “Power systems checkout” on page 30. • Hold and press the power switch for more than 4 seconds. • DC/DC & Charge board • System board
Battery can't be charged.	• Go to “Power systems checkout” on page 30. • Battery pack • DC/DC & Charge board • System board

Memory-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Memory count (size) appears different from the actual size.	• Go to “FRU tests” on page 48. • Enter BIOS Utility and execute "Load Setup Default Settings"; then reboot the system. • DIMM • System board

Audio-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Internal speakers make noise or emit no sound.	• Speaker volume control • Go to “FRU tests” on page 48. • Speaker(s)
External speakers make noise or emit no sound.	• Speaker volume control • Go to “FRU tests” on page 48. • Speaker(s)
In DOS or Windows, multimedia programs, no sound comes from the computer. (Only system beeps are heard at power on.)	• Speaker volume control • Go to “FRU tests” on page 48. • Speaker(s)

PC Card (PCMCIA)-Related Symptoms

Symptom/Error	FRU/Action in Sequence
System cannot detect the PC Card (PCMCIA)	• PC Card (PCMCIA) slots assembly • System board
PCMCIA slot pin is damaged.	PC Card (PCMCIA) slots assembly

Power Management-Related Symptoms

Symptom/Error	FRU/Action in Sequence
The system doesn't enter hibernation mode.	• Go to “Hibernation mode” on page 27. • Keyboard • Hard disk drive • System board
The system doesn't resume from hibernation mode.	• Go to “Hibernation mode” on page 27. • Hard disk drive • System board
The system doesn't enter into or resume from sleep mode after closing the LCD.	• Lid switch • System board
Battery fuel-gauge doesn't go higher than 90%.	• Remove battery pack and let it cool for 2 hours. • Refresh battery (continue using battery until power off, then charge the battery). • Battery pack • DC/DC & Charge board • System board
System configuration does not match the installed devices.	Enter BIOS Utility and execute "Load Setup Default Settings"; then reboot the system.
System hangs intermittently.	• Reseat hard disk drive. • Fan ASM (go to “FRU tests” on page 48). • System board
In DOS or Windows, multimedia programs, no sound comes from the computer.	• Speaker volume control • Speaker (go to “FRU tests” on page 48). • System board

Peripheral-Device-Related Symptom

Symptom/Error	FRU/Action in Sequence
External display does not work correctly.	System board

Symptom/Error	FRU/Action in Sequence
Printer problems.	• Run printer self-test. • Printer driver • Printer cable • Ensure that "Parallel Port" in the "Onboard Devices Configuration" menu of the BIOS Utility is correctly set. • System board
Serial or parallel port device problems.	• Device driver • Device cable • Device • Ensure that "Serial Port" and "Parallel Port" in the "Onboard Devices Configuration" menu of the BIOS Utility is correctly set. • System board

Modem-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Internal modem does not work correctly	• Go to “FRU tests” on page 48. • Modem connector • Modem board • System board

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 only be considered when a recurring problem exists.

When analyzing the intermittent problem, do the following:

1. Run the diagnostic test for the system board at least 10 times.
2. If no error is detected, do not replace any FRUs.
3. If any error is detected, replace the FRU. Rerun the test to verify that there are no more errors.

Undetermined Problems

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 the procedures below to isolate the failing FRU.

Verify that the power supply being used at the time of the failure is operating correctly.

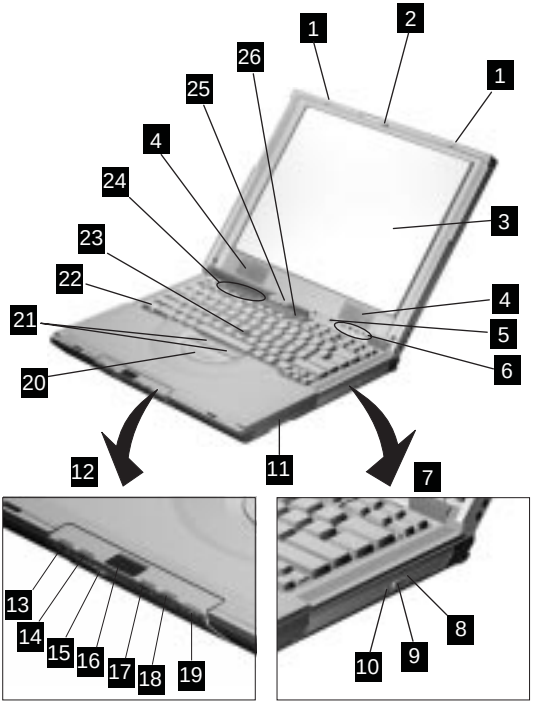
1. Power off the computer.

2. Check the cables, wires, and connectors for short circuits and open circuits. Visually check them for damage. If any problems are found, replace the FRU.
3. Remove or disconnect all of the following devices:
    - Non-IBM devices
    - Printer, external mouse & keyboard, and other external devices
    - Battery pack
    - Hard disk drive
    - Diskette drive/CD-ROM drive
    - PC Card (PCMCIA)
4. Power on the computer.
5. Determine if the problem has changed.
6. If the problem does not occur again, 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.
    - Charger board
    - Audio & battery function connection board
    - LCD assembly
    - System board

Locations

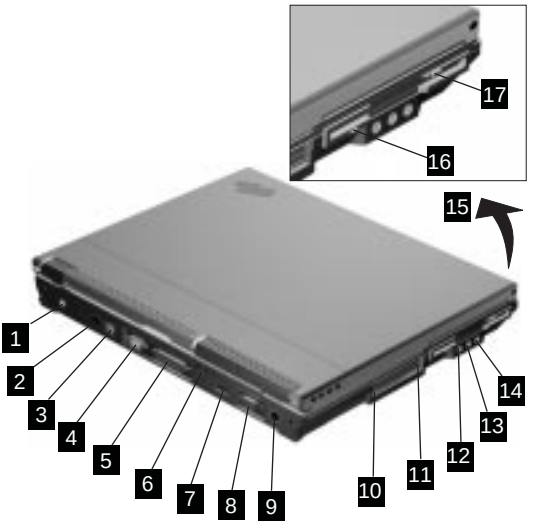
Front View

1. LCD latches
2. Keyboard Light (available on select models only)
3. LCD
4. Speakers
5. Keyboard Light switch (available on select models only)
6. Status indicators
7. CD-ROM or DVD-ROM drive
8. CD-ROM/DVD-ROM drive activity indicator
9. CD-ROM/DVD-ROM drive eject button
10. CD-ROM/DVD-ROM drive emergency eject hole
11. Battery pack
12. Media Center
13. Media Center previous track/chapter button
14. Media Center next track/chapter button
15. Volume control
16. Media Center status LCD
17. Media Center play/pause button
18. Media Center stop/eject button
19. Media Center power button
20. Internet Scroll Bar
21. Click buttons
22. Fn key
23. TrackPoint stick
24. Easy Launch buttons
25. Built-in microphone
26. Power button



Note: 15" LCD has different locations of speakers, microphone and status indicator. The speakers are located in the back of LCD. Microphone and status indicator are moved to the main unit.

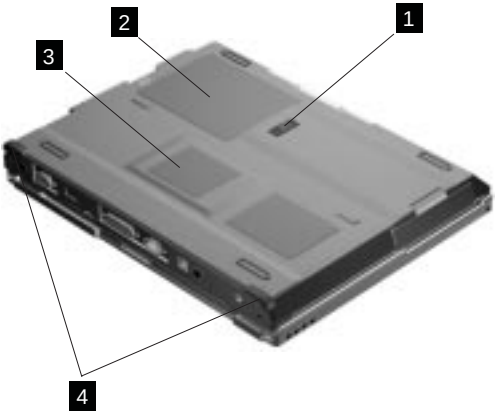
Rear View



1. Power jack

2. Mouse/keyboard (PS/2) connector
3. Telephone connector
4. Serial connector
5. Parallel connector
6. Security keyhole
7. Universal serial bus (USB) connector
8. External monitor connector
9. TV-out (S-video) jack
10. PC Card slots
11. PC Card eject buttons
12. Line-out/headphone jack
13. Line-in jack
14. Microphone-in jack
15. Diskette drive
16. Diskette-drive-activity indicator
17. Diskette eject button

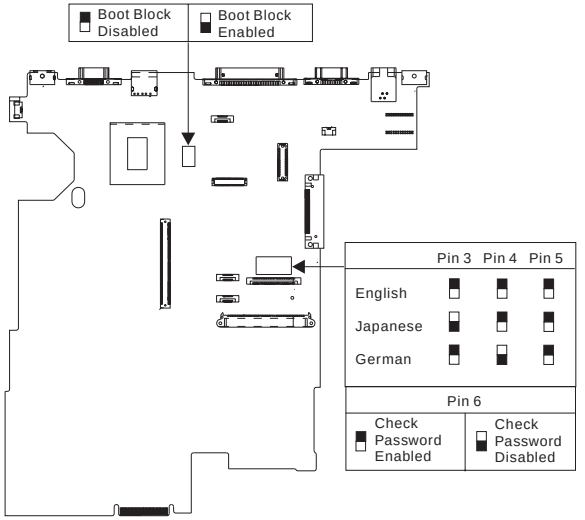
Bottom View



1. Battery-pack latch
2. Memory slot door
3. Modem card compartment
4. Tilt feet

Switch Locations

There are two switches found on the system board. Refer to the figure below on how to set these switches.



ThinkPad i Series 1400/1500 (Part I)

This section applies to the models in Group-A and B. (See the 2621 model table on page iii.)

Product overview

The following shows an overview of the system features.

Note: The table below applies to the models in Group-A (See the 2621 model table on page iii.)

Feature	Description
Processor	Intel** Celeron** processor 400, 433 or 466 MHz
Bus architecture	PCI
System memory	2 DIMM slots, no memory on system board 32 MB, 64 MB, and 128 MB DIMM card Maximum frequency: 66 MHz
CMOS RAM	114 bytes + 4 Kbytes
Video	12.1–inch, 16M colors, 800x600 pixel TFT SVGA color LCD 13.0–inch, 16M colors, 800x600 pixel HPA SVGA color LCD —or— 14.1–inch, 16M colors, 1024x768 pixel TFT XGA color LCD
Audio	16-bit audio Internal stereo speakers Internal microphone
Diskette drive	1.44MB (3–mode), 3.5 inch
Hard disk drive	4.8/6,4/8.1GB above, 2.5–inch, EIDE interface
CD-ROM drive or DVD-ROM drive	CD-ROM: 5.25–inch, 24X speed, EIDE interface —or— DVD-ROM: 5.25–inch, 4X speed, EIDE interface
Modem	56.6 Kbps, internal (depends on the model)
PC Card (PCMCIA)	One Type III or Type II, with CardBus and ZV support
I/O ports	External monitor Speaker-out Line-in Microphone-in DC-in Mouse/keyboard Parallel Serial USB Telephone (RJ11) TV-out (S-video) (DV model only)

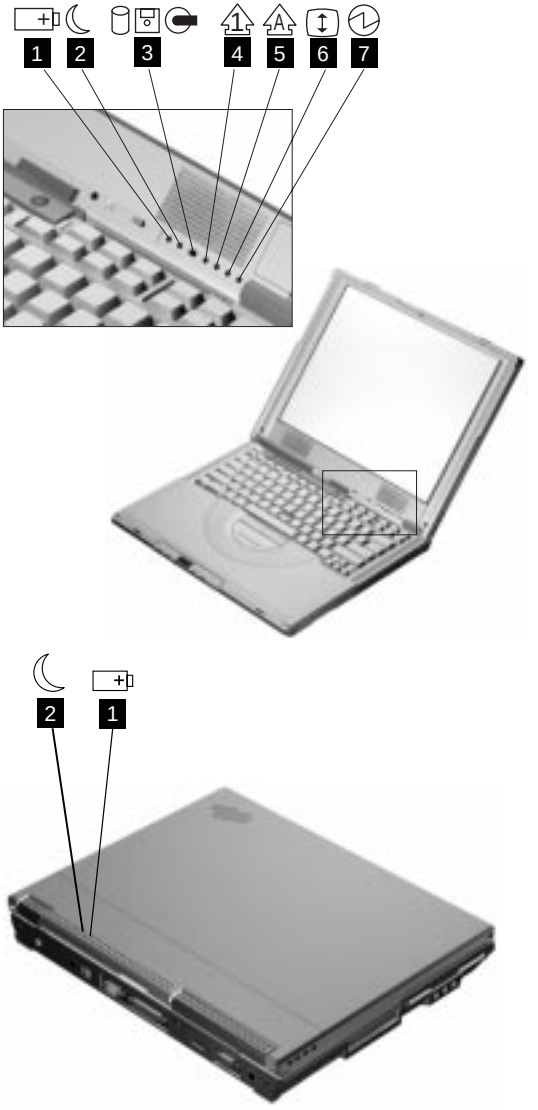
Feature	Description
AC Adapter	56–Watt type

Note: The table below applies to the models in Group-B (See the 2621 model table on page iii.)

Feature	Description
Processor	Intel** Celeron** processor 466 MHz
Bus architecture	PCI
System memory	2 DIMM slots, no memory on system board 32 MB, 64 MB, and 128 MB DIMM card Maximum frequency: 66 MHz
CMOS RAM	114 bytes + 4 Kbytes
Video	12.1–inch, 16M colors, 800x600 pixel TFT SVGA color LCD 13.0–inch, 16M colors, 800x600 pixel HPA SVGA color LCD —or— 14.1–inch, 16M colors, 1024x768 pixel TFT XGA color LCD
Audio	16-bit audio Internal stereo speakers Internal microphone
Diskette drive	1.44MB (3–mode), 3.5 inch
Hard disk drive	6/9/12GB above, 2.5–inch, EIDE interface
CD-ROM drive or DVD-ROM drive	CD-ROM: 5.25–inch, 24X speed, EIDE interface —or— DVD-ROM: 5.25–inch, 4X speed, EIDE interface
Modem	56.6 Kbps, internal (depends on the model)
PC Card (PCMCIA)	One Type III or Type II, with CardBus and ZV support
I/O ports	External monitor Speaker-out Line-in Microphone-in DC-in Mouse/keyboard Parallel Serial USB Telephone (RJ11) TV-out (S-video)

Feature	Description
AC Adapter	56–Watt type

Status indicators: The system-status indicators on the computer show the current status of your computer by their on or off states and colors (green and orange). Each indicator is identified with a symbol. The following shows the location and the meaning of each icon:



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) Standby mode	Green	The computer is in standby mode
	Blinking green	The computer is entering or resuming from hibernation mode.
(3) Drive in use	Orange (some will be Green)	Data is being read from or written to the hard disk, floppy drive, or data is being read from the CD-ROM drive. Do not enter standby 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 **Shift** key, and pressing the **NumLk** 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 **Shift** key being pressed. You enable or disable the Caps Lock mode by pressing the **Caps Lock** key.
(6) Scroll lock	Green	Scroll Lock mode is enabled. The **Arrow** keys can be used as screen-scroll function keys. The cursor cannot be moved with the **Arrow** keys. *Not all application programs support this function.* You enable or disable Scroll Lock mode by pressing the **ScrLk** key.
(7) Power on	Green	The computer is operational. This indicator is on when the computer is on.

FRU tests: The following table shows the applicable test for each FRU using PC-Doctor.

FRU	Applicable test
System board	1. CPU/Coprocessor (**Diagnostics**) 2. System board (**Diagnostics**)
Power	Battery (**Diagnostics**)
LCD unit	1. Video Adapter (**Diagnostics**) 2. Video (**Interactive Tests**)
Modem	1. Make sure the modem set up correctly. 2. Replacing the modem jack and modem card one at a time, run the modem tests in Other Devices (**Diagnostics**)
Audio	Internal Speaker (**Interactive Tests**) Stereo Speaker (**Interactive Tests**)
Speaker	System beeper: Internal Speaker (**Interactive Tests**)
PC Card slots	System board (**Diagnostics**)
Keyboard	1. Keyboard (**Diagnostics**) 2. Keyboard (**Interactive Tests**)
TrackPont or Pointing device	If the TrackPoint does not work, see if an external PS/2 mouse is connected to the mouse/keyboard connector and remove it. The TrackPoint is automatically disabled if an external PS/2 mouse is attached. Check also if the TrackPoint driver is correctly installed by accessing Windows Device Manager via the System icon in the Control Panel. 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 this does not correct the TrackPoint problem, continue with the following: Mouse (**Interactive Tests**).
Hard disk drive	Fixed Disks (**Diagnostics**)
Diskette drive	1. Diskette Drive (**Diagnostics**) 2. Diskette (**Interactive Tests**)
CD-ROM or DVD-ROM drive	CD-ROM/DVD (**Interactive Tests**)

FRU	Applicable test
Memory	1. If a DIMM is installed, remove it and run Memory Test-Quick (**Diagnostics**) 2. If the problem does not recur, replace the DIMM and run the test again. 3. If the test does not detect the error, run Memory Test-Full (**Diagnostics**)
Fan	1. Start Windows 98 and check the air turbulence at the louver at the rear of the computer. 2. Run the fan test in Other Devices (**Diagnostics**).

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 callout, to show the correct sequence of removal.
- Any FRUs that must be removed before removing the failing FRU are listed at the top of the page.
- To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement. See “Locations” on page 40 for internal cable connections and arrangement information.
- When replacing a FRU, use the correct screw size, as shown in the procedure.

Safety Notice 1

Translations in "Safety Notices (Multilingual Translations)" section: 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.

Safety Notice 3

Translations in "Safety Notices (Multilingual Translations)" section: 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.

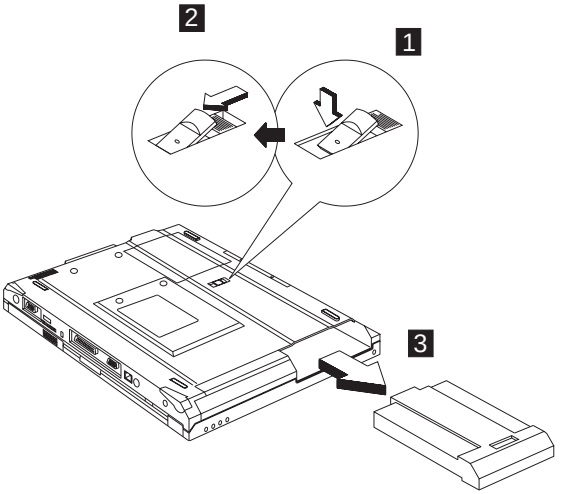
Safety Notice 8

Translations in "Safety Notices (Multilingual Translations)" section: Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, remove the battery pack, then disconnect any interconnecting cables.

Attention: The system board is sensitive and can be damaged by electronic discharge. Establish personal grounding by touching a ground point with one hand before touching these units.

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

Battery assembly

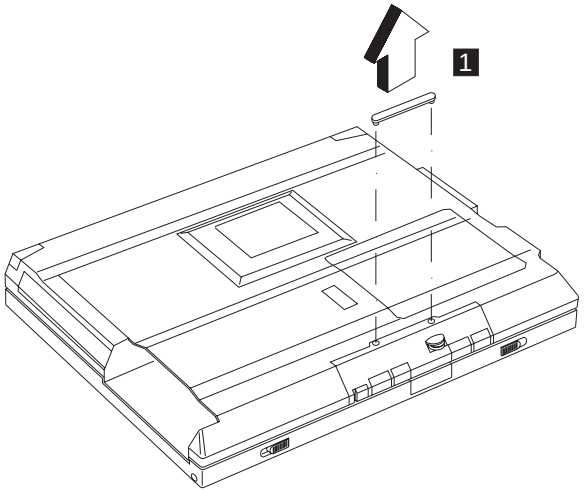


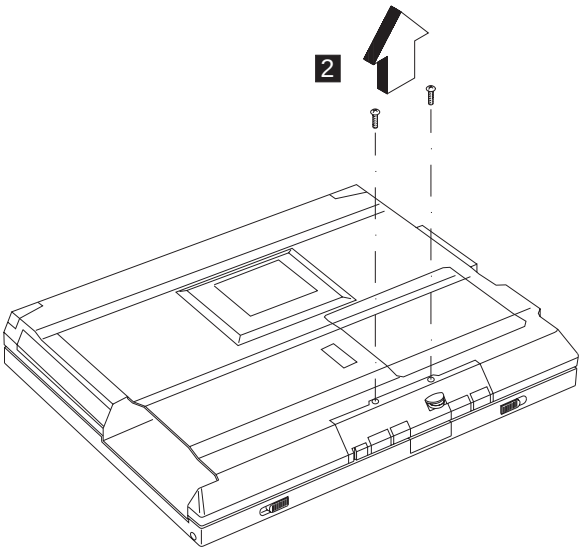
Note: When install a new battery pack, push the battery in and lock it. No need to repeat step 1 and 2.

Warning

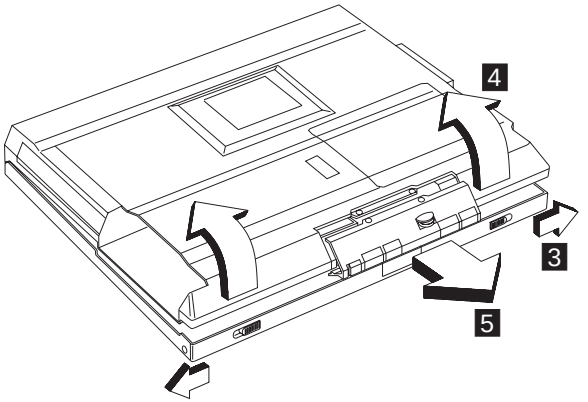
Battery packs are capable of delivering high currents for a significant amount of time. Do not short the battery terminals.

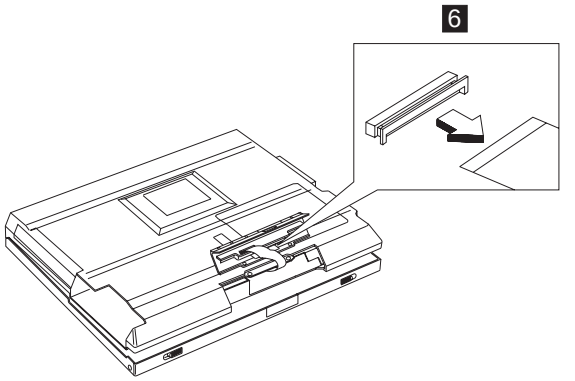
CD player panel and CD player control board





Step	Size (Quantity)	Color	Torque
1	M2.5 x 6L (2)	Black	3.2 kgf-cm

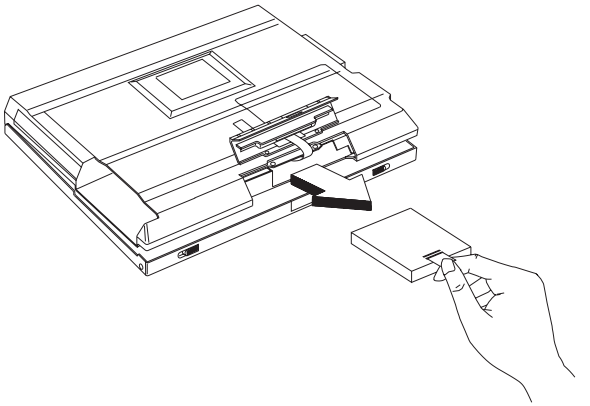




Note: The FPC is connected to the system board by the other end. When removing the CD player panel and CD player control board, release the FPC with caution.

Hard disk drive assembly

- "Battery assembly" on page 51
- "CD player panel and CD player control board" on page 51



Warning

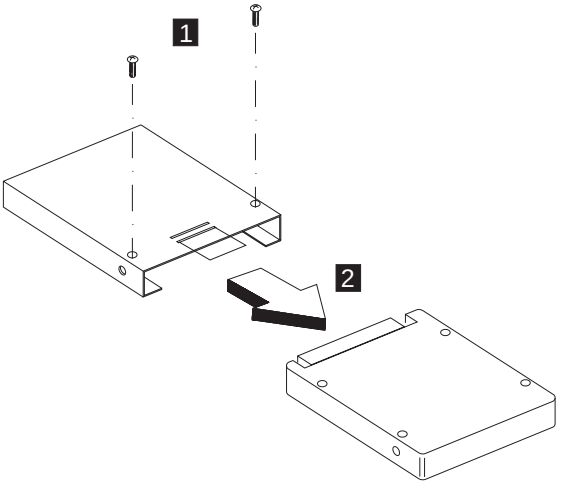
Do not drop or apply any shock to the hard disk drive. The hard disk drive is sensitive to physical shock. Incorrect handling can cause damage and permanent loss of data on the drive.

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.

Hard disk drive kitting pack

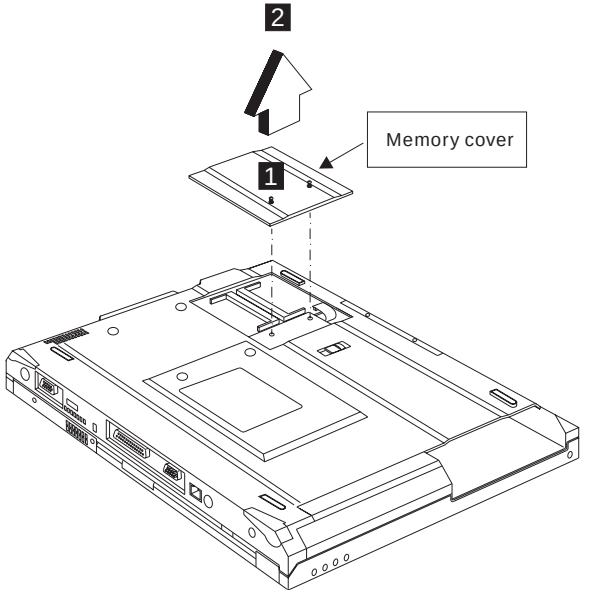
- “Battery assembly” on page 51
- “CD player panel and CD player control board” on page 51
- “Hard disk drive assembly” on page 53



Step	Size (Quantity)	Color	Torque
1	M3 x 4L (2)	Silver	3.2 kgf-cm

Memory cover and memory card

- “Battery assembly” on page 51



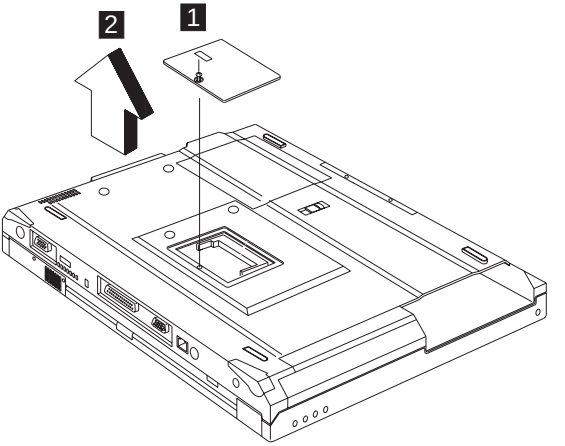
Note: The screw does not separate from the memory cover.

