IBM

IBM Mobile Systems
ThinkPad Computer
Hardware Maintenance Manual

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This manual supports: ThinkPad G40, G41

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About this manual

This manual contains service and reference information for IBM ThinkPad G40 and G41 products. Use this manual along with the advanced diagnostic tests to troubleshoot problems.

The manual is divided into sections as follows:

- The common sections provide general information, guidelines, and safety information required in servicing computers.
- The product-specific section includes service, reference, and product-specific parts information.

Important

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

Before servicing an IBM ThinkPad product, be sure to review the safety information under "Safety notices: multilingual translations" on page 5, "Safety information" on page 17, and "Laser compliance statement" on page 22.

Introduction

Important service information

> **Important**
>
> Software (i.e., BIOS and device driver) fixes are customer-installable. The BIOS and device drivers are posted on the IBM support site
> http://www.ibm.com/pc/support
>
> Advise customers to contact the PC Company HelpCenter at 800-772-2227 if they need assistance in obtaining or installing any software fixes.
>
> Customers in Canada should call IBM HelpPC at 800-565-3344 for assistance or download information.

Strategy for replacing FRUs

> **Before replacing parts**
>
> Make sure that all software fixes are installed before replacing any FRUs listed in this manual.

Use the following strategy to prevent unnecessary expense for replacing and servicing FRUs:

- **If you are instructed to replace a FRU but the replacement 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 replacing one of them does not correct the problem, reinstall that board, and then replace the other one.
- If an adapter or device consists of more than one FRU, any of the FRUs may be the cause of the error. 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: The setup configuration on the computer you are servicing may have been customized. Loading Setup Defaults or replacing the system board may alter the settings. Note the current configuration settings (using the BIOS Setup Utility); then, when service has been completed, verify that those settings remain in effect.

Strategy for replacing a hard disk drive

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 may have been changed. Be extremely careful during write operations such as copying, saving, or formatting. If you select an incorrect drive, data or programs can be overwritten.

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. Whatever causes the first error code may also cause false error codes. 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.

Diskette compatibility matrix

The compatibility of each of the drives with the diskettes for it is as follows:

Diskette drive	Diskette capacity	Compatibility
3.5-inch	1.0 MB	Read and write
	2.0 MB	Read and write
	4.0 MB	Not compatible

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, Hebrew, Italian, and Spanish.

Safety notice 1

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

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

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

לפני הפעלת המחשב לאחר החלפת FRU יש לוודא
שכל הברגים, הקפיצים, וחלקים קטנים אחרים נמצאים
במקומם ואינם חופשיים לזוז בתוך המחשב. כדי לוודא
זאת, יש לטלטל את המחשב ולהקשיב לגילוי קולות שקשוק.
חלקי או שבבי מתכת עלולים לגרום לקצרים חשמליים.

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.

(continued)

(continuation of safety notice 1)

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

Safety notice 2

⚠ **DANGER**

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

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

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

(continued)

(continuation of safety notice 2)

סוללות המתנה מסויימות מכילות כמות קטנה
של ניקל וקדמיום. אין לפרק סוללת המתנה,
לטעון אותה מחדש, להשליך אותה לאש או
למים או לקצר אותה. יש לסלק את הסוללה
כנדרש על ידי התקנות והחוקים המקומיים. יש
להשתמש רק בסוללה המופיעה ברשימת החלקים
המתאימה. שימוש בסוללה לא מתאימה עלול
לגרום להצתה או התפוצצות של הסוללה.

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

⚠ **DANGER**

> **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.**
>
> **מארז הסוללה מכיל כמות קטנה של ניקל**
> **וקדמיום. אין לפרק את מארז הסוללה, להשליך**
> **אותו לאש או למים או לקצר אותו. יש לסלק את**
> **מארז הסוללה הסוללה כנדרש על ידי התקנות**
> **והחוקים המקומיים. יש להשתמש רק בסוללה**
> **המופיעה ברשימת החלקים המתאימה בזמן החלפת**
> **מארז הסוללה. שימוש בסוללה לא מתאימה עלול**
> **לגרום להצתה או התפוצצות של הסוללה.**
>
> **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.**
>
> (continued)

(continuation of safety notice 3)

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

⚠ **DANGER**

**The lithium battery can cause a fire, an explosion, or a
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.**

(continued)

(continuation of safety notice 4)

**סוללת הליתיום עלולה לגרום לשריפה, להתפוצצות או
לכוויות קשות. אין לטעון אותה מחדש, לסלק את המחבר
המקוטב שלה, לפרק אותה או לחמם אותה לטמפרטורה
העולה על 100 מעלות צלזיוס. אין לשרוף את הסוללה ואין
לחשוף את תוכן התא למים. יש לסלק את הסוללה כנדרש
בתקנות ובחוקים המקומיים. יש להשתמש רק בסוללה
המופיעה ברשימת החלקים המתאימים. שימוש בסוללה
אחרת עלול לגרום לסכנת שריפה או התפוצצות.**

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

Safety notice 5

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

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

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

אם מסך הגביש הנוזלי (LCD) נשבר והנוזל מתוך המסך בא במגע
עם עיניכם או ידיכם, שטפו את האזורים הנגועים מיד במים במשך
15 דקות לפחות. פנו לקבלת עזרה רפואית אם תסמינים הנובעים
מהמגע עם הנוזל נמשכים לאחר השטיפה.

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

⚠ **DANGER**

> **To avoid shock, do not remove the plastic cover that protects 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.**
>
> **כדי למנוע התחשמלות, אין להסיר את מכסה הפלסטיק המגן על חלקו התחתון של הכרטיס ההפוך.**
>
> **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

⚠ **DANGER**

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

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.

אף שהסוללות הראשיות הן בעלות מתח נמוך, סוללה מקוצרת או מוארקת עלולה להפיק זרם מספיק לגרימת כוויות או להצתת חומרים דליקים.

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

⚠ **DANGER**

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

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

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

לפני סילוק FRU כלשהו, יש לכבות את המחשב, לנתק את כל כבלי החשמל משקעי החשמל, להוציא את מארז הסוללה, ואז לנתק כבלי חיבור אחרים אם יש כאלה.

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 presents 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 object that weighs 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 toolcase 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. Make sure 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.

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- 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.
- Fan louvers on the machine help to prevent overheating of internal components. Do not obstruct fan louvers or cover them with labels or stickers.

Warning

Handling the cord on this product or cords associated with accessories sold with this product will expose you to lead, a chemical known to the state of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***

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:

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– 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: An electrical shock can occur only when there is a complete circuit. 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 purpose of this inspection guide is to assist you in identifying potentially unsafe conditions. As each machine was designed and built, required safety items were installed to protect users and service personnel from injury. This guide addresses only those items. You should use good judgment 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 a bulging capacitor
- Mechanical hazards, such as loose or missing hardware

To determine whether there are any potentially unsafe conditions, use the following checklist at the beginning of every service task. 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 type specified in the parts list.
   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 devices that are sensitive to electrostatic discharge

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 an optical storage device such as a CD-ROM drive or a DVD-ROM drive. They are also sold separately as options. The 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, DVD drive or the other laser product 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, DVD-ROM drive or the other optical storage device could result in exposure to hazardous laser radiation. There are no serviceable parts inside those drives. **Do not open.**

Some CD-ROM drives, DVD-ROM drives, or other optical storage devices contain an embedded Class 3A or Class 3B laser diode. Note the following:

⚠ DANGER

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

Radiação por raio laser ao abrir. Não olhe fixo no feixe de luz, não olhe diretamente por meio de instrumentos óticos e evite exposição direta com o feixe de luz.
开启时会有激光发射时，请勿盯视激光光束，请勿直接查看视觉仪器，并且避免直接接触在激光光束之中。

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

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

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

Aprendo l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici e evitare l'esposizione diretta al fascio.
Открывая, берегитесь лазерного излучения.
Не смотрите на луч, не разглядывайте его
с помощью оптических инструментов, а также
избегайте прямого воздействия лазерного луча.

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

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

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.

Read this first

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

```
 ── Important notes ──

 • Only certified trained personnel should
   service the computer.
 • Read the entire FRU removal and replacement
   page before replacing any FRU.
 • Use new nylon-coated screws when you
   replace FRUs.
 • Be extremely careful during write operations
   such as copying, saving, or formatting. The
   drive startup sequence in the computer you are
   servicing might have been changed. If you select
   an incorrect drive, data or programs might be
   overwritten.
 • Replace FRUs only for the correct model.
   When you replace a FRU, make sure the model
   of the machine and the FRU part number are
   correct by referring to the FRU parts list.
 • A FRU should not be replaced because of a
   single, unreproducible failure. Single failures
   can occur for a variety of reasons that have
   nothing to do with a hardware defect, such as
   cosmic radiation, electrostatic discharge, or
   software errors. Consider replacing a FRU only
   when a problem recurs. If you suspect that a
   FRU is defective, clear the error log and run the
   test again. If the error does not recur, do not
   replace the FRU.
 • Be careful not to replace a nondefective FRU.
```

What to do first

When you do return a FRU, you must include the following information in the parts exchange form or parts return form that you attach to it:

__ 1. Name and phone number of servicer
__ 2. Date of service
__ 3. Date on which the machine failed

Read this first

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

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

Before checking problems with the computer, determine
whether the damage is covered under the warranty by
referring to the following:

The following are not covered under warranty:
- LCD panel cracked from the application of excessive
  force or from being dropped
- Scratched (cosmetic) parts
- Distortion, deformation, or discoloration of the cosmetic
  parts
- Cracked or broken plastic parts, broken latches, broken
  pins, or broken connectors caused by excessive force
- Damage caused by liquid spilled into the system
- Damage caused by the improper insertion of a PC Card
  or the installation of an incompatible card
- Damage caused by foreign material in the diskette drive
- Diskette drive damage caused by pressure on the
  diskette drive cover or by the insertion of a diskette with
  multiple labels
- Damaged or bent diskette eject button
- Fuses blown by attachment of a nonsupported device
- Forgotten computer password (making the computer
  unusable)
- Sticky keys caused by spilling a liquid onto the keyboard

**The following symptoms might indicate damage
caused by nonwarranted activities:**
- Missing parts might be a symptom of unauthorized
  service or modification.

- If the spindle of a hard disk drive becomes noisy, it may have been subjected to excessive force, or dropped.

Related service information

This section provides information about the following:
- "Service Web site"
- "Restoring the preloaded system"
- "Passwords" on page 30
- "Power management" on page 33

Service Web site

When the latest maintenance diskette and the system program service diskette become available, a notice will be posted on http://www.ibm.com/pc/partner/spm

Restoring the preloaded system

If the data on a hard disk drive is damaged or accidentally erased, you can restore the software that was shipped with the computer. This software includes the pre-installed operating system, applications, and device drivers.

To restore the pre-installed software, you can use either the Product Recovery program or a recovery CD.

Ordering the recovery CD

When the hard disk drive is replaced because of a failure, no Product Recovery program is on the new hard disk. In this case, you must use the Product Recovery CD for the computer. Order the recovery CD and the hard disk drive at the same time so that you can recover the new hard disk drive with the pre-installed software when they arrive. For information on which CD to order, and the latest procedure on how to do so, see "Recovery CDs" on page 147.

The Product Recovery program is in the Access IBM Predesktop Area, a section of the hard disk drive that is not displayed by Windows Explorer.

Note: The recovery process might take up to 2 hours.

Attention: All of the files on the primary hard disk partition (usually drive C) will be lost in the recovery process. Be sure to back up copies of the files you have saved on your drive C before you begin.

To use the Product Recovery program to install your pre-installed software, do the following:
1. If possible, save all your files to media other than your hard disk.
2. Turn off your computer.

3. Turn on your computer. At the prompt, press the Access IBM button. (The prompt "To interrupt normal startup, press the blue Access IBM button" appears for only a few seconds. You must press the Access IBM button quickly.) The Access IBM Predesktop Area appears on the screen. Next, double-click the "Recover to factory contents" icon. The Product Recovery program main menu opens.

4. Select the recovery options you want, and then follow the instructions on the screeen.

5. When the Product Recovery program finishes, your computer will restart and begin the configuration process.

Using the recovery CD

You can delete the Access IBM Predesktop Area partition by going into the BIOS Setup Utility (F1 at IBM Splash Screen), and then choosing Security -> IBM Predesktop Area --> Disabled. This will make the Access IBM Predesktop Area available to FDISK. If you choose Disabled, the following warning appears:

Attention! If you select Disabled, the IBM Predesktop Area will be visible and can be reclaimed by the OS. Once the area is overwritten by OS tools, it can't be used with Normal or Secure again and you will need to obtain a Recovery CD to retrieve original HDD. Please confirm that you wish to select Disabled.

FDISK will not delete the Access IBM Predesktop Area unless you do this, because it is not visible. You would have to use IBM ThinkPad Maintenance Diskette to completely wipe the drive.

To create the Access IBM Predesktop Area and install the preloaded system from the recovery CD, do the following:

To create the Access IBM Predesktop Area:

1. Erase all partitions on the hard disk drive, using FDISK or a similar application.

2. Boot with the recovery CD (and the boot diskette if required).

3. The following message is displayed: "**Your computer originally included a Product Recovery program ... Reinstall the Product Recovery program? (Y/N) [ ]**".

   Note: If the hard disk drive contains any partition, you do not receive this message; go to step 1.

4. Press the Y key. The Access IBM Predesktop Area is created and loaded with the Product Recovery program files.

>   **Note:** If you do not want to create the Access IBM
>   Predesktop Area, press the N key, and then go
>   to step 8.

5. At the next window, press Enter to continue.

    *   The Access IBM Predesktop Area is created. The
        system automatically reboots during this process.

    *   The recovery process copies some files to the
        Access IBM Predesktop Area, and PKUNZIPs
        others.

    *   Follow the prompts. You may be prompted to
        change CDs.

    *   When the process is complete, the system reboots.
        Continue to step 6 to install preloaded system.

Install the preloaded system from the CD:

6. Boot with the recovery CD (and the boot diskette if
    required.)

7. If the hard disk drive is blank, the following message
    is displayed: "**Your computer originally included a
    Product Recovery program ... Reinstall the
    Product Recovery program? (Y/N) [ ]**".

    *   To install the Access IBM Predesktop Area, go to
        step 4.

    *   To preload the hard disk drive without installing the
        Access IBM Predesktop Area, press the N key.

8. If you get a message asking which operating system
    to install, select the proper operating system and
    press Enter.

9. A message is displayed: "**Full Recovery:**". Press
    Enter to select.

10. On each of the next three windows, press the Y key.

11. Follow the prompts to complete the recovery.

Passwords

As many as three passwords may be needed for any
ThinkPad computer: the power-on password (POP), the
hard disk password (HDP), and the supervisor password
(SVP).

If any of these passwords has been set, a prompt for it
appears on the screen whenever the computer is turned
on. The computer does not start until the password is
entered.

Exception: If only an SVP is installed, the password
prompt does not appear when the operating
system is booted.

Power-on password:

A power-on password (POP) protects the system from being powered on by an unauthorized person. The password must be entered before an operating system can be booted.

Hard disk password:

There are two hard disk passwords (HDPs):

- User HDP—for the user
- Master HDP—for the system administrator, who can use it to get access to the hard disk even if the user has changed the user HDP

Note: There are two modes for the HDP: **User only** and **Master + User**. The **Master + User** mode requires two HDPs; the system administrator enters both in the same operation. The system administrator then provides the user HDP to the system user.

Attention: If the user HDP has been forgotten, check whether a master HDP has been set. If it has, it can be used for access to the hard disk drive. If no master HDP is available, IBM does not provide any services to reset either the user or the master HDP, or to recover data from the hard disk drive. The hard disk drive can be replaced for a scheduled fee.

Supervisor password:

A supervisor password (SVP) protects the system information stored in the IBM BIOS Setup Utility. The SVP must be entered in order to get access to the IBM BIOS Setup Utility and make changes to system configuration settings.

Attention: If the SVP has been forgotten and cannot be made available to the servicer, there is no service procedure to reset the password. The system board must be replaced for a scheduled fee.

How to remove the power-on password

To remove a POP that has been forgotten, do the following:

(A) If no SVP has been set:

1. Turn off the computer.
2. Remove the battery pack.

   For how to remove the battery pack, see "1010 Battery pack" on page 63.
3. Remove the backup battery.

   For how to remove the backup battery, see "1060 Backup battery" on page 69.

4. Turn on the computer and wait until the IBM Splash Screen disappears.

   After the POST ends, the password prompt does not appear. The POP has been removed.

5. Reinstall the backup battery and the battery pack.

(B) If an SVP has been set and is known by the servicer:

1. Turn on the computer; then, while the "To interrupt normal startup, press F1" message is displayed at the lower-left of the screen, press F1.

2. Enter the SVP. Select **Start setup utility**.

3. Select **Security**, using the cursor keys to move down the menu.

4. Select **Password**.

5. Select **Power-On Password**.

6. At the Enter Current Password field, enter the SVP.

7. When the Enter New Password field opens, leave it blank and press Enter twice.

8. In the Changes have been saved window, press Enter.

9. Press F10; then, in the Setup confirmation window, select **Yes**.

How to remove the hard disk password

Attention: If **User only** mode is selected and the user HDP has been forgotten and cannot be made available to the servicer, IBM does not provide any services to reset the user HDPs or to recover data from the hard disk drive. The hard disk drive can be replaced for a scheduled fee.

To remove a user HDP that has been forgotten, when the SVP and the master HDP are known, do the following:

1. Turn on the computer; then, while the "To interrupt normal startup, press the blue Access IBM button" message is displayed at the lower-left of the screen, press the Access IBM button.

2. Enter Master HDP. Select **Start setup utility**. Enter SVP.

3. Select **Security**, using the cursor keys to move down the menu.

4. Select **Password**.

5. Select **Hard-disk** *x* **password**, where *x* is the letter of the hard disk drive. A pop-up window opens.

6. Select **Master HDP**.

7. Enter the master HDP; then leave the New Password field blank and press Enter twice.

8. Press F10.

9. Select **Yes** in the Setup Configuration window.

Both user HDP and master HDP will have been removed.

Power management

To reduce power consumption, the computer has three power management modes: screen blank, standby, and hibernation.

Screen blank mode

Screen blank mode has three variants, as follows:

1. If you are using the ACPI operating system and you press Fn+F3,
   - The LCD backlight turns off.
   - The hard disk drive motor stops.
2. If the time set on the "Turn off monitor" timer in the operating system expires,
   - The LCD backlight turns off.

To end screen blank mode and resume normal operation, press any key.

Standby mode

When the computer enters standby mode, the following events occur in addition to what occurs in screen blank mode:

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

To enter standby mode, press Fn+F4.

Note: You can change the action of Fn+F4, if you are using the ACPI operating system.

In certain circumstances, the computer goes into standby mode automatically:

- If a "suspend time" has been set on the timer, and the user does not do any operation with the keyboard, the TrackPoint, the hard disk, the parallel connector, or the diskette drive within that time.
- If the battery indicator blinks orange, indicating that the battery power is low. (Alternatively, if **Hibernate when battery becomes low** has been selected in the "Power Management Properties" window, the computer goes into hibernation mode.)

Hibernation mode

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.

To cause the computer to enter hibernation mode, do any of the following:

- Press the Fn+F12 keys.
- If you are using the ACPI operating system and have defined one of the following actions as the event that causes the system to go into hibernation mode, perform that action.
    – Closing the lid.
    – Pressing the power button.
    – Pressing Fn+F4 keys.

Also, the computer goes into hibernation mode automatically in either of the following conditions:

- If a "hibernation time" has been set on the timer, and the user does not do any operation with the keyboard, the TrackPoint, the hard disk drive, the parallel connector, or the diskette drive within that time.
- If the timer conditions are satisfied in suspend mode.

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

Checkout guide

Use the following procedures as a guide in identifying and correcting problems with the ThinkPad computer.

Note: The diagnostic tests are intended to test only IBM products. The use of non-IBM products, prototype cards, or modified options can lead to false indications of errors and invalid system responses.

1. Identify the failing symptoms in as much detail as possible.
2. Verify the symptoms. Try to re-create the failure by running the diagnostic test or by repeating the 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 included in PC-Doctor. This section is an overview of the procedure. For details that depend on model-unique functions, refer to "Product overview" on page 43.

For some possible configurations of the computer, PC-Doctor might not run correctly. To avoid this problem, you need to initialize the computer setup by use of the IBM BIOS Setup Utility before you run PC-Doctor. On the IBM BIOS Setup Utility screen, press F9, Enter, F10, and then Enter.

Note: When you initialize the computer configuration, some devices are disabled, such as the serial port. If you test one of these devices, you will need to enable it by using PS2.EXE.

To run the test, do as follows:

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, click the left button.

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

   If the computer cannot be powered on, go to "Power system checkout" on page 37, and check the power sources.

   If an error code appears, go to "Symptom-to-FRU index" on page 50.

   On the first screen, select the model and press Enter. Follow the instructions on the screen.

2. The main panel of PC-Doctor appears.

3. Select **Diagnostics** with the arrow keys, and press
   Enter.

   A pull-down menu appears. (Its exact form depends on
   the model.)

   Note: PC-Doctor menu does not mean the formal
   support device list. Some unsupported device
   name may appear in the PC-Doctor menu.

   The options on the test menu are as follows:

Diagnostics	Interactive Tests
• Run Normal Test	• Keyboard
• Run Quick Test	• Video
• CPU/Coprocessor	• Internal Speaker
• Systemboard	• Mouse
• Video Adapter	• Diskette
• Parallel Ports	• System Load
• Fixed Disks	• CD-ROM/DVD Test
• Diskette Drives	• Actiontec Wireless Radio
• Other Devices	
• Communication	
• Wireless LAN	
• Memory Test – Full	
• Memory Test – Quick	

Notes:

• In the **Keyboard** test in **Interactive Tests**, the **Fn** key should
  be held down for at least 2 seconds; otherwise, it cannot be
  sensed.

• **Video Adapter** test supports only the LCD display on the
  ThinkPad computer. Before running PC-Doctor DOS, detach
  the external monitor.
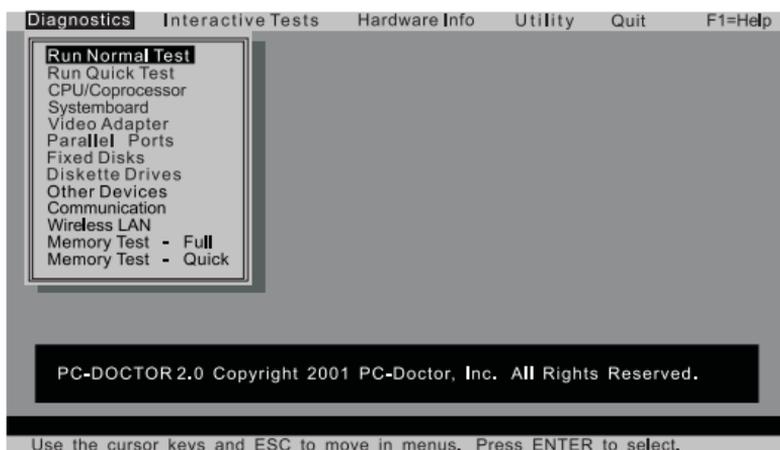
4. Run the applicable function test.
5. Follow the instructions on the screen. If there is a
   problem, PC-Doctor shows messages describing it.
6. To exit the test, select **Quit — Exit Diag**.

To cancel the test, press Esc.

Note: After executing PC-Doctor, check the system time/date and reset them if needed.

Detecting system information with PC-Doctor

PC-Doctor can detect the following system information:

Hardware Info
- System Configuration
- Memory Contents
- Physical Disk Drives
- Logical Disk Drives
- VGA Information
- IDE Drive Info
- PCI Information
- PNPISA Info
- SMBIOS Info
- VESA LCD Info

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 system checkout

To verify a symptom, 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 the battery pack supplies power when you power on the computer.

If you suspect a power problem, see the appropriate one of the following power supply checkouts:
- "Checking the ac adapter" on page 38

- "Checking operational charging"
- "Checking the battery pack" on page 39
- "Checking the backup battery" on page 40

Checking the ac adapter

You are here because the computer fails only when the ac adapter is used:

- If the power-on indicator does not turn on, check the power cord of the ac adapter for correct continuity and installation.
- If the computer does not charge during operation, go to "Checking operational charging."

To check the ac adapter, do the following:

1. Unplug the ac adapter cable from the computer.
2. Measure the output voltage at the plug of the ac adapter cable. See the following figure:
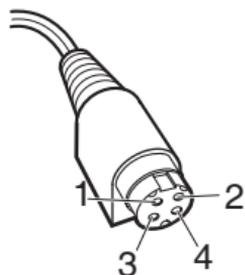
Pin	Voltage (V dc)
1	Vcc_+ 16V
2	Ground
3	Vcc_+ 16V
4	Ground

3. If the voltage is not correct, replace the ac adapter.
4. If the voltage is acceptable, do the following:
   - Replace the system board.
   - If the problem persists, go to "Product overview" on page 43.

Note: Noise from the ac adapter does not always indicate a defect.

Checking operational charging

To check whether the battery charges properly during operation, use a discharged battery pack or a battery pack 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, remove the battery pack and let it return to room temperature. Reinstall the battery pack. If the charge indicator or icon still does not turn on, replace the battery pack.

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

Checking the battery pack

Battery charging does not start until the Power Meter shows that less than 95% of the total power remains; under this condition the battery pack can charge to 100% of its capacity. This protects the battery pack from being overcharged or from having a shortened life.

To check the status of your battery, move your cursor to the Power Meter icon in the icon tray of the Windows taskbar and wait for a moment (but do not click), and the percentage of battery power remaining is displayed. To get detailed information about the battery, double-click the Power Meter icon.

Note: If the battery pack becomes hot, it may not be able to charge. Remove it from the computer and leave it at room temperature for a while. After it cools down, reinstall and recharge it.