To install the memory card:

With the notched end of the memory card toward the right side of the socket, insert the memory card, at an angle of approximately 20°, into the socket; then press it firmly. Pivot the memory card until it snaps into place.

Modem cover and modem card

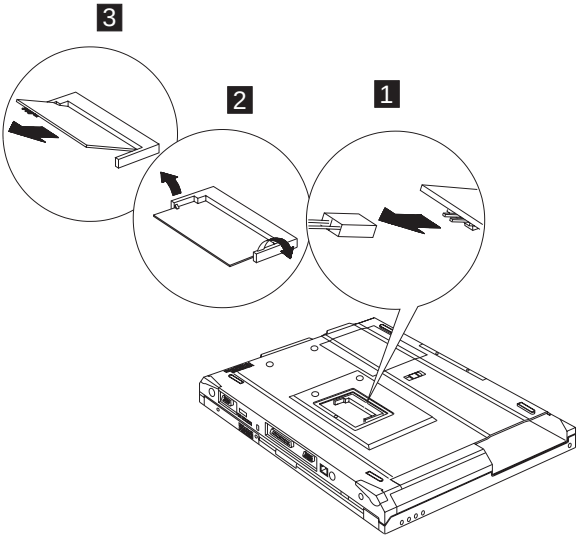
- “Battery assembly” on page 51



Note: The screw does not separate from the modem cover.

To remove the modem card:

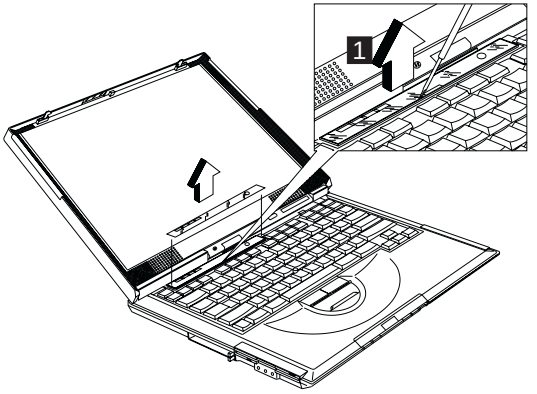
1. Disconnect the modem cable.
2. Press the release latches on both sides of the modem board.
3. Pull out the modem card.

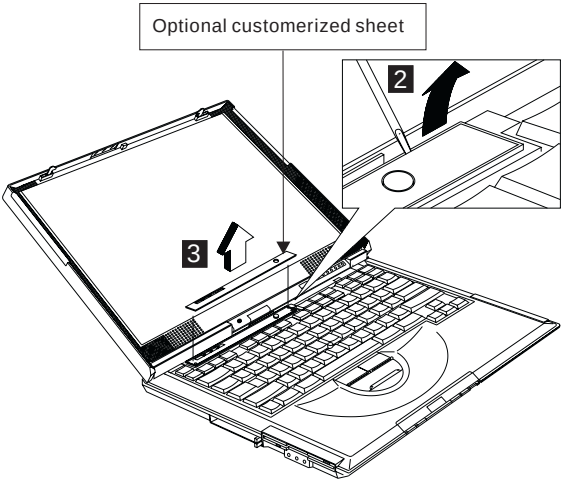


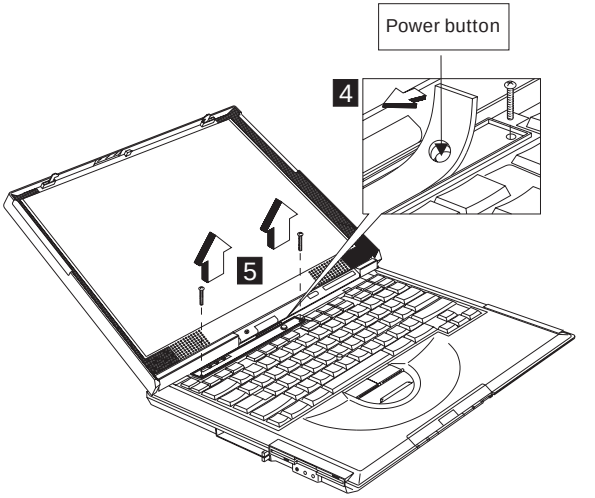
When reinserting the card, reverse the procedures above.

Middle cover and launch key assembly

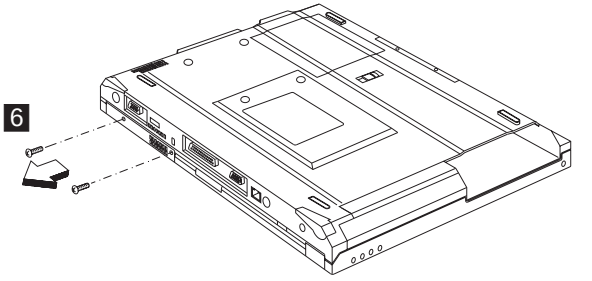
- “Battery assembly” on page 51



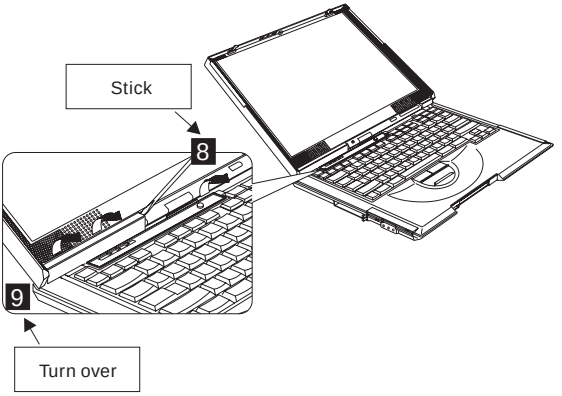




Step	Size (Quantity)	Color	Torque
1	M2 x 4L (2)	Silver	1.6 kgf-cm

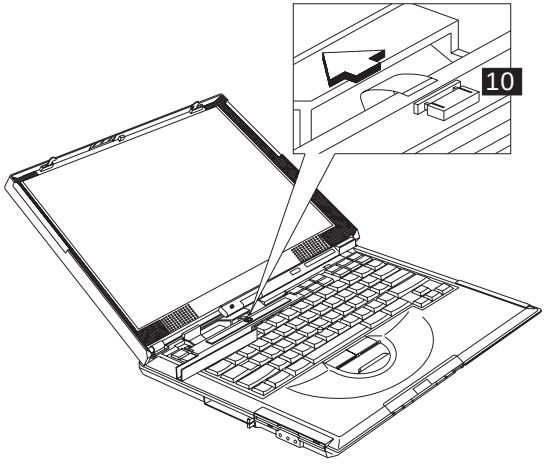


Step	Size (Quantity)	Color	Torque
3	M2.5 x 3.5L (2)	Black	3.2 kgf-cm

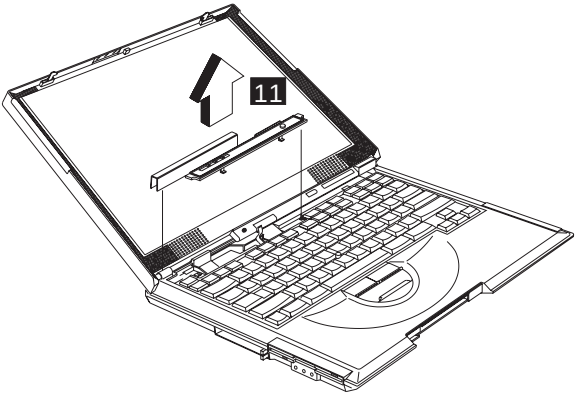


Notes:

1. Adjust the LCD module to the widest angle. Be careful not to scratch the surface of the middle cover.
2. Turn the middle cover and launch key assembly upside down when removing the FFC.

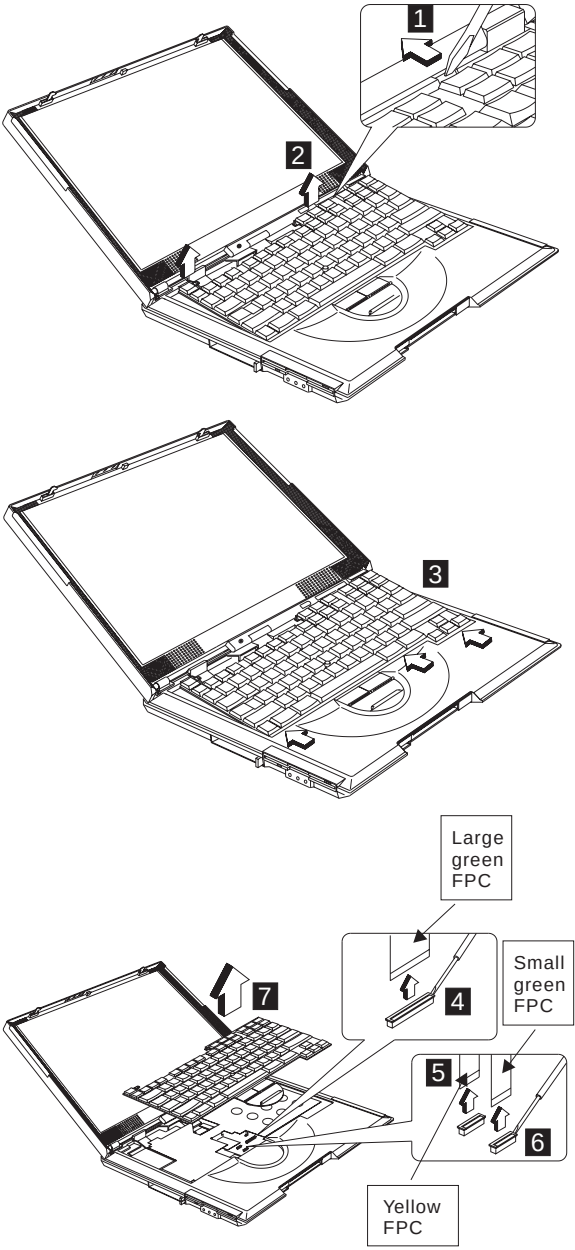


CAUTION:
There is a FFC connected to the middle cover. When removing the middle cover, release the FFC with caution.



Keyboard

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56



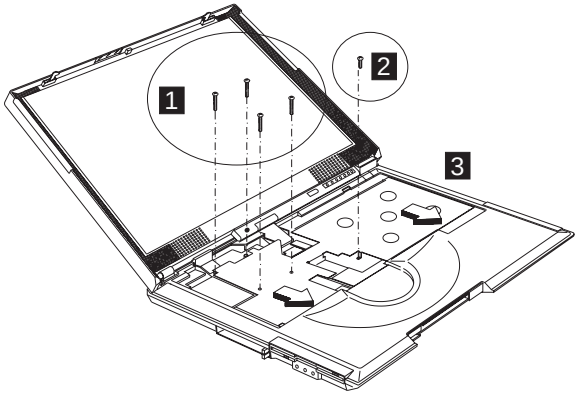
Note: Make sure the FPC finger side is facing outwards, when inserted.

Notes:

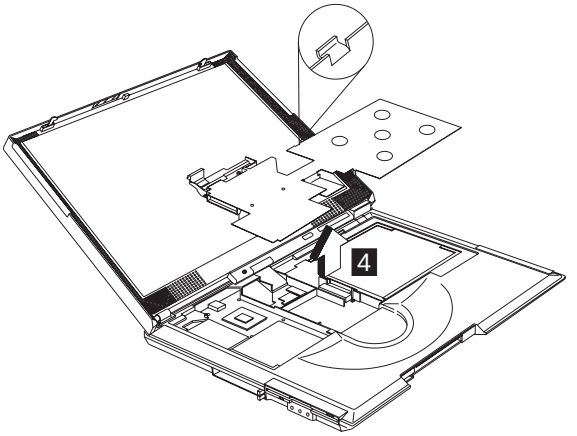
1. When replacing the keyboard, make sure that the 3 cables are clean and insert them directly into the connectors, making sure they make contact with the bottom of the connector. Now press down on the latch of the connector to secure.
2. If the cables do not touch the bottom of the connector, the keyboard function will be rendered useless.
3. The cables of the keyboard are fragile and could be damaged. Be careful when pulling out the cables.

Upper heat sink

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60

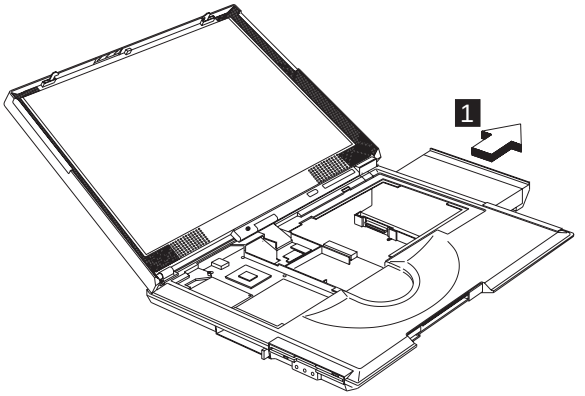


Step	Size (Quantity)	Color	Torque
1	M2 x 8L (4)	Black	1.6 kgf-cm
2	M2.5 x 10L (1)	Black	3.2 kgf-cm



CD-ROM/DVD-ROM assembly

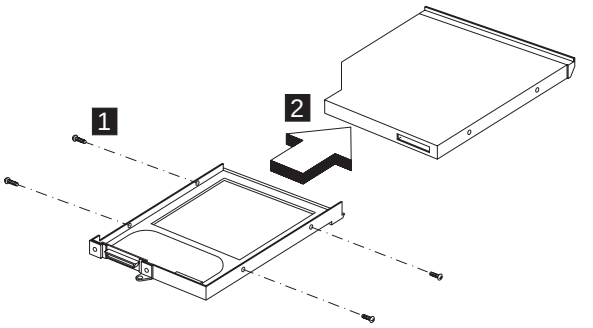
- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “Upper heat sink” on page 61



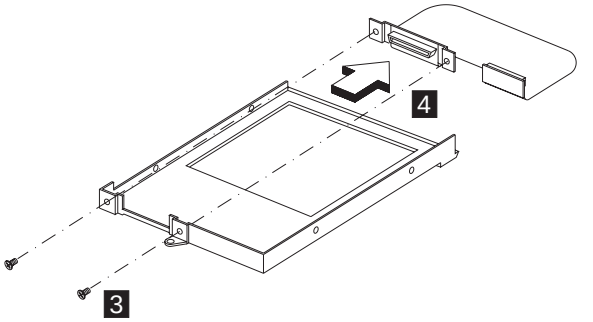
CAUTION:
When the CD-ROM/DVD-ROM assembly is removed, the machine is unstable.

CD-ROM/DVD-ROM chassis assembly

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “Upper heat sink” on page 61
- “CD-ROM/DVD-ROM assembly”



Step	Size (Quantity)	Color	Torque
1	M2 x 3L (4)	Silver	1.8 kgf-cm



Caution

Do not disassemble the CD-ROM; there are no user adjustments or serviceable parts inside. The use of controls, adjustments or performing procedures other than those specified may result in hazardous radiation exposure.

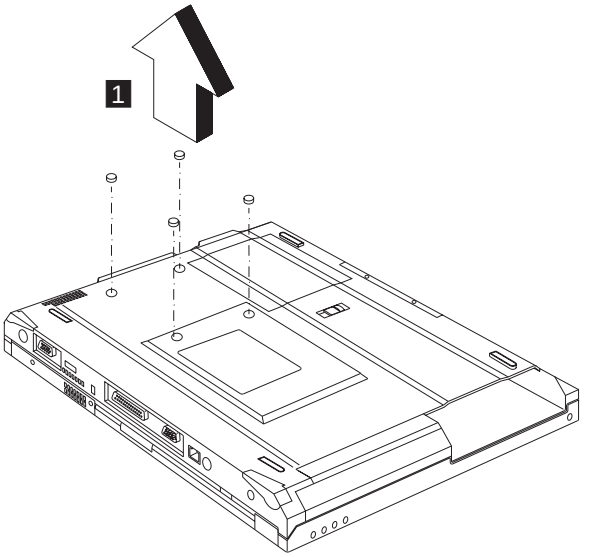
The CD-ROM is a sensitive electronic device, handling should be cautious.

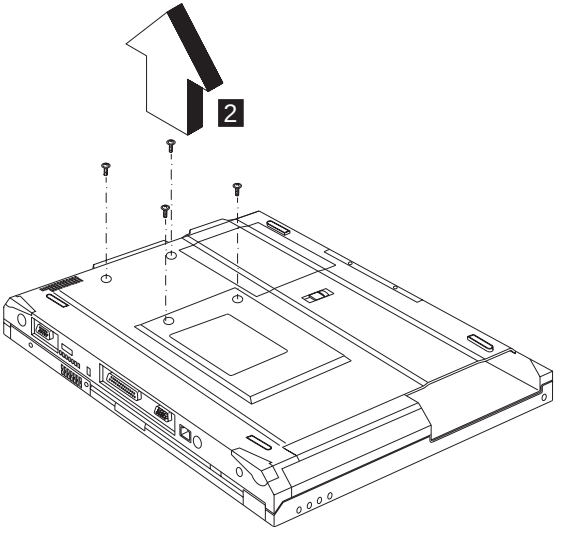
Do not apply any extra force to the CD-ROM drive when removing it.

Step	Size (Quantity)	Color	Torque
1	M2 x 3L (2)	Silver	1.3 kgf-cm

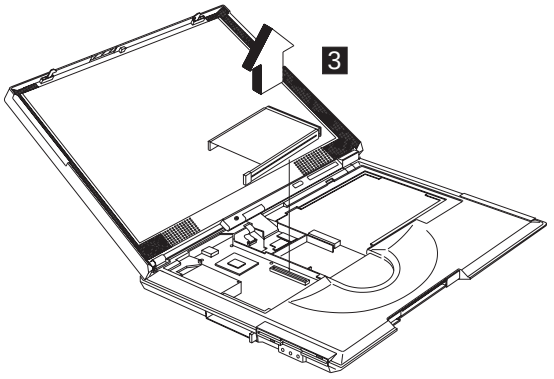
PCMCIA holder

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “Upper heat sink” on page 61





Step	Size (Quantity)	Color	Torque
1	M2 x 4L (4)	Silver with washer head	1.6 kgf-cm

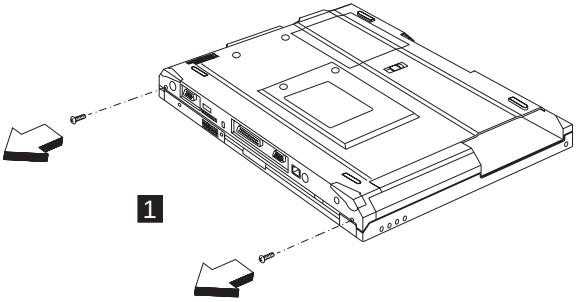


Note: Before removing and replacing the PCMCIA holder, make sure that the PCMCIA cards are removed.

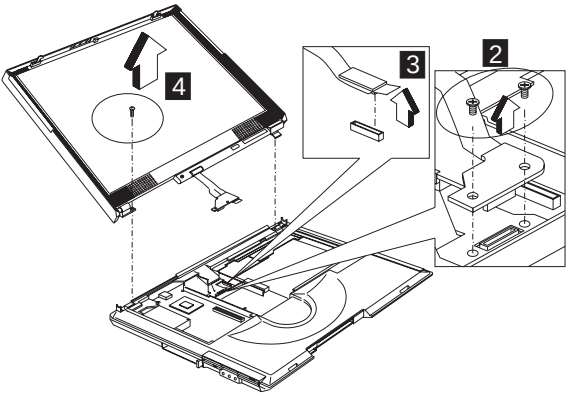
CAUTION:
When removing the PCMCIA holder, pull them up at an angle. It cannot be removed when pulled straight up.

LCD assembly

- "Battery assembly" on page 51
- "Middle cover and launch key assembly" on page 56
- "Keyboard" on page 60



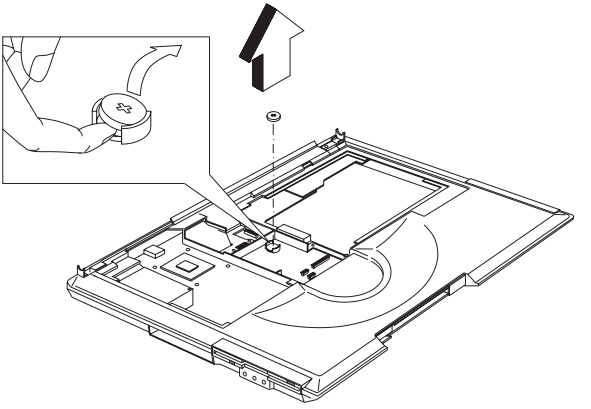
Step	Size (Quantity)	Color	Torque
1	M2.5 x 6L (2)	Black	3.2 kgf-cm



Step	Size (Quantity)	Color	Torque
2	M2 x 12L (2)	Silver	1.6 kgf-cm
4	M2.5 x 6L (1)	Black	3.2 kgf-cm

Backup battery

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “Upper heat sink” on page 61

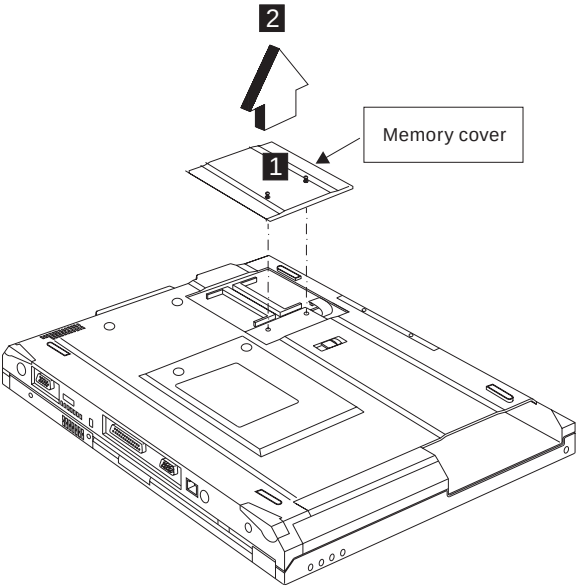


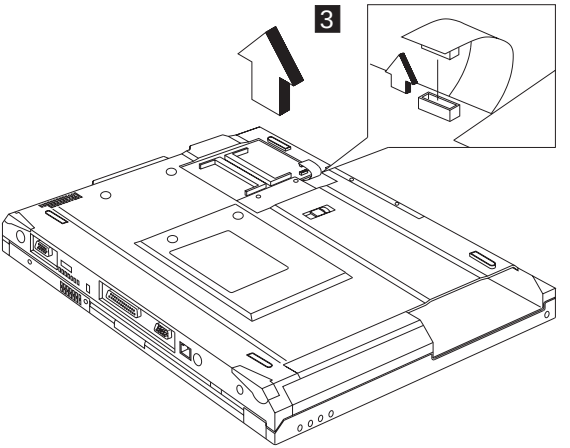
Safety Notice 4

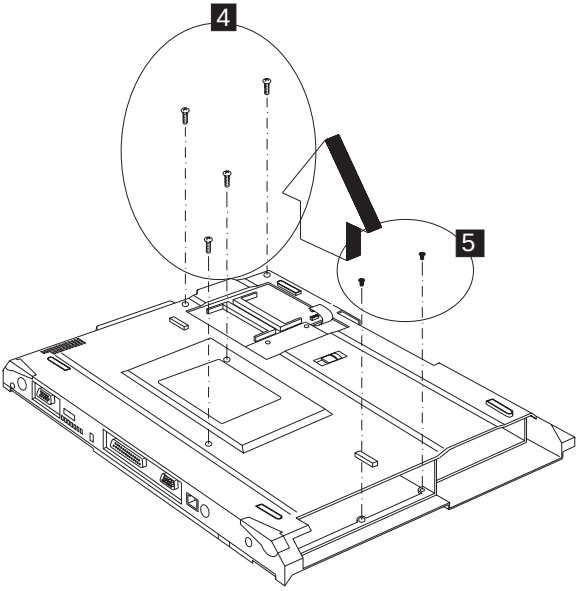
Translation in "Safety Notices: Multilingual Translations" section: The backup battery is a lithium battery and can cause a fire, an explosion, or severe burns. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use of an incorrect battery can result in ignition or explosion of the battery. Replacement batteries can be ordered from IBM or IBM Authorized Dealers.

Keyboard bezel

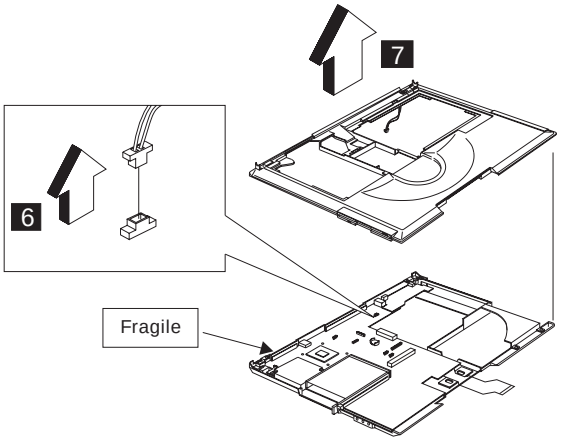
- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “Upper heat sink” on page 61
- “CD-ROM/DVD-ROM assembly” on page 62
- “LCD assembly” on page 65







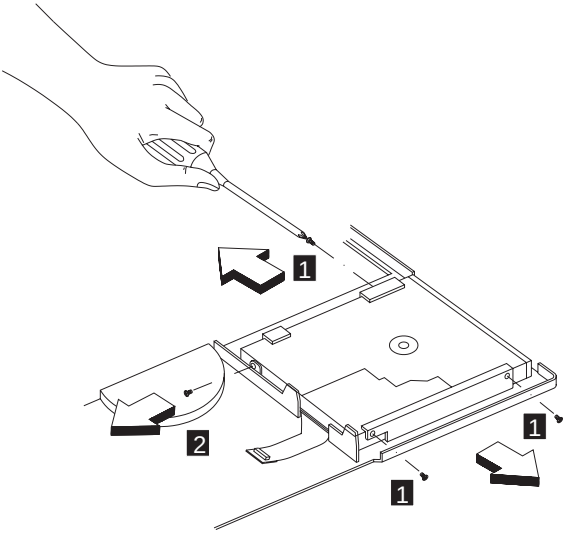
Step	Size (Quantity)	Color	Torque
1	M2.5 x 6L (4)	Black	3.2 kgf-cm
2	M2.5 x 3.5L (2)	Black	3.2 kgf-cm



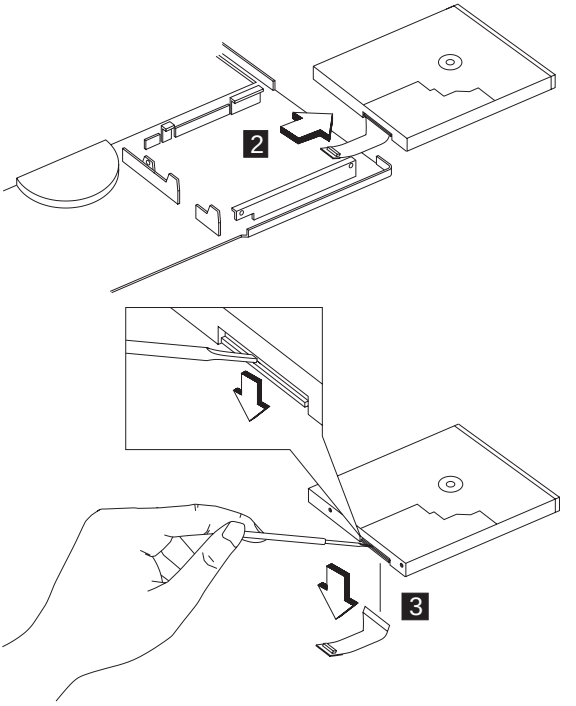
CAUTION:
The upper cover has several latches. When removing the upper cover from the bottom cover, gently release these latches, then raise the side of the uppoer cover facing the palm rest to remove it. Be careful not to break the latches.

Diskette drive assembly

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “Upper heat sink” on page 61
- “CD-ROM/DVD-ROM assembly” on page 62
- “LCD assembly” on page 65
- “Keyboard bezel” on page 67

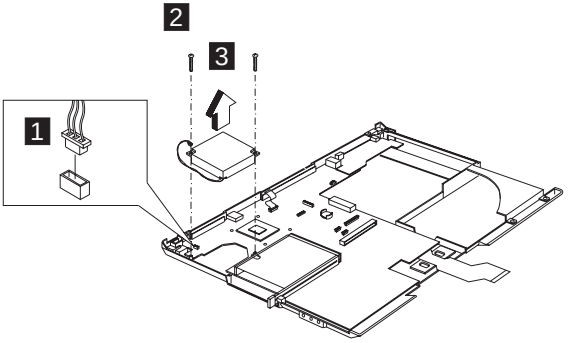


Step	Size (Quantity)	Color	Torque
1	M2.5 x 3.5L (3)	Black	2.0 kgf-cm
2	M2 x 4L (1)	Silver	1.6 kgf-cm



Fan assembly

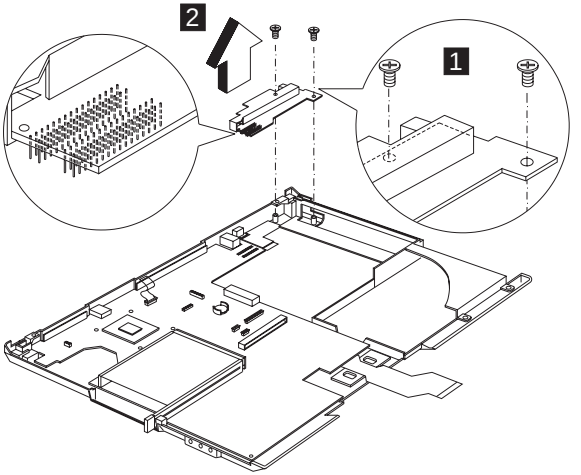
- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “Upper heat sink” on page 61
- “CD-ROM/DVD-ROM assembly” on page 62
- “LCD assembly” on page 65
- “Keyboard bezel” on page 67



Step	Size (Quantity)	Color	Torque
2	M2.5 x 3.5L (2)	Black	3.2 kgf-cm

DC-DC charger board

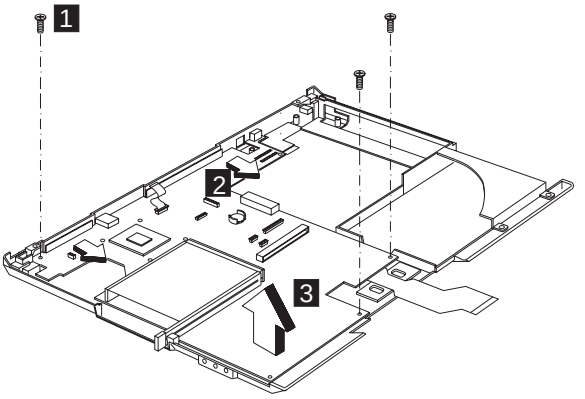
- "Battery assembly" on page 51
- "Middle cover and launch key assembly" on page 56
- "Keyboard" on page 60
- "Upper heat sink" on page 61
- "CD-ROM/DVD-ROM assembly" on page 62
- "LCD assembly" on page 65
- "Keyboard bezel" on page 67



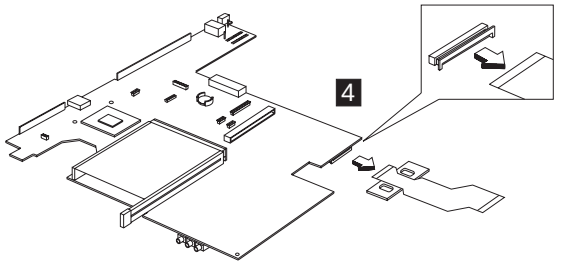
Step	Size (Quantity)	Color	Torque
1	M2.5 x 3.5L (2)	Black	3.2 kgf-cm

System board

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “Upper heat sink” on page 61
- “LCD assembly” on page 65
- “Keyboard bezel” on page 67
- “Fan assembly” on page 70
- “DC-DC charger board” on page 71



Step	Size (Quantity)	Color	Torque
1	M2.5 x 3.5L(3)	Black	3.2 kgf-cm

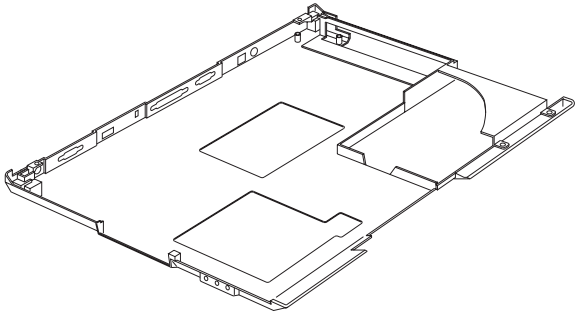


Notes:

1. When removing the system board from the bottom cover, gently raise the side of the system board facing the rear I/O ports; then pull out the system board.
2. When replacing the system board, align the power switch and power actuator. Make sure that the power switch operates correctly before securing the screws.

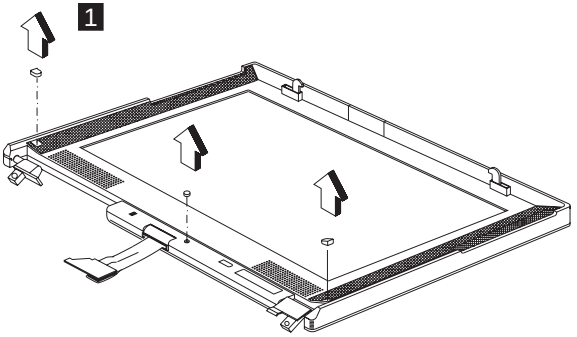
Bottom case

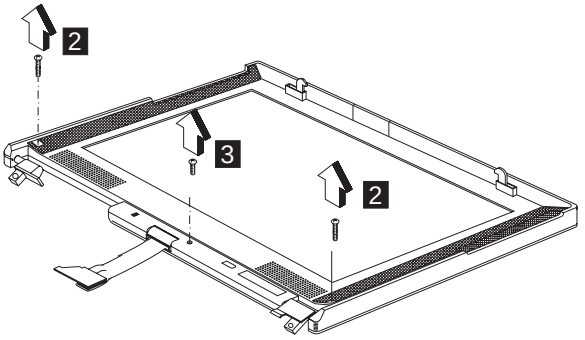
- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “Upper heat sink” on page 61
- “CD-ROM/DVD-ROM assembly” on page 62
- “LCD assembly” on page 65
- “Keyboard bezel” on page 67
- “System board” on page 72



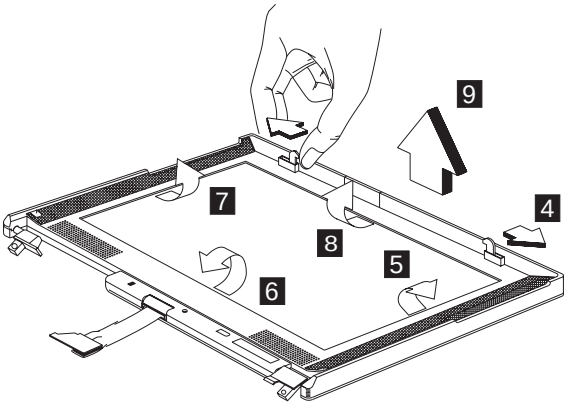
LCD bezel assembly (12.1")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65





Step	Size (Quantity)	Color	Torque
2	M2.5 x 10L(2)	Black	1.6 kgf-cm
3	M2.5 x 6L(1)	Black	1.6 kgf-cm

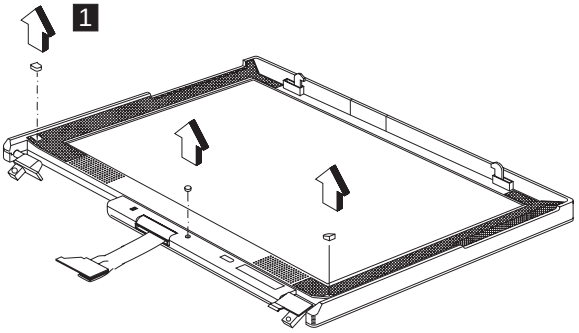


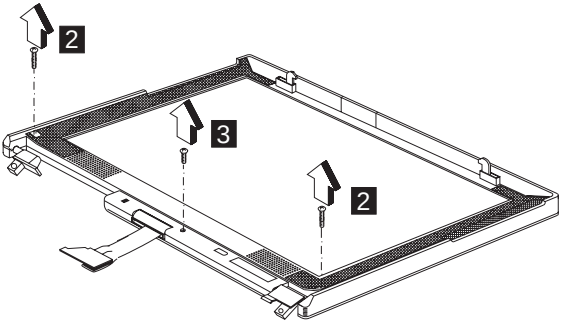
Note: When removing the LCD, take note of the following:

- Be careful not to scratch the LCD cover when removing the screw covers.
- The LCD front cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break these latches.
- Gently push the two hooks outward to remove the LCD front cover.

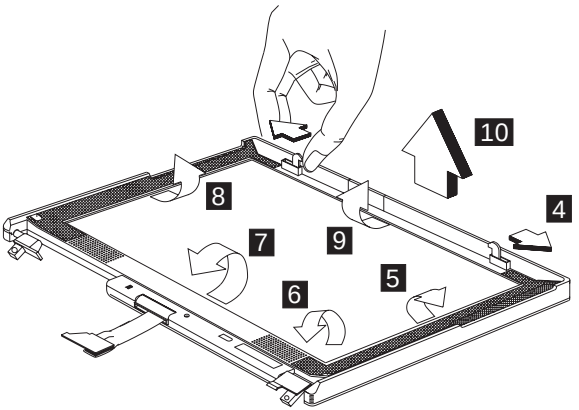
LCD bezel assembly (13.0")

- "Battery assembly" on page 51
- "Middle cover and launch key assembly" on page 56
- "Keyboard" on page 60
- "LCD assembly" on page 65





Step	Size (Quantity)	Color	Torque
2	M2.5 x 10L(2)	Black	3.2 kgf-cm
3	M2.5 x 6L(1)	Black	3.2 kgf-cm



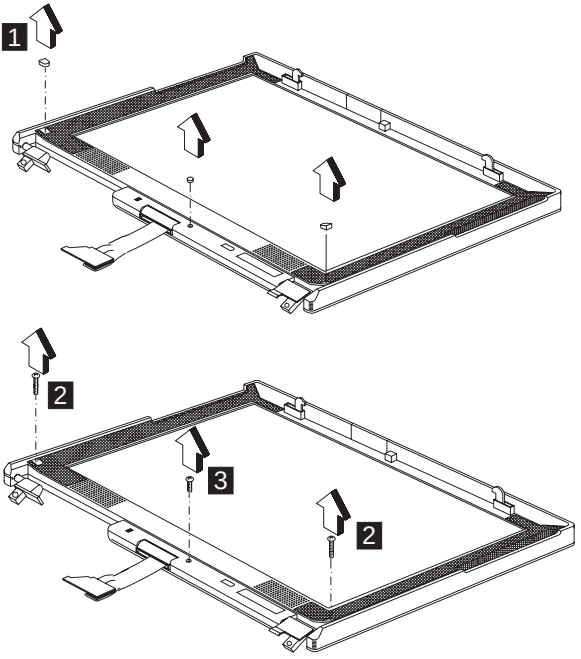
Note: When removing the LCD, take note of the following:

- Be careful not to scratch the LCD cover when removing the screw covers.
- The LCD front cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break these latches.

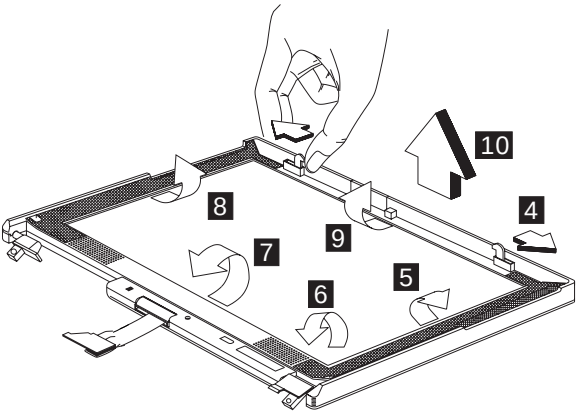
- Gently push the two hooks outward to remove the LCD front cover.

LCD bezel assembly (14.1")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65



Step	Size (Quantity)	Color	Torque
2	M2.5 x 10L(2)	Black	3.2 kgf-cm
3	M2.5 x 6L(1)	Black	3.2 kgf-cm

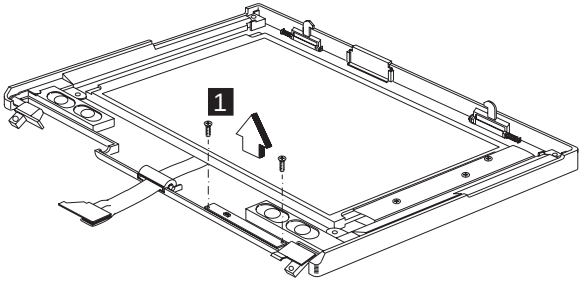


Note: When removing the LCD, take note of the following:

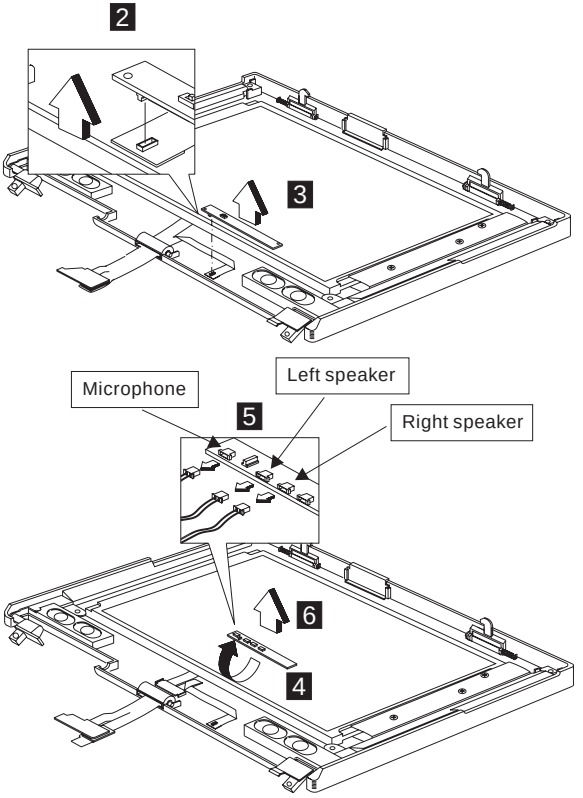
- Be careful not to scratch the LCD cover when removing the screw covers.
- The LCD front cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break these latches.
- Gently push the two hooks outward to remove the LCD front cover.

LED board (12.1")

- "Battery assembly" on page 51
- "Middle cover and launch key assembly" on page 56
- "Keyboard" on page 60
- "LCD assembly" on page 65
- "LCD bezel assembly (12.1")" on page 73

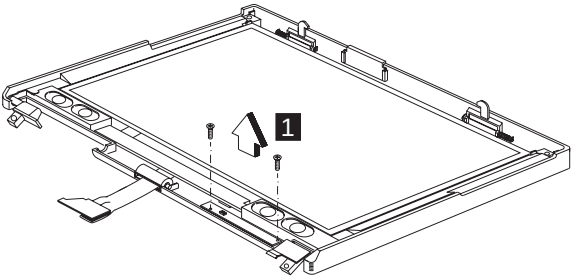


Step	Size (Quantity)	Color	Torque
1	M2 x 4L(2)	Silver	1.6 kgf-cm

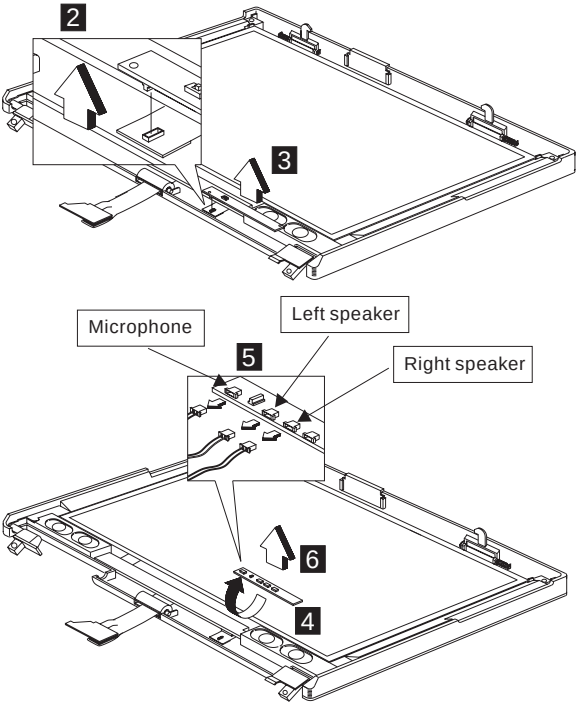


LED board (13.0")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (13.0")” on page 74

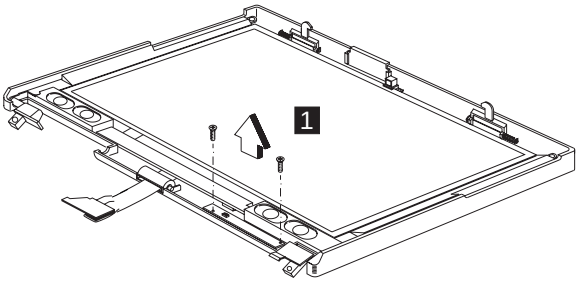


Step	Size (Quantity)	Color	Torque
1	M2 x 4L(2)	Silver	1.6 kgf-cm

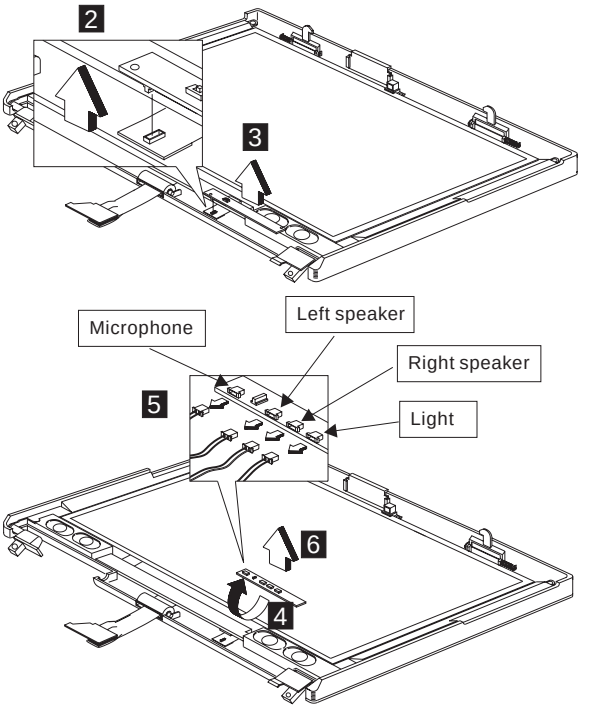


LED board (14.1")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (14.1")” on page 76

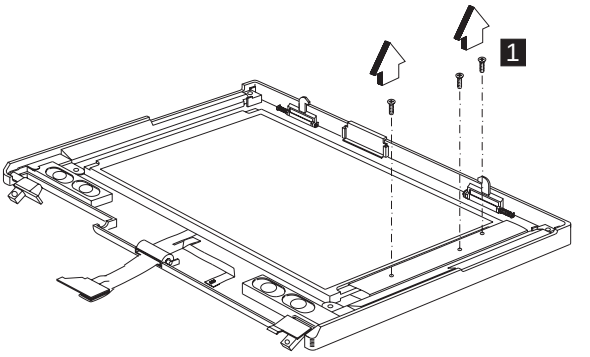


Step	Size (Quantity)	Color	Torque
1	M2 x 4L(2)	Silver	1.6 kgf-cm

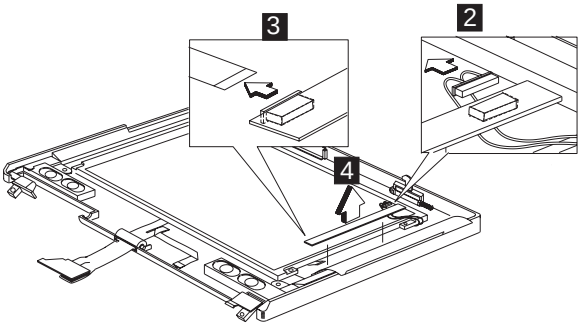


LCD inverter (12.1")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (12.1")” on page 73

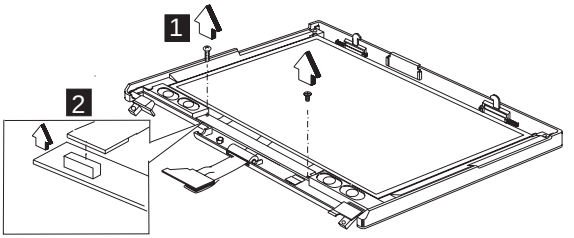


Step	Size (Quantity)	Color	Torque
1	M2 x 4L(2)	Silver	1.6 kgf-cm
	M3 x 5L(1)	Silver	3.2 kgf-cm

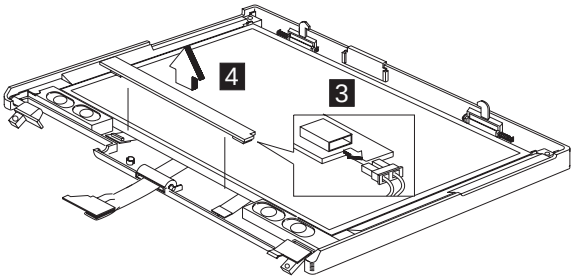


LCD inverter (13.0")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (13.0")” on page 74