To check the battery pack, do the following:

1. Power off the computer.
2. Remove the battery pack and measure the voltage between battery terminals 1 (+) and 5 (–). See the following figure:
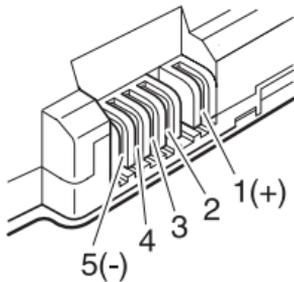
Terminal	Voltage (V dc)
1	+ 0 to + 12.6 (Li-ion)
5	Ground

3. If the voltage is less than +11.0 V dc, the battery pack has been discharged.

   Note: Recharging will take at least 3 hours, even if the indicator does not turn on.

   If the voltage is still less than +11.0 V dc after recharging, replace the battery.

4. If the voltage is more than +11.0 V dc, measure the resistance between battery terminals 4 and 5. The resistance must be 4 to 30 K Ω.

   If the resistance is not correct, replace the battery pack. If the resistance is correct, replace the system board.

Checking the backup battery

The backup battery is rechargeable.

To check the backup battery, do the following:

1. Power off the computer, and unplug the ac adapter from it.
2. Turn the computer upside down.
3. Remove the battery pack (see "1010 Battery pack" on page 63).
4. Remove the backup battery (see "Checking the battery pack" on page 39).
5. Measure the voltage of the backup battery. See the following figure.
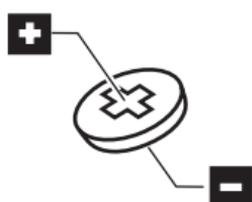
Terminal	Voltage (V dc)
+	+2.5 to +3.2
-	Ground

- If the voltage is not correct, recharge the backup battery by connecting the ac adapter to the computer for one hour.
- If the voltage is still not correct, replace the backup battery.
- If the backup battery discharges quickly after replacement, replace the system board.

   Note: The backup battery, which is used to preserve configuration information, such as the date and time while the computer is turned off, is depleted.

ThinkPad G40, G41

Product overview

This section presents the following product-unique information:
* "Specifications"
* "Status indicators" on page 45
* "FRU tests" on page 47
* "Fn key combinations" on page 49

Specifications

The following table lists the specifications of the ThinkPad G40, G41 series:

Feature	Description
Processor	• Intel® Pentium® 4 processor 3.06/3.2/3.46/3.6/3.73 GHz, L2 512 KB cache • Intel® Celeron® processor 2.4/2.53/2.66/2.8 GHz, L2 128 KB cache
Bus architecture	• 400 MHz FSB • HUB link • PCI bus • LPC bus • 333 MHz DDR SDRAM (PC2700)
Memory (standard)	• 128 MB DDR SDRAM SO DIMM (PC2700) card × 1 • 256 MB DDR SDRAM SO DIMM (PC2700) card × 1 • 512 MB DDR SDRAM SO DIMM (PC2700) card × 1
Memory (optional)	• 128 MB DDR SDRAM SO DIMM (PC2700) card • 256 MB DDR SDRAM SO DIMM (PC2700) card • 512 MB DDR SDRAM SO DIMM (PC2700) card • 1024 MB DDR SDRAM SO DIMM (PC2700) (maximum of 2048 MB)
Graphic memory	• UMA architecture
CMOS RAM	• 242 bytes
hard disk drive	• 30.0 GB, 4200 rpm, 2.5-inch, IDE interface • 40.0 GB, 4200 rpm, 2.5-inch, IDE interface • 40.0 GB, 5400 rpm, 2.5-inch, IDE interface • 60.0 GB, 7200 rpm, 2.5-inch, IDE interface • 80.0 GB, 5400 rpm, 2.5-inch, IDE interface

(continued)

Feature	Description
Display	• 14.1-inch, 16M colors, XGA (1024 × 768 resolution) TFT color LCD • 15-inch, 16M colors, XGA (1024 × 768 resolution) TFT color LCD • 15-inch, 16M colors, SXGA+ (1400 × 1050 resolution) TFT color LCD
I/O port	• External monitor connector • Stereo headphone jack • Monaural microphone jack • Parallel connector • RJ11 connector • RJ45 connector • PS/2 mouse connector • Universal serial bus (USB) connector × 4
Audio	• Internal monaural speaker • Software control volume
Mini PCI adapter	• IEEE 802.11b wireless LAN card • IEEE 802.11a/b wireless LAN Combo card
PC Cards	• Type-II: two slots • Type-III: one slot
Modem card	• V.90 (V.92 design) modem daughter card (MDC-2)
AC adapter	• 120-watt type
Fixed bays	• CD-ROM drive • DVD drive • CD-RW/DVD drive • FDD drive
Preinstalled operating system	Windows XP Home Edition Windows XP Professional Windows 2000 Professional (Japan only)

Status indicators

The system status indicators show the status of the
computer, as follows:
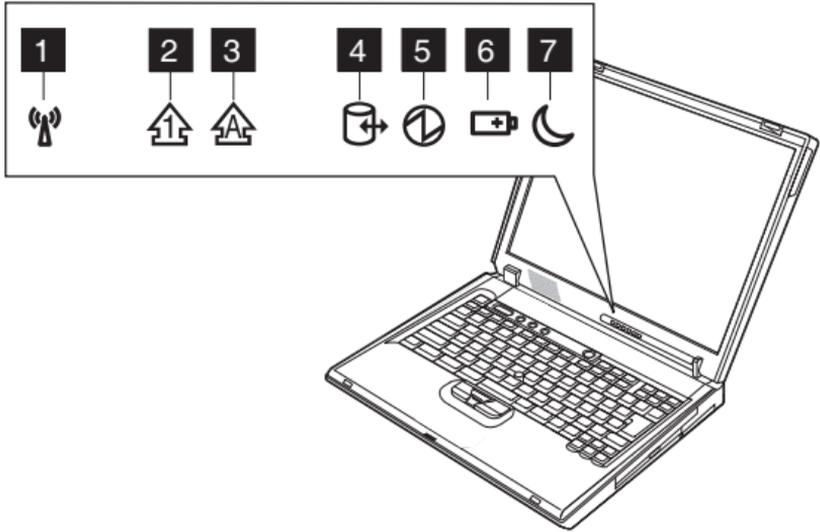
Indicator	Meaning	
1 Wireless status	**Green:**	Wireless is operational. This indicator is on when the Wireless is on and not in suspend mode.
	Blinking green:	Data is being transmitted.

Note: The wireless indicator is only available on selected
models.

(continued)

Indicator		Meaning	
2	Num lock	**Green:**	The numeric keypad on the keyboard is enabled. To enable or disable the keypad, press and hold the Shift key, and press the NumLk (ScrLk) key.
3	Caps lock	**Green:**	Caps Lock mode is enabled. To enable or disable Caps Lock mode, press the Caps Lock key.
4	Drive in use	**Green:**	Data is being read from or written to the hard disk drive or the diskette drive. When this indicator is on, do not put the computer into standby mode or turn off the computer.
		Note: Do not move the system while the green drive-in-use light is on. Sudden physical shock could cause drive errors.	
5	Power on	**Green:**	The computer is on and ready to use. This indicator stays lit whenever the computer is on and is not in standby mode.
6	Battery status	**Green:**	The battery is in use and has enough power. The ac adapter has charged the battery completely.
		Blinking green:	The battery is being charged, but still has enough power to operate. (At regular intervals, the indicator light turns off briefly.)
		Orange:	The battery is being charged, but the battery power is still low.
		Blinking orange:	The battery needs to be charged. When the indicator starts blinking orange, the computer beeps three times.
		Note: If an unauthorized battery is installed, this indicator starts blinking orange.	
7	Standby status	**Green:**	The computer is in standby mode.
		Blinking green:	The computer is entering standby mode or hibernation mode, or is resuming normal operation.

FRU tests

The following table shows the test for each FRU.

FRU	Applicable test
System board	1. **Diagnostics** --> **CPU/Coprocessor** 2. **Diagnostics** --> **Systemboard**
Power	**Diagnostics** --> **Other Devices** --> **IBM AC Adapter**, **IBM Battery 1**
LCD unit	1. **Diagnostics** --> **Video Adapter** 2. **Interactive Tests** --> **Video**

Modem, MDC-2	1. Make sure the modem is set up correctly.
	2. Replace the modem jack and the modem card in turn, and run the following tests in **Diagnostics** --> **Communication**:
	    a. Lucent Soft Modem Loopback
	    b. Lucent Soft Modem Dialtone

Audio	1. **Interactive Tests** --> **Internal Speaker** 2. **Diagnostics** --> **Other Devices** --> **Analog Devices AC97 CODEC Test**
Speaker	**Interactive Tests** --> **Internal Speaker**
PC Card slots	1. **Diagnostics** --> **Systemboard** --> **PCMCIA** 2. Insert a PC Card Wrap Plug into every PC Card Slot and run **Diagnostics** --> **Systemboard** --> **PCMCIA External Loop**
Keyboard	1. **Diagnostics** --> **Systemboard** --> **Keyboard** 2. **Interactive Tests** --> **Keyboard**
TrackPoint or pointing device	If the TrackPoint does not work, check the configuration in the ThinkPad Configuration program. If the TrackPoint is disabled, select **Enable** to enable it. After you use the TrackPoint, the pointer may drift on the screen for a short time. This drift can occur when a slight, steady pressure is applied to the TrackPoint pointer. This symptom is not a hardware problem. If the pointer stops after a short time, no service action is necessary. If enabling the TrackPoint does not correct the problem, continue with the following: • **Interactive Tests** --> **Mouse**
Hard disk drive	**Diagnostics** --> **Fixed Disks**
Diskette drive	1. **Diagnostics** --> **Diskette Drives** 2. **Interactive Tests** --> **Diskette**

(continued)

FRU	Applicable test
CD-ROM or DVD drive	1. **Diagnostics** --> **Other Devices** --> **CD-ROM/DVD** 2. **Interactive Tests** --> **CD-ROM/DVD Test**
Memory	1. If two DIMMs are installed, remove one of them and run **Diagnostics** --> **Memory Test—Quick**. 2. If the problem does not recur, return the DIMM to its place, remove the other one, and run the test again. 3. If the test does not detect the error, run **Diagnostics** --> **Memory Test—Full**.
Fan	1. Turn on the computer and check the air turbulence at the louver near the power switch. 2. Run **Diagnostics** --> **Other Devices** --> **IBM Fan**.

Fn key combinations

The following table shows the function of each combination of Fn with a function key.

Key combination	Description
Fn+F1	Reserved.
Fn+F2	Reserved.
Fn+F3	Turn off the LCD display, leaving the screen blank. To turn the LCD display on again, press any key or the TrackPoint stick.
Fn+F4	Put the computer in standby mode. To return to normal operation, press the Fn key independently, without pressing a function key. **Note:** The setting can be changed so that pressing it puts the computer into hibernation mode or even shuts the computer down.
Fn+F5	Open the Wireless Radio Control screen. **Note:** To use this function, the IBM PM device driver must be installed on the computer.
Fn+F6	Reserved.
Fn+F7	Switch between the computer display and an external monitor (CRT). If an external monitor is attached, computer output is displayed in the following three patterns in turn: • CRT display • Computer display + CRT display • Computer display **Note:** This setting can be changed so that pressing it starts a presentation scheme directly with no need to start Presentation Director.
Fn+F9	Open the EasyEject Utility screen. **Note:** This function is supported only in Windows XP and Windows 2000.
Fn+F10	Reserved.
Fn+F11	Reserved.
Fn+F12	Put the computer into hibernation mode. To return to normal operation, press the power button for less than four seconds. **Note:** To use Fn+F12 for hibernation, the IBM PM device driver must be installed on the computer.
Fn+Home	The computer display becomes brighter.
Fn+End	The computer display becomes less bright.
Fn+Spacebar	Enable the FullScreen Magnifier function.

Symptom-to-FRU index

The symptom-to-FRU index in this section lists symptoms and errors and their possible causes. The most likely cause is listed first, in boldface type.

Note: Do the FRU replacement or other actions in the sequence shown in the column headed "FRU or action, in sequence." If replacing a FRU does not solve the problem, put the original part back in the computer. Do not replace a nondefective FRU.

This index can also help you determine, during regular servicing, what FRUs are likely to need to be replaced next.

A numeric error is displayed for each error detected in POST or system operation. In the displays, **n** can be any number.

If no numeric code is displayed, check the narrative descriptions of symptoms. If the symptom is not described there, go to "Intermittent problems" on page 58.

Note

For an IBM device not supported by diagnostic codes in the ThinkPad notebook computers, see the manual for that device.

Numeric error codes

Symptom or error	FRU or action, in sequence
0175 Bad CRC1, stop POST task—The EEPROM checksum is not correct.	**System board**.
0177 Bad SVP data, stop POST task.	**System board**.
0182 Bad CRC2. Enter BIOS Setup and load Setup Defaults.	**Run IBM BIOS Setup Utility and Load Setup Defaults**.
0185 Bad startup sequence settings. Enter BIOS Setup and load setup defaults.	**Run IBM BIOS Setup Utility and Load Setup Defaults**

Symptom or error	FRU or action, in sequence
0187 EAIA data access error—The access to EEPROM is failed.	**System board**.
0188 Invalid RFID serialization information area or bad CRC2—The EEPROM checksum is not correct.	**System board**.
0189 Invalid RFID configuration information area—The EEPROM checksum is not correct.	**System board**.
0190 Critical low-battery error	1. **Charge the battery pack**. 2. Battery pack.
0191 System Security — Invalid remote change requested.	**The system configuration change has failed. Confirm the operation and try again. To clear the error, enter the IBM BIOS Setup Utility.**
0199 System security — IBM security password retry count exceeded.	1. **Confirm supervisor password and try again**. 2. **Run IBM BIOS Setup Utility**.
01C9 More than one Ethernet devices are found. Remove one of them. Press <Esc> to continue.	1. **Remove either a Mini PCI Ethernet card or an Ethernet daughter card; or press Esc to ignore the warning message**. 2. System board.
0200 Hard disk error—The hard disk is not working.	1. **Reseat the hard disk drive**. 2. Load Setup Defaults in IBM BIOS Setup Utility. 3. Hard disk drive. 4. System board.
021x Keyboard error	**Run interactive tests of the keyboard and the auxiliary input device**.
0230 Shadow RAM error—Shadow RAM fails at offset nnnn.	**System board**.
0231 System RAM error—System RAM fails at offset nnnn.	1. **DIMM**. 2. System board.
0232 Extended RAM error—Extended RAM fails at offset nnnn.	1. **DIMM**. 2. System board.

Symptom or error	FRU or action, in sequence
0250 System battery error—System battery is dead.	1. **Recharge the backup battery for one hour by connecting the ac adapter to the computer and run IBM BIOS Setup Utility to verify the configuration.** 2. Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date.
0251 System CMOS checksum bad—Default configuration used.	1. **Recharge the backup battery for one hour by connecting the ac adapter to the computer and run IBM BIOS Setup Utility to verify the configuration.** 2. Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date.
0260 System timer error	1. **Recharge the backup battery for one hour by connecting the ac adapter to the computer and run IBM BIOS Setup Utility to verify the configuration.** 2. **Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date**. 3. System board.
0270 Real time clock error	1. **Recharge the backup battery for one hour by connecting the ac adapter to the computer and run IBM BIOS Setup Utility to verify the configuration.** 2. **Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date**. 3. System board.
0271 Date and time error—Neither the date nor the time is set in the computer.	**Run IBM BIOS Setup Utility to reset the time and date**.
0280 Previous boot incomplete—Default configuration used.	1. **Load "Setup Default" in IBM BIOS Setup Utility**. 2. DIMM. 3. System board.
02D0 System cache error	1. **CPU**
02F4 EISA CMOS not writable	1. **Load Setup Defaults in IBM BIOS Setup Utility**. 2. Recharge the backup battery for one hour by connecting the ac adapter to the computer and run IBM BIOS Setup Utility to verify the configuration. 3. Replace the backup battery. 4. System board.

Symptom or error	FRU or action, in sequence
02F5 DMA test failed	1. **DIMM**. 2. System board.
02F6 Software NMI failed	1. **DIMM**. 2. System board.
02F7 Fail-safe timer NMI failed	1. **DIMM**. 2. System board.
1802 Unauthorized network card is plugged in—Power off and remove the miniPCI network card.	1. **Remove Mini PCI network card.** 2. System board.
1803 Unauthorized daughter card is plugged in—Power off and remove the daughter card.	1. **Remove the daughter card.** 2. System board.
1810 Hard disk partition layout error	1. **If the Access IBM Predesktop Area has been previously disabled, then go to the IBM BIOS Setup Utility by pressing F1 to open the IBM BIOS Setup Utility. Select Security->IBM Predesktop Area->Access IBM Predesktop Area. Set this item to Disabled. Save and Exit.** 2. If the Access IBM Predesktop Area has been previously disabled, press Enter to load Access IBM Predesktop Area. Then run **RECOVER TO FACTORY CONTENTS** in Access IBM Predesktop Area. 3. If item 2 failed, press F3 in the welcome screen in **RECOVER TO FACTORY CONTENTS** Run FDISK, and then delete all partitions. Run **RECOVER TO FACTORY CONTENTS** in Access IBM Predesktop Area again. 4. If item 3 failed, select CD-ROM boot in **RECOVER TO FACTORY CONTENTS** Run FDISK, and then delete all partitions. Run **Startup** in Access IBM Predesktop Area. Boot from Recovery CD and perform full recovery from it. 5. If item 4 failed, replace the hard disk drive.

Error messages

Symptom or error	FRU or action, in sequence
Device address conflict.	1. **Load "Setup Defaults" in IBM BIOS Setup Utility**. 2. Recharge the backup battery for one hour by connecting the ac adapter to the computer and run IBM BIOS Setup Utility to verify the configuration. 3. Backup battery. 4. System board.
Allocation error for device.	1. **Load "Setup Defaults" in IBM BIOS Setup Utility**. 2. Recharge the backup battery for one hour by connecting the ac adapter to the computer and run IBM BIOS Setup Utility to verify the configuration. 3. Backup battery. 4. System board.
Failing bits: nnnn.	1. **DIMM**. 2. System board.
Invalid system configuration data.	1. **DIMM**. 2. System board.
I/O device IRQ conflict.	1. **Load "Setup Defaults" in IBM BIOS Setup Utility**. 2. Recharge the backup battery for one hour by connecting the ac adapter to the computer and run IBM BIOS Setup Utility to verify the configuration. 3. Backup battery. 4. System board.
Operating system not found.	1. Check that the operating system has no failure and is installed correctly. 2. **Enter IBM BIOS Setup Utility and see whether the hard disk drive and the diskette drive are properly identified**. 3. Reseat the hard disk drive. 4. Reinstall the operating system. 5. Diskette drive. 6. Hard disk drive. 7. System board.
Hibernation error.	1. **Restore the system configuration to what it was before the computer entered hibernation mode**. 2. If memory size has been changed, re-create the hibernation file.
Fan error.	**Fan**.

Symptom or error	FRU or action, in sequence

EMM386 Not Installed — Unable to Set Page Frame Base Address.	Edit C:\CONFIG.SYS and change a line from
	
	`device=C:\WINDOWS\EMM386.EXE RAM`
	
	to
	
	`device=C:\WINDOWS\EMM386.EXE NOEMS`
	
	and save this file.

CardBus Configuration Error —Device Disabled	Press F1 to go to the IBM BIOS Setup Utility. Press F9 and then Enter to load the default setting. Press F10 and then Enter to restart the system.
Thermal sensing error.	**System board**.

Beep symptoms

Symptom or error	FRU or action, in sequence
One beep and a blank, unreadable, or flashing LCD.	1. **Reseat the LCD connector**. 2. LCD assembly. 3. External CRT. 4. System board.
One long and two short beeps, and a blank or unreadable LCD.	1. **System board**. 2. LCD assembly. 3. DIMM.
Two short beeps with error codes.	**POST error. See "Numeric error codes" on page 50.**
Two short beeps and a blank screen.	1. **System board**. 2. DIMM.
Three short beeps, pause, three more short beeps, and one short beep.	1. **DIMM**. 2. System board
One short beep, pause, three short beeps, pause, three more short beeps, and one short beep.	
Only cursor appears.	**Reinstall operating system**.
Five short beeps and a blank screen.	**System board**

No-beep symptoms

Symptom or error	FRU or action, in sequence
No beep, power-on indicator on, LCD blank, and no POST.	1. **Make sure that every connector is connected tightly and correctly**. 2. DIMM. 3. System board.
No beep, power-on indicator on, and LCD blank during POST.	1. **Reseat DIMM**. 2. System board.
The power-on password prompt appears.	A power-on password or a supervisor password is set. Type the password and press **Enter**.
The hard disk password prompt appears.	A hard disk password is set. Type the password and press **Enter**.
The DOS full screen looks smaller.	Start the ThinkPad Configuration program and set the **Screen expansion** function.

LCD-related symptoms

> **Important**
>
> The TFT LCD for the notebook computer contains
> many thin-film transistors (TFTs). A small number of
> dots that are missing, discolored, or always lighted
> 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:
> - **XGA:** 8 or more bright dots, 8 or more dark dots,
>   or a total of 9 or more bright and dark dots.
> - **SXGA+:** 11 or more bright dots, 13 or more dark
>   dots, or a total of 16 or more bright and dark
>   dots.
>
> **Note:** A bright dot means a pixel is always on
> (white or color.) A dark dot means a pixel is
> always off (black color.)

Symptom or error	FRU or action, in sequence
No beep, power-on indicator on, and a blank LCD during POST.	**System board**.
• LCD backlight not working. • LCD too dark. • LCD brightness cannot be adjusted. • LCD contrast cannot be adjusted.	1. **Reseat the LCD connectors**. 2. LCD assembly. 3. System board.
• LCD screen unreadable. • Characters missing pixels. • Screen abnormal. • Wrong color displayed.	1. **See important note for "LCD-related symptoms."** 2. Reseat all LCD connectors. 3. LCD assembly. 4. System board.
Horizontal or vertical lines displayed on LCD.	**LCD assembly**.

Intermittent problems

Intermittent system hang problems can be due to a variety of causes that have nothing to do with a hardware defect, such as cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a problem recurs.

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

Undetermined problems

You are here because the diagnostic tests did not identify which adapter or device failed, wrong devices are installed, a short circuit is suspected, or the system is inoperative. Follow these procedures to isolate the failing FRU (do not isolate FRUs that have no defects).

Verify that all attached devices are supported by the computer.

Verify that the power supply being used at the time of the failure is operating correctly. (See "Power system checkout" on page 37.)
1. Power off the computer.
2. Visually check each FRU for damage. Replace any damaged FRU.
3. Remove or disconnect all of the following devices:
   a. Non-IBM devices
   b. Printer, mouse, and other external devices
   c. Battery pack
   d. Hard disk drive
   e. External diskette drive
   f. DIMM
   g. CD-ROM and diskette drive
   h. PC Cards
4. Power on the computer.
5. Determine whether the problem has changed.
6. If the problem does not recur, reconnect the removed devices one at a time until you find the failing FRU.
7. If the problem remains, replace the following FRUs one at a time (do not replace a nondefective FRU):
   a. System board
   b. LCD assembly

FRU replacement notices

This section contains notices related to removing and replacing parts. Read this section carefully before replacing any FRU.

Screw notices

Loose screws can cause a reliability problem. In IBM ThinkPad computers, this problem is addressed with special nylon-coated screws that have the following characteristics:

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

Do the following when you service this machine:

- Keep the screw kit (for the P/N, see "Miscellaneous parts" on page 150) in your tool bag.
- Always use new screws.
- Use a torque screwdriver if you have one.

Tighten screws as follows:

- **Plastic to plastic**

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

  90 degrees more

  (Cross-section)
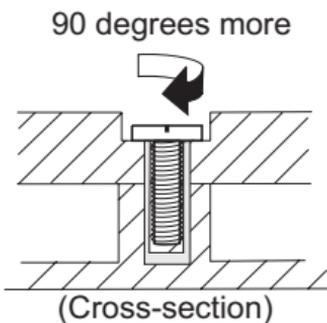
- **Logic card to plastic**

  Turn an additional **180 degrees** after the screw head touches the surface of the logic card:

  180 degrees more

  (Cross-section)
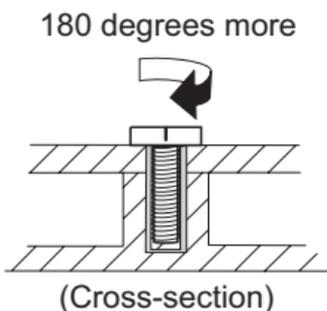
- **Torque driver**

  If you have a torque driver, refer to the "Torque" column for each step.

- Make sure you use the correct screw. If you have a torque screwdriver, tighten all screws firmly to the torque shown in the table. **Never use a screw that you removed. Use a new one. Make sure the screws are tightened firmly.**

Retaining serial numbers

This section includes the following descriptions:
- "Restoring the serial number of the system unit"
- "Retaining the UUID"

Restoring the serial number of the system unit

When the computer was manufactured, the EEPROM on the system board was loaded with the serial numbers of the system and all major components. These numbers need to remain the same throughout the life of the computer.

If you replace the system board, you must restore the serial number of the system unit to its original value.

Before replacing the system board, save the original serial number by doing the following:

1. Install the ThinkPad hardware maintenance diskette version 1.69 or later, and restart the computer.
2. From the main menu, select **1. Set System Identification**.
3. Select **2. Read S/N data from EEPROM**.

The serial number for each device is displayed. Write down the serial number of the system unit, designated as follows:

   20: System unit serial number

After you have replaced the system board, restore the serial number by doing the following:

1. Install the ThinkPad hardware maintenance diskette version 1.69 or later and restart the computer.
2. From the main menu, select **1. Set system identification**.
3. Select **1. Add S/N data from EEPROM**.

   Follow the instructions on the screen.

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

Retaining the UUID

The Universally Unique Identifier (UUID) is a 128-bit number uniquely assigned to your computer at production

and stored in the EEPROM of your system board. The algorithm that generates the number is designed to provide unique IDs until the year A.D. 3400. No two computers in the world have the same number.

When you replace the system board, you must set the UUID on the new system board as follows:

1. Install the ThinkPad hardware maintenance diskette version 1.69 or later, and restart the computer.
2. From the main menu, select **4. Assign UUID**.

   A new UUID is created and written. If a valid UUID already exists, it is not overwritten.

Removing and replacing a FRU

This section presents directions and drawings for use in removing and replacing a FRU. Be sure to observe the following general rules:

1. Do not try to service any computer unless you have been trained and certified. An untrained person runs the risk of damaging parts.

2. Before replacing any FRU, review "FRU replacement notices" on page 59.

3. Begin by removing any FRUs that have to be removed before the failing FRU. Any such FRUs are listed at the top of the page. Remove them in the order in which they are listed.

4. Follow the correct sequence in the steps for removing the FRU, as indicated in the drawings by the numbers in square callouts.

5. When turning a screw to replace a FRU, turn it in the direction indicated by the arrow in the drawing.

6. When removing the FRU, move it in the direction indicated by the arrow in the drawing.

7. To put the new FRU in place, reverse the removal procedure and follow any notes that pertain to replacement. For information about connecting and arranging internal cables, see "Locations" on page 109.

8. When replacing a FRU, use the correct screw as shown in the procedures.

⚠ DANGER

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

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

Attention: The system board is sensitive to, and can be damaged by, electrostatic discharge. Before touching it, establish personal grounding by touching a ground point with one hand or by using an electrostatic discharge (ESD) strap (P/N 6405959).

1010 Battery pack

⚠ DANGER

Use only the battery in the parts listing for the model you are servicing. Use of an incorrect battery can result in ignition or explosion of the battery.
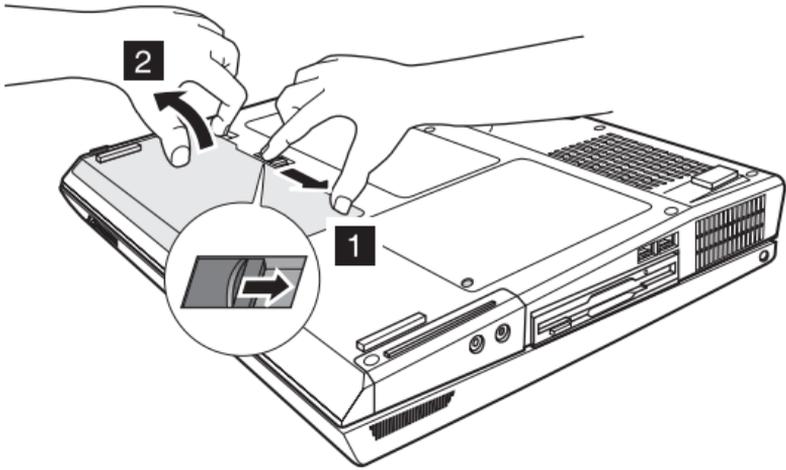
1020 Hard disk drive

Attention

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

- 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.

For access, remove this FRU:
- "1010 Battery pack" on page 63
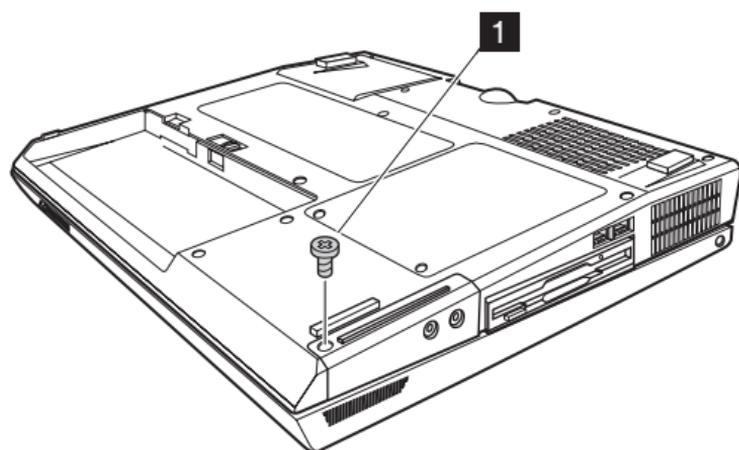
Note: The hard disk drive is attached to the cover.

Step	Screw (quantity)
1	HDD M3 × 4 mm, Black (1)
Note: Use a 2.5-mm Allen wrench to remove the security screw.	

(continued)
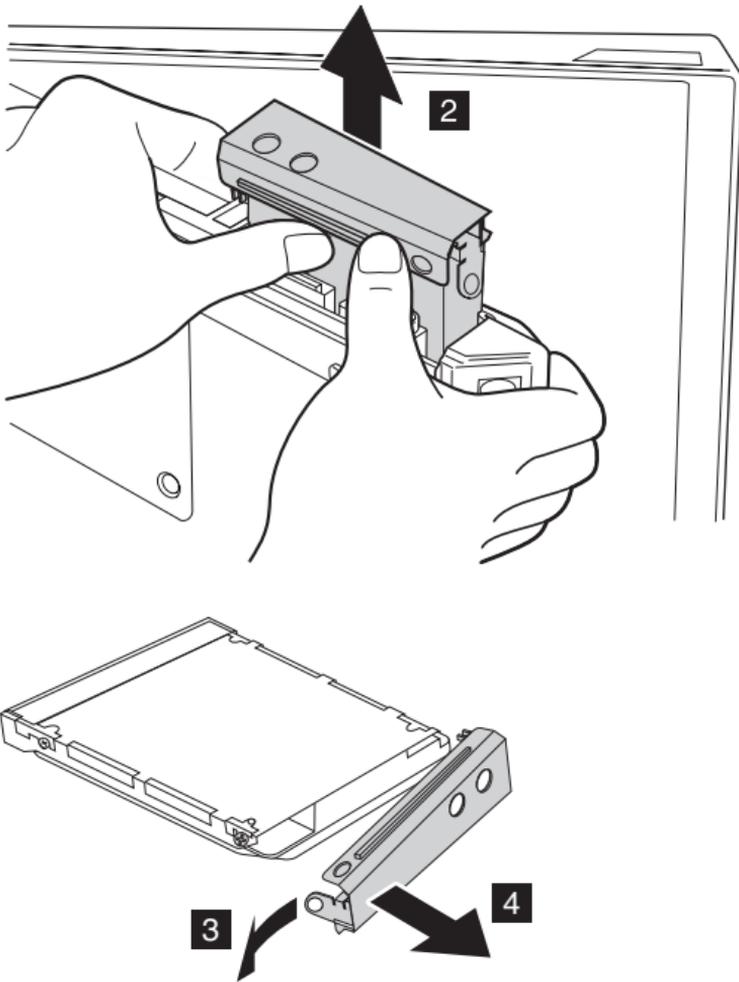
When installing: Make sure that the hard disk connector is firmly attached.

1030 DIMM door

For access, remove this FRU:
• "1010 Battery pack" on page 63

Note: Loosen the screws **1**, but do not remove them.
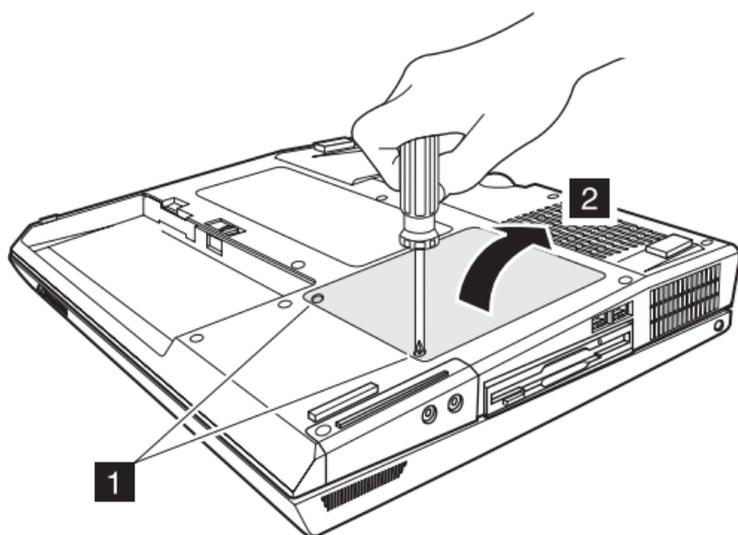
Step	Screw (quantity)	Torque
1	M2.5 captive screw (2)	Nm 0.3 Nm (3.2 kgfcm)

1040 DIMM

For access, remove these FRUs, in order:
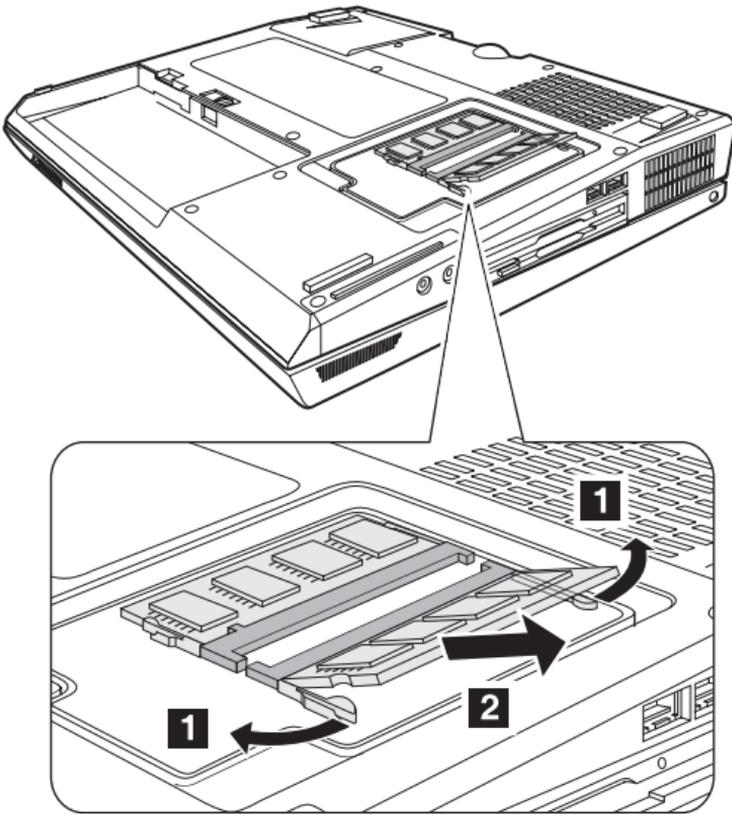
When installing: With the notched end of the DIMM toward the socket, insert the DIMM into the socket, and then press it firmly. Pivot the DIMM until it snaps into place. Make sure that the card is firmly fixed in the slot and does not move easily.

1050 Modem daughter card (MDC)

For access, remove this FRU:
- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
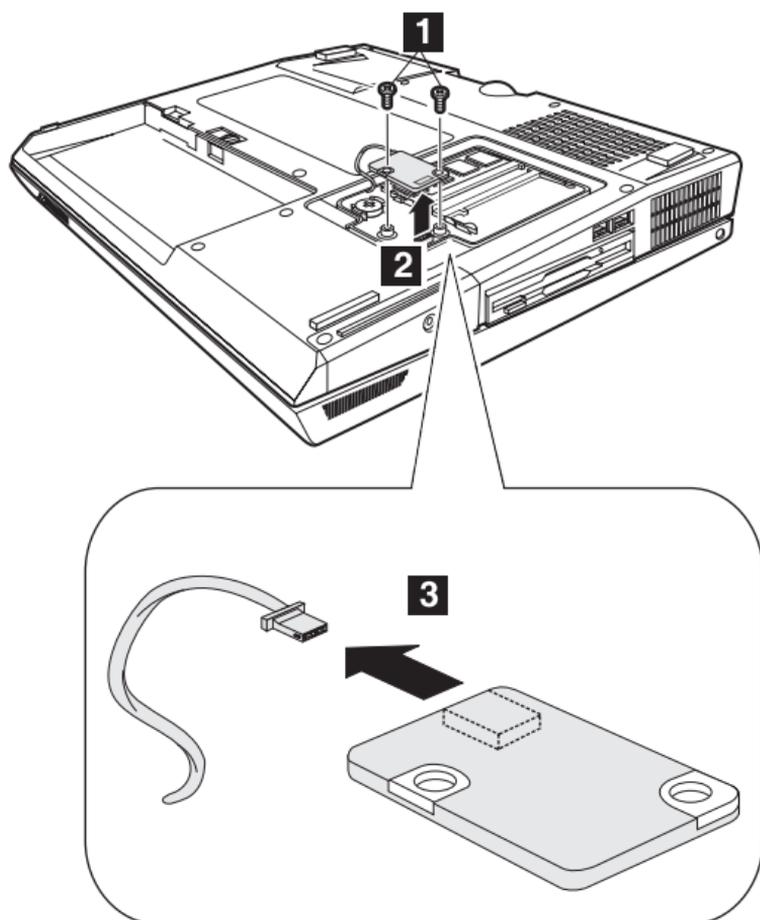
Step	Screw (quantity)	Torque
1	M2.5 x 5 mm, Silver (2)	Nm 0.3 (3.2 kgfcm)

1060 Backup battery

⚠ DANGER

Use only the battery in the parts listing for the computer you are servicing. Use of an incorrect battery can result in ignition or explosion of the battery.

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
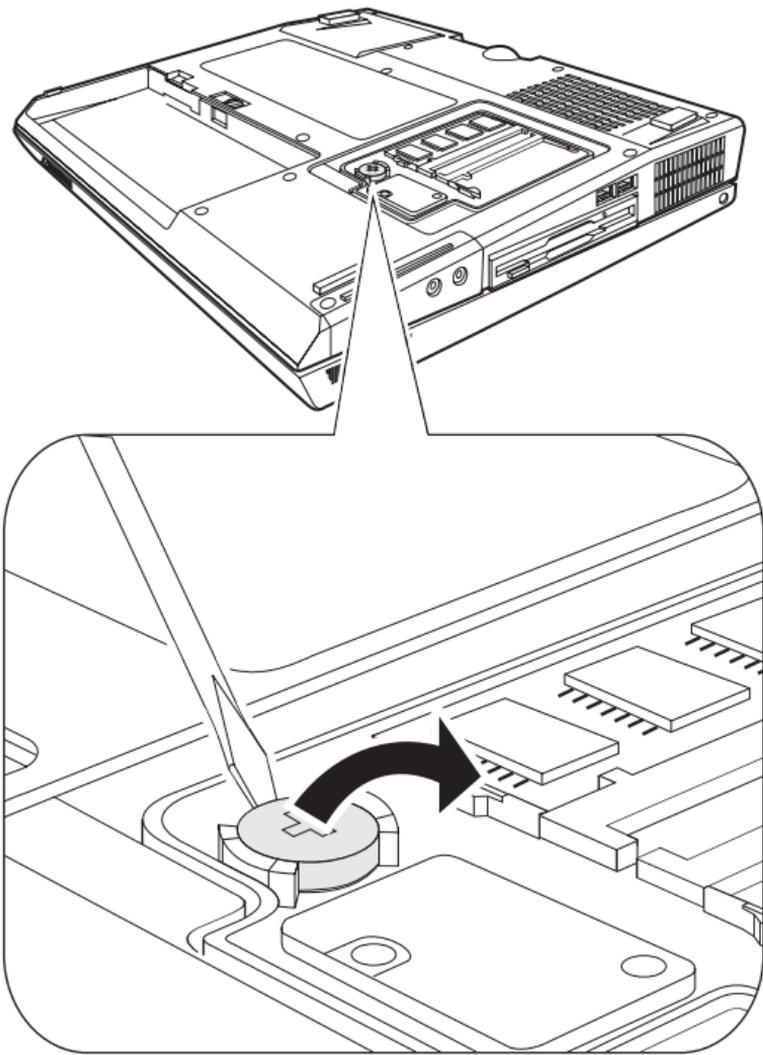
1070 Keyboard

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
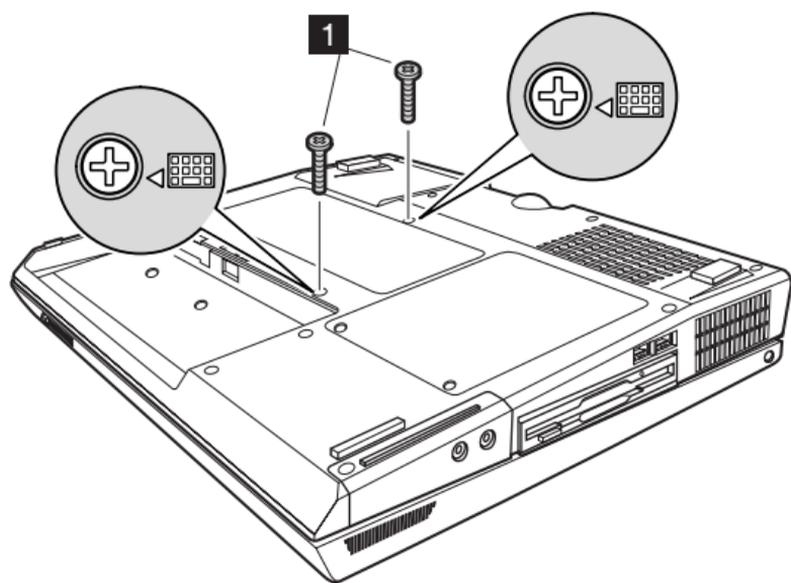
Step	Screw (quantity)	Torque
1	M2.5 × 7 mm, Black (2)	Nm 0.3 (3.2 kgfcm)

(continued)
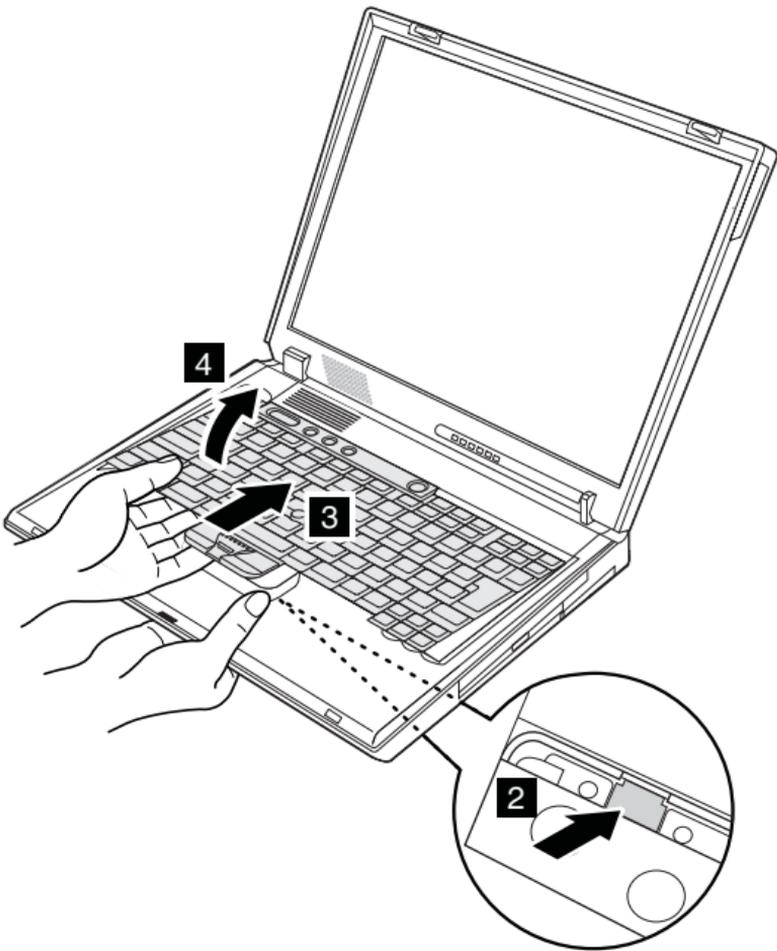
In step `2`, push the keyboard from the bottom, while at the same time pushing a little in the direction of the arrow in step `3`. Take care not to bend the keyboard when lifting it at step `4`.
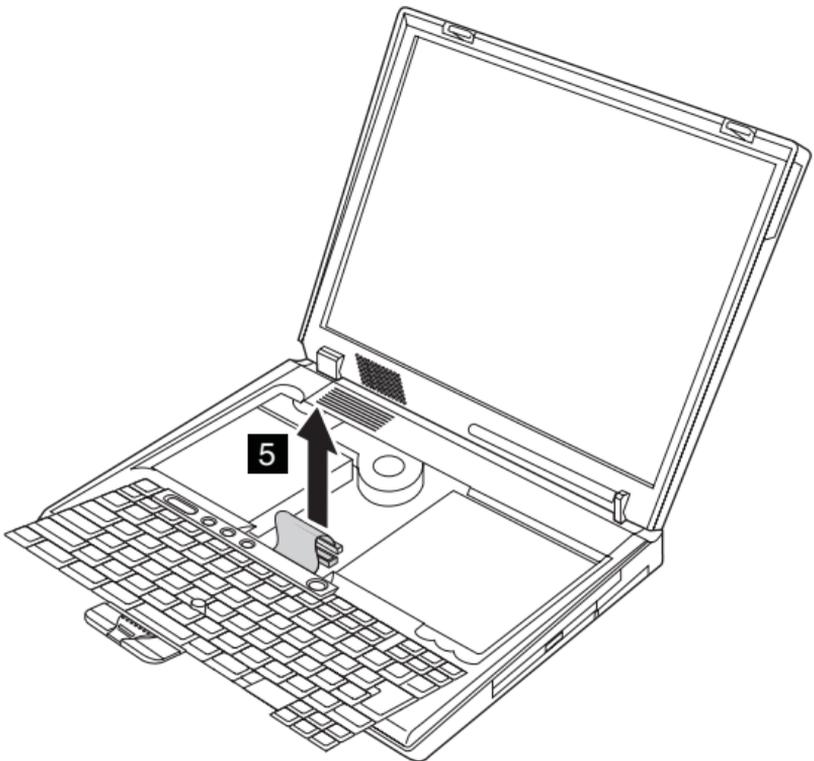
1080 Middle cover

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1070 Keyboard" on page 70
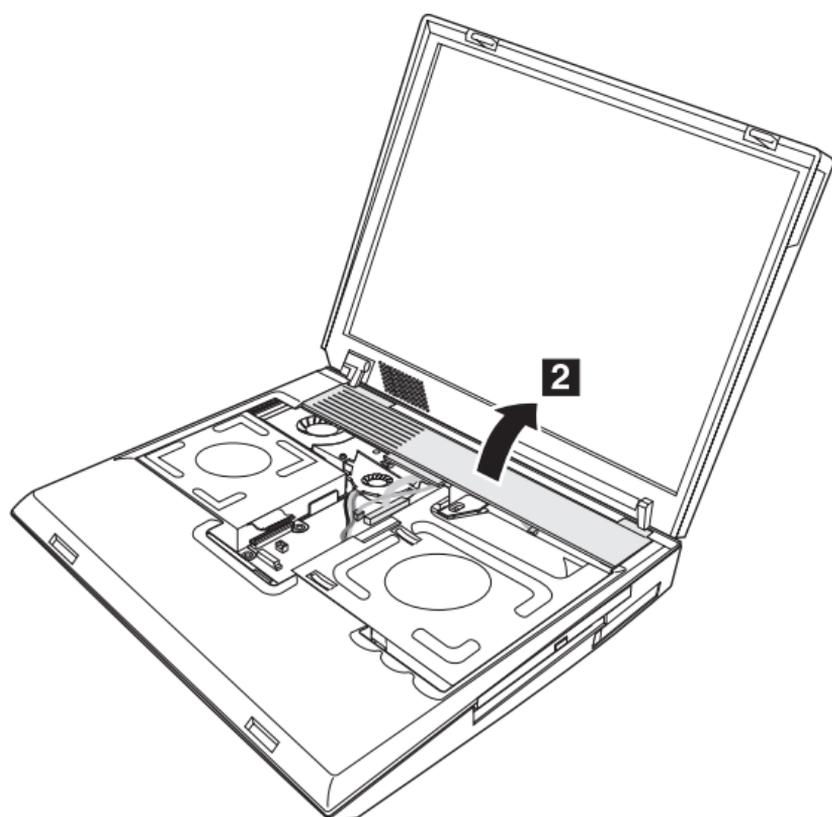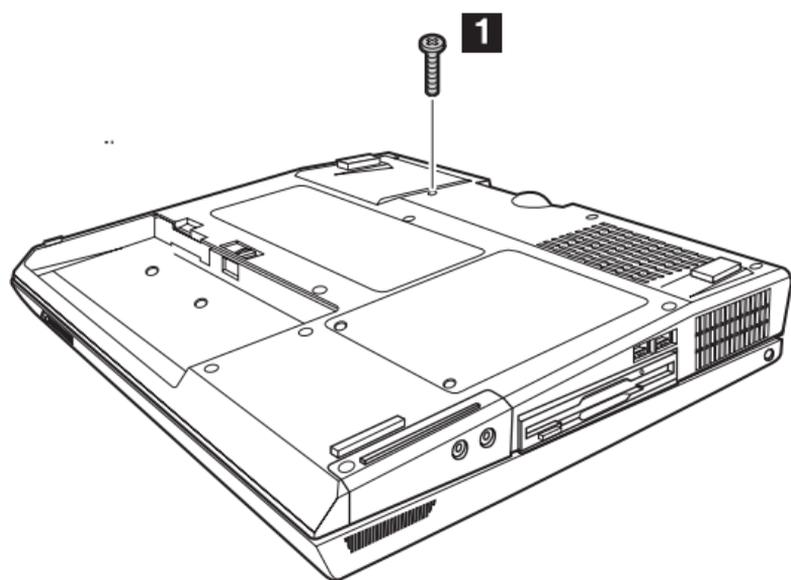
Step	Screw (quantity)	Torque
1	M2.5 × 8 mm, Black (1)	Nm 0.3 (3.2 kgfcm)

Note: The bottom-side screw that secures the middle cover may be a security or tamper-proof screw for 802.11a/b wireless models.

1090 Hinge cover

For access, remove this FRU:
- "1010 Battery pack" on page 63
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
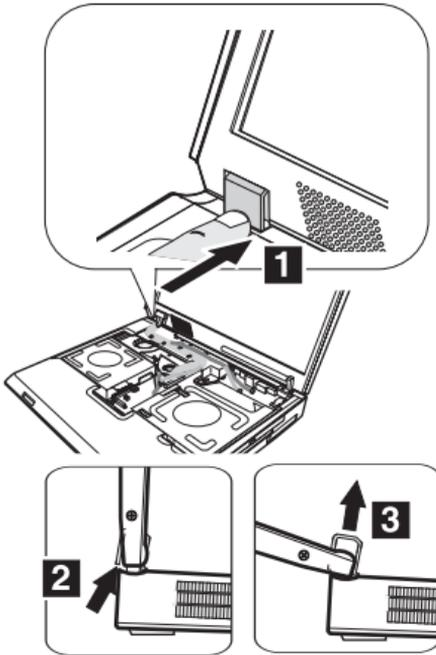

When installing: Align the hinge cover squarely and push down.