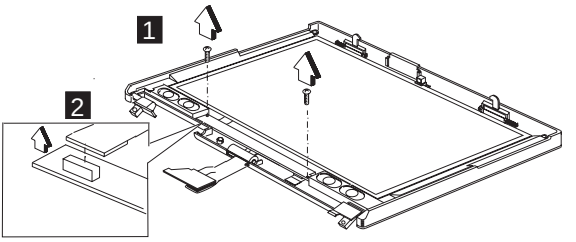


Step	Size (Quantity)	Color	Torque
1	M2 x 4L(2)	Silver	1.6 kgf-cm

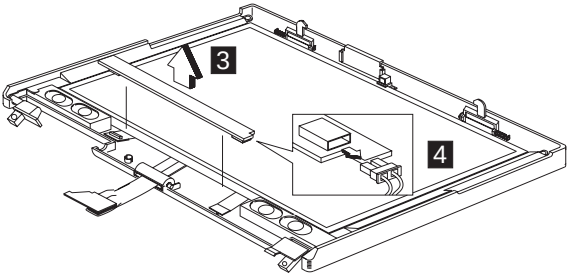


LCD inverter (14.1")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (14.1")” on page 76

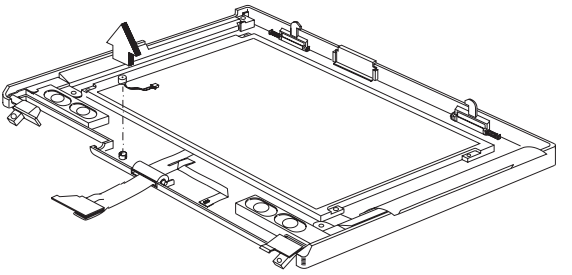


Step	Size (Quantity)	Color	Torque
1	M2 x 4L(2)	Silver	1.6 kgf-cm



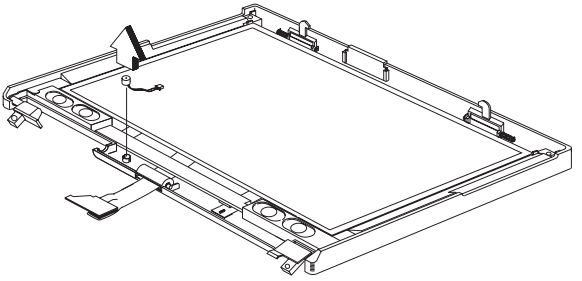
Cable assembly of microphone (12.1")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (12.1")” on page 73
- “LED board (12.1")” on page 77



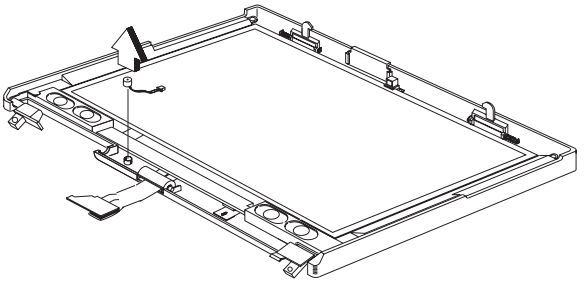
Cable assembly of microphone (13.0")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (13.0")” on page 74
- “LED board (13.0")” on page 78



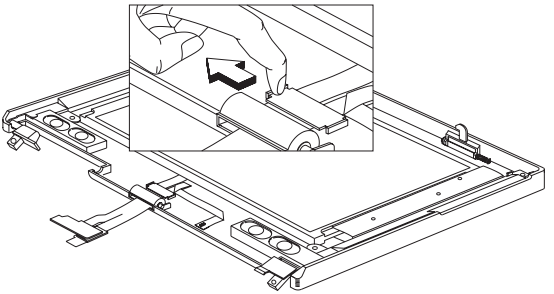
Cable assembly of microphone (14.1")

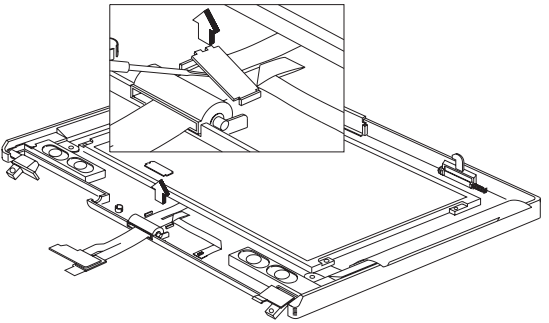
- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (14.1")” on page 76
- “LED board (14.1")” on page 79

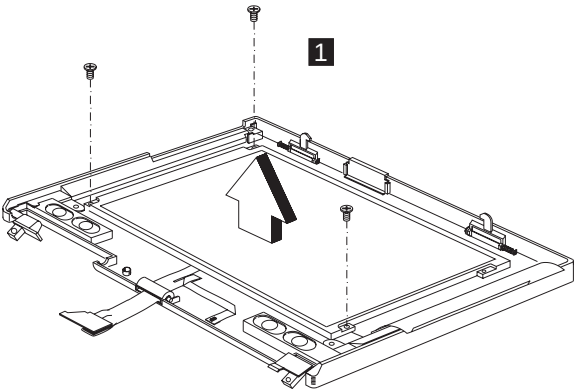


LCD bracket hinge assembly, speaker assembly and LCD rear cover assembly (12.1")

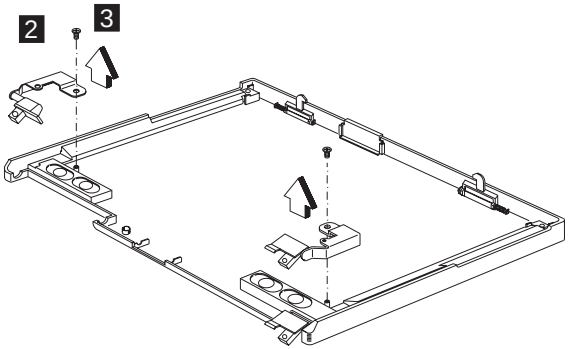
- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (12.1")” on page 73
- “LED board (12.1")” on page 77
- “LCD inverter (12.1")” on page 80
- “Cable assembly of microphone (12.1")” on page 82



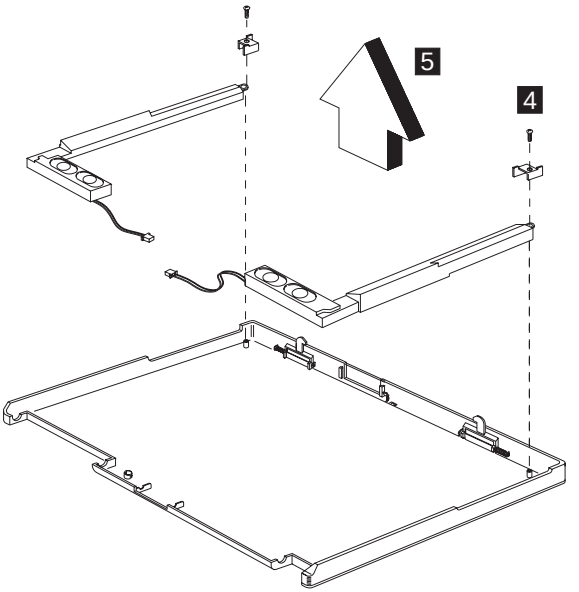




Step	Size (Quantity)	Color	Torque
1	M3 x 5L(3)	Silver	3.2 kgf-cm



Step	Size (Quantity)	Color	Torque
2	M2.5 x 6L(3)	Black	3.2 kgf-cm

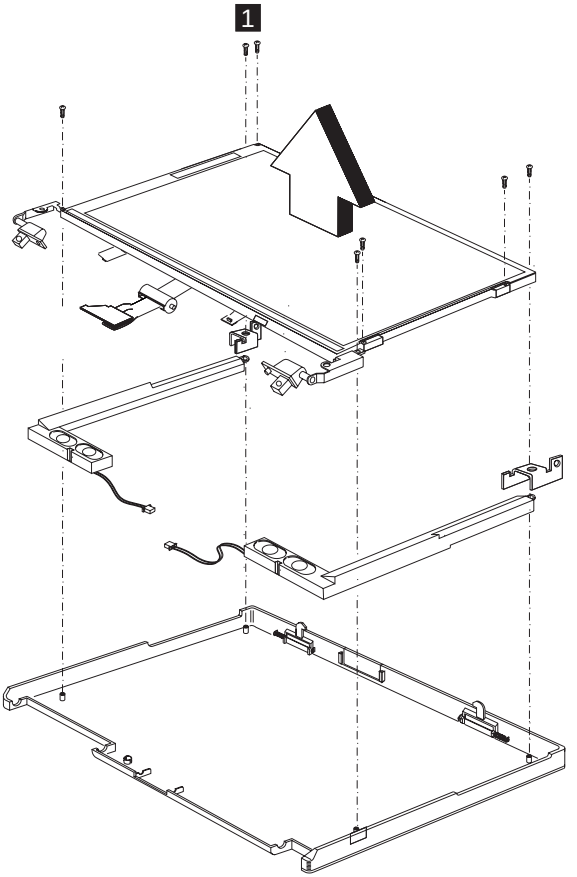


Step	Size (Quantity)	Color	Torque
4	M2.5 x 6L(2)	Black	3.2 kgf-cm

LCD bracket hinge assembly, speaker assembly and LCD rear cover assembly (13.0")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (13.0")” on page 74

- “LED board (13.0")” on page 78
- “LCD inverter (13.0")” on page 81
- “Cable assembly of microphone (13.0")” on page 82

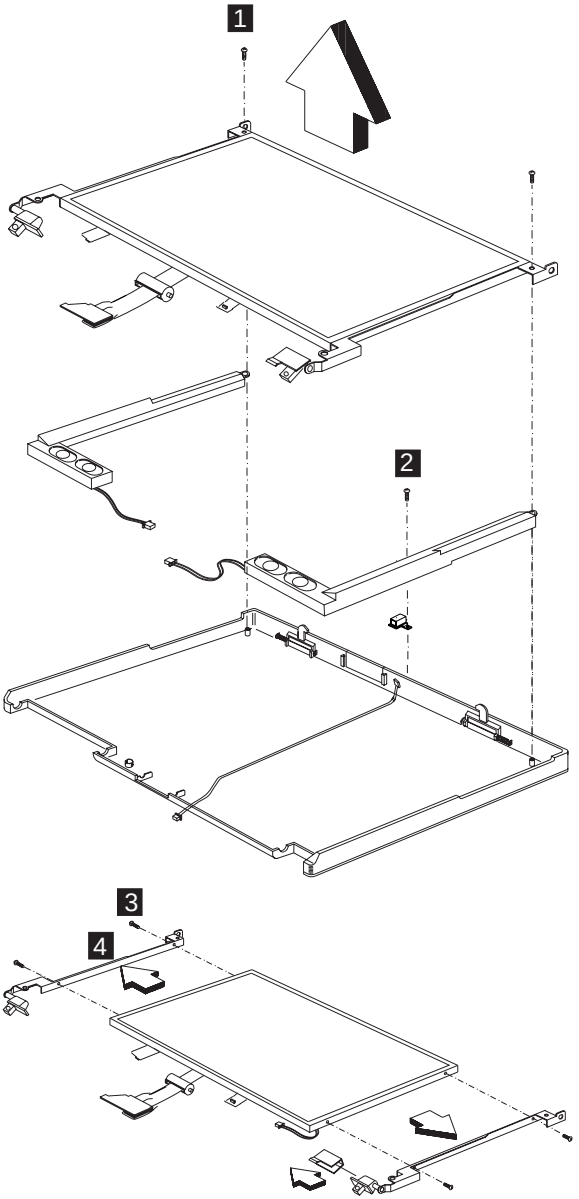


Step	Size (Quantity)	Color	Torque
1	M2.5 x 6L(7)	Black	3.2 kgf-cm

LCD bracket hinge assembly, speaker assembly, keyboard light, and LCD rear cover assembly (14.1")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (14.1")” on page 76
- “LED board (14.1")” on page 79
- “LCD inverter (14.1")” on page 81

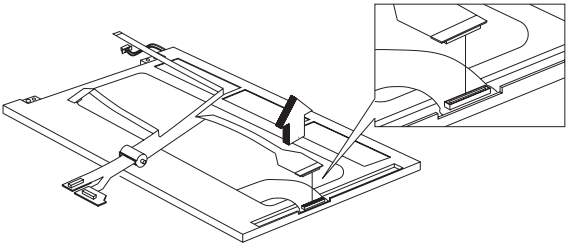
- “Cable assembly of microphone (14.1")” on page 83



Step	Size (Quantity)	Color	Torque
1	M2.5 x 6L(2)	Black	3.2 kgf-cm
2	M2 x 4L(1)	Silver	1.6 kgf-cm
3	M2 x 3L(4)	Silver	1.6 kgf-cm

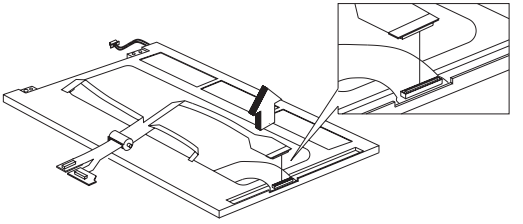
LCD FPC assembly (12.1")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (12.1")” on page 73
- “LED board (12.1")” on page 77
- “LCD inverter (12.1")” on page 80
- “Cable assembly of microphone (12.1")” on page 82
- “LCD bracket hinge assembly, speaker assembly and LCD rear cover assembly (12.1")” on page 83



LCD FPC assembly (13.0")

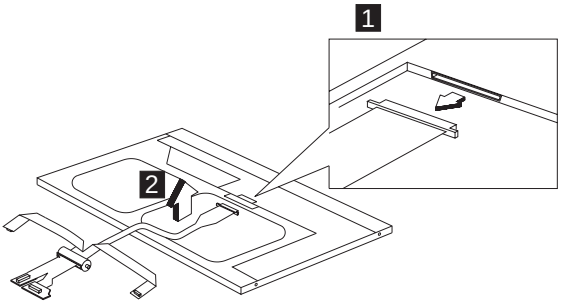
- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65
- “LCD bezel assembly (13.0")” on page 74
- “LED board (13.0")” on page 78
- “LCD inverter (13.0")” on page 81
- “Cable assembly of microphone (13.0")” on page 82
- “LCD bracket hinge assembly, speaker assembly and LCD rear cover assembly (13.0")” on page 85



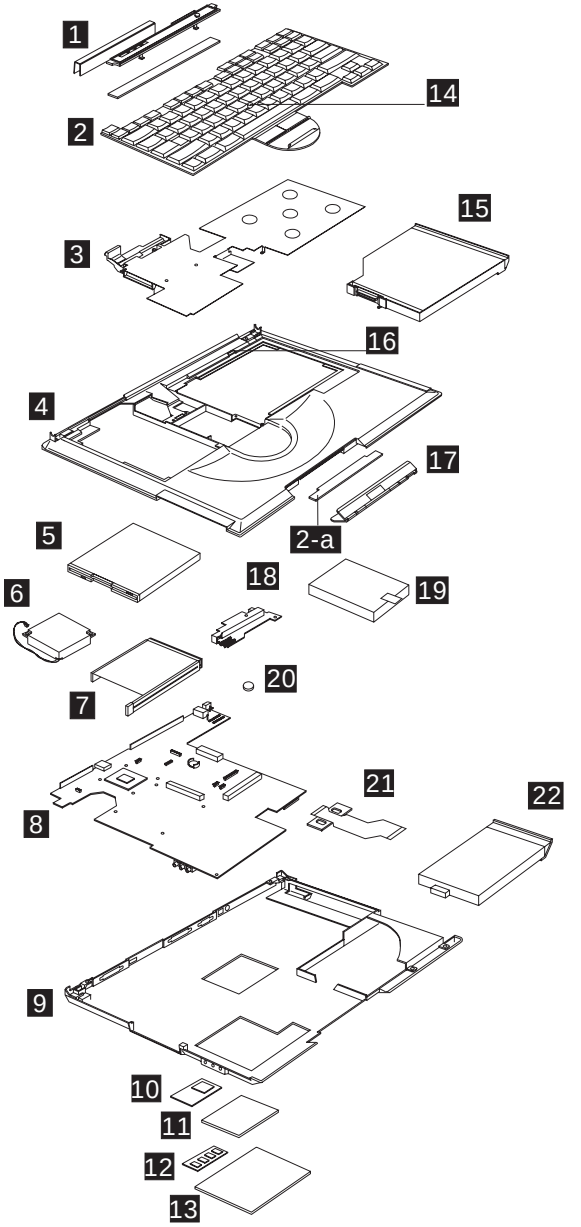
LCD FPC assembly (14.1")

- “Battery assembly” on page 51
- “Middle cover and launch key assembly” on page 56
- “Keyboard” on page 60
- “LCD assembly” on page 65

- “LCD bezel assembly (14.1")” on page 76
- “LED board (14.1")” on page 79
- “LCD inverter (14.1")” on page 81
- “Cable assembly of microphone (14.1")” on page 83
- “LCD bracket hinge assembly, speaker assembly, keyboard light, and LCD rear cover assembly (14.1")” on page 86



Parts list (ThinkPad i Series 1400/1500)



Note: The table below applies to the models in Group-A (See the 2621 model table on page iii.)

No.	Description	FRU No.
1	Middle Cover & Launch Key ASM 14.1"	08K5865

No.	Description	FRU No.
	Middle Cover & Launch Key ASM 14.1" (for Japan)	08K6054
	Middle Cover & Launch Key ASM 12.1"/13.0"	08K5869
	Middle Cover & Launch Key ASM 12.1"/13.0" (for Japan)	08K6055
2	Launch Key Board	08K3404
2-a	CD Control Card	08K3405
3	Upper Heat sink	08K5868
4	Keyboard Bezel (IBM Logo, Lid SW, Bracket Screw, PCMCIA Shutter)	08K5918
	Keyboard Bezel (IBM Logo, Lid SW, Bracket Screw, PCMCIA Shutter) (for Japan)	08K6053
5	FDD w/ Bezel	05K9179
6	Fan ASM	08K5872
7	PCMCIA Holder	08K5873
8	Planar W/O TV out (Celeron 400)	10L1535
	Planar W/ TV out (Celeron 433)	10L1537
	Planar W/ TV out (Celeron 466)	10L1539
9	Bottom Case (w/ TV-out) (PCMCIA Shutter, Rubber Foot, Stand Foot, Battery Latch)	08K5866
	Bottom Case (w/o TV-out) (PCMCIA Shutter, Rubber Foot, Stand Foot, Battery Latch)	08K5867
10	PCI Modem (Ambit)	10L1296
11	Modem Cover	08K5863
12	DIMM 32 MB	08K3408
	DIMM 64 MB	08K3409
13	DIMM Cover	05K7073
14	Pointing Stick Caps	84G6536
15	24X CD-ROM Module (LG)	05K9264
	24X CD-ROM Module (TEAC)	05K9178
	4X DVD Module (Toshiba)	27L3864
	CD-ROM Chassis	08K5862
16	Lid S/W ASM	08K5871
17	CD Control Panel	08K5876
18	DC/DC Charger	10L1729
19	HDD Module Assy. 4.8 GB (IBM)	05K9172
	HDD Module Assy. 4.8 GB (Hitachi)	05K9173
	HDD Module Assy. 6.4 GB (IBM)	05K9174
	HDD Module Assy. 6.4 GB (Hitachi)	05K9175

No.	Description	FRU No.
	HDD Module Assy. 8.1 GB (IBM)	05K9176
	Kitting, HDD (HDD adapter bracket SCR)	08K5861
20	RTC Battery	11J8591
21	FPC Cable Group (FPCs of CD-ROM, FDD, EZ Launch, CD-Play)	27L0498
22	Battery Assy (LiIon) 9 Cells (Panasonic)	02K6647
	Battery Assy (NiMH) 8 Cells (Panasonic)	02K6630
9-a	LEG (R/L)	08K5870
	Miscellaneous Kit Right Hinge Cap 12.1"/13.0" Right Hinge Cap 14.1" Rubber Foot * 4 PCMCIA Screw Cover * 4 Modem Cover Mylar Film CD-Player Panel Mylar Screw Cushion for LCD Bezel * 2 Screw Cap for LCD Bezel Screw Mylar for Rear Cover * 4 12.1" LCD FPC Holder RJ-11 Cable 12.1" Top Bracket * 2 13.0" Top Bracket * 2 Battery Latch Knob Keyboard Light Switch Launch Key Panel	08K6604

No.	Description	FRU No.
	Miscellaneous Kit (for Japan) Right Hinge Cap 12.1"/13.0" 12.1" LCD FPC Holder 12.1" Top Bracket * 2 Right Hinge Cap 14.1" Rubber Foot * 4 PCMCIA Screw Cover * 4 Modem Cover Mylar Film CD-Player Panel Mylar Screw Cushion for LCD Bezel * 2 (Japan model) Screw Cap for LCD Bezel (Japan model) Screw Mylar for Rear Cover * 4 (Japan model) RJ11 Cable 13.0" Top Bracket * 2 Battery Latch Knob Keyboard Light Switch Launch Key Panel	08K6592
	Screw Kit WAFER MYLO M2.5*3.5LB-ZN Black PAN NYLOK M2.5*6LB-ZN Black PAN NYLOK M2.5*10LB-ZN Black MACH PH M2*8LB-ZN Pan Black MACH PAN M2*10L NI Silver M2*4 WAFER NI Silver M2*L3 Wafer Head Black SCREW PAN M2*12L NI Silver SCREW M3*5L 700 Wafer Silver	08K5877

Note: The table below applies to the models in Group-B (See the 2621 model table on page iii.)

No.	Description	FRU No.
1	Middle Cover & Launch Key ASM 14.1"	08K5865
	Middle Cover & Launch Key ASM 14.1" (for Japan)	08K6054
	Middle Cover & Launch Key ASM 12.1"/13.0"	08K5869
	Middle Cover & Launch Key ASM 12.1"/13.0" (for Japan)	08K6055
2	Launch Key Board	08K3404
2-a	CD Control Card	08K3405

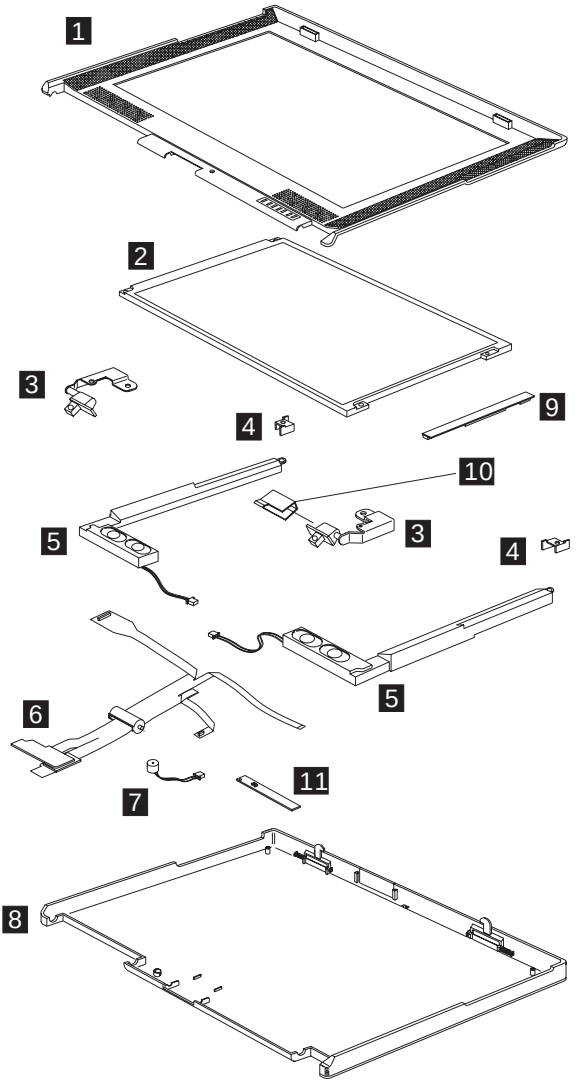
No.	Description	FRU No.
3	Upper Heatsink	08K5868
4	Keyboard Bezel (IBM Logo, Lid SW, Bracket Screw, PCMCIA Shutter)	08K5918
	Keyboard Bezel (IBM Logo, Lid SW, Bracket Screw, PCMCIA Shutter) (for Japan)	08K6053
5	FDD w/ Bezel	05K9179
6	Fan ASM	08K5872
7	PCMCIA Holder	08K5873
8	Planar W/O TV out (Celeron 400)	10L1535
	Planar W/ TV out (Celeron 433)	10L1537
	Planar W/ TV out (Celeron 466)	10L1539
9	Bottom Case (w/ TV-out) (PCMCIA Shutter, Rubber Foot, Stand Foot, Battery Latch)	08K5866
	Bottom Case (w/o TV-out) (PCMCIA Shutter, Rubber Foot, Stand Foot, Battery Latch)	08K5867
10	PCI Modem (Ambit)	10L1296
11	Modem Cover	08K5863
12	DIMM 32 MB	08K3408
	DIMM 64 MB	08K3409
13	DIMM Cover	05K7073
14	Pointing Stick Caps	84G6536
15	24X CD-ROM Module (LG)	05K9264
	24X CD-ROM Module (TEAC)	05K9178
	4X DVD Module (Toshiba)	27L3864
	CD-ROM Chassis	08K5862
16	Lid S/W ASM	08K5871
17	CD Control Panel	08K5876
18	DC/DC Charger	10L1729
19	HDD Module ASM 6.0 GB (IBM)	05K9250
	HDD Module ASM 9.0 GB (IBM)	05K9252
	HDD Module ASM 12.0 GB (IBM)	05K9254
	Kitting, HDD (HDD adapter bracket SCR)	08K5861
20	RTC Battery	11J8591
21	FPC Cable Group	27L0498
22	Battery Assy (LiIon) 9 Cells (Panasonic)	02K6647
	Battery Assy (NiMH) 8 Cells (Panasonic)	02K6630
9-a	LEG (R/L)	08K5870

No.	Description	FRU No.
	CD Control Card	08K3405
	Miscellaneous Kit Right Hinge Cap 12.1"/13.0" Right Hinge Cap 14.1" Rubber Foot * 4 PCMCIA Screw Cover * 4 Modem Cover Mylar Film CD-Player Panel Mylar Screw Cushion for LCD Bezel * 2 Screw Cap for LCD Bezel Screw Mylar for Rear Cover * 4 12.1" LCD FPC Holder RJ11 Cable 12.1" Top Bracket * 2 13.0" Top Bracket * 2 Battery Latch Knob Keyboard Light Switch Launch Key Panel	08K6604
	Miscellaneous Kit (for Japan) Right Hinge Cap 12.1"/13.0" 12.1" LCD FPC Holder 12.1" Top Bracket * 2 Right Hinge Cap 14.1" Rubber Foot * 4 PCMCIA Screw Cover * 4 Modem Cover Mylar Film CD-Player Panel Mylar Screw Cushion for LCD Bezel * 2 (Japan model) Screw Cap for LCD Bezel (Japan model) Screw Mylar for Rear Cover * 4 (Japan model) RJ11 Cable 13.0" Top Bracket * 2 Battery Latch Knob Keyboard Light Switch Launch Key Panel	08K6592

No.	Description	FRU No.
	Screw Kit WAFER MYLO M2.5*3.5LB-ZN Black PAN NYLOK M2.5*6LB-ZN Black PAN NYLOK M2.5*10LB-ZN Black MACH PH M2*8LB-ZN Pan Black MACH PAN M2*10L NI Silver M2*4 WAFER NI Silver M2*L3 Wafer Head Black SCREW PAN M2*12L NI Silver SCREW M3*5L 700 Wafer Silver	08K5877

LCD FRU

12.1-inch SVGA TFT



Note: The table below applies to the models in Group-A (See the 2621 model table on page iii.)