1095 FDD assembly

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1070 Keyboard" on page 70
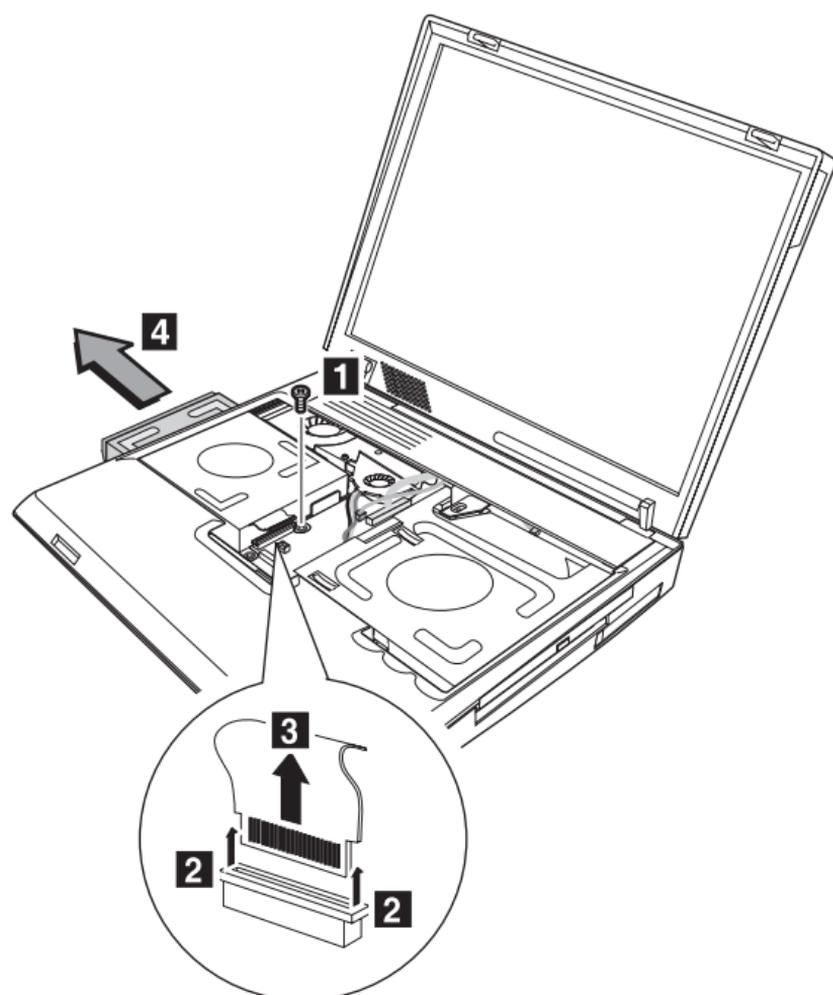
Step	Screw (quantity)	Torque
1	M2.5 × 5 mm, Silver (1)	0.3 Nm (3.2 kgfcm)

1100 Blank bezel FDD assembly

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1070 Keyboard" on page 70
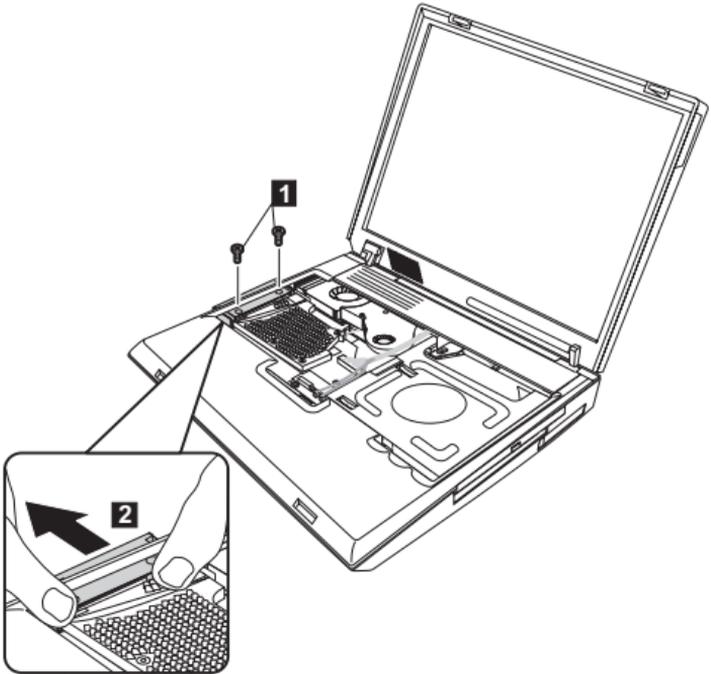
Step	Screw (quantity)	Torque
1	M2.0 × 4 mm, Silver (2)	0.3 Nm (3.2 kgfcm)
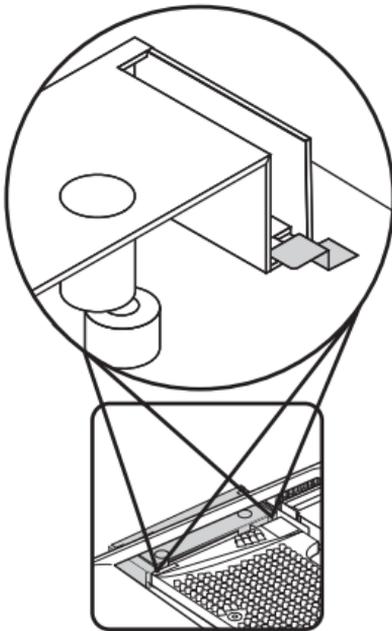
When Installing: Be sure the corners of the FDD cover go under the clasps on the FDD bracket.

1110 VGA heatsink assembly

For access, remove these FRUs, in order:

- "1010 Battery pack" on page 63
- "1070 Keyboard" on page 70
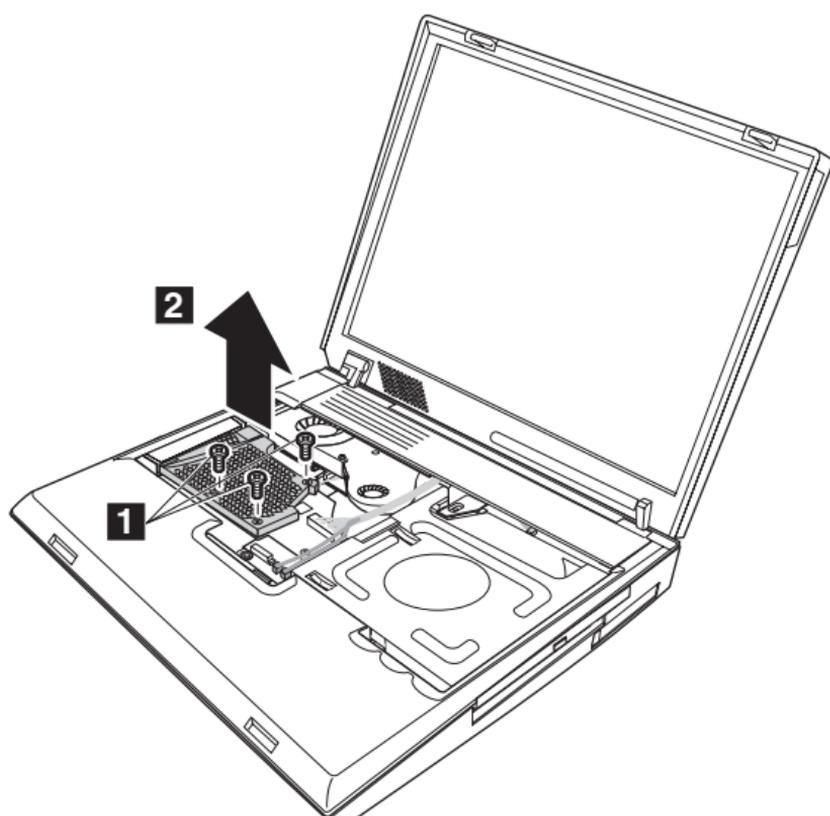
Step	Screw (quantity)	Torque
1	M2.0 × 4 mm, Silver (3)	0.3 Nm (3.2 kgfcm)

1120 VGA card assembly

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1070 Keyboard" on page 70
- "1110 VGA heatsink assembly" on page 76
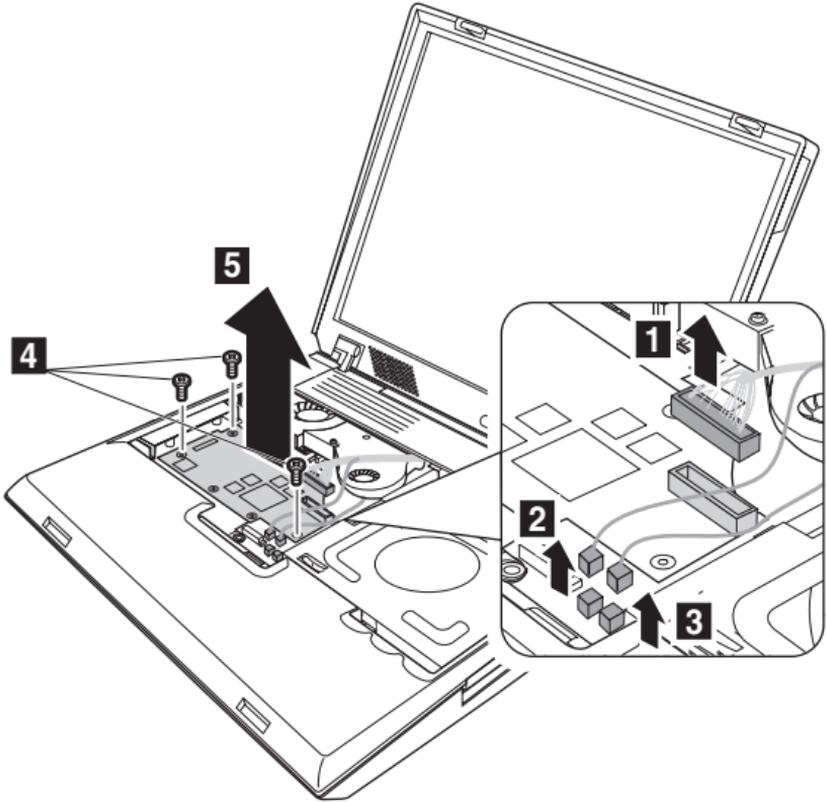
Step	Screw (quantity)	Torque
4	M2.0 × 4 mm, Silver (1)	0.3 Nm (3.2 kgfcm)

1130 CD-ROM/DVD drive and ODD bracket

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1070 Keyboard" on page 70
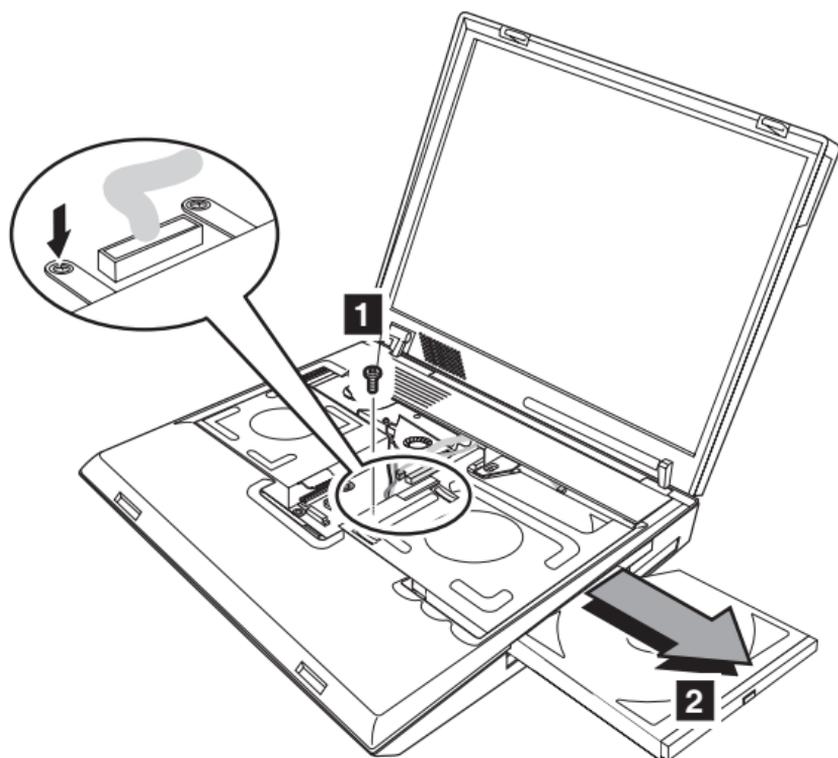
Step	Screw (quantity)	Torque
1	M2.5 stud Phillips × 5 mm, Silver (1)	0.3 Nm (3.2 kgfcm)
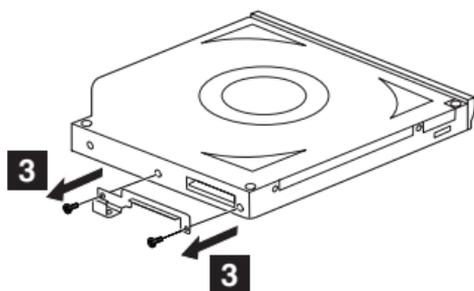
1140 Mini PCI adapter

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
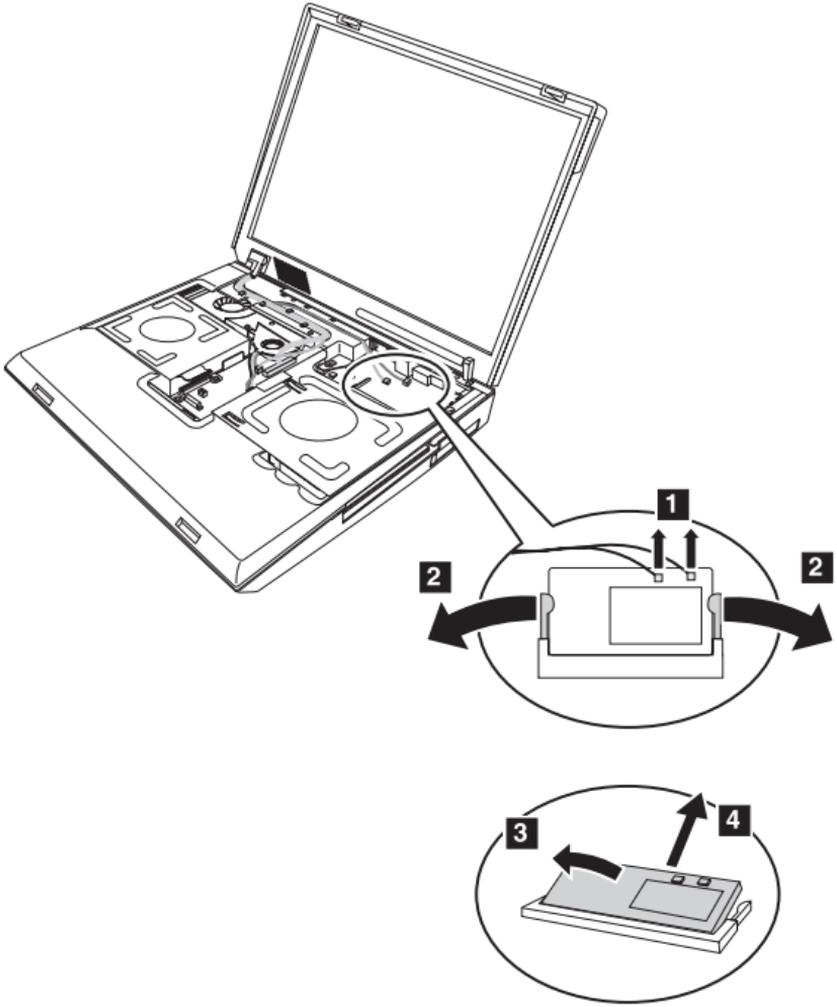
1150 PC card slot assembly

For access, remove these FRUs, in order:

- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
- "1130 CD-ROM/DVD drive and ODD bracket" on page 78
- "1140 Mini PCI adapter" on page 79
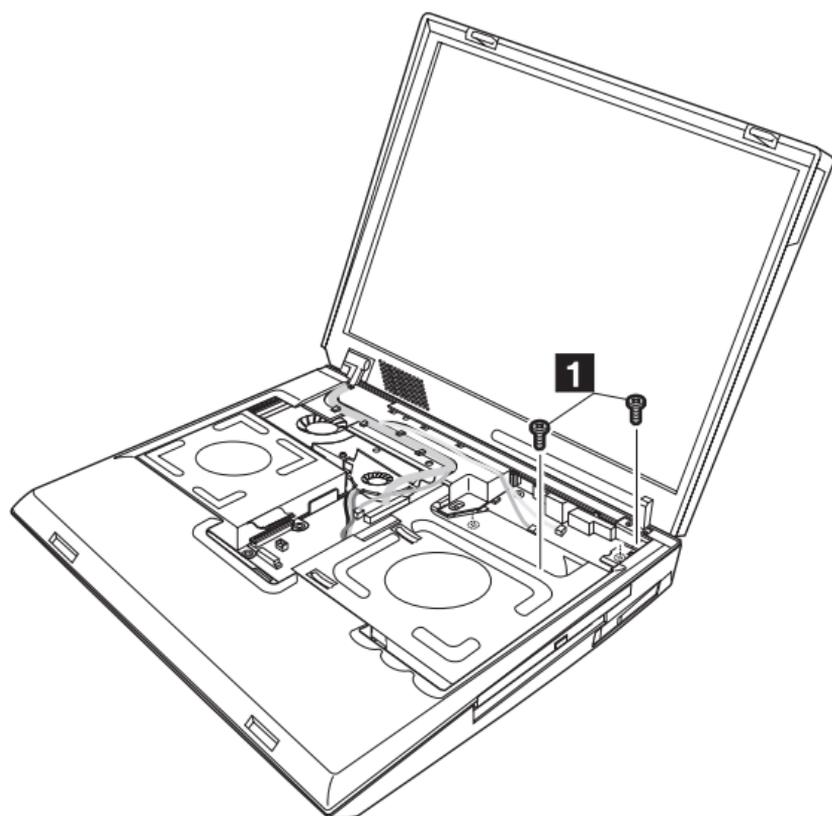
| Step	Screw (quantity)	Torque
1	M2.5 × 8 mm, Black (2)	0.3 Nm (3.2 kgfcm)

(continued)

Loosen the two screws at `2` about half-way out. Then, push down firmly on both screws in the direction of the arrow `3` to disconnect the PC card slot assembly from the system board.
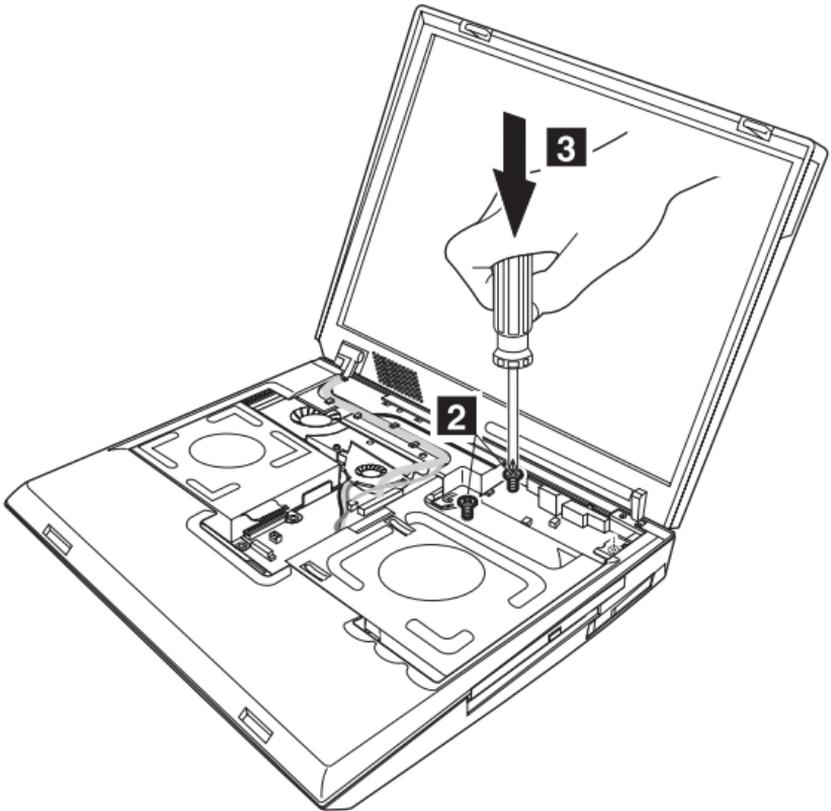
Step	Screw (quantity)	Torque
`2`	M2.5 × 8 mm, Black (2)	0.3 Nm (3.2 kgfcm)

Push the PC card eject buttons `4` to pop the buttons out. While holding the PC card door down, pull on the PC card eject buttons and carefully remove the PC card slot assembly `5`.

(continued)
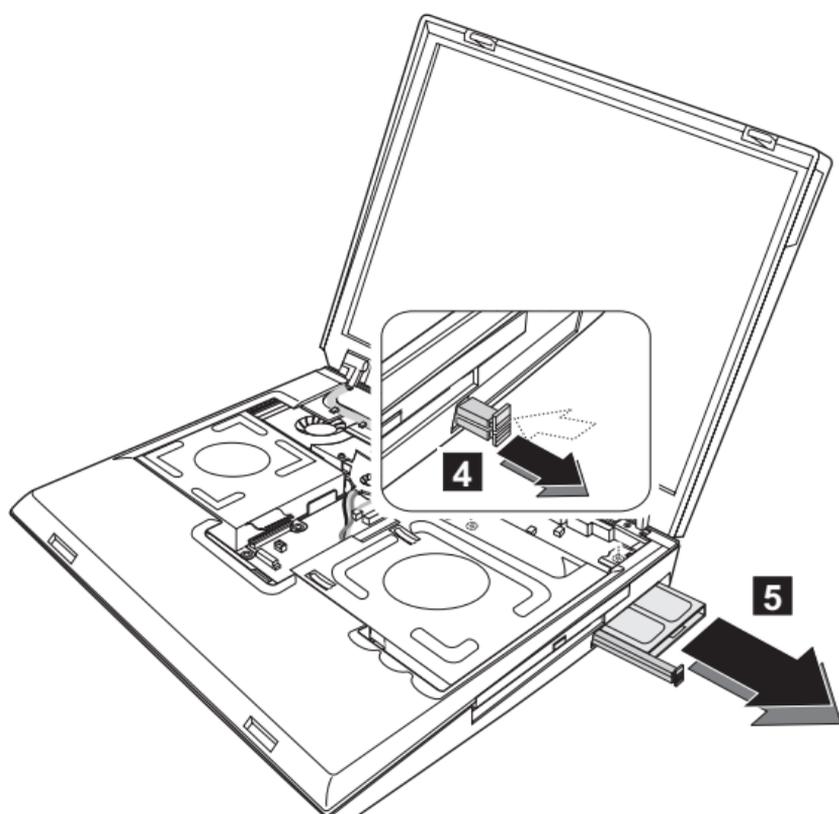
When installing: At steps **2** and **3** , tighten the two new screws slowly until both screws have caught the first threads of the screw holes on the PC card slot assembly. Then, tighten each screw one turn at a time, alternating between screws to evenly pull the assembly connector onto the system board connector.

1160 LCD and Keyboard bezel assembly

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
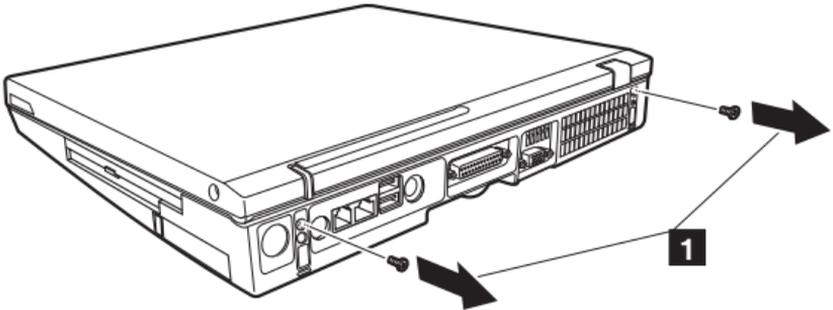
Step	Screw (quantity)	Torque
1	M2.5 × 7 mm, Black (2)	0.3 Nm (3.2 kgfcm)
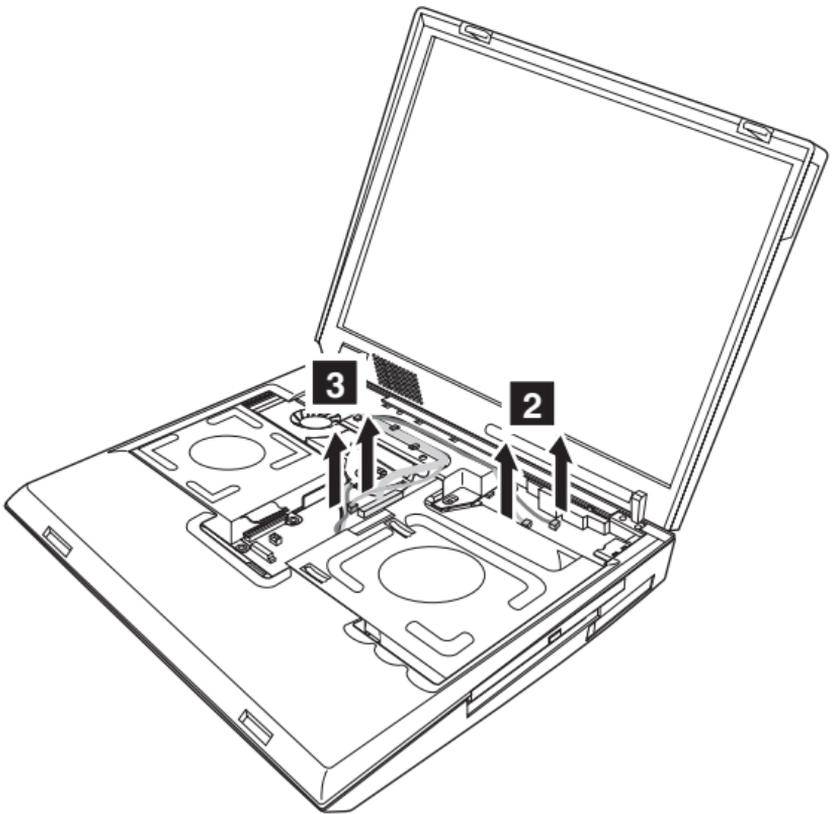
(continued)

Non-FDD models: The VGA connector for non-FDD models is as shown below.
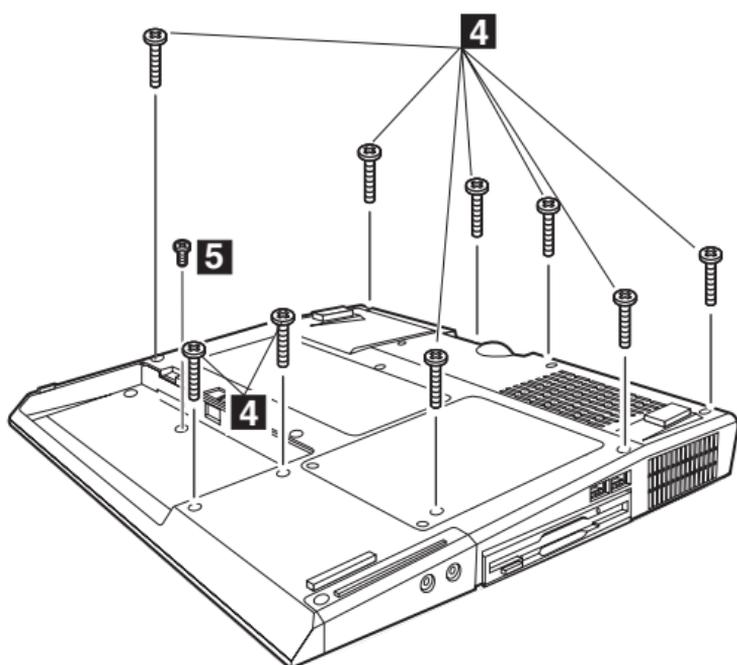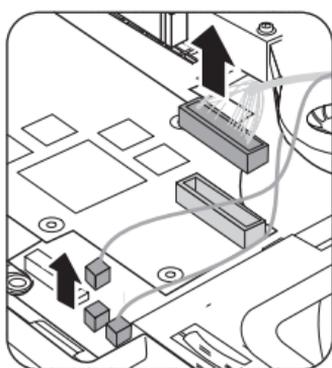
Step	Screw (quantity)	Torque
4	M 2.5 × 7 mm, Black (9)	0.3 Nm (3.2 kgfcm)
5	M 2.5 × 3 mm, Silver (1)	0.3 Nm (3.2 kgfcm)
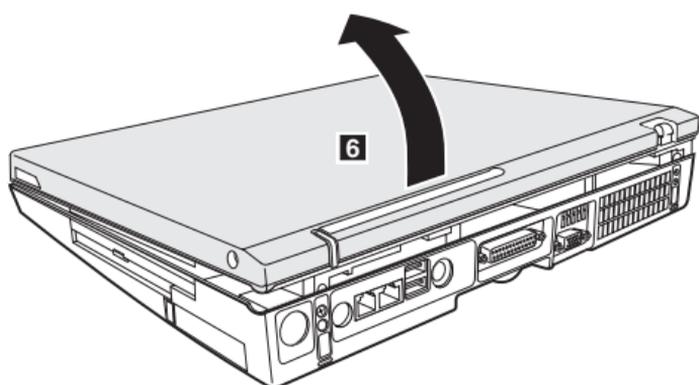
(continued)

When installing: Make sure the red band $\boxed{A}$ on the LCD cable is aligned with the corner of the keyboard bezel under the hinge.
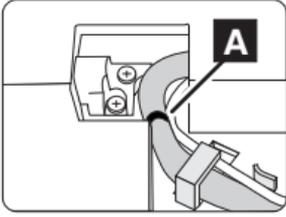
1170 LCD assembly

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
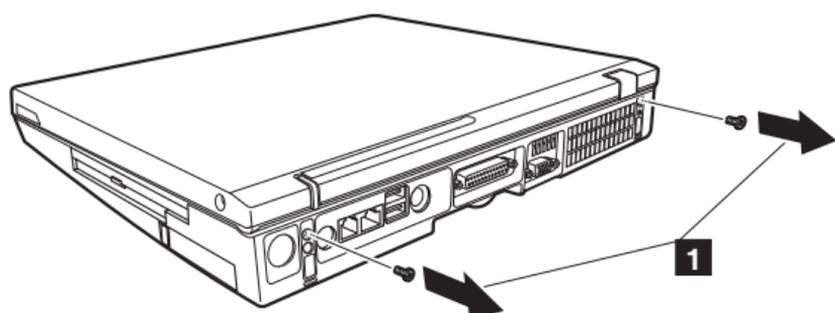
Step	Screw (quantity)	Torque
1	M2.5 × 7 mm, Black (2)	0.3 Nm (3.2 kgfcm)
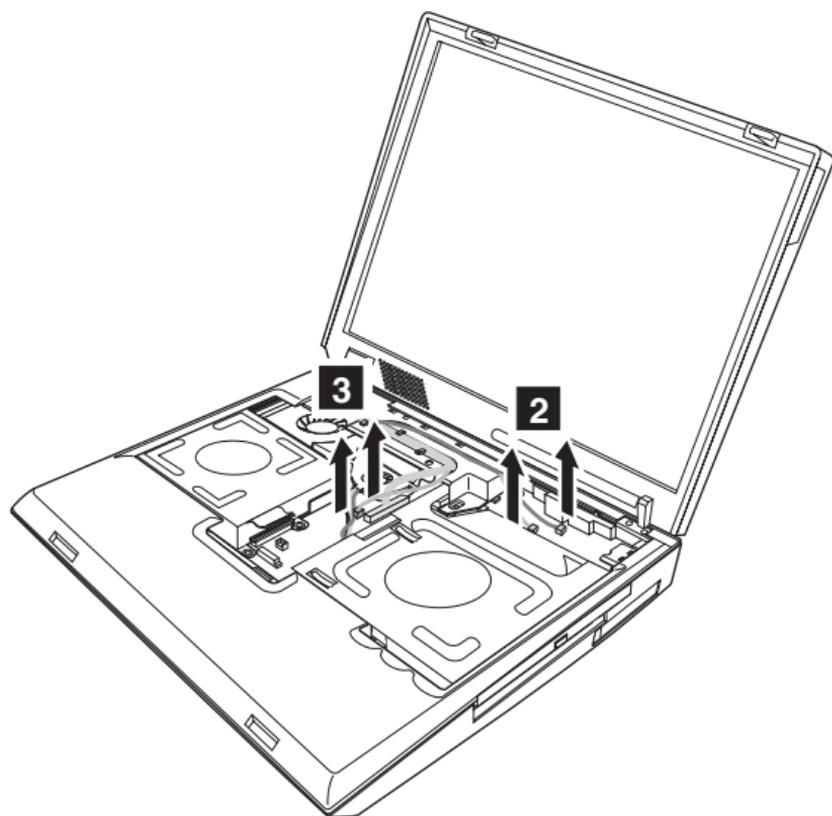
(continued)

Non-FDD models: The VGA connector for non-FDD models is as shown below.
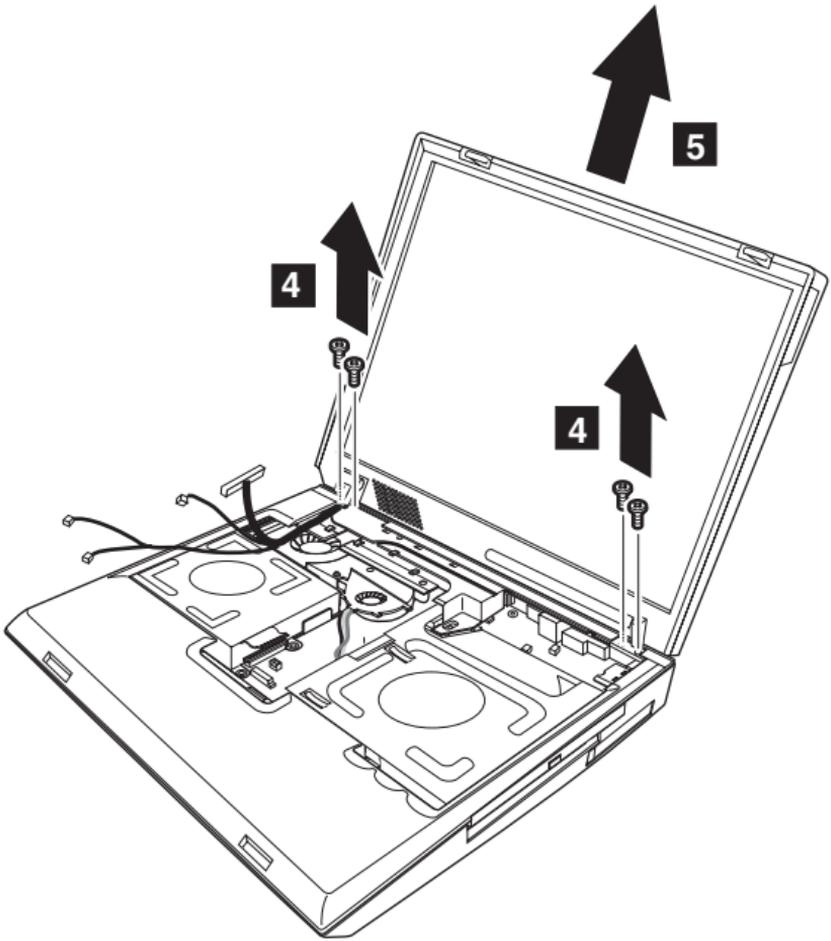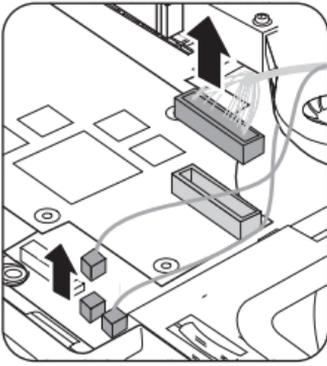
Step	Screw (quantity)	Torque
4	M 2.5 × 7 mm, Silver (4)	0.3 Nm (3.2 kgfcm)

(continued)

When installing: Make sure the red band A on the LCD
cable is aligned with the corner of the
keyboard bezel under the hinge.
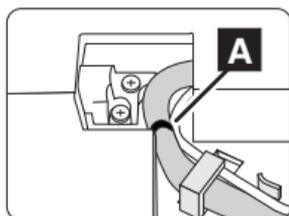
1180 Keyboard bezel

For access, remove these FRUs, in order:

- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
- "1170 LCD assembly" on page 86
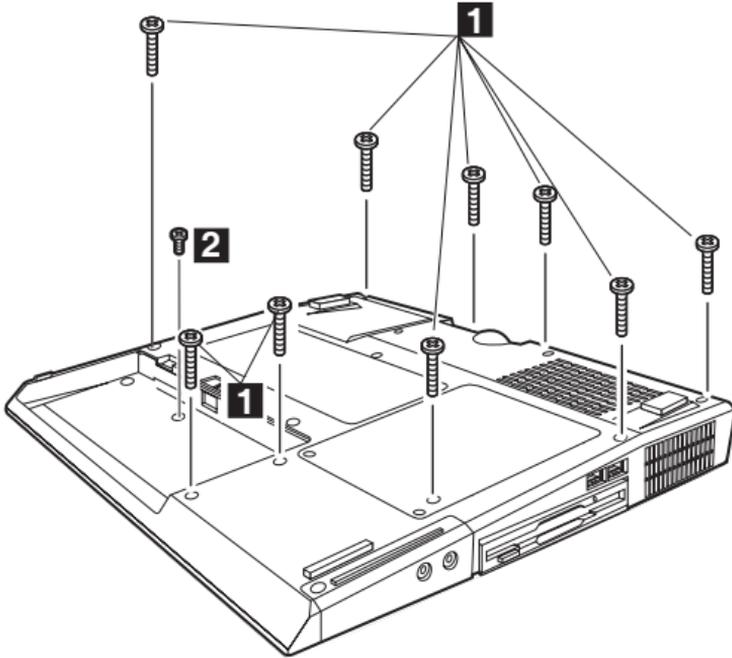
Step	Screw (quantity)	Torque
1	M 2.5 × 7 mm, Black (9)	0.3 Nm (3.2 kgfcm)
2	M 2.5 × 3 mm, Silver (1)	0.3 Nm (3.2 kgfcm)

(continued)

Remove the keyboard bezel in the direction of arrow **3** .
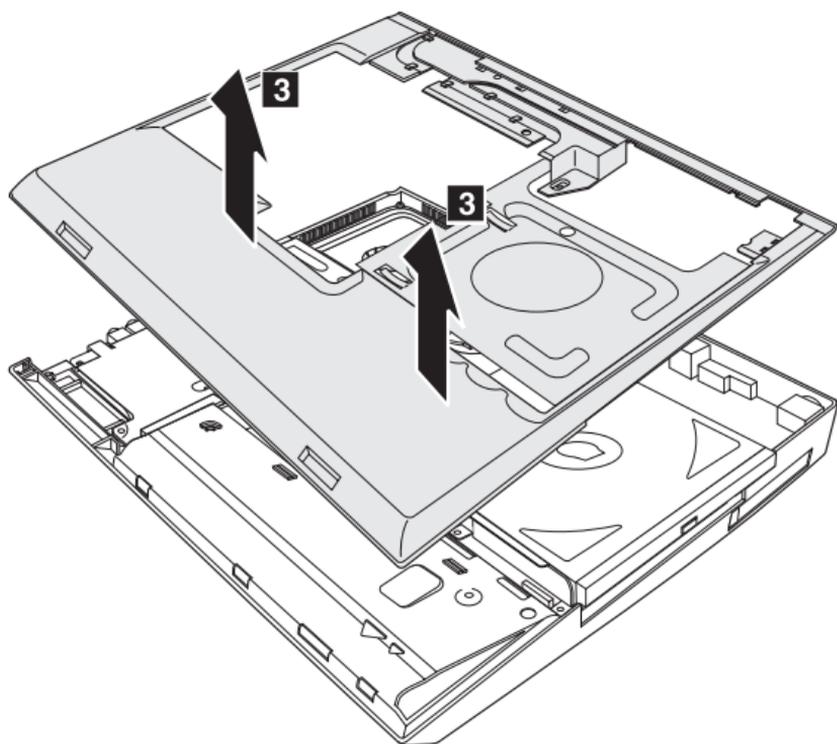
1190 Fan assembly

For access, remove these FRUs, in order:

- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
- "1160 LCD and Keyboard bezel assembly" on page 83

To prevent the CPU from being pulled from the socket when the fan is removed, remove the screw **2** and reinsert it **3** . Then carefully turn the screw to separate the fan as you lift up **4** .

Step	Screw (quantity)	Torque
1	M2.5 captive × (4)	0.3 Nm (3.2 kgfcm)

(continued)

When installing: Apply 1 gram (approx.) of thermal grease to the underside of the fan assembly, spreading it evenly with the provided spatula. Do not apply thermal grease directly to the CPU. Then, when the fan is in place, tighten the screws in this order: **A** ; **B** ; and **C** .

Caution: When installing, be sure the screw that was moved from position **2** to **3** above, is returned to its original location.

2000 Fan (CPU 3 GHz) and CPU fixture

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
- "1160 LCD and Keyboard bezel assembly" on page 83

To prevent the CPU from being pulled from the socket when the fan is removed, remove the screw 2 and reinsert it 3 . Then carefully turn the screw to separate the fan as you lift up 4 .

Step	Screw (quantity)	Torque
1	M2.5 captive × (4)	0.3 Nm (3.2 kgfcm)

(continued)

When installing: Apply 1 gram (approx.) of thermal grease to the underside of the fan assembly, spreading it evenly with the provided spatula. Do not apply thermal grease directly to the CPU. Then, when the fan is in place, tighten the screws in this order: **A** ; **B** ; and **C** .

Caution: When installing, be sure the screw that was moved from position **2** to **3** above, is returned to its original location.

2010 CPU

For access, remove these FRUs, in order:

Rotate the head of the screw in the direction of the arrow
1 to release the lock; then remove the CPU 2.
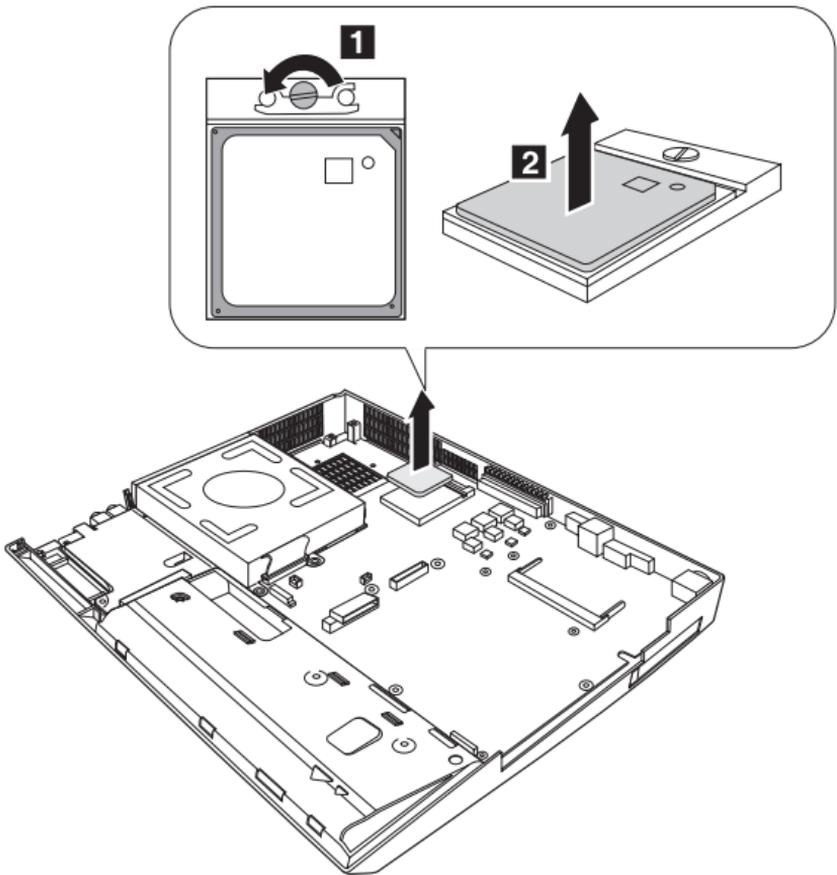
When installing: Place the CPU on the CPU socket with the pin 1 corner as shown 1, and then rotate the head of the screw in the direction of the arrow 2 to secure the CPU.
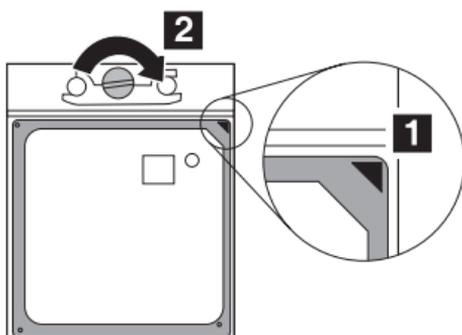
2020 CD-ROM/DVD drive bracket

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
- "1160 LCD and Keyboard bezel assembly" on page 83
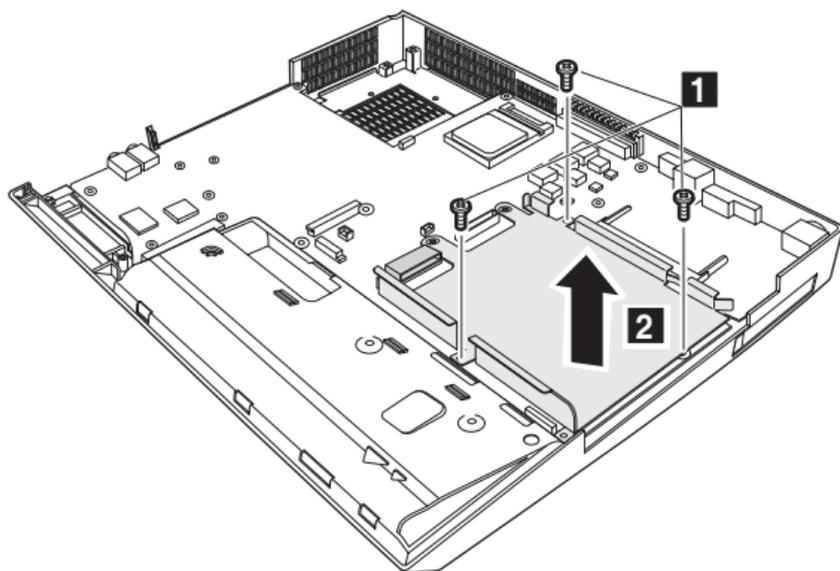
Step	Screw (quantity)	Torque
1	M2.5 × 5 mm, Silver (3)	0.3 Nm (3.2 kgfcm)

2030 FDD bracket

For access, remove these FRUs, in order:
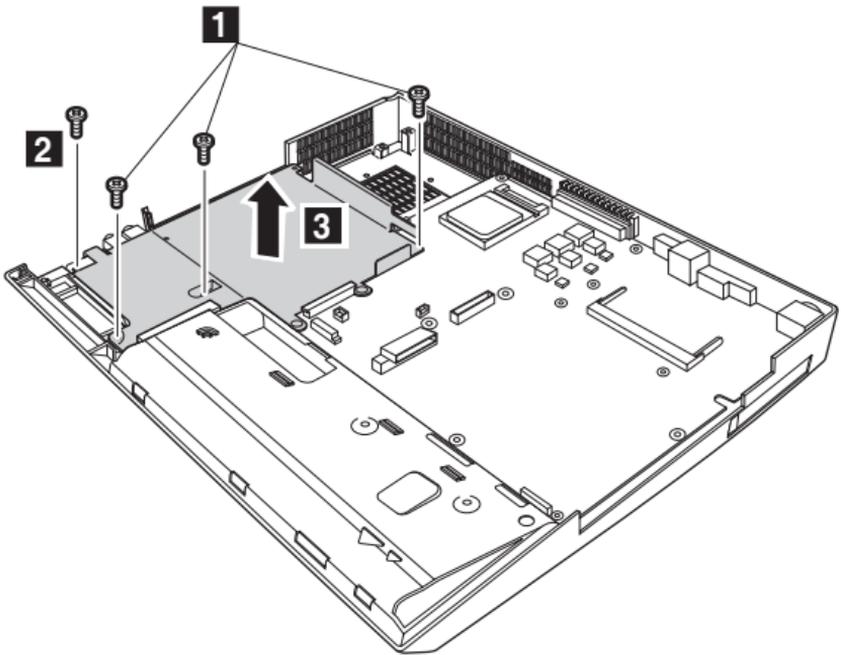
Step	Screw (quantity)	Torque
1	M2.5 × 5 mm, Silver (3)	0.3 Nm (3.2 kgfcm)
2	M2.5 × 3 mm, Silver (1)	0.3 Nm (3.2 kgfcm)

2040 System board

For access, remove these FRUs, in order:

- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
- "1130 CD-ROM/DVD drive and ODD bracket" on page 78
- "1140 Mini PCI adapter" on page 79
- "1160 LCD and Keyboard bezel assembly" on page 83
- "1190 Fan assembly" on page 91
- "2010 CPU" on page 95
- "2000 Fan (CPU 3 GHz) and CPU fixture" on page 93
- "2020 CD-ROM/DVD drive bracket" on page 96
- "1095 FDD assembly" on page 74
- "2030 FDD bracket" on page 97
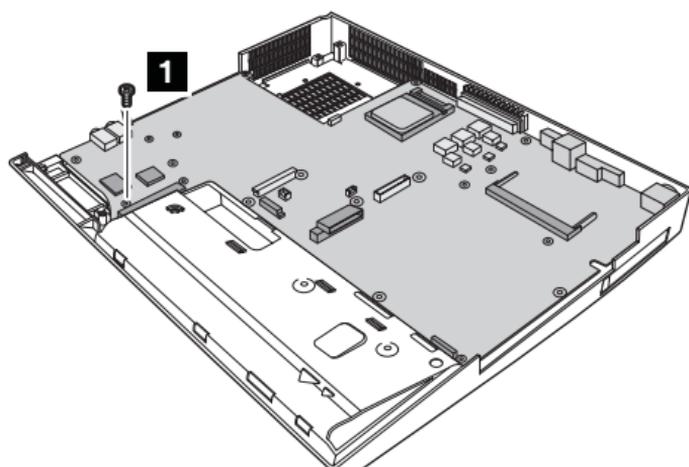
Step	Screw (quantity)	Torque
1	M2.5 × 5 mm, Silver (2)	0.3 Nm (3.2 kgfcm)
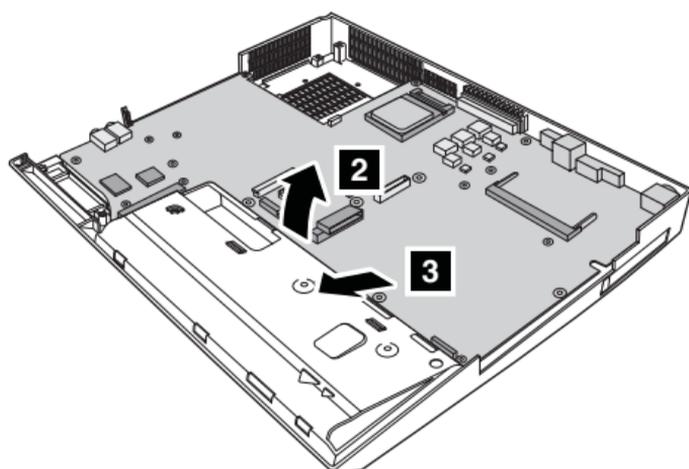
2050 Lower case assembly