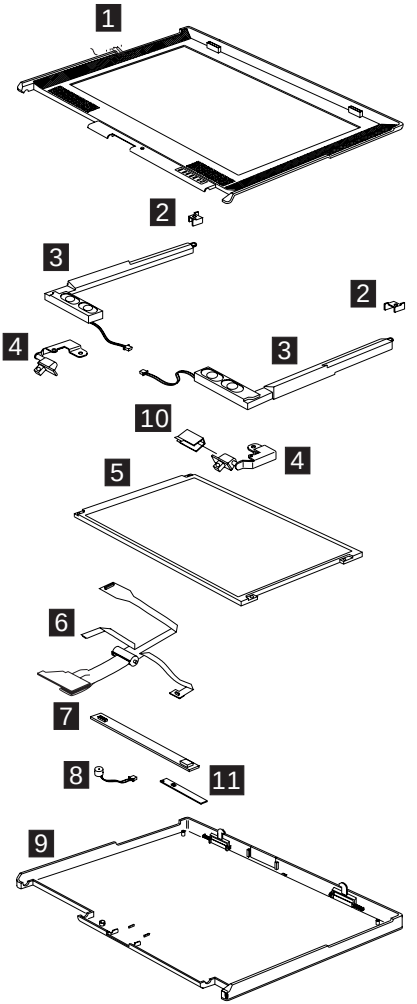
No.	Description	FRU No.
1	LCD BEZEL ASM 12.1"	08K5849
2	12.1" TFT LCD	08K5844
3	LCD Bracket-Hinge 12.1" (R,L)	08K5850
4	Misc. 12.1" Top Bracket	08K5878
5	Speaker ASM (R,L)	08K6374

No.	Description	FRU No.
6	12.1" LCD FPC Assy.	27L0494
7	Cable Asm. of Microphone & Key-board LED Light	27L0497
	Cable Asm. of Microphone & Key-board LED Light (for Japan)	27L0511
8	LCD Rear Cover ASM 12.1" TFT	08K5848
9	LCD Inverter 12.1"	10L1380
10	Misc. Right Hinge Cap 12.1"/13.0" (for worldwide)	08K6604
	Misc. Right Hinge Cap 12.1"/13.0" (for Japan)	08K6592
11	LED BD	10L1443
	LG/IBM Logo Kit	08K5860

Note: The table below applies to the models in Group-B (See the 2621 model table on page iii.)

No.	Description	FRU No.
1	LCD BEZEL ASM 12.1"	08K5849
	12.1" TFT LCD Bezel (for Japan model)	08K6388
2	12.1" TFT LCD	08K5844
3	LCD Bracket-Hinge 12.1" (R,L)	08K5850
4	Misc. 12.1" Top Bracket	08K5878
5	Speaker ASM (R,L)	08K6374
6	12.1" LCD FPC Assy.	27L0494
	12.1" LCD FPC Assy. (for Japan model)	27L0536
7	Cable Asm. of Microphone	27L0497
	Cable Asm. of Microphone (for Japan model)	27L0511
8	LCD Rear Cover ASM 12.1" TFT	08K5848
	LCD Rear Cover ASM 12.1" TFT (for Japan model0	08K6387
9	LCD Inverter 12.1"	10L1380
10	Misc. Right Hinge Cap 12.1"/13.0" (for worldwide)	08K6604
	Misc. Right Hinge Cap 12.1"/13.0" (for Japan)	08K6592
11	LED BD	10L1443
	LG/IBM Logo Kit	08K5860

13.0-inch SVGA HPA

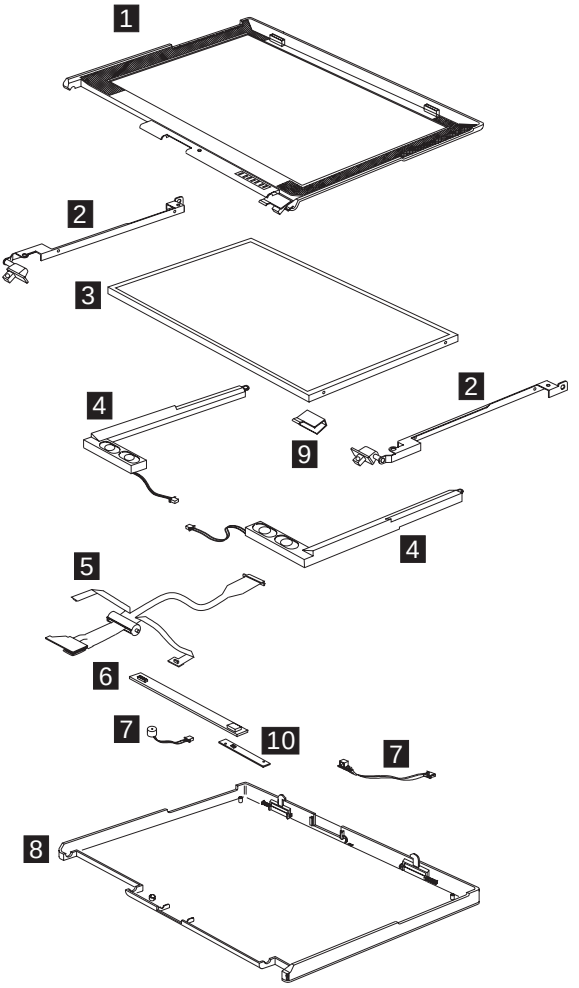


Note: The table below applies to the models in Group-A and B (See the 2621 model table on page iii.)

No.	Description	FRU No.
1	LCD BEZEL ASM 13.0"	08K5853
	LCD BEZEL ASM 13.0" (for Japan)	08K6051
2	Misc. 13.0" Top Bracket	08K5878
3	Speaker Module (R,L)	08K6374
4	LCD Bracket-Hinge 13.0" (R,L)	08K5854
5	13.0" HPA LCD	05K9596
6	13.0" LCD FPC Assy.	27L0495
	13.0" LCD FPC Assy. (for Japan)	27L0510

No.	Description	FRU No.
7	LCD Inverter 12.1"/13.0"	10L1380
8	Cable Asm. of Microphone & Keyboard LED Light	27L0497
	Cable Asm. of Microphone & Keyboard LED Light (for Japan)	27L0511
9	LCD Rear Cover ASM 13.0" HPA	08K5852
	LCD Rear Cover ASM 13.0" HPA (with logo kit) (for Japan)	08K6048
10	Misc. Right Hinge Cap 12.1"/13.0" (for worldwide)	08K6604
	Misc. Right Hinge Cap 12.1"/13.0" (for Japan)	08K6592
11	LED BD	10L1443
	LG/IBM Logo Kit	08K5860

14.1" XGA TFT



Note: The table below applies to the models in Group-A (See the 2621 model table on page iii.)

No.	Description	FRU No.
1	LCD BEZEL ASM 14.1"	08K5856
	LCD BEZEL ASM 14.1" (for Japan)	08K6050
2	LCD Bracket-Hinge 14.1" (R,L)	08K5857
3	14.1" TFT LCD (LG)	05K9591
	14.1" TFT LCD (Samsung)	05K9498
4	Speaker Module (R,L)	08K6374
5	14.1" LCD FPC Assy.	27L0496
	14.1" LCD FPC Assy. (for Japan)	27L0509
6	LCD Inverter 14.1"	10L1442

No.	Description	FRU No.
7	Cable ASM of Microphone & Keyboard LED Light	27L0497
	Cable ASM of Microphone & Keyboard LED Light (for Japan)	27L0511
8	LCD Rear Cover ASM 14.1" TFT	08K5855
	LCD Rear Cover ASM 14.1" TFT (for Japan)	08K6047
9	Misc. Right Hinge Cap 14.1" (for worldwide)	08K6604
	Misc. Right Hinge Cap 14.1" (for Japan)	08K6592
10	LED BD	10L1443
	LG/IBM Logo Kit	08K5860

Note: The table below applies to the models in Group-B (See the 2621 model table on page iii.)

No.	Description	FRU No.
1	LCD BEZEL ASM 14.1"	08K5856
	LCD BEZEL ASM 14.1" (for Japan model)	08K6050
	LCD BEZEL ASM 14.1" (NEC LCD)	08K6276
	LCD BEZEL ASM 14.1" (NEC LCD) (for Japan model)	08K6386
2	LCD Bracket-Hinge 14.1" (R,L)	08K5857
	LCD Bracket-Hinge 14.1" (R,L) (NEC LCD)	08K6282
3	14.1" TFT LCD (LG)	05K9591
	14.1" TFT LCD (Samsung)	05K9498
	14.1" TFT LCD (NEC)	05K9602
4	Speaker Module (R,L)	08K6374
5	14.1" LCD FPC Assy.	27L0496
	14.1" LCD FPC Assy. (for Japan)	27L0509
	14.1" LCD FPC Assy. (NEC LCD)	27L0523
	14.1" LCD FPC Assy. (NEC LCD) (for Japan model)	27L0535
6	LCD Inverter 14.1"	10L1442
7	Cable ASM of Microphone & Keyboard LED Light	27L0497
	Cable ASM of Microphone & Keyboard LED Light (for Japan)	27L0511
	Cable ASM of Microphone & Keyboard LED Light (NEC LCD)	27L0566
8	LCD Rear Cover ASM 14.1" TFT	08K5855
	LCD Rear Cover ASM 14.1" TFT (for Japan)	08K6047

No.	Description	FRU No.
	LCD Rear Cover ASM 14.1" TFT (NEC LCD)	08K6275
	LCD Rear Cover ASM 14.1" TFT (NEC LCD) (for Japan model)	08K6385
9	Misc. Right Hinge Cap 14.1" (for worldwide)	08K6604
	Misc. Right Hinge Cap 14.1" (for Japan)	08K6592
10	LED BD	10L1443
	LG/IBM Logo Kit	08K5860

Keyboard

Description	Vendor	FRU No.
Keyboard US	API	02K5077
Keyboard Chinese	API	02K5078
Keyboard Korean	API	02K5079
Keyboard Swiss	API	02K5080
Keyboard Canadian French	API	02K5081
Keyboard Belgian	API	02K5082
Keyboard Danish	API	02K5083
Keyboard Italy	API	02K5084
Keyboard French	API	02K5085
Keyboard German	API	02K5086
Keyboard Norwegian	API	02K5087
Keyboard Portuguese	API	02K5088
Keyboard Spanish	API	02K5089
Keyboard Dutch	API	02K5090
Keyboard Swedish/Finnish	API	02K5091
Keyboard Japan	API	02K5092
Keyboard UK English	API	02K5093
Keyboard La Spanish	API	02K5095
Keyboard US ENGLISH	ALPS	02K5060
Keyboard KOREAN	ALPS	02K5061
Keyboard UK ENGLISH	ALPS	02K5062
Keyboard CANADIAN FRENCH	ALPS	02K5063
Keyboard GERMANY	ALPS	02K5064
Keyboard FRENCH	ALPS	02K5065
Keyboard DUTCH	ALPS	02K5066
Keyboard SWEDISH/FINNISH	ALPS	02K5067
Keyboard NORWEGIAN	ALPS	02K5068
Keyboard DANISH	ALPS	02K5069

Description	Vendor	FRU No.
Keyboard JAPANESE	ALPS	02K5070
Keyboard TRAD. CHINESE	ALPS	02K5071
Keyboard ITALIAN	ALPS	02K5072
Keyboard SPANISH	ALPS	02K5073
Keyboard SWISS	ALPS	02K5074
Keyboard PORTUGUESE	ALPS	02K5075
Keyboard BELGIAN	ALPS	02K5076
Keyboard LA SPANISH	ALPS	02K5094

Common parts list

Tools

Description	FRU No.
Tri-Connector Wrap Plug	72X8546
PC Test Card	35G4703
Audio Wrap Cable	66G5180
Screwdriver Kit	95F3598
USB Parallel Test Cable	05K2580
Torque Screwdriver	05K4695
5mm Socket Wrench	05K4694
Screwdriver	05K4693

Miscellaneous

Description	FRU No.
Headset (for Japan only)	02K4941

Modem cable

Description	FRU No.
Modem cable (German)	27L0441
Modem cable (UK, NZ)	27L0442
Modem cable (France)	27L0443
Modem cable (Holland)	27L0444
Modem cable (Sweden)	27L0445
Modem cable (Norway/Fin)	27L0446
Modem cable (Danish)	27L0447
Modem cable (Italy)	27L0448
Modem cable (Austria)	27L0449
Modem cable (Spain)	27L0450
Modem cable (Belgium)	27L0451
Modem cable (Switzerland)	27L0462

Description	FRU No.
Modem cable (Portugal)	27L0447
Modem cable (US/C, JPN, Twn, APN, LA, Brz)	27L0465
Modem cable (Australia)	27L0467

AC adapter

Description	FRU No.
AC Adapter 2-pin (Delta)	02K6548
AC Adapter 2-pin (Sanken)	02K6554
AC Adapter 3-pin (Delta)	02K6550
AC Adapter 3-pin (Sanken)	02K6555

Power cords: IBM power cords for a specific country are usually available only in that country.

For 2–pin power cords:

IBM power cord part number	Used in these countries or regions
13H5273	Japan

For 3–pin power cords:

Note: The grounded adapter is required for full MPRII compliance. If a 3–pin power cord came with your computer, see “Safety Information” on page 11.

IBM power cord part number	Used in these countries or regions
02K0539	Simple China
36L8867	Argentina
76H3514	Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay
76H3516	Aruba, Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
76H3518	Austria, Belgium, Bosnia-Herzogovina, Bulgaria, Croatia, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Macao, Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Turkey, Yugoslavia
76H3520	Denmark **Note:** Due to consumer product, 2621 supplies power cord 76H3518 to Denmark.
76H3522	Bangladesh, Myanmar, Pakistan, South Africa, Sri Lanka

IBM power cord part number	Used in these countries or regions
76H3524	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Malaysia, Nigeria, Oman, Qatar, Singapore, United Kingdom
76H3528	Liechtenstein, Switzerland
76H3530	Chile, Ethiopia, Italy, Libya
76H3532	Israel
76H3535	Korea

ThinkPad i Series 1400/1500 (Part II)

This section applies to the models in Group-C. (See the 2621 model table on page iii.)

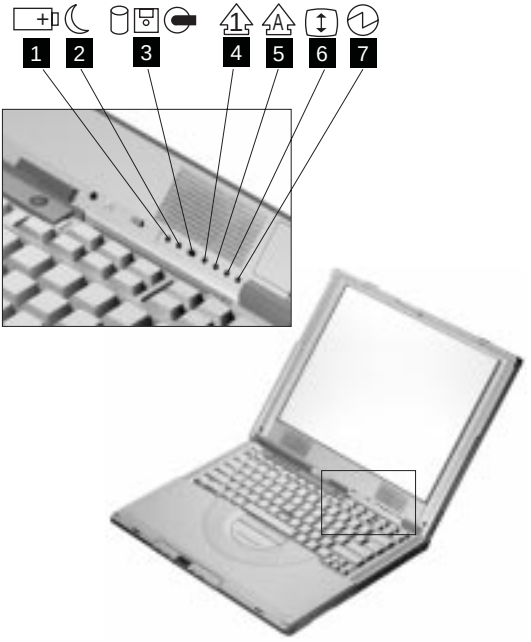
Product overview

The following shows an overview of the system features.

Feature	Description
Processor	Intel** Pentium** III processor 500 MHz —or— Intel** Celeron** processor 500 MHz
Bus architecture	PCI & AGP
System memory	2 DIMM slots, no memory on system board 32 MB, 64 MB, and 128 MB DIMM card Maximum frequency: 100 MHz
CMOS RAM	114 bytes + 4 Kbytes
Video	12.1–inch, 18 bit colors, 800x600 pixel TFT SVGA color LCD 13.0–inch, 16 bit colors, 800x600 pixel HPA SVGA color LCD —or— 14.1–inch, 18 bit colors, 1024x768 pixel TFT XGA color LCD 15.0–inch, 18 bit colors, 1024x768 pixel TFT XGA color LCD CRT 32 bit colors
Audio	16-bit audio Internal stereo speakers Internal microphone
Diskette drive	1.44MB (3–mode), 3.5 inch
Hard disk drive	6/12/18GB above, 2.5–inch, EIDE interface
CD-ROM drive or DVD-ROM drive	CD-ROM: 5.25–inch, 24X speed, EIDE interface —or— DVD-ROM: 5.25–inch, 6X speed, EIDE interface
Modem	56.6 Kbps, internal (depends on the model)
PC Card (PCMCIA)	One Type III or Type II, with CardBus and ZV support

Feature	Description
I/O ports	External monitor Speaker-out Line-in Microphone-in DC-in Mouse/keyboard Parallel Serial USB Telephone (RJ11)/Modem TV-out (S-video)
AC Adapter	56–Watt type

Status indicators: The system-status indicators on the computer show the current status of your computer by their on or off states and colors (green and orange). Each indicator is identified with a symbol. The following shows the location and the meaning of each icon:



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) Standby mode	Green	The computer is in standby mode
	Blinking green	The computer is entering or resuming from hibernation mode.
(3) Drive in use	Green	Data is being read from or written to the hard disk, floppy drive, or data is being read from the CD-ROM drive. Do not enter standby 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 **Shift** key, and pressing the **NumLk** key. For details, see the *User's Reference*.

Symbol	Color	Meaning
(5) Caps lock	Green	Caps Lock mode is enabled. All alphabetic characters *(A-Z)* are entered in capital letters without the **Shift** key being pressed. You enable or disable the Caps Lock mode by pressing the **Caps Lock** key.
(6) Scroll lock	Green	Scroll Lock mode is enabled. The **Arrow** keys can be used as screen-scroll function keys. The cursor cannot be moved with the **Arrow** keys. *Not all application programs support this function.* You enable or disable Scroll Lock mode by pressing the **ScrLk** key.
(7) Power on	Green	The computer is operational. This indicator is on when the computer is on.

FRU tests: The following table shows the applicable test for each FRU using PC-Doctor.

FRU	Applicable test
System board	1. CPU/Coprocessor (**Diagnostics**) 2. System board (**Diagnostics**)
Power	Battery (**Diagnostics**)
LCD unit	1. Video Adapter (**Diagnostics**) 2. Video (**Interactive Tests**)
Modem	1. Make sure the modem set up correctly. 2. Replacing the modem jack and modem card one at a time, run the modem tests in Other Devices (**Diagnostics**)
Audio	Internal Speaker (**Interactive Tests**) Stereo Speaker (**Interactive Tests**)
Speaker	System beeper: Internal Speaker (**Interactive Tests**)
PC Card slots	System board (**Diagnostics**)
Keyboard	1. Keyboard (**Diagnostics**) 2. Keyboard (**Interactive Tests**)

FRU	Applicable test
TrackPont or Pointing device	If the TrackPoint does not work, see if an external PS/2 mouse is connected to the mouse/keyboard connector and remove it. The TrackPoint is automatically disabled if an external PS/2 mouse is attached. Check also if the TrackPoint driver is correctly installed by accessing Windows Device Manager via the System icon in the Control Panel. 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 this does not correct the TrackPoint problem, continue with the following: Mouse (**Interactive Tests**).
Hard disk drive	Fixed Disks (**Diagnostics**)
Diskette drive	1. Diskette Drive (**Diagnostics**) 2. Diskette (**Interactive Tests**)
CD-ROM or DVD-ROM drive	CD-ROM/DVD (**Interactive Tests**)
Memory	1. If a DIMM is installed, remove it and run Memory Test-Quick (**Diagnostics**) 2. If the problem does not recur, replace the DIMM and run the test again. 3. If the test does not detect the error, run Memory Test-Full (**Diagnostics**)
Fan	1. Start Windows 98 and check the air turbulence at the louver at the rear of the computer. 2. Run the fan test in Other Devices (**Diagnostics**).

FRU removals and replacements

This section contains information about removals and replacements of model types in Group-C III (15.0" TFT). For other model types in Group-C, please refer to Part I for 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 callout, to show the correct sequence of removal.
- Any FRUs that must be removed before removing the failing FRU are listed at the top of the page.
- To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement. See “Locations” on page 40 for internal cable connections and arrangement information.
- When replacing a FRU, use the correct screw size, as shown in the procedure.

Safety Notice 1

Translations in "Safety Notices (Multilingual Translations)" section: 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.

Safety Notice 3

Translations in "Safety Notices (Multilingual Translations)" section: 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.

Safety Notice 8

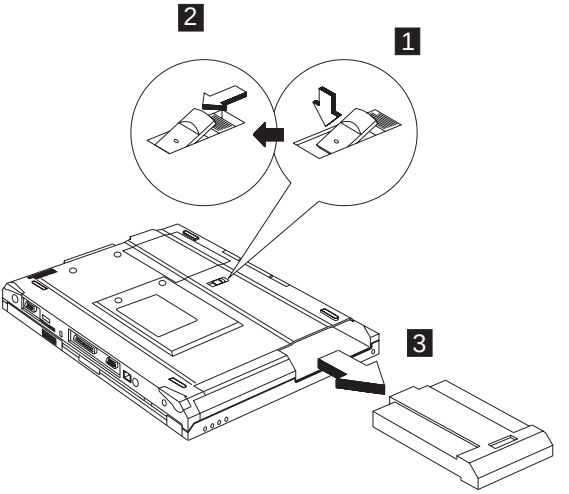
Translations in "Safety Notices (Multilingual Translations)" section: Before removing any FRU, power-off the computer, unplug all power cords from electrical outlets, remove the battery pack, then disconnect any interconnecting cables.

Attention: The system board is sensitive and can be damaged by electronic discharge. Establish personal

grounding by touching a ground point with one hand before touching these units.

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

Battery assembly

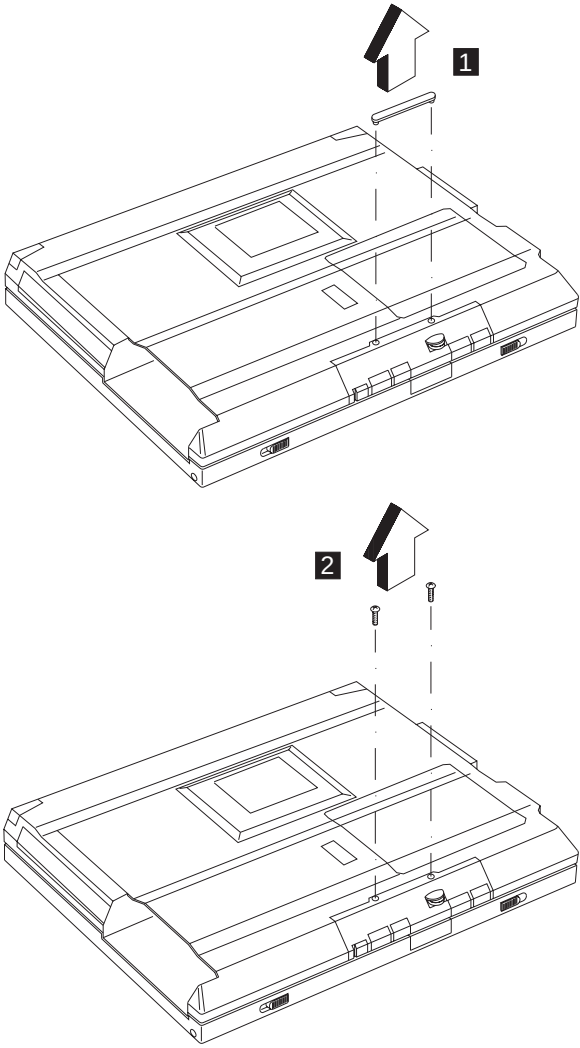


Note: When install a new battery pack, push the battery in and lock it. No need to repeat step 1 and 2.