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
- "1130 CD-ROM/DVD drive and ODD bracket" on page 78
- "1140 Mini PCI adapter" on page 79
- "1160 LCD and Keyboard bezel assembly" on page 83
- "2020 CD-ROM/DVD drive bracket" on page 96
- "1095 FDD assembly" on page 74
- "2030 FDD bracket" on page 97
- "2040 System board" on page 98
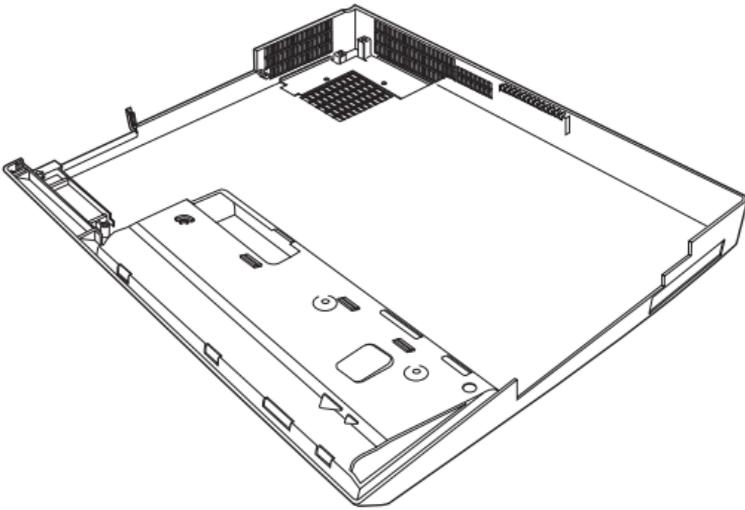
2060 Modem cable

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
- "1140 Mini PCI adapter" on page 79
- "1130 CD-ROM/DVD drive and ODD bracket" on page 78
- "1140 Mini PCI adapter" on page 79
- "1170 LCD assembly" on page 86
- "1180 Keyboard bezel" on page 89
- "2020 CD-ROM/DVD drive bracket" on page 96
- "1095 FDD assembly" on page 74
- "2030 FDD bracket" on page 97
- "2040 System board" on page 98
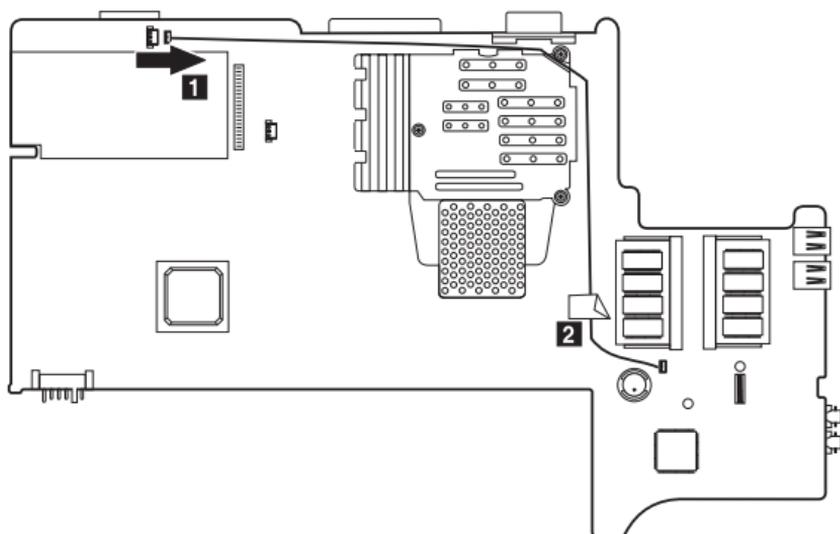
2070 PC card slot assembly

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
- "1140 Mini PCI adapter" on page 79
- "1130 CD-ROM/DVD drive and ODD bracket" on page 78
- "1140 Mini PCI adapter" on page 79
- "1160 LCD and Keyboard bezel assembly" on page 83
- "2020 CD-ROM/DVD drive bracket" on page 96
- "1095 FDD assembly" on page 74
- "2030 FDD bracket" on page 97
- "2040 System board" on page 98
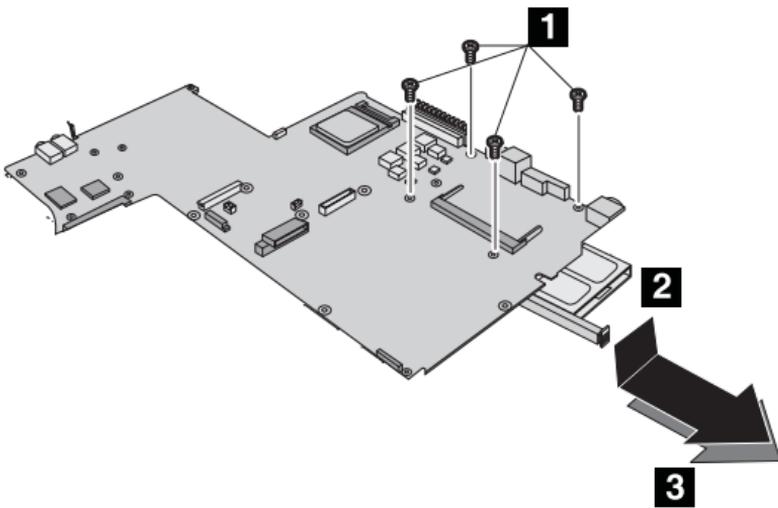
Step	Screw (quantity)	Torque
1	M2.5 × 8 mm, Silver (4)	0.3 Nm (3.2 kgfcm)

2080 LCD front bezel

For access, remove this FRU:
- "1010 Battery pack" on page 63

After removing screws 1, detach all of the latches 2 to
4 in order.
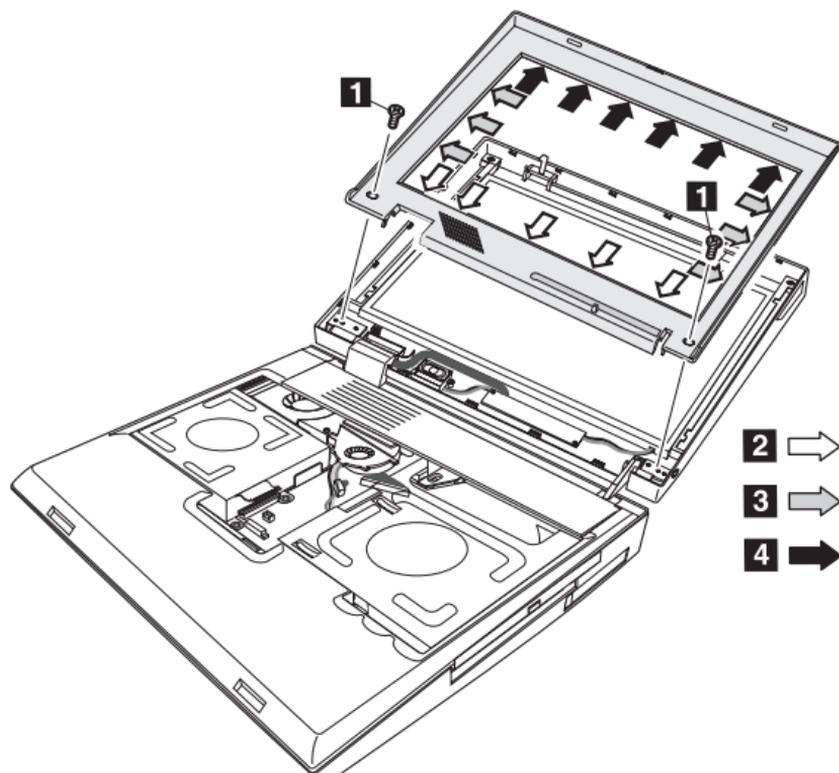
Step	Screw (quantity)	Torque
1	M2.5 × 5 mm, Black (2)	0.3 Nm (3.2 kgfcm)

When installing: Make sure that all of the latches of the
LCD front bezel are firmly attached to
the LCD cover.

2090 Inverter card

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "2080 LCD front bezel" on page 102
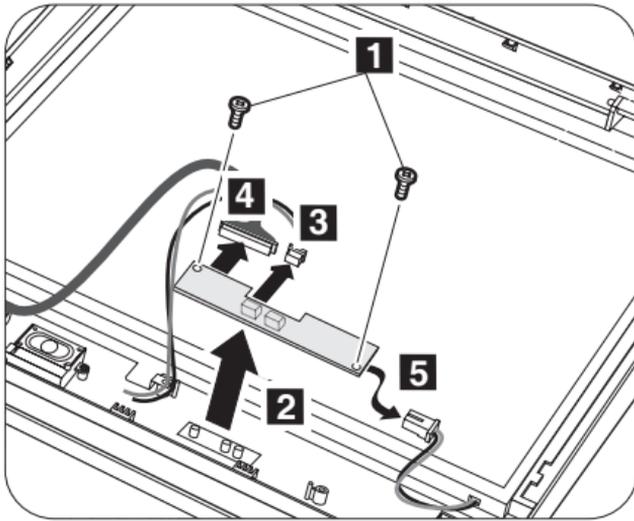
Step	Screw (quantity)	Torque
1	M2.5 × 5 mm, Silver (2)	0.3 Nm (3.2 kgfcm)

When installing: Make sure that connectors **3** , **4** and **5** are firmly attached. Some models have an extra connector; make sure connector **3** is connected to the socket on the left.

3000 Speaker assembly

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "2080 LCD front bezel" on page 102
- "2090 Inverter card" on page 103
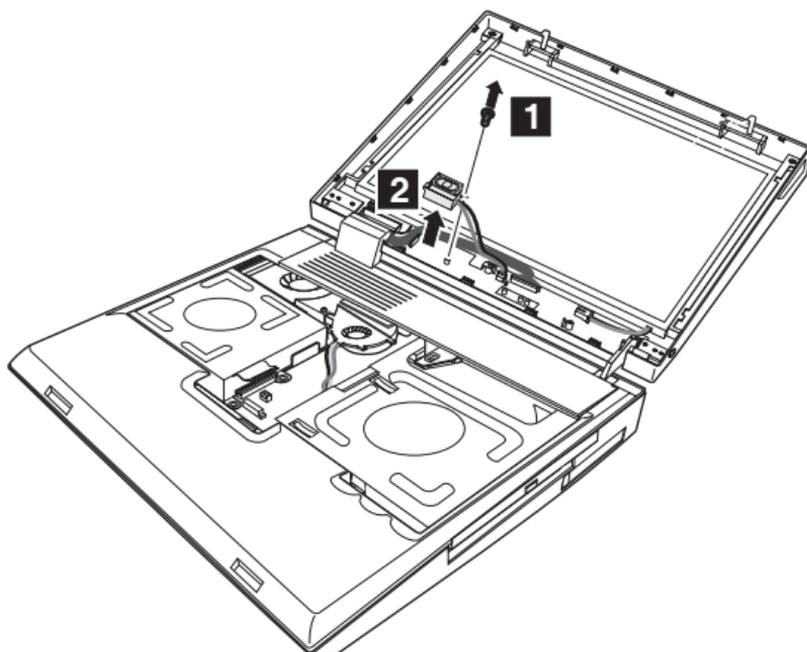
Step	Screw (quantity)	Torque
1	M2.5 × 5 mm, Silver (1)	0.3 Nm (3.2 kgfcm)

When installing: Make sure the LCD cable is not pinched and aligned to the left of the speaker.
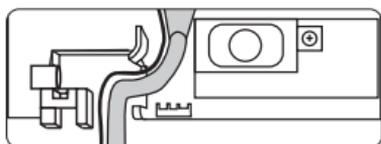
3010 LCD cable assembly

For access, remove these FRUs, in order:

- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
- "1170 LCD assembly" on page 86
- "2080 LCD front bezel" on page 102
- "2090 Inverter card" on page 103
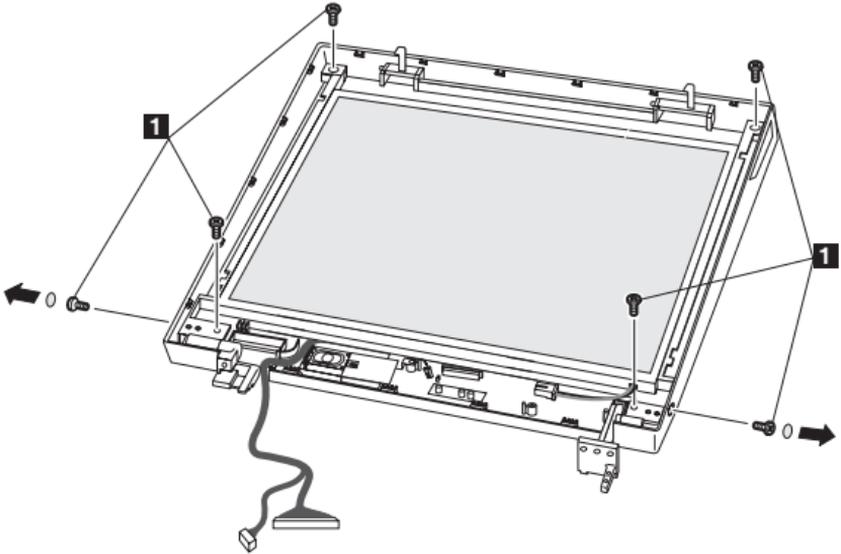
Step	Screw (quantity)	Torque
1	M2.5 × 5 mm, Silver (6)	0.3 Nm (3.2 kgfcm)

(continued)
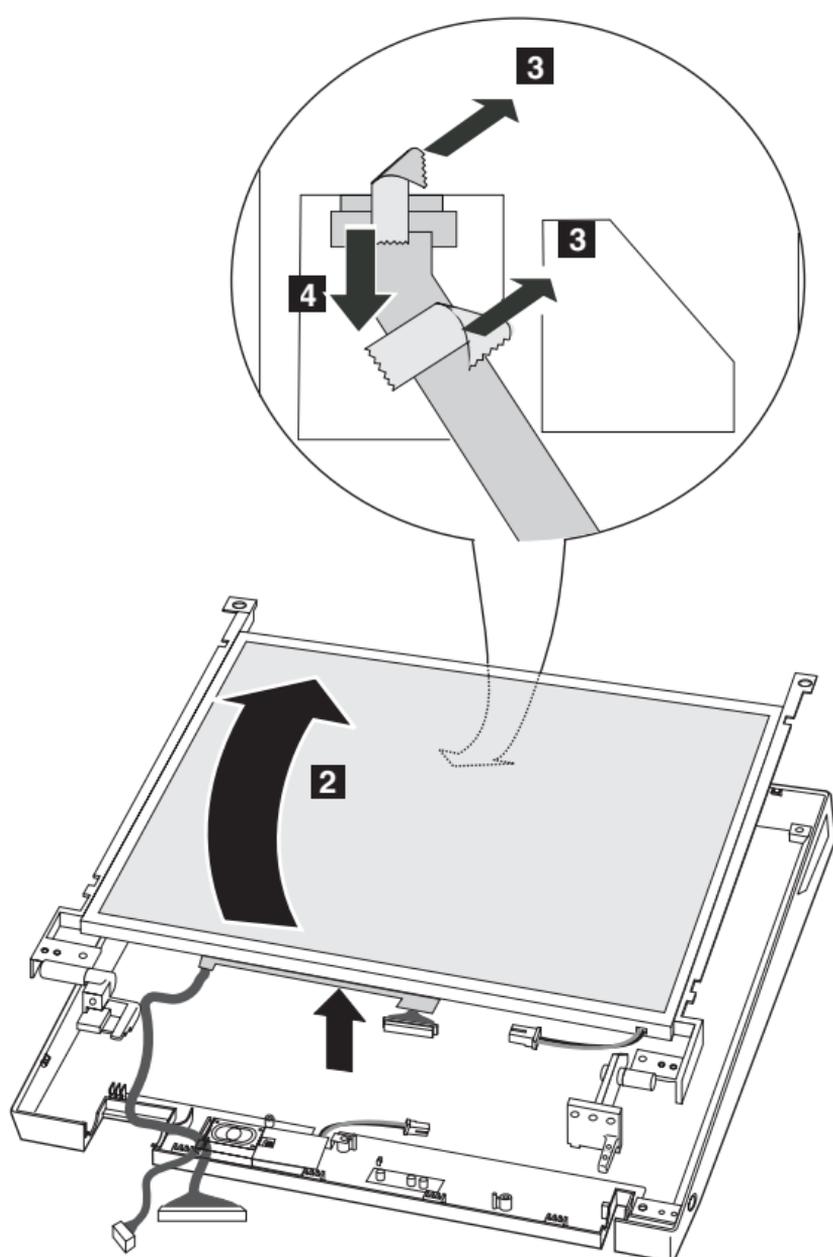
When installing: Make sure the LCD cable is not pinched and aligned to the left of the speaker.
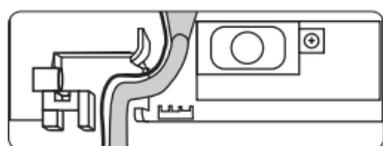
3020 Wireless antenna and rear cover

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1030 DIMM door" on page 66
- "1070 Keyboard" on page 70
- "1080 Middle cover" on page 72
- "1090 Hinge cover" on page 73
- "1170 LCD assembly" on page 86
- "2080 LCD front bezel" on page 102
- "2090 Inverter card" on page 103
- "3010 LCD cable assembly" on page 105
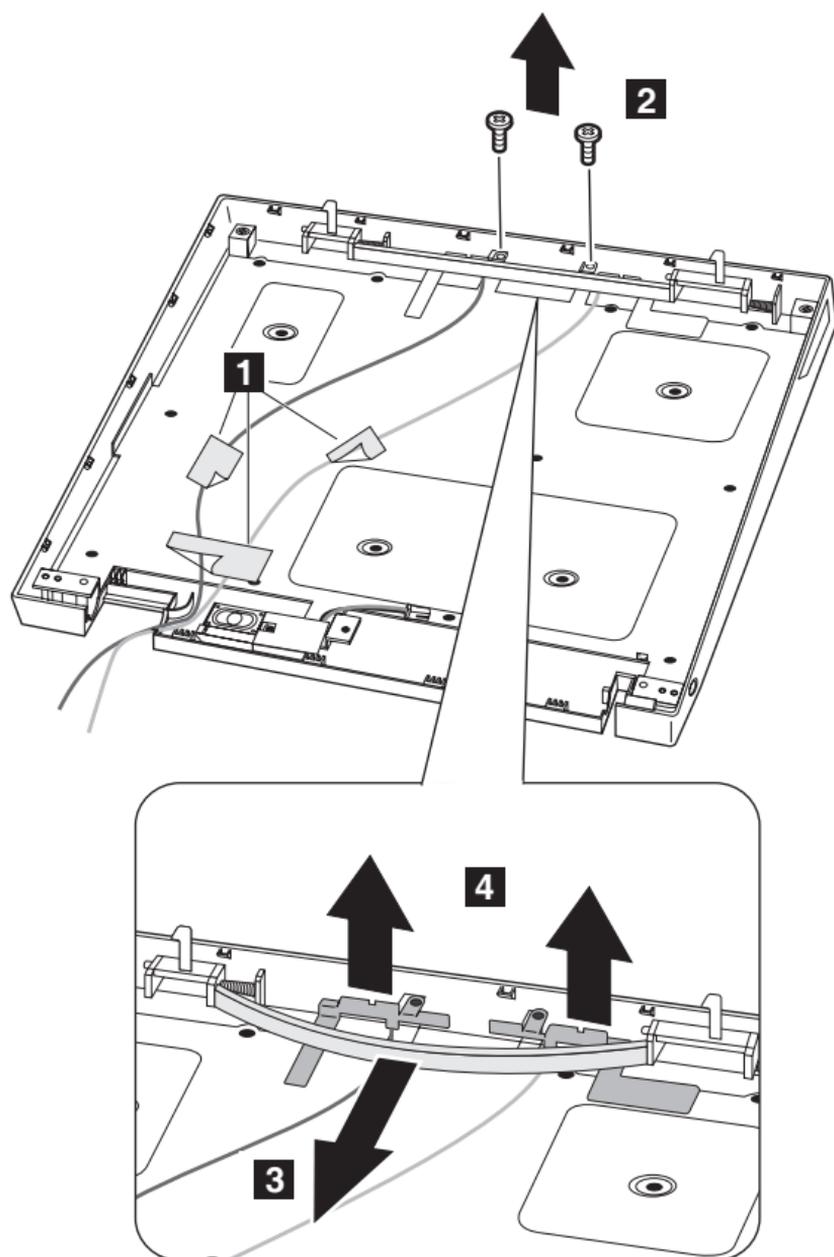
Step	Screw (quantity)	Torque
2	M2.0 × 3.5 mm, Black (2)	0.3 Nm (3.2 kgfcm)

3030 LCD panel and hinge assembly

For access, remove these FRUs, in order:
- "1010 Battery pack" on page 63
- "1070 Keyboard" on page 70
- "1090 Hinge cover" on page 73
- "1170 LCD assembly" on page 86
- "2080 LCD front bezel" on page 102
- "2090 Inverter card" on page 103
- "3010 LCD cable assembly" on page 105
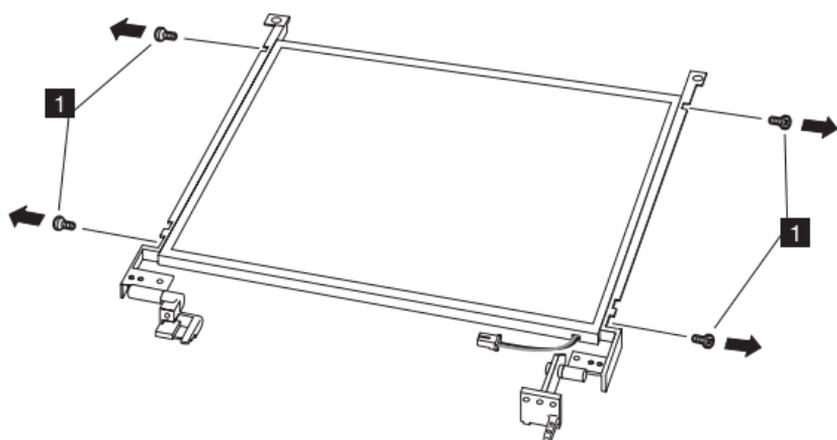
Step	Screw (quantity)	Torque
1	M2.0 × 4 mm, Silver (4)	0.25 Nm (2.5 kgfcm)

Locations

Front view

1	System status indicators
2	Power status indicators
3	Power switch
4	PC card slots
5	PC card eject button
6	CD/DVD drive eject button
7	CD/DVD drive
8	TrackPoint stick
9	TrackPoint buttons
10	Access IBM button
11	Volume control buttons
12	Monaural speaker
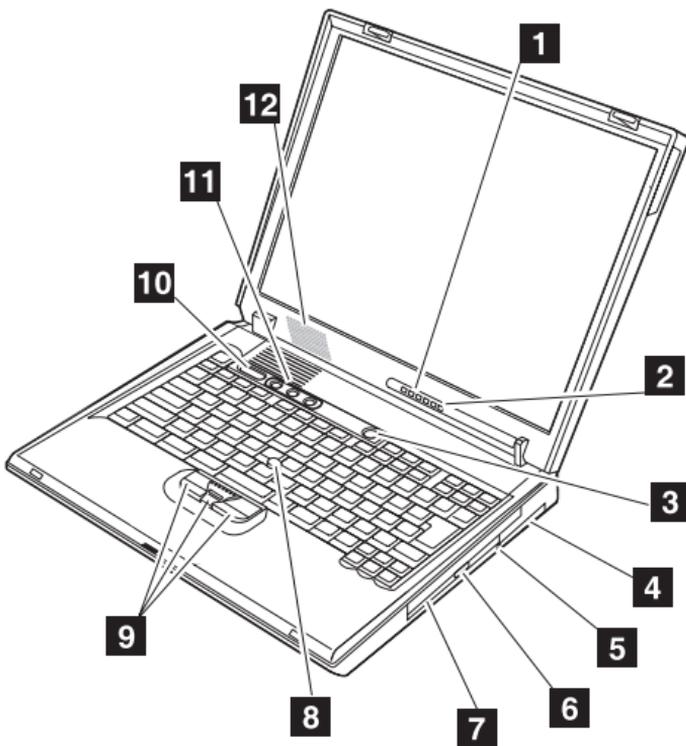
Rear view

1	AC power connector
2	Modem connector
3	Ethernet connector
4	Universal serial bus (USB) connectors
5	PS/2 connector
6	Parallel connector
7	External-monitor connector
8	Security keyhole
9	Power status indicators
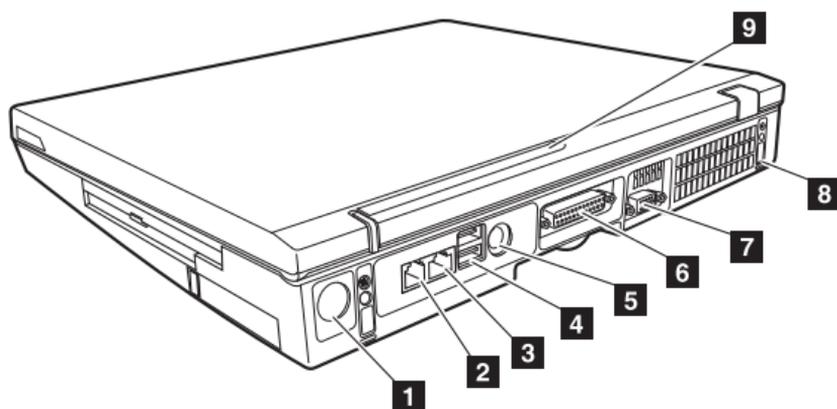
Bottom view

1	LCD latch
2	Battery pack
3	Battery pack latch
4	DIMM slots
5	USB connectors
6	Floppy disk drive
7	Floppy disk drive eject button
8	Stereo headphone jack
9	Microphone jack
10	Hard disk drive
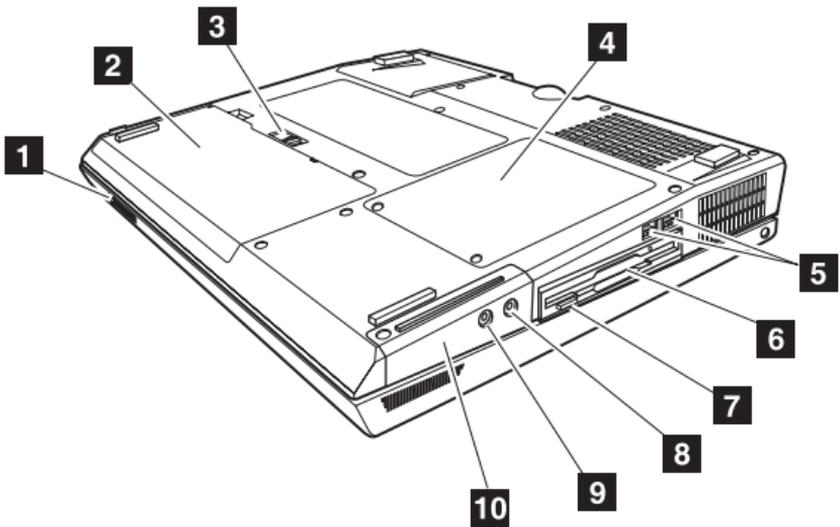
Parts list

G40, G41 series

The G40, G41 series includes several models. The following table summarizes the characteristics of each model, to help you determine which FRU in the parts list meets your need.