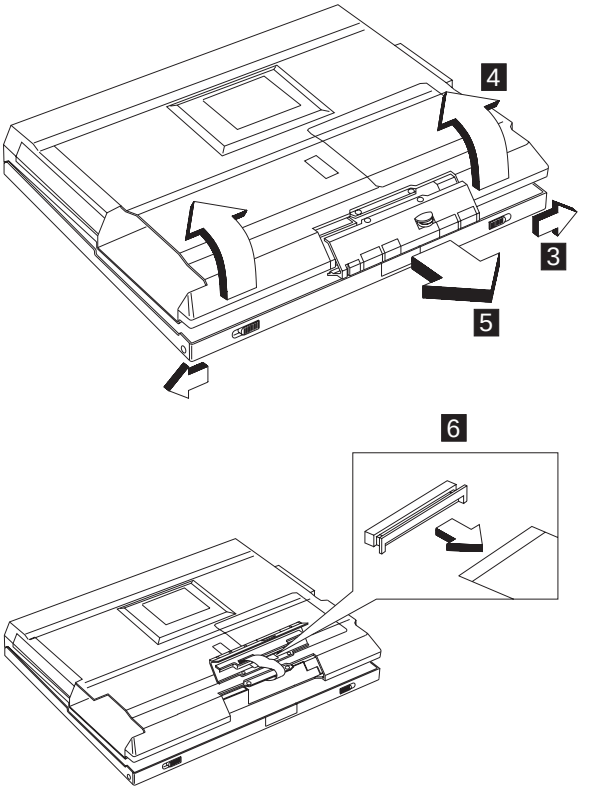
Warning

Battery packs are capable of delivering high currents for a significant amount of time. Do not short the battery terminals.

CD player panel and CD player control board



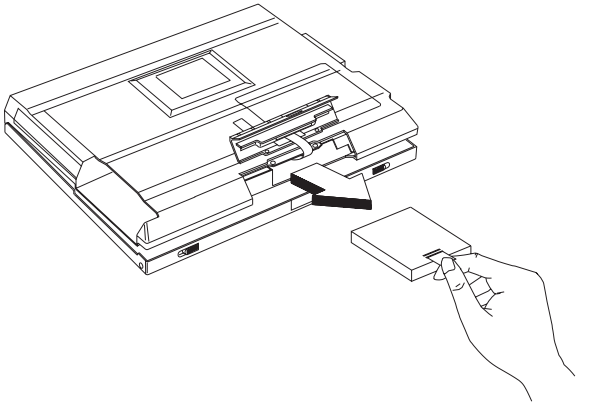
Step	Size (Quantity)	Color	Torque
1	M2.5 x 6L (2)	Black	3.2 kgf-cm



Note: The FPC is connected to the system board by the other end. When removing the CD player panel and CD player control board, release the FPC with caution.

Hard disk drive assembly

- “Battery assembly” on page 114
- “CD player panel and CD player control board” on page 115



Warning

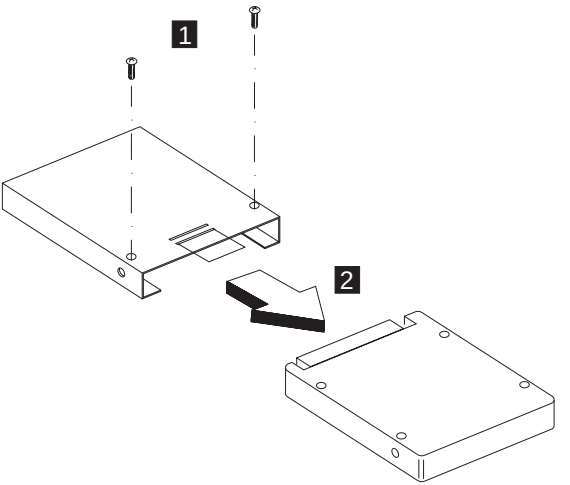
Do not drop or apply any shock to the hard disk drive. The hard disk drive is sensitive to physical shock. Incorrect handling can cause damage and permanent loss of data on the drive.

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.

Hard disk drive kitting pack

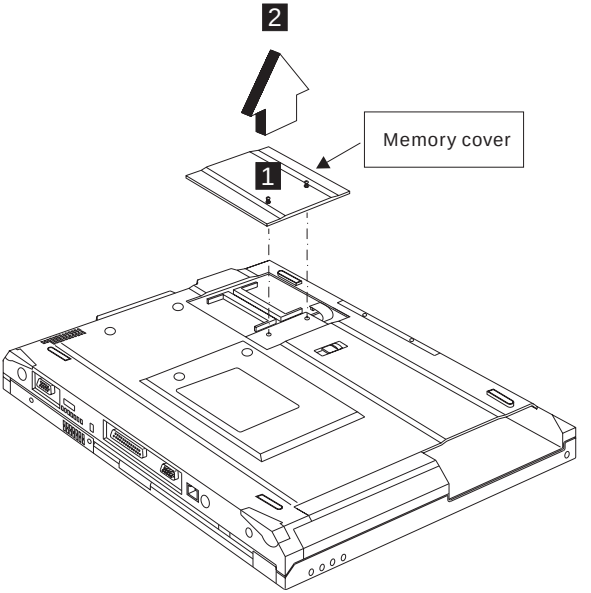
- "Battery assembly" on page 114
- "CD player panel and CD player control board" on page 115
- "Hard disk drive assembly" on page 116



Step	Size (Quantity)	Color	Torque
1	M3 x 4L (2)	Silver	3.2 kgf-cm

Memory cover and memory card

- “Battery assembly” on page 114



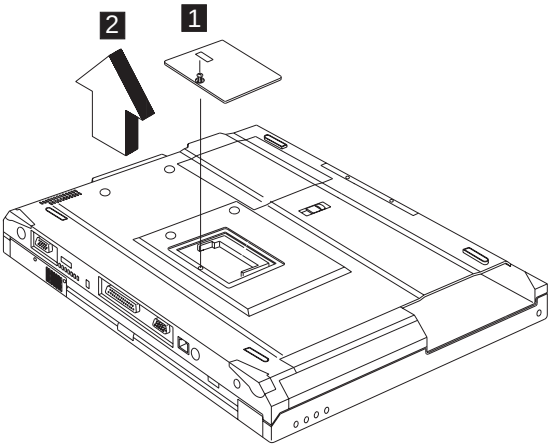
Note: The screw does not separate from the memory cover.

To install the memory card:

With the notched end of the memory card toward the right side of the socket, insert the memory card, at an angle of approximately 20°, into the socket; then press it firmly. Pivot the memory card until it snaps into place.

Modem cover and modem card

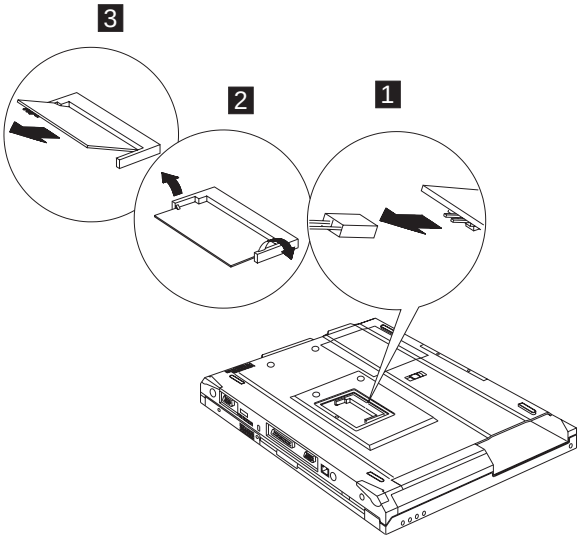
- “Battery assembly” on page 114



Note: The screw does not separate from the modem cover.

To remove the modem card:

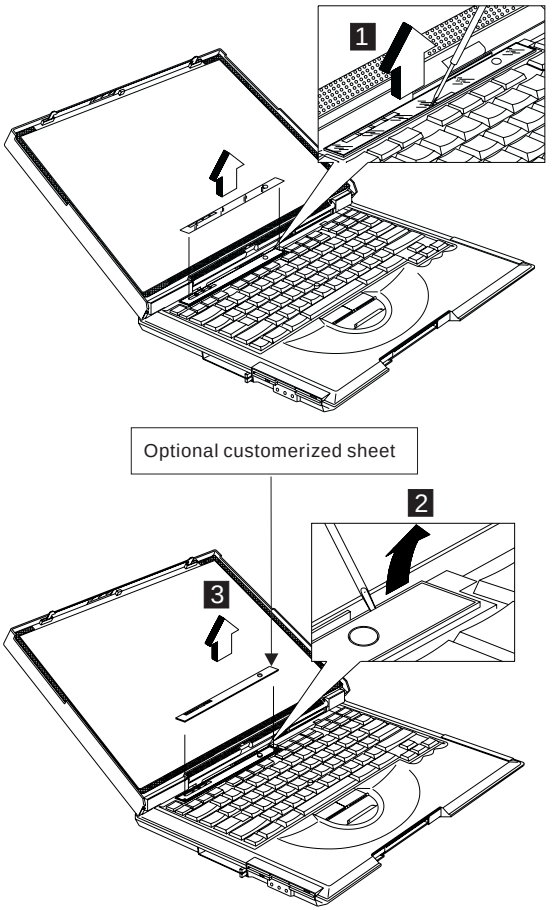
1. Disconnect the modem cable.
2. Press the release latches on both sides of the modem board.
3. Pull out the modem card.

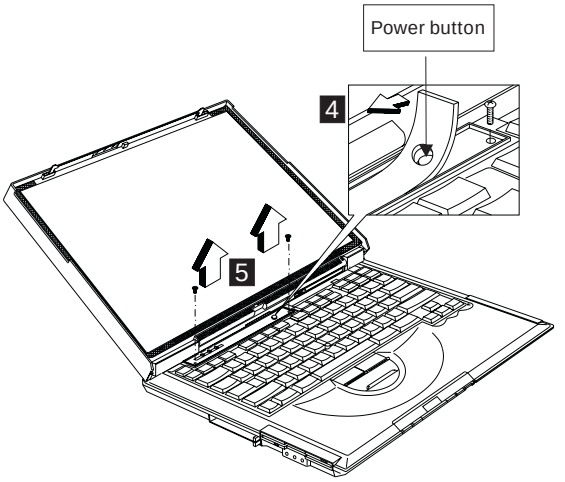


When reinserting the card, reverse the procedures above.

Launch key assembly

- “Battery assembly” on page 114

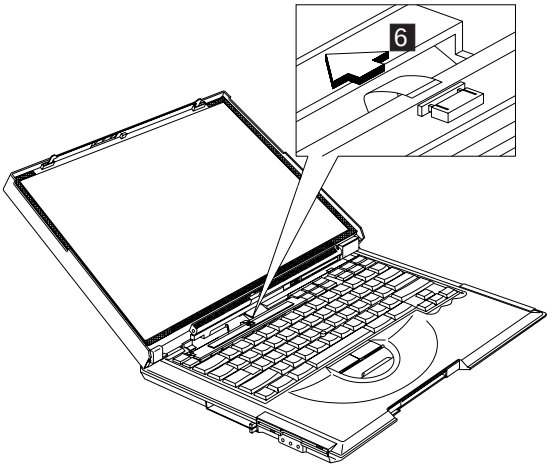




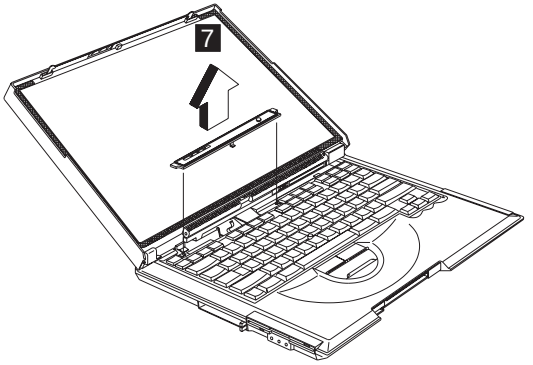
Step	Size (Quantity)	Color	Torque
5	M2 x 4L (2)	Silver	1.6 kgf-cm

Notes:

1. Adjust the LCD module to the widest angle. Be careful not to scratch the surface of the middle cover.
2. Turn the middle cover and launch key assembly upside down when removing the FFC.

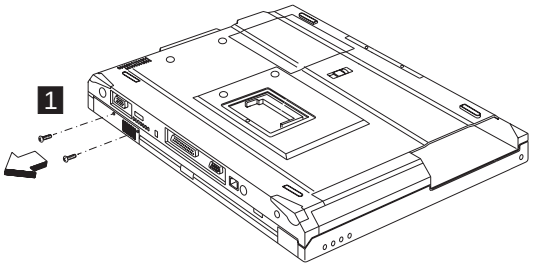


CAUTION:
There is a FFC connected to the middle cover. When removing the middle cover, release the FFC with caution.

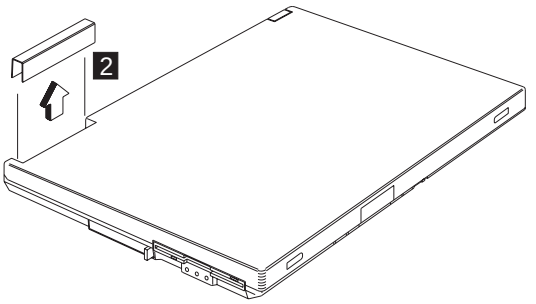


Left hinge cap

- “Battery assembly” on page 114
- “Launch key assembly” on page 120



Step	Size (Quantity)	Color	Torque
1	M2.5 x 3.5L (2)	Black	3.2 kgf-cm



Keyboard

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap”

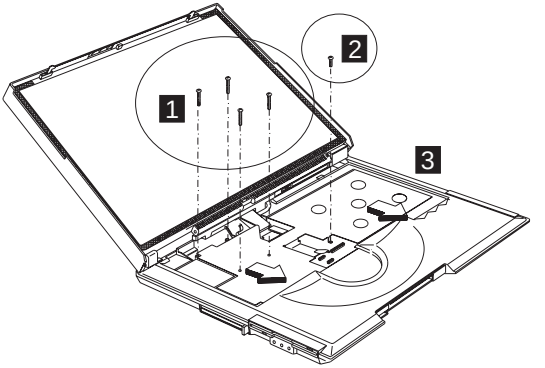
Note: Make sure the FPC finger side is facing outwards, when inserted.

Notes:

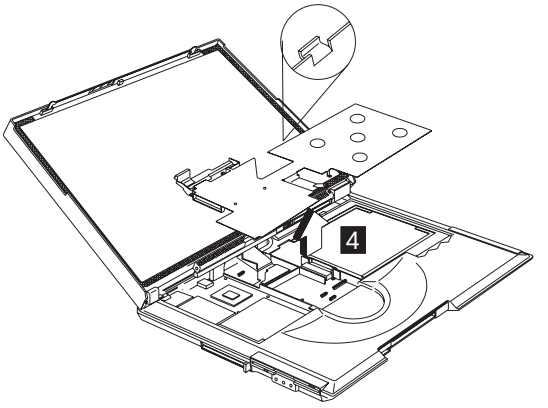
1. When replacing the keyboard, make sure that the 3 cables are clean and insert them directly into the connectors, making sure they make contact with the bottom of the connector. Now press down on the latch of the connector to secure.
2. If the cables do not touch the bottom of the connector, the keyboard function will be rendered useless.
3. The cables of the keyboard are fragile and could be damaged. Be careful when pulling out the cables.

Upper heat sink

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123

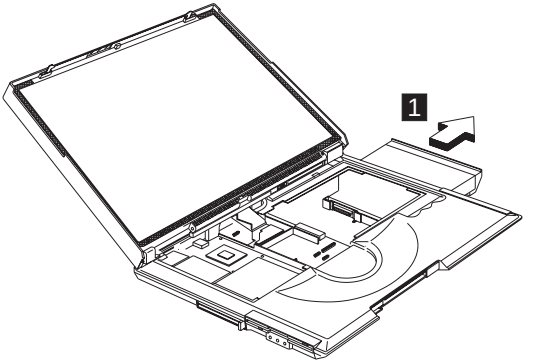


Step	Size (Quantity)	Color	Torque
1	M2 x 8L (4)	Black	1.6 kgf-cm
2	M2.5 x 10L (1)	Black	3.2 kgf-cm



CD-ROM/DVD-ROM assembly

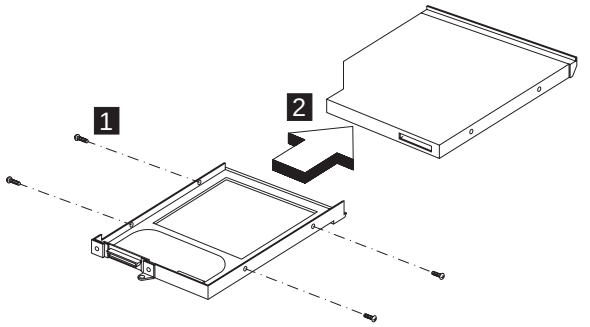
- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “Upper heat sink” on page 124



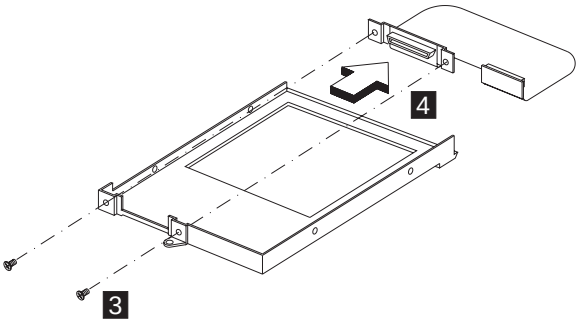
CAUTION:
When the CD-ROM/DVD-ROM assembly is removed, the machine is unstable.

CD-ROM/DVD-ROM chassis assembly

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “Upper heat sink” on page 124
- “CD-ROM/DVD-ROM assembly”



Step	Size (Quantity)	Color	Torque
1	M2 x 3L (4)	Silver	1.8 kgf-cm



Caution

Do not disassemble the CD-ROM; there are no user adjustments or serviceable parts inside. The use of controls, adjustments or performing procedures other than those specified may result in hazardous radiation exposure.

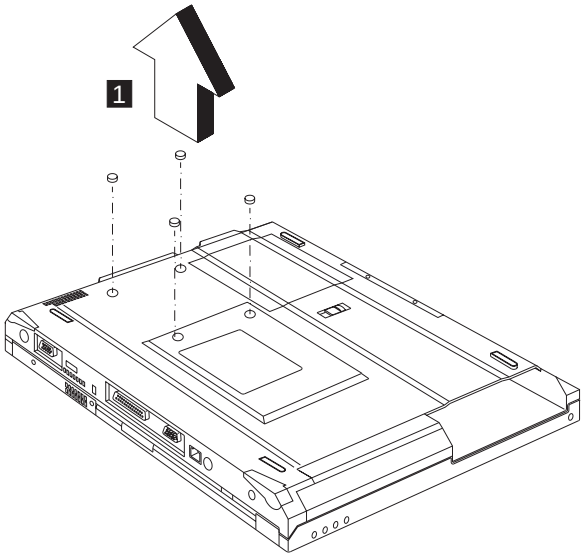
The CD-ROM is a sensitive electronic device, handling should be cautious.

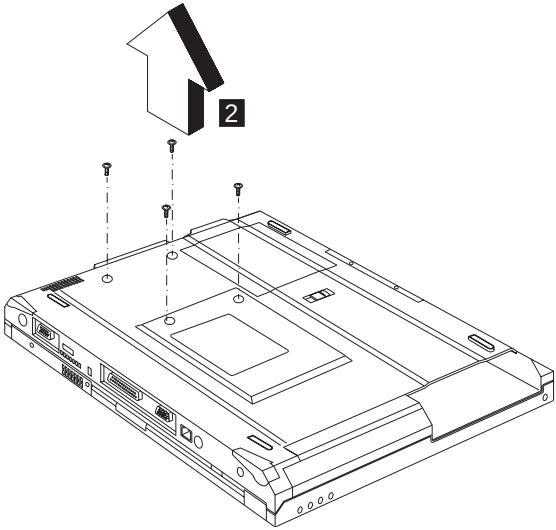
Do not apply any extra force to the CD-ROM drive when removing it.

Step	Size (Quantity)	Color	Torque
1	M2 x 3L (2)	Silver	1.3 kgf-cm

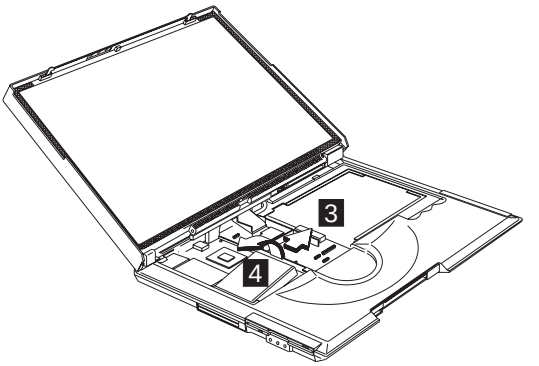
PCMCIA holder

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “Upper heat sink” on page 124





Step	Size (Quantity)	Color	Torque
1	M2 x 4L (4)	Silver with washer head	1.6 kgf-cm

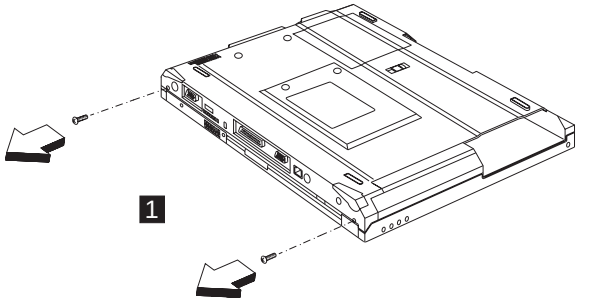


Note: Before removing and replacing the PCMCIA holder, make sure that the PCMCIA cards are removed and the eject levers are sticking out.

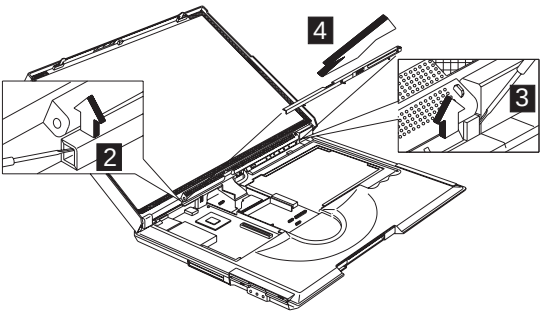
CAUTION:
When removing the PCMCIA holder, pull them up at an angle. It cannot be removed when pulled straight up.

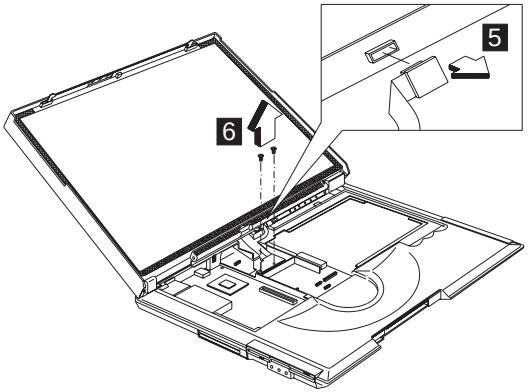
LCD assembly

- "Battery assembly" on page 114
- "Launch key assembly" on page 120
- "Left hinge cap" on page 122
- "Keyboard" on page 123

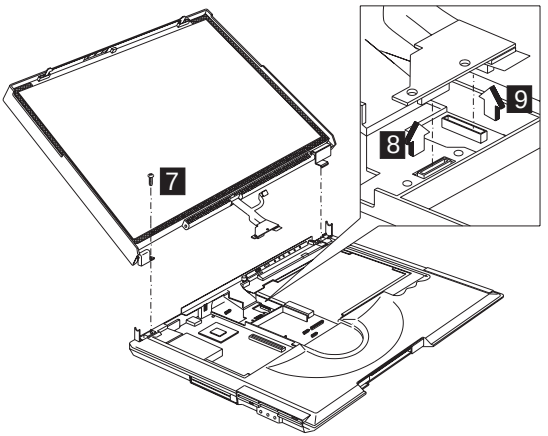


Step	Size (Quantity)	Color	Torque
1	M2.5 x 6L (2)	Black	3.2 kgf-cm





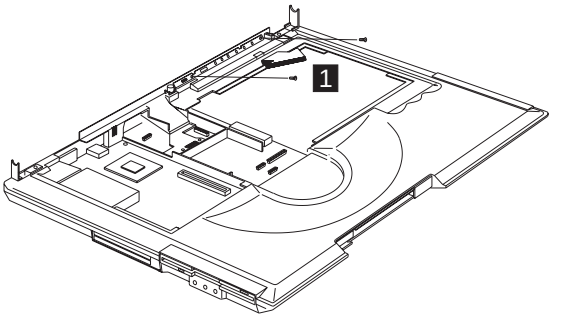
Step	Size (Quantity)	Color	Torque
6	M2 x 12L (2)	Silver	1.6 kgf-cm



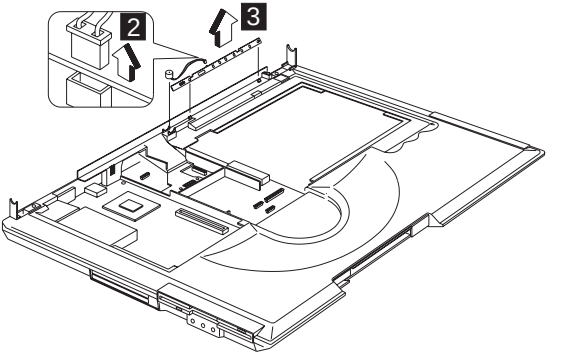
Step	Size (Quantity)	Color	Torque
7	M2.5 x 6L (1)	Black	3.2 kgf-cm

LED board assembly and Cable assembly of microphone

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “LCD assembly” on page 128

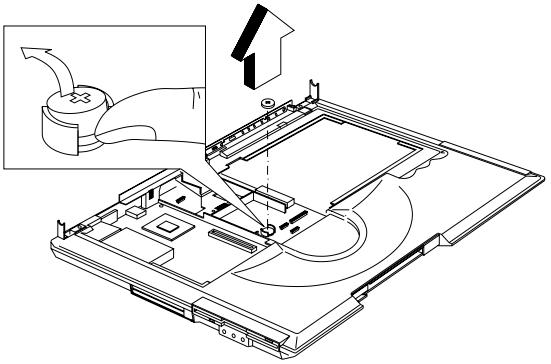


Step	Size (Quantity)	Color	Torque
1	M2 x 4L(2)	Silver	1.6 kgf-cm



Backup battery

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Keyboard” on page 123
- “Upper heat sink” on page 124

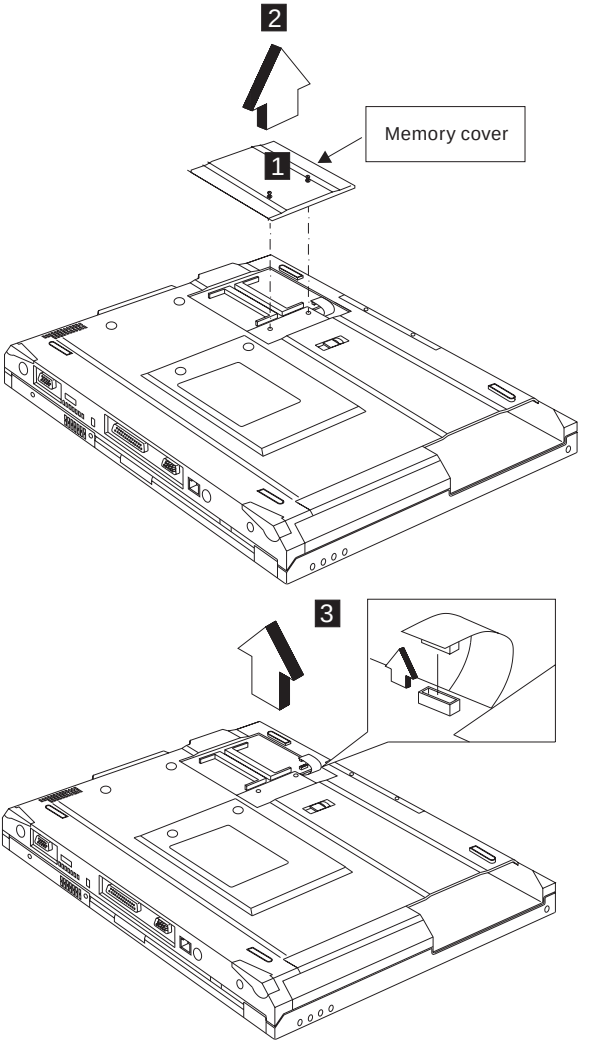


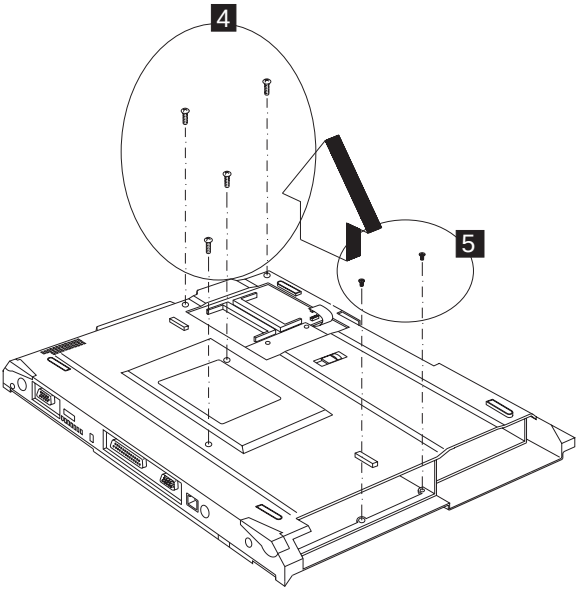
Safety Notice 4

Translation in "Safety Notices: Multilingual Translations" section: The backup battery is a lithium battery and can cause a fire, an explosion, or severe burns. 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 of an incorrect battery can result in ignition or explosion of the battery. Replacement batteries can be ordered from IBM or IBM Authorized Dealers.

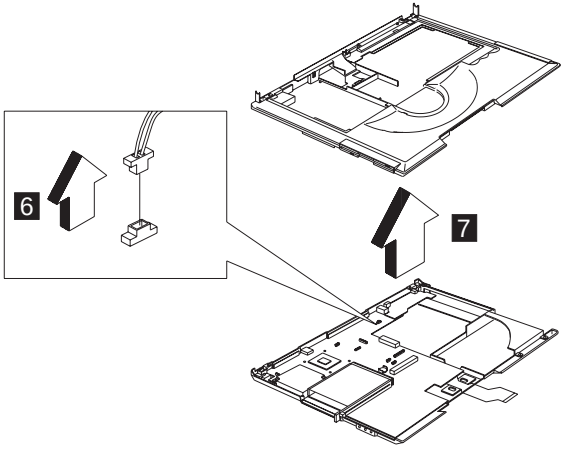
Keyboard bezel

- "Battery assembly" on page 114
- "Launch key assembly" on page 120
- "Left hinge cap" on page 122
- "Keyboard" on page 123
- "Upper heat sink" on page 124
- "CD-ROM/DVD-ROM assembly" on page 125
- "LCD assembly" on page 128
- "LED board assembly and Cable assembly of microphone" on page 130


2
Memory cover
1
3



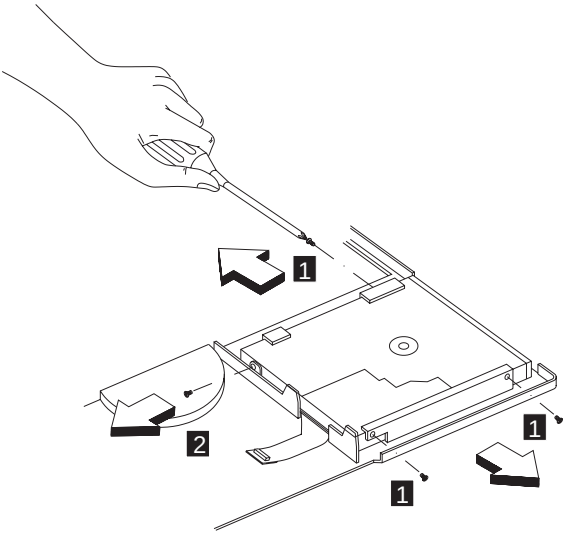
Step	Size (Quantity)	Color	Torque
1	M2.5 x 6L (4)	Black	3.2 kgf-cm
2	M2.5 x 3.5L (2)	Black	3.2 kgf-cm



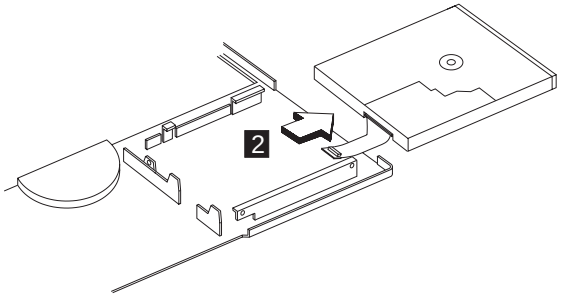
CAUTION:
The upper cover has several latches. When removing the upper cover from the bottom cover, gently release these latches, then raise the side of the uppoer cover facing the palm rest to remove it. Be careful not to break the latches.

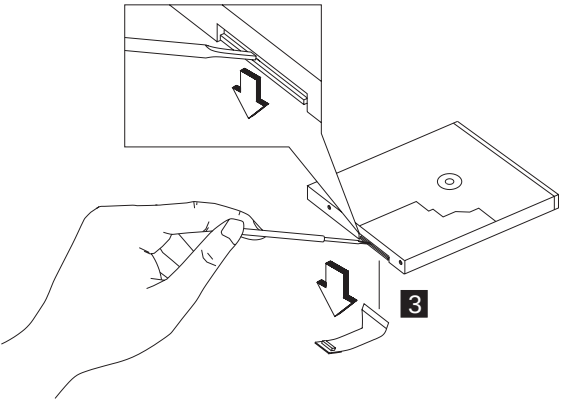
Diskette drive assembly

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “Upper heat sink” on page 124
- “CD-ROM/DVD-ROM assembly” on page 125
- “LCD assembly” on page 128
- “LED board assembly and Cable assembly of microphone” on page 130
- “Keyboard bezel” on page 131



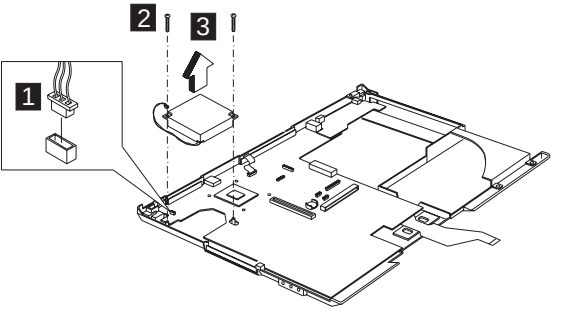
Step	Size (Quantity)	Color	Torque
1	M2.5 x 3.5L (3)	Black	2.0 kgf-cm
2	M2 x 4L (1)	Silver	1.6 kgf-cm





Fan assembly

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “Upper heat sink” on page 124
- “LCD assembly” on page 128
- “LED board assembly and Cable assembly of microphone” on page 130
- “Keyboard bezel” on page 131

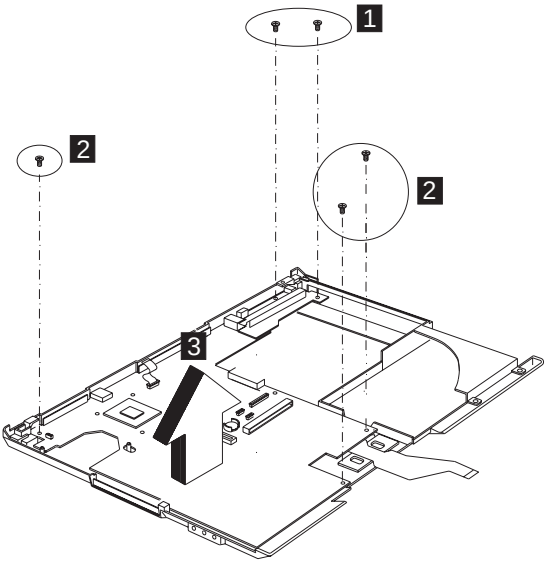


Step	Size (Quantity)	Color	Torque
2	M2.5 x 3.5L (2)	Black	3.2 kgf-cm

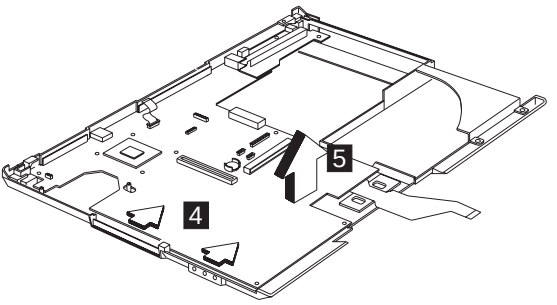
DC-DC charger board and System board

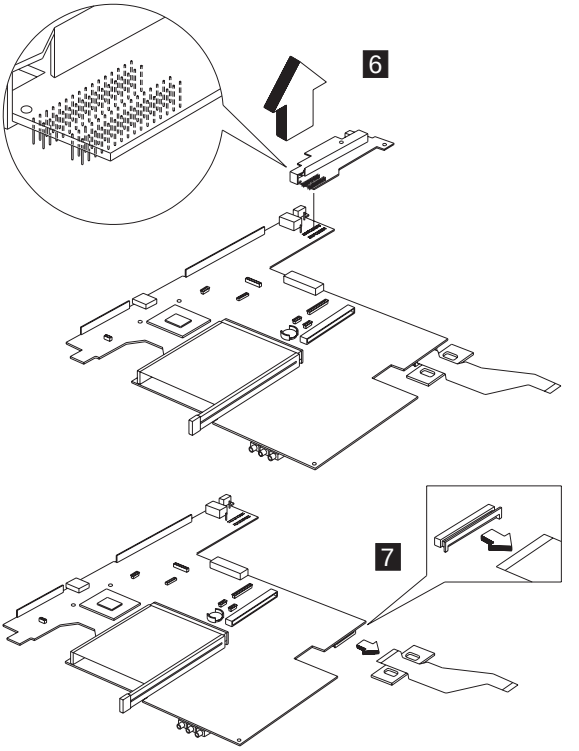
- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “Upper heat sink” on page 124
- “CD-ROM/DVD-ROM assembly” on page 125

- “LCD assembly” on page 128
- “LED board assembly and Cable assembly of microphone” on page 130
- “Keyboard bezel” on page 131
- “Fan assembly” on page 135



Step	Size (Quantity)	Color	Torque
1	M2.5 x 3.5L (2)	Black	3.2 kgf-cm
2	M2.5 x 3.5L (3)	Black	3.2 kgf-cm



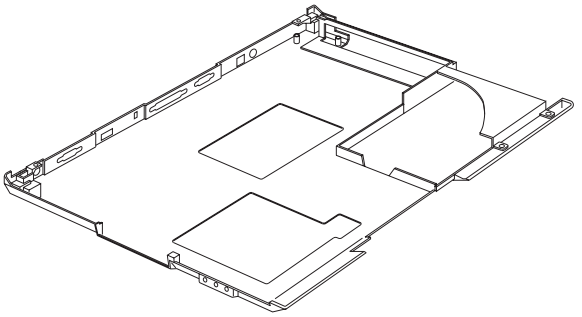


Notes:

1. When removing the system board from the bottom cover, gently raise the side of the system board facing the rear I/O ports; then pull out the system board.
2. When replacing the system board, align the power switch and power actuator. Make sure that the power switch operates correctly before securing the screws.

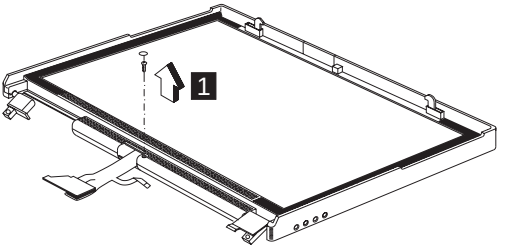
Bottom case

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “Upper heat sink” on page 124
- “CD-ROM/DVD-ROM assembly” on page 125
- “LCD assembly” on page 128
- “LED board assembly and Cable assembly of microphone” on page 130
- “Keyboard bezel” on page 131
- “DC-DC charger board and System board” on page 135

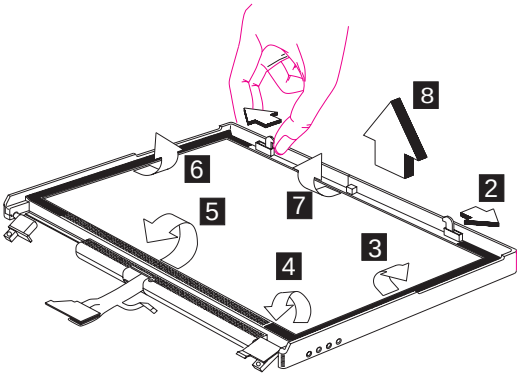


LCD bezel assembly (15.0")

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “LCD assembly” on page 128



Step	Size (Quantity)	Color	Torque
1	M2.5 x 4L(1)	Silver	1.6 kgf-cm



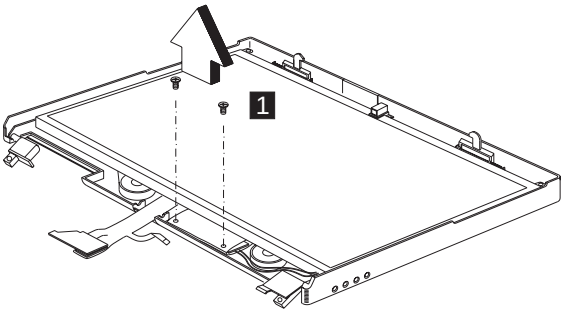
Note: When removing the LCD, take note of the following:

- Be careful not to scratch the LCD cover when removing the screw covers.

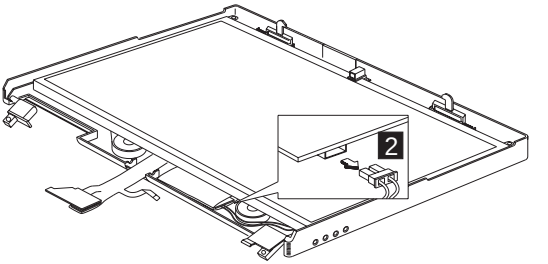
- The LCD front cover has several latches. Release these latches; then remove the LCD cover. Be careful not to break these latches.
- Gently push the two hooks outward to remove the LCD front cover.

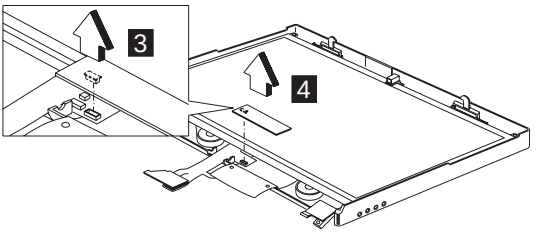
LCD inverter (15.0")

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “LCD assembly” on page 128
- “LCD bezel assembly (15.0")” on page 138



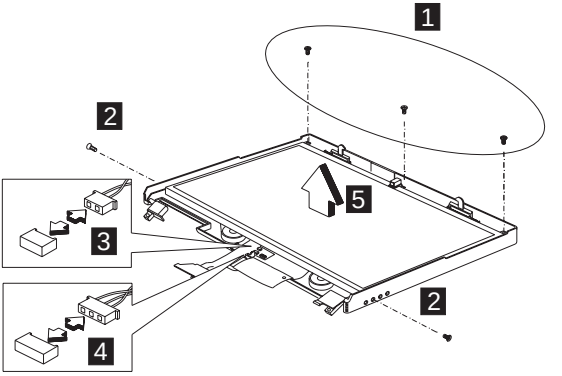
Step	Size (Quantity)	Color	Torque
1	M2 x 4L(2)	Silver	1.6 kgf-cm



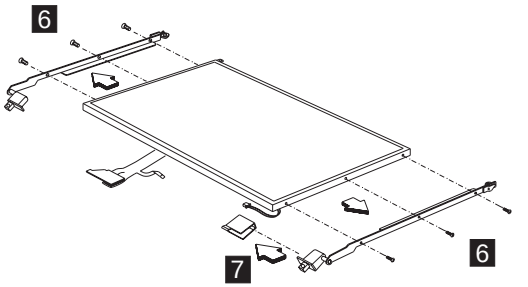


LCD bracket hinge assembly (15.0")

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “LCD assembly” on page 128
- “LCD bezel assembly (15.0")” on page 138
- “LCD inverter (15.0")” on page 139



Step	Size (Quantity)	Color	Torque
1	M2.5 x 4L(3)	Silver	1.6 kgf-cm
2	M2.5 x 6L(2)	Black	3.2 kgf-cm

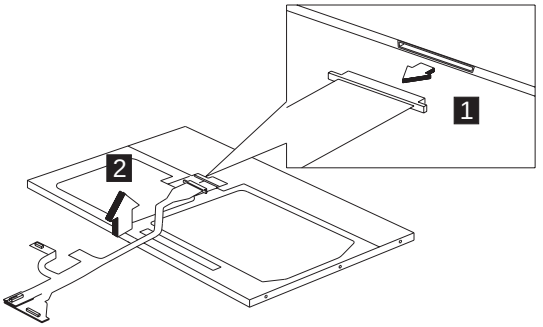


Step	Size (Quantity)	Color	Torque
6	M2 x 3L(6)	Silver	1.6 kgf-cm

LCD FPC assembly (15.0")

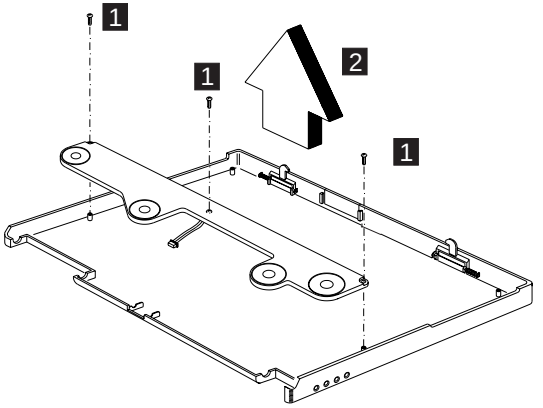
- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “LCD assembly” on page 128
- “LCD bezel assembly (15.0")” on page 138

- “LCD inverter (15.0")” on page 139
- “LCD bracket hinge assembly (15.0")” on page 140



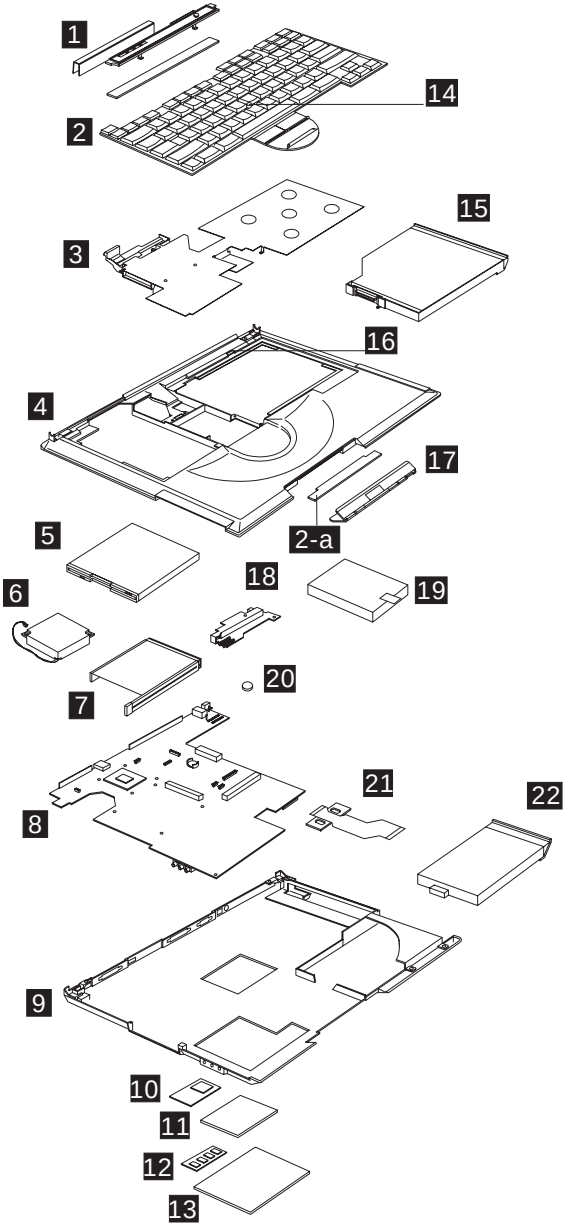
Speaker assembly (15.0")

- “Battery assembly” on page 114
- “Launch key assembly” on page 120
- “Left hinge cap” on page 122
- “Keyboard” on page 123
- “LCD assembly” on page 128
- “LCD bezel assembly (15.0")” on page 138
- “LCD inverter (15.0")” on page 139
- “LCD bracket hinge assembly (15.0")” on page 140



Step	Size (Quantity)	Color	Torque
1	M2 x 4L(3)	Silver	1.6 kgf-cm

Parts list (ThinkPad i Series 1400/1500)



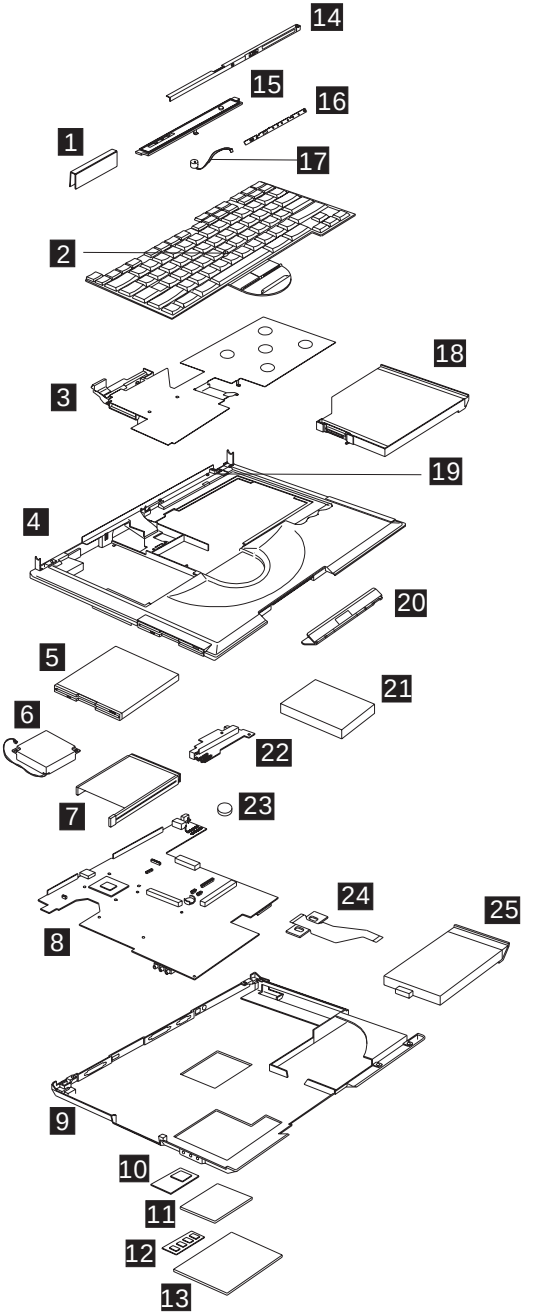
Note: The table below applies to the models in Group-C I, II, and IV. (See the 2621 model table on page iii.)