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT Cel 2.2G/memory, 128 MB/HDD, 20 GB				
2387 79x	14.1 in, XGA	CD-ROM	Open	NiMH, 8 cell
CPU, P4 DT Cel 2.2G/memory, 128 MB/HDD, 30 GB				
2388 7Ax	14.1 in, XGA	CD-ROM	802.11b	Lithium, 6 cell
2388 7Bx				
2388 7Cx				
2388 7Fx				NiMH, 8 cell
CPU, P4 DT Cel 2.2G/memory, 256 MB/HDD, 30 GB				
2388 7Dx	14.1 in, XGA	CD-ROM	Open	Lithium, 6 cell
2388 7Gx			802.11b	NiMH, 8 cell
2388 7Jx			Open	
2388 7Zx				
2388 7Lx		DVD		Lithium, 6 cell
2388 7Hx				
2388 7Mx				Lithium, 12 cell
2388 7Nx		Combo		
2388 7Kx				NiMH, 8 cell
2388 7Yx				
CPU, P4 DT Cel 2.2G/memory, 256 MB/HDD, 40 GB				
2388 7Px	14.1 in, XGA	Combo	802.11b	Lithium, 12 cell
2388 7Qx			Open	
CPU, P4 DT Cel 2.2G/memory, 128 MB/HDD, 30 GB				
2388 8Cx	15 in, XGA	CD-ROM	Open	NiMH, 8 cell

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 2.2G/memory, 256 MB/HDD, 30 GB				
2388 8Ax	15 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2388 8Dx		DVD	802.11b	Lithium Ion, 12 cell
2388 8Ex			Open	
2388 8Fx				
CPU, P4 DT 2.2G/memory, 256 MB/HDD, 40 GB				
2388 8Bx	15 in, XGA	CD-ROM	802.11b	Lithium Ion, 6 cell
2388 8Gx		DVD	Open	
2388 8Hx		Combo	802.11b	
2388 8Jx			Open	Lithium Ion, 12 cell
CPU, P4 DT 2.6G/memory, 128 MB/HDD, 30 GB				
2388 9Ax	14.1 in, XGA	CD-ROM	802.11b	Lithium Ion, 6 cell
2388 9Bx			Open	
2388 9Cx				
CPU, P4 DT 2.6G/memory, 256 MB/HDD, 30 GB				
2388 9Gx	14.1 in, XGA	DVD	Open	Lithium Ion, 6 cell
2388 9Dx				
2388 9Hx				Lithium Ion, 12 cell
2388 9Ex		Combo		Lithium Ion, 6 cell
2388 9Jx				Lithium Ion, 12 cell
CPU, P4 DT 2.6G/memory, 256 MB/HDD, 40 GB				
2388 9Mx	14.1 in, XGA	DVD	Open	Lithium Ion, 6 cell
2388 9Qx		Combo		
2388 9Rx			802.11b	Lithium Ion, 12 cell
2388 9Sx			Open	

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 2.6G/memory, 128 MB/HDD, 30 GB				
2388 AAx	15 in, XGA	CD-ROM	802.11b	Lithium Ion, 6 cell
2388 ABx			Open	
2388 AEx				NiMH, 8 cell
CPU, P4 DT 2.6G/memory, 256 MB/HDD, 30 GB				
2388 ACx	15 in, XGA	CD-ROM	802.11b	NiMH, 8 cell
2388 ADx			Open	
2388 AYx				
2388 AKx		DVD		Lithium Ion, 6 cell
2388 AFx			802.11b	Lithium Ion, 12 cell
2388 AGx			Open	
2388 AMx		Combo		
2388 ANx				
2388 APx				NiMH, 8 cell
2388 AZx				
2388 B1x	15 in, SXGA+			Lithium Ion, 12 cell
CPU, P4 DT 2.6G/memory, 128 MB/HDD, 40 GB				
2388 AHx	15 in, XGA	CD-ROM	802.11b	Lithium Ion, 6 cell
2388 AJx			Open	
CPU, P4 DT 2.6G/memory, 256 MB/HDD, 40 GB				
2388 ALx	15 in, XGA	DVD	Open	Lithium Ion, 6 cell
2388 AQx				
2388 AUx				Lithium Ion, 12 cell
2388 ARx		Combo		Lithium Ion, 6 cell
2388 ASx				
2388 ATx			802.11 a/b	Lithium Ion, 12 cell
2388 AVx			Open	
2388 B2x			802.11b	

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 2.6G/memory, 256 MB/HDD, 40 GB				
2388 B1x-B3x	15 in, SXGA+	Combo	Open	Lithium Ion, 12 cell
CPU, P4 DT 2.6G/memory, 256 MB/HDD, 60 GB				
2388 AWx	15 in, XGA	Combo	802.11 a/b	Lithium Ion, 12 cell
CPU, P4 DT 2.8G/memory, 256 MB/HDD, 40 GB				
2388 C1x	15 in, XGA	Combo	Open	Lithium Ion, 12 cell
2388 C2x				
CPU, P4 DT 3.0G/memory, 256 MB/HDD, 30 GB				
2388 BAx	14.1 in, XGA	DVD	Open	Lithium Ion, 12 cell
CPU, P4 DT 3.0G/memory, 256 MB/HDD, 40 GB				
2388 BAx - BBx	15 in, XGA	Combo	802.11b	Lithium Ion, 12 cell
2388 BCx			Open	
2388 BDx - BLx	15 in, SXGA+			
CPU, P4 DT 3.0G/memory, 256 MB/HDD, 60 GB				
2388 BDx	15 in, SXGA+	Combo	802.11 a/b	Lithium Ion, 12 cell
2388 BEx				
2388 BFx			Open	
2388 BMx				
CPU, P4 DT 3.0G/memory, 512 MB/HDD, 60 GB				
2388 BNx	15 in, SXGA+	Combo	802.11 a/b	Lithium Ion, 12 cell
CPU, P4 DT Cel 2.2G/memory, 256 MB/HDD, 30 GB				
2389 7Ex	14.1 in, XGA	CD-ROM	802.11 a/b	Lithium Ion, 12 cell
2389 7Jx			Open	NiMH, 8 cell
2389 7Zx				
2389 7Kx		Combo		
2389 7Yx				

(continued)

Parts list

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 2.6G/memory, 256 MB/HDD, 30 GB				
2389 9Fx	14.1 in, XGA	CD-ROM	802.11 a/b	Lithium Ion, 12 cell
2389 ACx	15 in, XGA			NiMH, 8 cell
2389 ADx			Open	
2389 AYx				
2389 APx		Combo		
2389 AZx				
CPU, P4 DT 2.6G/memory, 256 MB/HDD, 40 GB				
2389 AWx - ATx	15 in, XGA	Combo	802.11 a/b	Lithium Ion, 12 cell
2388 99x	14.1, XGA	Combo	Open	
2388 A8x	15 in, XGA			
2388 A9x				
CPU, P4 DT 2.2G/memory, 256 MB/HDD, 30 GB				
2388 88x	15 in, XGA	DVD	Open	Lithium Ion, 12 cell
2388 89x				
CPU, P4 DT 2.2G/memory, 256 MB/HDD, 30 GB				
2388 A7x	15 in, XGA	DVD	Open	Lithium Ion, 12 cell
CPU, P4 DT 3.0G/memory, 256 MB/HDD, 40 GB				
2388 B8x	15 in, XGA	Combo	802.11 a/b	Lithium Ion, 12 cell
2388 B9x			Open	
CPU, P4 DT 2.2G/memory, open/HDD, open				
2388 CAx	14.1 in, XGA	Open	802.11 a/b	Open
2388 CBx			Open	

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 2.6G/memory, open/HDD, open				
2388 CJx	14.1 in, XGA	Open	802.11 a/b	Open
2388 CKx			Open	
2388 CCx	15 in, XGA		802.11 a/b	
2388 CDx			Open	
CPU, P4 DT Cel 2.2G/memory, open/HDD, 30 GB				
2389 CEx	14.1 in, XGA	Open	802.11b	NiMH, 8 cell
2389 CFx			Open	
CPU, P4 DT 2.6G/memory, open/HDD, 30 GB				
2389 CGx	15 in, XGA	Open	802.11b	NiMH, 8 cell
2389 CHx			Open	
CPU P4 DT Cel 2.4G/memory 128 MB/HDD 20 GB				
2388 DA+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2388 DB+				NiMH, 8 cell
CPU P4 DT Cel 2.4G/memory 256 MB/HDD 20 GB				
2388 DC+	14.1 in, XGA	CD-ROM	Open	NiMH, 8 cell
CPU P4 DT Cel 2.4G/memory 128 MB/HDD 30 GB				
2388 DD+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2388 DE+			802.11b	
CPU P4 DT Cel 2.4G/memory 256 MB/HDD 30 GB				
2388 DF+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2388 DG+				Lithium Ion, 12 cell
2388 DJ+				NiMH, 8 cell
2388 DK+		DVD		Lithium Ion, 6 cell
2388 DM+		Combo		Lithium Ion, 12 cell
2388 DN+				NiMH, 8 cell

(continued)

ThinkPad G40, G41 **117**

Parts list

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT Cel 2.4G/memory, 256 MB/HDD, 40 GB				
2388 DP+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2388 DQ+				
2388 DR+			802.11b	NiMH, 8 cell
CPU, P4 DT Cel 2.4G/memory, 256 MB/HDD, 30 GB				
2388 DS+	15 in, XGA	DVD	Open	Lithium Ion, 12 cell
2388 DT+				
2388 DU+			802.11b	
2388 DV+		Combo	Open	
CPU, P4 DT Cel 2.4G/memory, 256 MB/HDD, 40 GB				
2388 DW+	15 in, XGA	Combo	Open	Lithium Ion, 12 cell
2388 DX+			802.11b	
CPU, P4 DT 2.6G/memory, 256 MB/HDD, 30 GB				
2388 EA+	14.1 in, XGA	DVD	Open	Lithium Ion, 6 cell
CPU, P4 DT 2.8G/memory, 256 MB/HDD, 30 GB				
2388 EB+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2388 ED+	15 in, XGA	Combo		NiMH, 8 cell
CPU, P4 DT 2.8G/memory, 256 MB/HDD, 40 GB				
2388 EE+	15 in, XGA	DVD	Open	Lithium Ion, 12 cell
2388 EF+		Combo		Lithium Ion, 6 cell
2388 EG+				
CPU, P4 DT 2.8G/memory, 256 MB/HDD, 60 GB				
2388 EJ+	15 in, XGA	Combo	802.11 a/b	Lithium Ion, 12 cell
2388 EK+	15 in, SXGA+			
CPU, P4 DT 3.0G/memory, 256 MB/HDD, 40 GB				
2388 EL+	15 in, XGA	DVD	Open	Lithium Ion, 12 cell
2388 EM+		Combo	802.11b	
2388 EN+			802.11 a/b	

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 3.0G/memory, 256 MB/HDD, 60 GB				
2388 EP+	15 in, XGA	Combo	Open	Lithium Ion, 12 cell
CPU, P4 DT 3.0G/memory, 512 MB/HDD, 60 GB				
2388 EQ+	15 in, S+XGA	Combo	802.11b	Lithium Ion, 12 cell
CPU, P4 DT Cel 2.4G/memory, 256 MB/HDD, 30 GB				
2389 DJ+	14.1 in, XGA	CD-ROM	Open	NiMH, 8 cell
2389 DN+		Combo		
CPU, P4 DT 3.0G/memory, 256 MB/HDD, 40 GB				
2389 EM+	15 in, XGA	Combo	802.11b	Lithium Ion, 12 cell
CPU, P4 DT 3.0G/memory, 512 MB/HDD, 60 GB				
2389 EQ+	15 in, S+XGA	Combo	802.11b	Lithium Ion, 12 cell
CPU, P4 DT Cel 2.4G/memory, 256 MB/HDD, 30 GB				
2389 DH+	14.1 in, XGA	CD-ROM	802.11 a/b	Lithium Ion, 12 cell
2384 DL+		DVD	Open	
CPU, P4 DT Cel 2.4G/memory, 256 MB/HDD, 40 GB				
2384 DW+	15 in, XGA	Combo	Open	Lithium Ion, 12 cell
CPU, P4 DT 2.8G/memory, 256 MB/HDD, 30 GB				
2384 EC+	14.1 in, XGA	Combo	Open	Lithium Ion, 12 cell
2384 EH+	15 in, XGA			
CPU, P4 DT Cel 2.4G				
2388 FA+	14.1 in, XGA	Open	Open	Open
2388 FB+			802.11b	
2388 FC+			Open	
2388 FD+			802.11 a/b	
2388 FE+	15 in, XGA		Open	
2388 FF+			802.11 a/b	
2389 FA+	14.1 in, XGA		Open	
2389 FB+			802.11b	

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT Cel 2.5G/memory, 128 MB/HDD, 30 GB				
2388 HA+	14.1 in, XGA	CD-ROM	802.11b	Lithium Ion, 6 cell
2388 HB+			Open	
CPU, P4 DT Cel 2.5G/memory, 256 MB/HDD, 30 GB				
2388 HC+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2388 HD+				
2388 HF+				
2388 HG+		DVD		
2388 HH+		Combo		
2388 HJ+				
2388 HK+	15 in, XGA	DVD	802.11b	Lithium Ion, 12 cell
2388 HL+			Open	
2388 HM+		Combo	802.11b	
2388 HN+			Open	NiMH, 8 cell
CPU, P4 DT Cel 2.5G/memory, 256 MBx2/HDD, 30 GB				
2388 HP+	15 in, XGA	Combo	Open	NiMH, 8 cell
CPU, P4 DT Cel 2.5G/memory, 256 MB/HDD, 40 GB				
2388 HQ+	15 in, XGA	Combo	Open	Lithium Ion, 12 cell
CPU, P4 DT Cel 2.6G/memory, 128 MB/HDD, 30 GB				
2388 JB+	14.1 in, XGA	DVD	Open	Lithium Ion, 6 cell
CPU, P4 DT Cel 2.6G/memory, 256 MB/HDD, 30 GB				
2388 JA+	14.1 in, XGA	CD-ROM	Open	NiMH, 8 cell
2388 JD+	14.1 in, XGA	Combo		
2388 JE+	15 in, XGA	CD-ROM		
2388 JF+		DVD	802.11b	NiMH, 12 cell
2388 JG+			Open	
2388 JH+		Combo	802.11b	
2388 JJ+			Open	NiMH, 8 cell

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT Cel 2.6G/memory, 256 MBx2/HDD, 30 GB				
2388 JK+	15 in, XGA	Combo	Open	NiMH, 8 cell
CPU, P4 DT Cel 2.6G/memory, 256 MB/HDD, 40 GB				
2388 JL+	15 in, XGA	DVD	Open	Lithium Ion, 12 cell
2388 JM+		Combo	802.11b	
2388 JP+			Open	
2388 JQ+				Lithium Ion, 6 cell
2388 JR+				
CPU, P4 DT 2.8G/memory, 256 MB/HDD, 30 GB				
2388 KA+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2388 KB+		Combo		Lithium Ion, 12 cell
2388 KE+	15 in, XGA	CD-ROM		Lithium Ion, 6 cell
CPU, P4 DT 2.8G/memory, 256 MB/HDD, 40 GB				
2388 KC+	14.1 in, XGA	DVD	Open	Lithium Ion, 6 cell
2388 KD+				
2388 KF+	15 in, XGA			
2388 KG+		Combo	802.11b	Lithium Ion, 6 cell
2388 KJ+			Open	
CPU, P4 DT 2.8G/memory, 512 MB/HDD, 60 GB				
2388 KN+	14.1 in, XGA	Combo	Open	Lithium Ion, 12 cell
2388 KR+	15 in, XGA			

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT Cel 2.5G/memory, 256 MB/HDD, 30 GB				
2389 HJ+	14.1 in, XGA	Combo	Open	NiMH, 8 cell
2389 HN+	15 in, XGA			
2389 HE+	14.1 in, XGA	CD-ROM	802.11 a/b	Lithium Ion, 12 cell
CPU, P4 DT Cel 2.6G/memory, 256 MB/HDD, 30 GB				
2389 JA+	14.1 in, XGA	CD-ROM	Open	NiMH, 8 cell
2389 JE+	15 in, XGA			
2389 JJ+		Combo		
2389 JC+	14.1 in, XGA			Lithium Ion, 12 cell
CPU, P4 DT Cel 2.6G/memory, 256 MB/HDD, 40 GB				
2389 JP+	15 in, XGA	Combo	Open	Lithium Ion, 12 cell
CPU, P4 DT 2.8G/memory, 256 MB/HDD, 30 GB				
2389 KE+	15 in, XGA	CD-ROM	Open	NiMH, 8 cell
CPU, P4 DT 2.8G/memory, 256 MB/HDD, 40 GB				
2389 KH+	15 in, XGA	Combo	802.11 a/b	Lithium Ion, 12 cell
2389 KM+	15 in, SXGA			
CPU, P4 DT Cel 2.6G/memory, 256 MB/HDD, 40 GB				
2384 JN+	15 in, XGA	Combo	802.11 a/b	Lithium Ion, 12 cell
CPU, P4 DT 3.0G/memory, 256 MB/HDD, 40 GB				
2384 KP+	15 in, XGA	Combo	Open	Lithium Ion, 12 cell
2384 KQ+	15 in, SXGA		802.11 a/b	
CPU, P4 DT Cel 2.5G				
2388 LA+	15 in, XGA	Open	Open	Open
CPU, P4 DT Cel 2.6G				
2388 LB+	14.1 in, XGA	Open	Open	Open
2388 LC+	15 in, XGA			

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 2.8G				
2388 LD+	15 in, XGA	Open	Open	Open
CPU, P4 DT Cel 2.4G/memory, 128 MB/HDD, 30 GB				
2881 22+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2881 28+		DVD		
CPU, P4 DT Cel 2.4G/memory, 256 MB/HDD, 30 GB				
2881 23+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2881 24+				
2881 25+		DVD		
2881 26+		Combo		
2881 27+				
2881 29+		DVD		
2881 2A+		Combo		Lithium Ion, 6 cell
2881 2B+		CD-ROM	802.11 b/g	
2881 2E+	15 in, XGA	CD-ROM	Open	
2881 2F+		DVD		Lithium Ion, 12 cell
2881 2G+		Combo	802.11 b/g	
2881 2H+			Open	Lithium Ion, 6 cell
CPU, P4 DT Cel 2.4G/memory, 256 MB/HDD, 40 GB				
2881 2D+	15 in, XGA	Combo	Open	Lithium Ion, 12 cell
CPU, P4 DT Cel 2.4G/memory, 512 MB/HDD, 30 GB				
2881 2C+	15 in, XGA	Combo	Open	Lithium Ion, 6 cell

(continued)

Parts list

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT Cel 2.4G/memory, 256 MB/HDD, 40 GB				
2881 2J+	15 in, XGA	DVD	Open	Lithium Ion, 12 cell
2881 2K+		CD-ROM		
2881 2L+		DVD		
2881 2M+		Combo		
2881 2N+		CD-ROM		
CPU, P4 DT Cel 2.4G/memory, 128 MB/HDD, 40 GB				
2881 2N+	15 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
CPU, P4 DT Cel 2.53G/memory, 128 MB/HDD, 30 GB				
2881 32+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2881 38+		DVD		
CPU, P4 DT Cel 2.53G/memory, 128 MB/HDD, 40 GB				
2881 3N+	15 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
CPU, P4 DT Cel 2.53G/memory, 256 MB/HDD, 30 GB				
2881 33+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2881 34+				
2881 35+		DVD		
2881 36+		Combo		
2881 37+				
2881 39+				
2881 3A+				
2881 3B+		CD-ROM	802.11 b/g	
CPU, P4 DT Cel 2.53G/memory, 512 MB/HDD, 30 GB				
2881 3C+	15 in, XGA	Combo	Open	Lithium Ion, 6 cell

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT Cel 2.53/memory, 256 MB/HDD, 40 GB				
2881 3D+	15 in, XGA	Combo	Open	Lithium Ion, 12 cell
2881 3J+		DVD		
2881 3K+		CD-ROM		Lithium Ion, 6 cell
2881 3L+		DVD		
2881 3K+		Combo		
CPU, P4 DT Cel 2.53/memory, 256 MB/HDD, 30 GB				
2881 3E+	15 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2881 3F+		DVD		Lithium Ion, 12 cell
2881 3G+		CD-ROM	802.11 b/g	
2881 3H+		Combo	Open	Lithium Ion, 6 cell
CPU, P4 DT Cel 2.66G/memory, 256 MB/HDD, 30 GB				
2881 43+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2881 44+				
2881 45+		DVD		
2881 46+		Combo		
2881 48+				
2881 4A+			802.11 b/g	
2881 4D+	15 in, XGA	CD-ROM	Open	
2881 4E+		DVD		Lithium Ion, 12 cell
2881 4F+			802.11 b/g	
2881 4G+		Combo	Open	Lithium Ion, 6 cell

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT Cel 2.66G/memory, 128 MB/HDD, 30 GB				
2881 42+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2881 47+		DVD		
CPU, P4 DT Cel 2.66G/memory, 256 MB/HDD, 40 GB				
2881 49+	14.1 in, XGA	Combo	Open	Lithium Ion, 6 cell
2881 4C+	15 in, XGA			
2881 4H+		DVD		
2881 4K+		CD-ROM		
CPU, P4 DT Cel 2.66G/memory, 512 MB/HDD, 30 GB				
2881 4B+	15 in, XGA	Combo	Open	Lithium Ion, 6 cell
2881 4J+		Multi-burner		
CPU, P4 DT Cel 2.66G/memory, 512 MB/HDD, 40 GB				
2881 4M+	15 in, XGA	Combo	802.11 b/g	Lithium Ion, 6 cell
CPU, P4 DT Cel 2.66G/memory, 256 MB/HDD, 80 GB				
2881 4L+	15 in, XGA	Combo	Open	Lithium Ion, 6 cell
CPU, P4 DT 3.06G/memory, 128 MB/HDD, 30 GB				
2881 57+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
CPU, P4 DT 3.06G/memory, 256 MB/HDD, 30 GB				
2881 54+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2881 55+		Combo		
2881 58+		DVD		
2881 5C+	15 in, XGA	CD-ROM		
2881 5M+		Combo		Lithium Ion, 12 cell
CPU, P4 DT 3.06G/memory, 512 MB/HDD, 30 GB				
2881 5G+	15 in, XGA	Combo	Open	Lithium Ion, 6 cell

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 3.06G/memory, 256 MB/HDD, 40 GB				
2881 52+	14.1 in, XGA	DVD	Open	Lithium Ion, 6 cell
2881 53+				
2881 56+		Combo		
2881 59+			802.11 b/g	
2881 5B+	15 in, XGA		Open	
2881 5A+	15 in, SXGA+		802.11 b/g	
2881 5D+	15 in, XGA	DVD	Open	
2881 5E+		Combo	802.11 b/g	Lithium Ion, 12 cell
2881 5F+			Open	
2881 5H+		CD-ROM		Lithium Ion, 6 cell
2881 5J+		DVD		
2881 5K+		Combo	802.11 b/g	Lithium Ion, 12 cell
2881 5L+				
CPU, P4 DT 3.2G/memory, 256 MB/HDD, 30 GB				
2881 64+	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2881 65+		Combo		
2881 6A+	15 in, XGA	CD-ROM		

(continued

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 3.2G/memory, 256 MB/HDD, 40 GB				
2881 62+	14.1 in, XGA	DVD	Open	Lithium Ion, 6 cell
2881 63+				
2881 66+		Combo		
2881 67+			802.11 b/g	
2881 68+	15 in, SXGA+		Open	
2881 69+	15 in, XGA			
2881 6B+				
2881 6C+			802.11 b/g	Lithium Ion, 12 cell
2881 6D+			Open	
2881 6E+			802.11 b/g	
2881 6F+		Multi-burner	Open	
CPU, P4 DT 3.2G/memory, 512 MB/HDD, 30 GB				
2881 6G+	15 in, XGA	Combo	Open	Lithium Ion, 6 cell
CPU, P4 DT 3.2G/memory, 512 MB/HDD, 30 GB				
2881 6H+	15 in, XGA	DVD	Open	Lithium Ion, 6 cell
CPU, P4 DT Cel 2.4G/memory, 256 MB/HDD, 30 GB				
2882 2P+	14.1 in, XGA	Combo	Open	Lithium Ion, 6 cell
2882 2Q+				
2882 2R+	15 in, XGA	CD-ROM		
2882 2S+		Combo		
2882 2T+	14.1 in, XGA	CD-ROM	802.11 b/g	
2886 2Ux	15 in, XGA	Combo		