No.	Description	FRU No.
1	Middle Cover & Launch Key ASM 14.1"	08K5865

No.	Description	FRU No.
	Middle Cover & Launch Key ASM 14.1" (for Japan)	08K6054
	Middle Cover & Launch Key ASM 12.1"/13.0"	08K5869
	Middle Cover & Launch Key ASM 12.1"/13.0" (for Japan)	08K6055
2	Launch Key Board	08K3404
2-a	CD Control Card	08K3183
3	Upper Heat sink	08K6695
4	Keyboard Bezel (IBM Logo, Lid SW, Bracket Screw, PCMCIA Shutter)	08K6693
	Keyboard Bezel (IBM Logo, Lid SW, Bracket Screw, PCMCIA Shutter) (for Japan)	08K6694
5	FDD w/ Bezel	05K9179
	FDD w/ Bezel (w/ version: W)	05K9271
6	Fan ASM	08K5872
7	PCMCIA Holder	08K5873
8	Planar W/TV out (Celeron 500)	08K3114
	Planar W/TV out (Coppermine 500)	08K3140
9	Bottom Case (w/TV out, w/w 2621)	08K6672
	Bottom Case (w/TV out, for IIPC)	08K6673
	Bottom Case (w/TV out, for Korea)	08K6674
	Bottom Case (w/TV out, for 2651 worldwide)	08K6677
10	PCI Modem (Ambit)	10L1296
11	Modem Cover	08K5863
12	DIMM 32 MB	08K3408
	DIMM 64 MB	08K3409
13	DIMM Cover	05K7073
14	Pointing Stick Caps	84G6536
15	24X CD-ROM Module (LG)	05K9277
	24X CD-ROM Module (Teac)	05K9278
	6X DVD-ROM Module (Toshiba)	05K9258
	CD-ROM Chassis	08K5862
16	Lid S/W ASM	08K5871
17	CD Control Panel	08K5876
18	DC/DC Charger	08K3186
19	HDD Module ASM 6.0 GB (IBM)	05K9250
	HDD Module ASM 9.0 GB (IBM)	05K9252
	HDD Module ASM 12.0 GB (IBM)	05K9254
	HDD Module ASM 18.0 GB (IBM)	27L3428

No.	Description	FRU No.
	Kitting, HDD (HDD adapter, HDD bracket (for 9.5mm HDD), HDD bracket (for 12.5mm HDD), screw x 2))	08K5861
20	RTC Battery	11J8591
21	FPC Cable Group	27L0498
22	Battery Assy (LiIon) 9 Cells (Sanyo)	02K6632
	Battery Assy (LiIon) 9 Cells (Panasonic)	02K6647
	Battery Assy (NiMH) 8 Cells (Panasonic)	02K6630
	Battery Assy (NiMH) 8 Cells (Sanyo)	02K6634
	LEG (R/L)	08K5870
	CD Control Card	08K3183
	Miscellaneous Kit Right Hinge Cap 12.1"/13.0" Right Hinge Cap 14.1" Rubber Foot * 4 PCMCIA Screw Cover * 4 Modem Cover Mylar Film CD-Player Panel Mylar Screw Cushion for LCD Bezel * 2 Screw Cap for LCD Bezel Screw Mylar for Rear Cover * 4 Screw Mylar for 15.0" LCD Bezel Side Screw Mylar for 15.0" LCD Bezel * 2 12.1" LCD FPC Holder RJ11 Cable 12.1" Top Bracket * 2 13.0" Top Bracket * 2 Battery Latch Knob Keyboard Light Switch Launch Key Panel	08K6604

No.	Description	FRU No.
	Miscellaneous Kit (for Japan) Right Hinge Cap 12.1"/13.0" 12.1" LCD FPC Holder 12.1" Top Bracket * 2 Right Hinge Cap 14.1" Rubber Foot * 4 PCMCIA Screw Cover * 4 Modem Cover Mylar Film CD-Player Panel Mylar Screw Cushion for LCD Bezel * 2 (Japan model) Screw Cap for LCD Bezel (Japan model) Screw Mylar for Rear Cover * 4 (Japan model) Screw Mylar for 15.0" LCD Bezel (Japan model) Side Screw Mylar for 15.0" LCD Bezel * 2 (Japan model) RJ11 Cable 13.0" Top Bracket * 2 Battery Latch Knob Keyboard Light Switch Launch Key Panel	08K6592
	Screw Kit WAFER MYLO M2.5*3.5LB-ZN Black PAN NYLOK M2.5*6LB-ZN Black PAN NYLOK M2.5*10LB-ZN Black MACH PH M2*8LB-ZN Pan Black MACH PAN M2*10L NI Silver M2*4 WAFER NI Silver M2*L3 Wafer Head Black SCREW PAN M2*12L NI Silver SCREW M3*5L 700 Wafer Silver MACH PAN M2*6L NI Silver	08K6691



Note: The table below applies to the models in Group-C III. (See the 2621 model table on page iii.)

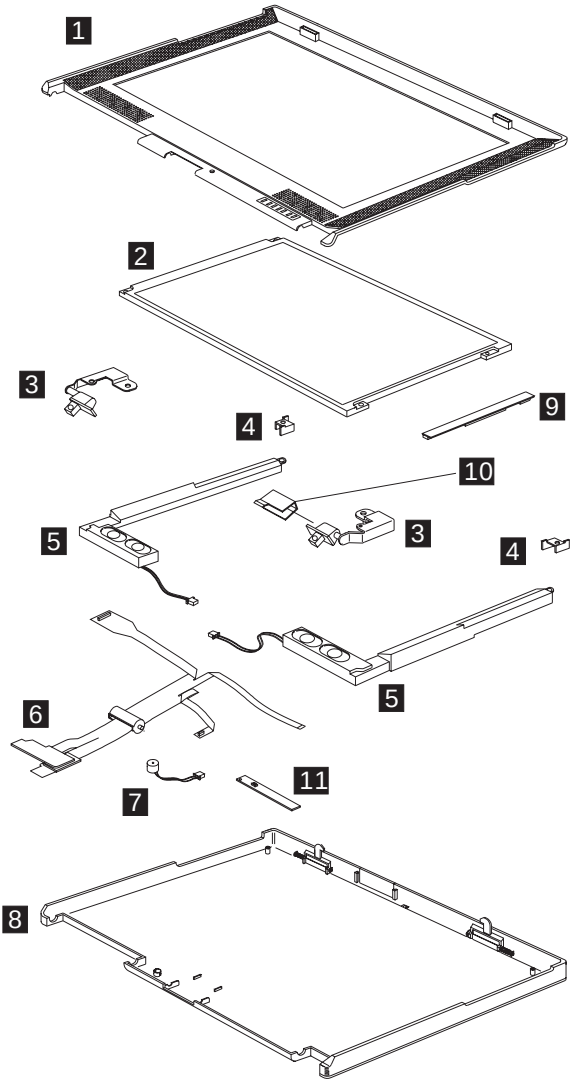
No.	Description	FRU No.
1	15.0" Hinge Cap ASM	08K6380
	15.0" Hinge Cap ASM (for Japan model)	08K6391
2	Pointing Stick Caps	84G6536
3	Upper Heat sink	08K6695
4	Keyboard Bezel for 15.0" model (PCMCIA Shutter, Rubber Foot, Stand Foot, Battery Latch)	08K6277
	Keyboard Bezel for 15.0" model (PCMCIA Shutter, Rubber Foot, Stand Foot, Battery Lactch) (for Japan model)	08K6392
5	FDD w/ Bezel (w/version: W)	05K9271
6	Fan ASM	08K5872
7	PCMCIA Holder	08K5873
8	Planar W/TV out (Celeron 500)	08K3114
	Planar W/TV out (Coppermine 500)	08K3140
9	Bottom Case (w/TV out, w/w 2621)	08K6672
	Bottom Case (w/TV out, for IIPC)	08K6673
	Bottom Case (w/TV out, for Korea)	08K6674
	Bottom Case (w/TV out, for 2651 worldwide)	08K6677
10	PCI Modem (Ambit)	10L1296
	PCI Modem (CIS)	10L1329
11	Modem Cover	08K5863
12	DIMM 32 MB	08K3408
	DIMM 64 MB	08K3409
13	DIMM Cover	05K7073
14	LED Cover for 15.0" Model	08K6381
	LED Cover for 15.0" Model (for Japan model)	08K6410
15	Middle Cover for 15"	08K6280
	Middle Cover for 15" (for Japan model)	08K6393
16	LED Board for 15.0" Model	08K3116
17	Cable ASM of Microphone & Keyboard LED Light for 15.0" LCD	27L0540
	Cable ASM of Microphone & Keyboard LED Light for 15.0" LCD (for Japan model)	27L0541
18	24X CD-ROM Module (LG)	05K9277
	24X CD-ROM Module (Teac)	05K9278
	6X DVD-ROM Module (Toshiba)	05K9258
	CD-ROM Chassis	08K5862

No.	Description	FRU No.
19	Lid S/W ASM	08K5871
20	CD Control Panel	08K5876
21	HDD Module ASM 6.0 GB (IBM)	05K9250
	HDD Module ASM 9.0 GB (IBM)	05K9252
	HDD Module ASM 12.0 GB (IBM)	05K9254
	HDD Module ASM 18.0 GB (IBM)	27L3428
	Kitting, HDD (HDD adapter, HDD bracket (for 9.5mm HDD), HDD bracket (for 12.5mm HDD), screw x 2))	08K5861
22	DC/DC Charger	08K3186
23	RTC Battery	11J8591
24	FPC Cable Group (CD-ROM FPC, FDD FPC, Launch Key FPC, CD-Player FPC)	27L0498
25	Battery Assy (LiIon) 9 Cells (Panasonic)	02K6647
	Battery Assy (NiMH) 8 Cells (Panasonic)	02K6630
	LEG (R/L)	08K5870
	CD-ROM Chassis	08K5862
	CD Control Card	08K3183
	Miscellaneous Pack Right Hinge Cap 12.1"/13.0" Right Hinge Cap 14.1" Rubber Foot * 4 PCMCIA Screw Cover * 4 Modem Cover Mylar Film CD-Player Panel Mylar Screw Cushion for LCD Bezel * 2 Screw Cap for LCD Bezel Screw Mylar for Rear Cover * 4 Screw Mylar for 15.0" LCD Bezel Side Screw Mylar for 15.0" LCD Bezel * 2 12.1" LCD FPC Holder RJ11 Cable 12.1" Top Bracket * 2 13.0" Top Bracket * 2 Battery Latch Knob Keyboard Light Switch Launch Key Panel	08K6604

No.	Description	FRU No.
	Miscellaneous Pack (for Japan) Right Hinge Cap 12.1"/13.0" 12.1" LCD FPC Holder 12.1" Top Bracket * 2 Right Hinge Cap 14.1" Rubber Foot * 4 PCMCIA Screw Cover * 4 Modem Cover Mylar Film CD-Player Panel Mylar Screw Cushion for LCD Bezel * 2 (Japan model) Screw Cap for LCD Bezel (Japan model) Screw Mylar for Rear Cover * 4 (Japan model) Screw Mylar for 15.0" LCD Bezel (Japan model) Side Screw Mylar for 15.0" LCD Bezel * 2 (Japan model) RJ11 Cable 13.0" Top Bracket * 2 Battery Latch Knob Keyboard Light Switch Launch Key Panel	08K6592
	Screw Kit WAFER MYLO M2.5*3.5LB-ZN Black PAN NYLOK M2.5*6LB-ZN Black PAN NYLOK M2.5*10LB-ZN Black MACH PH M2*8LB-ZN Pan Black MACH PAN M2*10L NI Silver M2*4 WAFER NI Silver M2*L3 Wafer Head Black SCREW PAN M2*12L NI Silver SCREW M3*5L 700 Wafer Silver MACH PAN M2*6L NI Silver	08K6691

LCD FRU

12.1-inch SVGA TFT

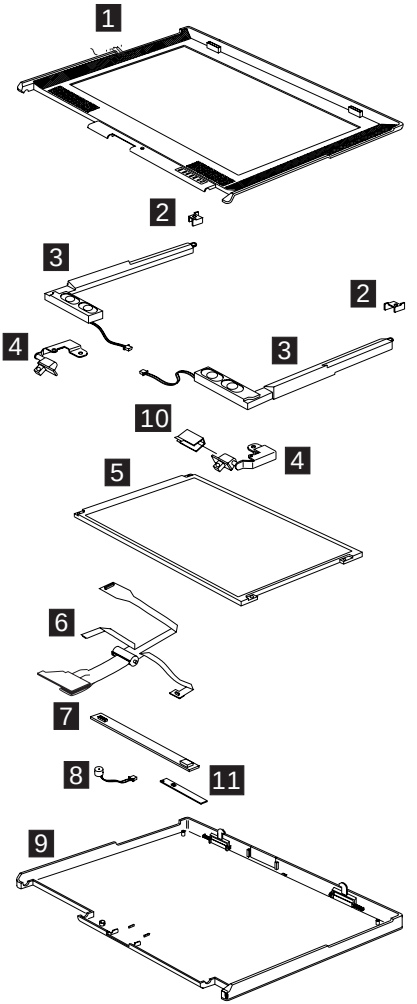


Note: The table below applies to the models in Group-C I. (See the 2621 model table on page iii.)

No.	Description	FRU No.
1	LCD BEZEL ASM 12.1"	08K5849
	LCD BEZEL ASM 12.1" (for Japan model)	08K6388
2	12.1" TFT LCD	08K5844
3	LCD Bracket-Hinge 12.1" (R,L)	08K5850
4	Misc. 12.1" Top Bracket	08K5878

No.	Description	FRU No.
5	Speaker ASM (R,L)	08K6374
6	12.1" LCD FPC Assy.	27L0494
	12.1" LCD FPC Assy. (for Japan model)	27L0536
7	Cable Asm. of Microphone	27L0497
	Cable Asm. of Microphone (for Japan model)	27L0511
8	LCD Rear Cover ASM 12.1" TFT	08K5848
	LCD Rear Cover ASM 12.1" TFT (for Japan model0	08K6387
9	LCD Inverter 12.1"	10L1380
10	Misc. Right Hinge Cap 12.1"/13.0" (for worldwide)	08K6604
	Misc. Right Hinge Cap 12.1"/13.0" (for Japan)	08K6592
11	LED BD	08K3182
	LG/IBM Logo Kit	08K5860

13.0-inch SVGA HPA

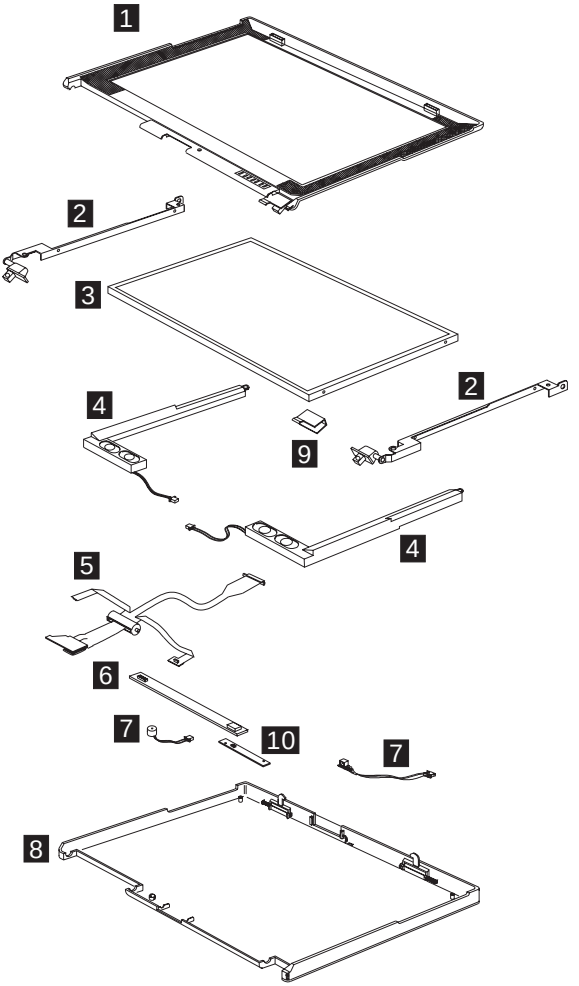


Note: The table below applies to the models in Group-C IV. (See the 2621 model table on page iii.)

No.	Description	FRU No.
1	LCD BEZEL ASM 13.0"	08K5853
	13.0" HPA LCD Bezel (for Japan)	08K6051
2	Misc. 13.0" Top Bracket	08K5878
3	Speaker Module (R,L)	08K6374
4	LCD Bracket-Hinge 13.0" (R,L)	08K5854
5	13.0" HPA LCD	05K9596
6	13.0" LCD FPC Assy.	27L0495
	13.0" LCD FPC Assy. (for Japan)	27L0510

No.	Description	FRU No.
7	LCD Inverter 13.0"	10L1380
8	Cable Asm. of Microphone	27L0497
	Cable Asm. of Microphone (for Japan)	27L0511
9	LCD Rear Cover ASM 13.0" HPA	08K5852
	LCD Rear Cover ASM 13.0" HPA (with logo kit) (for Japan)	08K6048
10	Misc. Right Hinge Cap 12.1"/13.0" (for worldwide)	08K6604
	Misc. Right Hinge Cap 12.1"/13.0" (for Japan)	08K6592
11	LED BD	08K3182
	LG/IBM Logo Kit	08K5860

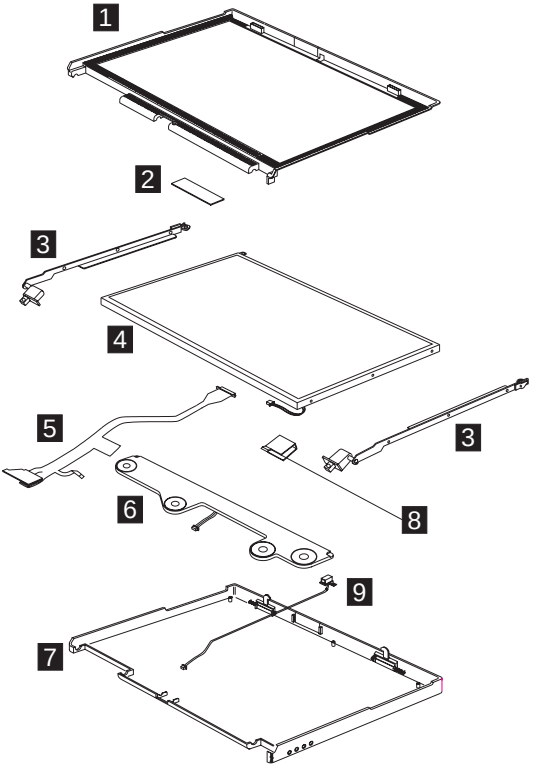
14.1–inch XGA TFT



Note: The table below applies to the models in Group-C II. (See the 2621 model table on page iii.)

No.	Description	FRU No.
1	LCD BEZEL ASM 14.1"	08K5856
	LCD BEZEL ASM 14.1" (for Japan model)	08K6050
	LCD BEZEL ASM 14.1" (NEC LCD)	08K6276
	LCD BEZEL ASM 14.1" (NEC LCD) (for Japan model)	08K6386
2	LCD Bracket-Hinge 14.1" (R,L)	08K5857
	LCD Bracket-Hinge 14.1" (R,L) (NEC LCD)	08K6282
3	14.1" TFT LCD (LG)	05K9591
	14.1" TFT LCD (Samsung)	05K9498
	14.1" TFT LCD (NEC)	05K9602
4	Speaker Module (R,L)	08K6374
5	14.1" LCD FPC Assy.	27L0496
	14.1" LCD FPC Assy. (for Japan)	27L0509
	14.1" LCD FPC Assy. (NEC LCD)	27L0523
	14.1" LCD FPC Assy. (NEC LCD) (for Japan model)	27L0535
6	LCD Inverter 14.1"	10L1442
7	Cable ASM of Microphone & Key-board LED Light	27L0497
	Cable ASM of Microphone & Key-board LED Light (for Japan)	27L0511
	Cable ASM of Microphone & Key-board LED Light (NEC LCD)	27L0566
8	LCD Rear Cover ASM 14.1" TFT	08K5855
	LCD Rear Cover ASM 14.1" TFT (for Japan)	08K6047
	LCD Rear Cover ASM 14.1" TFT (NEC LCD)	08K6275
	LCD Rear Cover ASM 14.1" TFT (NEC LCD) (for Japan model)	08K6385
9	Misc. Right Hinge Cap 14.1"	08K6604
	Misc. Right Hinge Cap 14.1"	08K6592
10	LED BD	08K3182
	LG/IBM Logo Kit	08K5860

15.0–inch XGA TFT



Note: The table below applies to the models in Group-C III. (See the 2621 model table on page iii.)

No.	Description	FRU No.
1	LCD Bezel ASM 15.0"	08K6279
	15.0" TFT LCD Bezel (for Japan model)	08K6390
2	LCD Inverter 15.0"	08K3113
3	15.0" Hinge ASM	08K6281
4	15.0" TFT LCD	05K9604
5	15.0" TFT LCD FPC ASM	27L0522
	15.0" TFT LCD FPC ASM (for Japan model)	27L0537
6	Speaker Module for 15.0" LCD	08K6382
7	LCD Rear Cover ASM 15.0" TFT	08K6278
	LCD Rear Cover ASM 15.0" TFT (for Japan model)	08K6389
8	15.0" Hinge Cap ASM	08K6380
9	Cable ASM of Microphone & Keyboard LED Light for 15.0" LCD	27L0540

No.	Description	FRU No.
	Cable ASM of Microphone & Key-board LED Light for 15.0" LCD (for Japan model)	27L0541
	LG/IBM Logo Kit	08K5860

Keyboard

Description	Vendor	FRU No.
Keyboard US	API	02K5077
Keyboard Chinese	API	02K5078
Keyboard Korean	API	02K5079
Keyboard Swiss	API	02K5080
Keyboard Canadian French	API	02K5081
Keyboard Belgian	API	02K5082
Keyboard Danish	API	02K5083
Keyboard Italy	API	02K5084
Keyboard French	API	02K5085
Keyboard German	API	02K5086
Keyboard Norwegian	API	02K5087
Keyboard Portuguese	API	02K5088
Keyboard Spanish	API	02K5089
Keyboard Dutch	API	02K5090
Keyboard Swedish/Finnish	API	02K5091
Keyboard Japan	API	02K5092
Keyboard UK English	API	02K5093
Keyboard La Spanish	API	02K5095
Keyboard US ENGLISH	ALPS	02K5060
Keyboard KOREAN	ALPS	02K5061
Keyboard UK ENGLISH	ALPS	02K5062
Keyboard CANADIAN FRENCH	ALPS	02K5063
Keyboard GERMANY	ALPS	02K5064
Keyboard FRENCH	ALPS	02K5065
Keyboard DUTCH	ALPS	02K5066
Keyboard SWEDISH/FINNISH	ALPS	02K5067
Keyboard NORWEGIAN	ALPS	02K5068
Keyboard DANISH	ALPS	02K5069
Keyboard JAPANESE	ALPS	02K5070
Keyboard TRAD. CHINESE	ALPS	02K5071
Keyboard ITALIAN	ALPS	02K5072
Keyboard SPANISH	ALPS	02K5073
Keyboard SWISS	ALPS	02K5074

Description	Vendor	FRU No.
Keyboard PORTUGUESE	ALPS	02K5075
Keyboard BELGIAN	ALPS	02K5076
Keyboard LA SPANISH	ALPS	02K5094

Common parts list

Tools

Description	FRU No.
Tri-Connector Wrap Plug	72X8546
PC Test Card	35G4703
Audio Wrap Cable	66G5180
Screwdriver Kit	95F3598
USB Parallel Test Cable	05K2580
Torque Screwdriver	05K4695
5mm Socket Wrench	05K4694
Screwdriver	05K4693

Miscellaneous

Description	FRU No.
Headset (for Japan only)	02K4941

Modem cable

Description	FRU No.
Modem cable (German)	27L0441
Modem cable (UK, NZ)	27L0442
Modem cable (France)	27L0443
Modem cable (Holland)	27L0444
Modem cable (Sweden)	27L0445
Modem cable (Norway/Fin)	27L0446
Modem cable (Danish)	27L0447
Modem cable (Italy)	27L0448
Modem cable (Austria)	27L0449
Modem cable (Spain)	27L0450
Modem cable (Belgium)	27L0451
Modem cable (Switzerland)	27L0462
Modem cable (Portugal)	27L0447
Modem cable (US/C, JPN, Twn, APN, LA, Brz)	27L0465
Modem cable (Australia)	27L0467

AC adapter

Description	FRU No.
AC Adapter 2-pin (Delta)	02K6548
AC Adapter 2-pin (Sanken)	02K6554
AC Adapter 3-pin (Delta)	02K6550
AC Adapter 3-pin (Sanken)	02K6555

Power cords: IBM power cords for a specific country are usually available only in that country.

For 2–pin power cords:

IBM power cord part number	Used in these countries or regions
13H5273	Japan

For 3–pin power cords:

Note: The grounded adapter is required for full MPRII compliance. If a 3–pin power cord came with your computer, see “Safety Information” on page 11.

IBM power cord part number	Used in these countries or regions
02K0539	Simple China
36L8867	Argentina
76H3514	Australia, New Zealand, Papua New Guinea, Paraguay, Uruguay
76H3516	Aruba, Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Curacao, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Thailand, Trinidad (West Indies), United States of America, Venezuela
76H3518	Austria, Belgium, Bosnia-Herzogovina, Bulgaria, Croatia, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Macao, Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Turkey, Yugoslavia
76H3520	Denmark **Note:** Due to consumer product, 2621 supplies power cord 76H3518 to Denmark.
76H3522	Bangladesh, Myanmar, Pakistan, South Africa, Sri Lanka

IBM power cord part number	Used in these countries or regions
76H3524	Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Malaysia, Nigeria, Oman, Qatar, Singapore, United Kingdom
76H3528	Liechtenstein, Switzerland
76H3530	Chile, Ethiopia, Italy, Libya
76H3532	Israel
76H3535	Korea

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Celeron	Intel Corporation
Mylar	E.I. Du Pont de Nemours and Company
PC-Doctor	Watergate Software, Inc.
PCMCIA	Personal Computer Memory Card Interface Association
Pentium	Intel Corporation

Part Number: 09N8606

Printed in U.S.A.