(continued

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT Cel 2.4G/memory, open/HDD, open				
2882 2Vx	14.1 in, XGA	Open	Open	Open
2882 2Wx	15 in, XGA			
2886 2Xx	14.1 in, XGA			
2886 2Yx				
2886 2Zx	15 in, XGA			
CPU, P4 DT Cel 2.53G/memory, 256 MB/HDD, 30 GB				
2882 2Px	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2882 2Qx		Combo		
2882 2Rx	15 in, XGA	CD-ROM		
2882 2Sx		Combo		
2882 2Tx	14.1 in, XGA	CD-ROM	802.11 b/g	
2886 2Ux	15 in, XGA	Combo		
CPU, P4 DT Cel 2.53G/memory, open/HDD, open				
2881 3Vx	14.1 in, XGA	Open	Open	Open
2881 3Wx	15 in, XGA			
2886 3Xx	14.1 in, XGA			
2886 3Yx				
2886 3Zx	15 in, XGA			

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT Cel 2.66G/memory, 256 MB/HDD, 30 GB				
2882 4Px	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2882 4Qx		Combo		
2882 4Rx	15 in, XGA	CD-ROM		
2882 4Sx		Combo		
2882 4Tx	14.1 in, XGA	CD-ROM		Lithium Ion, 12 cell
2882 4Ux				Lithium Ion, 6 cell
CPU, P4 DT Cel 2.66G/memory, open/HDD, open				
2881 4Vx	14.1 in, XGA	Open	Open	Open
2881 4Wx	15 in, XGA			
2886 4Xx	14.1 in, XGA			
2886 4Yx				
CPU, P4 DT 3.06G/memory, 256 MB/HDD, 30 GB				
2881 84x	15 in, XGA	Combo	Open	Lithium Ion, 12 cell
2881 87x				
2882 5Px	14.1 in, XGA	CD-ROM		
2882 5Qx		Combo		
2882 5Sx	15 in, XGA	CD-ROM		

(continued

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 3.06G/memory, 256 MB/HDD, 40 GB				
2881 85x	15 in, XGA	Combo	802.11 b/g	Lithium Ion, 12 cell
2881 88x				
2882 5Rx			Open	Lithium Ion, 6 cell
2882 8Xx			802.11 b/g	Lithium Ion, 12 cell
2886 5Tx				Lithium Ion, 6 cell
2886 92x				
CPU, P4 DT 3.06G/memory, 512 MB/HDD, 40 GB				
2881 86x	15 in, XGA	Combo	802.11 b/g	Lithium Ion, 12 cell
2881 72x		Multi-burner	Open	
2881 82x		Combo		
2881 83x				
CPU, P4 DT 3.06G/memory, open/HDD, open				
2881 5Vx	14.1 in, XGA	Open	Open	Open
2881 5Wx	15 in, XGA			
2886 5Xx	14.1 in, XGA			
2886 5Yx				
2886 97x	15 in, SXGA+			
2886 98x	15 in, XGA			

(continued

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 3.2G/memory, 256 MB/HDD, 30 GB				
2882 6Px	14.1 in, XGA	CD-ROM	Open	Lithium Ion, 6 cell
2882 6Qx		Combo		
2882 6Sx	15 in, XGA	CD-ROM		
CPU, P4 DT 3.2G/memory, 256 MB/HDD, 40 GB				
2881 89x	15 in, SXGA+	Combo	Open	Lithium Ion, 6 cell
2881 8Ax		Multi-burner		
2881 8Dx		Combo	802.11 b/g	Lithium Ion, 12 cell
2881 8Gx	15 in, XGA	Multi-burner		
2882 6Rx		Combo	Open	Lithium Ion, 6 cell
2882 8Rx	15 in, SXGA+			
2882 8Sx		Multi-burner		
2882 8Yx	15 in, XGA	Combo	802.11 b/g	Lithium Ion, 12 cell
CPU, P4 DT 3.2G/memory, 512 MB/HDD, 40 GB				
2881 8Bx	15 in, SXGA+	Combo	Open	Lithium Ion, 6 cell
2881 8Jx	15 in, XGA			Lithium Ion, 12 cell
2886 93x	15 in, SXGA+		802.11 b/g	Lithium Ion, 6 cell

(continued)

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 3.2G/memory, 512 MB/HDD, 80 GB				
2881 8Cx	15 in, SXGA+	Combo	Open	Lithium Ion, 6 cell
2881 8Ex	15 in, XGA			Lithium Ion, 12 cell
2881 8Fx				
2881 8Hx			802.11 b/g	
2881 73x	15 in, SXGA+			
2882 8Tx	15 in, XGA		Open	
2882 8Ux				
2882 78x	15 in, SXGA+		802.11 b/g	Lithium Ion, 6 cell
CPU, P4 DT 3.2G/memory, open/HDD, open				
2881 6Vx	14.1 in, XGA	Open	Open	Open
2881 6Wx				
2881 94x	15 in, SXGA+			
2886 6Xx	14.1 in, XGA			
2886 6Xx	15 in, SXGA+			
2886 7Xx				
2886 99x				
2886 9Ax	15 in, XGA			
CPU, P4 DT 3.46G/memory, 256 MB/HDD, 40 GB				
2881 6Jx	14.1 in, XGA	Combo	Open	Lithium Ion, 12 cell
2881 8Px	15 in, XGA		802.11 b/g	
2881 8Qx			Open	
2882 8Nx			802.11 b/g	

(continued)

Parts list

Model	LCD	Bay device	Mini PCI	Battery
CPU, P4 DT 3.46G/memory, 256 MB/HDD, 80 GB				
2881 8Nx	15 in, XGA	Combo	Open	Lithium Ion, 12 cell
CPU, P4 DT 3.46G/memory, 512 MB/HDD, 80 GB				
2881 74x	15 in, SXGA+	Multi-burner	802.11 b/g	Lithium Ion, 12 cell
2881 75x				
2881 76x		Combo		
2881 8Kx				
2881 8Lx				
2881 8Mx		Multi-burner		
2882 77x				
2882 8Vx		Combo		
2886 79x		Multi-burner		Lithium Ion, 6 cell
CPU, P4 DT 3.46G/memory, open/HDD, open				
2881 7Vx	15 in, SXGA+	Open	Open	Open
2881 7Wx	15 in, XGA			
2881 95x	15 in, SXGA+			
2881 96x	15 in, XGA			
2886 7Yx	15 in, SXGA+			
2886 9Bx				
2886 9Cx	15 in, XGA			

(continued)

- Each FRU is available for all types or models, unless specific types or models are specified.

- A CRU (customer replaceable unit) is identified by a single asterisk (*) or two asterisks (**) in the CRU ID column. An N in the CRU ID column means the part is not a CRU. A single asterisk (*) means the part is a Tier 1 CRU; two asterisks (**) means the part is a Tier 2 CRU.

- FRUs marked with `OP` are available as options.

Overall
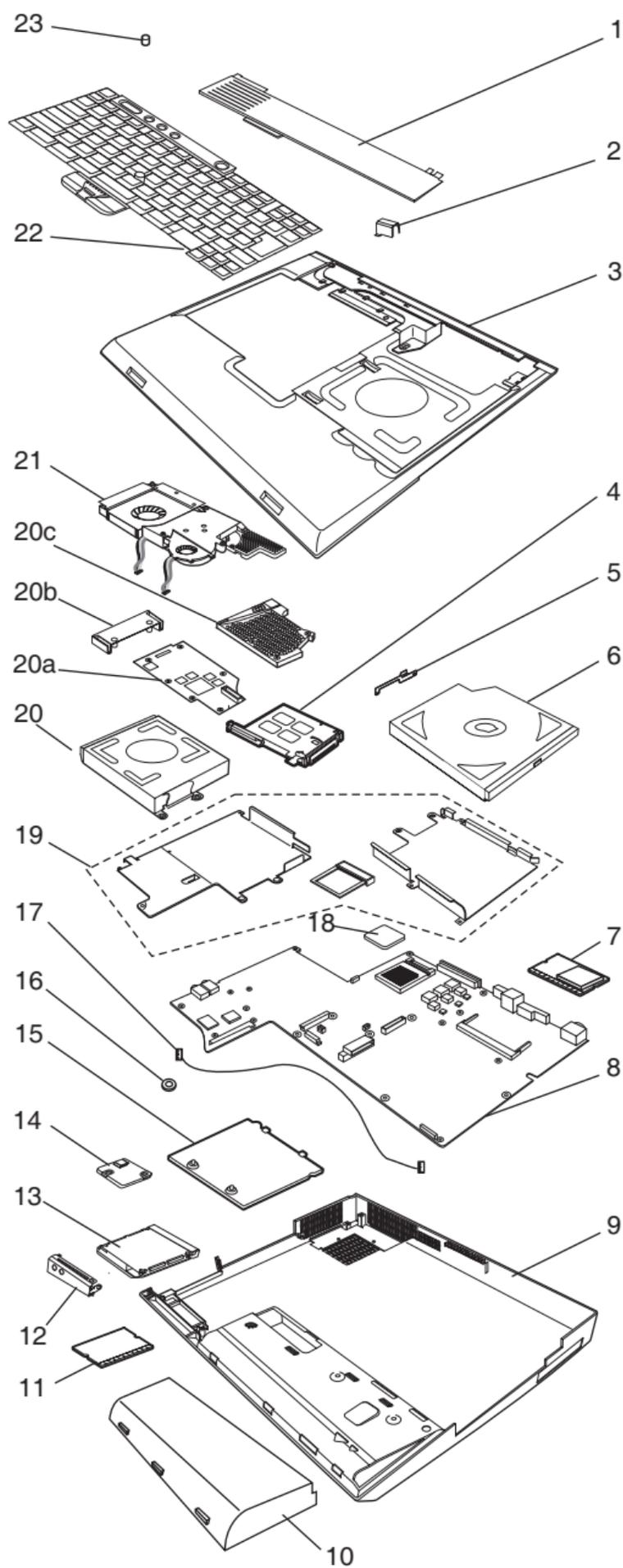
No.	FRU	P/N	CRU ID
1	Middle cover ASM	91P8539	**
2	Hinge cap	91P8533	*
3	Upper case-KBD bezel (*1) refer to item 24	91P8538	N
	Upper case-KBD bezel (*1) refer to item 24	26R8030	
4	PC card slot	91P8537	N
	PC card slots	26R8086	
5	ODD bracket	91P8803	N
6	CD-ROM TEAC CD-224E-C (bare) with bracket	13N6710	**
	CD-ROM HLDS CRN-8245B (bare) with bracket	08K9841	
	DVD MKE SR-8177 (bare) with bracket	08K9845	
	DVD Toshiba SD-C2612 (bare) with bracket	92P6037	
	Combo IV x24x10x8x24 TEAC DW-224E (bare) with bracket	92P6016	
	Combo IV EC x24x10x8x24 TEAC DW-224A13 (bare) with bracket	92P6105	
	Combo IV x24x10x8x24 KME UJDA-740 (bare) with bracket	92P6065	
	Combo IV EC x24x10x8x24 KME UJDA-750 (bare) with bracket	92P6102	
	CD-R HLDS CRN-8245B (bare)	92P6565	
	DVD HLDS GDR-8082N (bare)	92P6567	
	DVD MKE SR-8178 DBZ2 (bare)	92P6571	
	Combo PCC UJDA-760BM2 (bare)	92P6563	
	Combo HLDS GCC-4241N-IMJO (bare)	92P6569	
	Multi PCC UJ-830 (bare)	13N6827	
	Multi PCC UJ-811 (bare)	92P6575	

No.	FRU	P/N	CRU ID
7	802.11 a/b Philips Wireless Card - W/W except JP/China	91P7263	N
	802.11 a/b Philips Wireless Card - Japan	26P8447	
	802.11 a/b Philips Wireless Card - China	26P8446	
	802.11b Actiontec Wireless Card (IBM High Rate Wireless LAN Mini PCI Adapter III)	91P7261	
	802.11 b/g Clymer Wireless Card - US	93P3475	
	802.11 b/g Clymer Wireless Card - ROW	93P3477	
	802.11a/b/g Bartlett Wireless Card - US	93P4262	
	802.11a/b/g Bartlett Wireless Card - EMEA	93P4264	
	802.11a/b/g Bartlett Wireless Card - JP	93P4266	
8	System board with bottom heatsink from 238-1xx to 238x-5xx	93P3314	N
	System board with bottom heatsink from 238x-7xx to 238x-9xx and 238x-Axx to 238x-Cxx	93P3318	
	System board for Celeron	93P4273	
	System board for Prescott - Integrated VGA	93P4274	
	System board for Prescott - External VGA	93P4275	
9	Lower case with label W/W -wireless	91P8540	N
	Lower case with label EMEA -wireless	91P8541	
	Lower case with label IIPC -wireless	91P8542	
	Lower case with label Korea -wireless	91P8543	
	Lower case with label Taiwan -wireless	91P8544	
	Lower case with label W/W -no wireless	91P8545	
	Lower case with label EMEA -no wireless	91P8546	
	Lower case with label IIPC -no wireless	91P8547	
	Lower case with label Korea -no wireless	91P8548	
	Lower case with label Taiwan -no wireless	91P8549	

No.	FRU	P/N	CRU ID
9	Lower case with label India-all models	91P8550	N
	Lower case with label wireless and model related	91P8625	
	Lower case with label M/T 2389 W/W -wireless	13N5265	
	Lower case with label M/T 2384 W/W -wireless	13N5002	
	Lower case with label M/T 2384 W/W -no wireless	13N5038	
	Lower case with label M/T 2881 W/W - wireless	26R8016	
	Lower case with label M/T 2881 EMEA - wireless	26R8017	
	Lower case with label M/T 2881 IIPC - wireless	26R8018	
	Lower case with label M/T 2881 Korea - wireless	26R8019	
	Lower case with label M/T 2881 Taiwan - wireless	26R8020	
	Lower case with label M/T 2881 Brazil - wireless	91P8799	
	Lower case with label M/T 2881 W/W - no wireless	26R8021	
	Lower case with label M/T 2881 EMEA - no wireless	26R8022	
	Lower case with label M/T 2881 IIPC - no wireless	26R8023	
	Lower case with label M/T 2881 Korea - no wireless	26R8024	
	Lower case with label M/T 2881 Taiwan - no wireless	26R8025	
	Lower case with label M/T 2881 Brazil - no wireless	91P8800	
	Lower case with label India - all models	26R8083	
	Lower case with label M/T 2882 W/W - wireless	26R8033	
	Lower case with label M/T 2882 W/W - no wireless	91P8729	
	Lower case with label M/T 2882 Brazil - wireless	91P8801	
	Lower case with label M/T 2882 Brazil - no wireless	91P8802	
	Lower case with label M/T 2886 W/W - wireless	26R8031	
	Lower case with label M/T 2886 W/W - no wireless	26R8032	
	Label wireless and model related	91P8689	

No.	FRU	P/N	CRU ID
10	Main battery Li-Ion 4P3S Sanyo up to 2.8 GHz model	08K8179	*
	Main battery Li-Ion 4P3S Panasonic up to 2.8 GHz model	08K8181	
	Main battery Li-Ion 4P3S Sanyo 3 GHz model	92P0994	
	Main battery Li-Ion 4P3S Panasonic 3 GHz model	92P0996	
	Main battery Li-Ion 2P3S Sanyo	08K8183	
	Main battery Li-Ion 2P3S Panasonic	08K8185	
	Main battery Li-Ion high rate 6 cell	92P1057	
	Main battery Ni-MH 8S Sanyo	08K8187	
	Dummy battery cover	13N5218	
11	CARD ASM DDR - 128 MB	10K0029	**
	CARD ASM DDR - 256 MB	10K0031	
	CARD ASM DDR - 512 MB	10K0033	
	CARD ASM DDR - 1024 MB	10K0035	
12	HDD cover	91P8552	*
13	HDD with tray & screws 20 GB Hitachi DK23EA-20	92P6017	*
	HDD with tray & screws 20 GB Fujitsu MHS2020AT	92P6019	
	HDD with tray & screws 40 GB Hitachi DK23EA-40	92P6021	
	HDD with tray & screws 40 GB Fujitsu MHS2040T	92P6023	
	HDD with tray & screws 20 GB Hitachi IC25N020ATMR04	92P6086	
	HDD with tray & screws 30 GB Hitachi IC25N030ATMR04	92P6088	
	HDD with tray & screws 40 GB Hitachi IC25N040ATMR04	92P6090	
	HDD with tray & screws 60 GB Hitachi IC25N060ATMR04	92P6092	
	HDD with tray & screws 20 GB Fujitsu MHT2020AT	92P6094	
	HDD with tray & screws 30 GB Fujitsu MHT2030AT	92P6096	
	HDD with tray & screws 40 GB Fujitsu MHT2040AT	92P6098	
	HDD with tray & screws 80 GB Moraga B	92P6123	
	HDD with tray & screws 60 Moraga C	92P6122	
	HDD with tray & screws 40 Moraga B	92P6119	
	HDD with tray & screws 40 Toshiba Proteus	92P6121	

No.	FRU	P/N	CRU ID
14	CDC Modem card	91P7657	**
	MDC II Modem card	93P4166	
15	DIMM door	91P8553	*
16	RTC battery	92P0992	N
17	Cable kit - RJ-11 x1, FPC FDD x1	91P6794	N
18	CPU DT-P4 Cel 2.0 GHz C1 stepping	91P7248	N
	CPU DT-P4 Cel 2.0 GHz D1 stepping	91P7399	
	CPU DT-P4 Cel 2.2 GHz D1 stepping	91P7397	
	CPU DT-P4 2.2 GHz D1 stepping	91P7404	
	CPU DT-P4 Cel 2.4 GHz D1 stepping	91P7398	
	CPU DT-P4 Cel 2.4 GHz D1 stepping	93P4283	
	CPU DT-P4 Cel 2.53 GHz D1 stepping	93P4284	
	CPU DT-P4 Cel 2.67 GHz D1 stepping	93P4285	
	CPU DT-P4 Cel 2.58 GHz D1 stepping	27K9913	
	CPU DT-P4 2.4 GHz C1 stepping	91P7249	
	CPU DT-P4 2.4 GHz D1 stepping	91P7400	
	CPU DT-P4 2.5 GHz D1 stepping	93P4195	
	CPU DT-P4 2.6 GHz D1 stepping	93P4196	
	CPU DT-P4 2.7 GHz D1 stepping	93P4197	
	CPU DT-P4 2.8 GHz D1 stepping	93P4198	
	CPU DT-P4 2.6 GHz C1 stepping	91P7250	
	CPU DT-P4 2.6 GHz D1 stepping	91P7401	
	CPU DT-P4 2.8 GHz C1 stepping	91P7251	
	CPU DT-P4 2.8 GHz D1 stepping	91P7402	
	CPU DT-P4 3.0 GHz C1 stepping	91P7252	
	CPU DT-P4 3.0 GHz D1 stepping	91P7403	
	CPU DT-P4 3.07 GHz D1 stepping	93P4286	
	CPU DT-P4 3.2 GHz D1 stepping	93P4287	
	CPU DT-P4 3.47 GHz D1 stepping	93P4288	
	CPU DT-P4 3.6 GHz D1 stepping	93P4289	
19	Misc. parts kit (HDD/optical shields, CPU fixture) (*1) refer to item 24	91P8554	N
	Misc. parts kit (HDD/optical shields, CPU fixture) (*1) refer to item 24	26R8040	
20	FDD TEAC with bracket & screws	92P5986	N
	FDD SONY with bracket & screws	92P5988	
20a	External VGA card - 64 MB	93P4276	N
	External VGA card - 128 MB	93P4294	
20b	Blank bezel FDD	13N5497	N
	Blank bezel FDD with vent	26R8015	

No.	FRU	P/N	CRU ID
20c	Heatsink - VGA External card	26R8043	N
21	Fan ASM	91P8535	N
	Fan ASM -CPU 3 GHz	91P8536	
	Fan/heatsink ASM for F4	26R8028	
	NB heatsink with hex screw	26R8087	
22	Keyboard** (see "Keyboard" on page 146.)		
23	Pointing stick cap (standard)	91P9642	*
	Pointing stick cap (convex)	91P8422	
	Pointing stick cap (flare)	91P8423	
	Pointing stick cap (hair composition)	84G6535	
24	Rubber/tape kit from 238x-7xx to 238x09xx and 238x-Axx to 238x-Cxx	13N5549	N
	Rubber/tape kit - rubber foot x4, screw cap x4	26R8042	

LCD FRUs
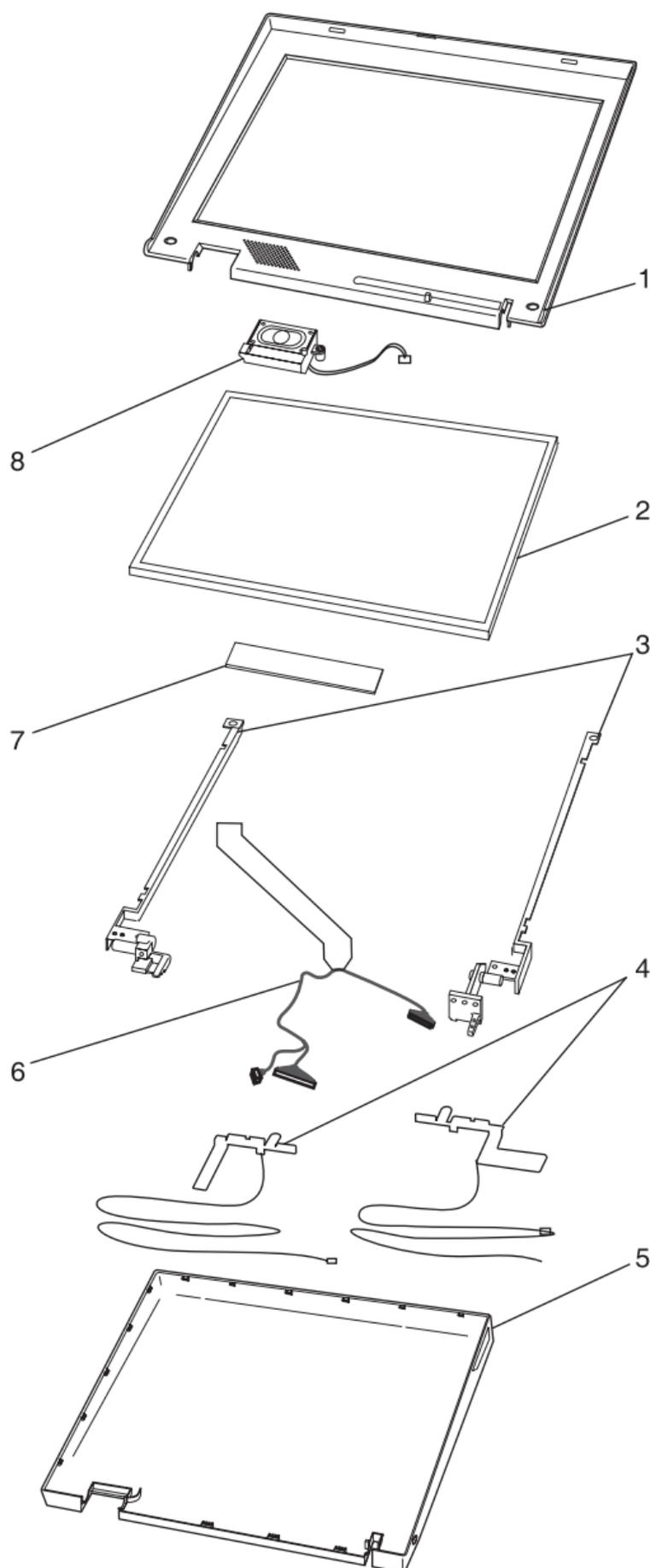
14.1 in. TFT

No.	FRU	P/N	CRU ID
1	LCD Bezel ASM (*1) refer to item 24	91P8531	N
	LCD Bezel ASM - no Wireless LED (*1) refer to item 24	26R8027	
	LCD Bezel ASM - Wireless LED (*1) refer to item 24	26R8085	
2	LCD Panel ASM Hydis	92P6636	N
	LCD Panel ASM IDT	92P6638	
	LCD Panel ASM AUO	92P6692	
3	LCD Hinge/bracket kit (*1) refer to item 23	91P8532	N
4	Wireless antenna kit	91P8551	N
5	LCD Rear Cover ASM - Wireless	91P8528	N
	LCD Rear Cover ASM - no Wireless	91P8529	
	LCD Rear Cover ASM - Wireless	91P8677	
	LCD Rear Cover ASM - no Wireless	91P8678	
6	LCD Cable ASM	91P6793	N
	LCD Cable ASM XGA HighTech	91P6820	
	LCD Cable ASM Foxconn	91P6864	
7	LCD Inverter/LED card Sumida	91P7197	N
	LCD Inverter/LED card Ambit	91P7281	
8	Speaker ASM	91P8198	N

15 in. TFT

No.	FRU	P/N	CRU ID
1	LCD Bezel ASM (*1) refer to item 24	91P8530	N
	LCD Bezel ASM - no Wireless LED (*1) refer to item 24	26R8026	
	LCD Bezel ASM - Wireless LED (*1) refer to item 24	26R8084	
2	LCD Panel ASM XGA LGP	11P8310	N
	LCD Panel ASM XGA Hitachi	92P6657	
	LCD Panel ASM SXGA+ Samsung	92P6667	
	LCD Panel ASM SXGA+ Hitachi	92P6659	
	LCD Panel ASM XGA LGP	92P6694	
	LCD Panel ASM XGA Hitachi	92P5580	
	LCD Panel ASM SXGA Hitachi	92P5581	
3	LCD Hinge/bracket kit	91P8534	N
4	Wireless antenna kit (*1) refer to item 24	91P8551	N

No.	FRU	P/N	CRU ID
5	LCD Rear Cover ASM - Wireless	91P8528	N
	LCD Rear Cover ASM - no Wireless	91P8529	
	LCD Rear Cover ASM - Wireless	91P8677	
	LCD Rear Cover ASM - no Wireless	91P8678	
6	LCD Cable ASM XGA	91P6792	N
	LCD Cable ASM SXGA+	91P6797	
	LCD Cable ASM XGA HighTech	91P6821	
	LCD Cable ASM SXGA+ HighTech	91P6822	
	LCD Cable ASM XGA Foxconn	91P6865	
	LCD Cable ASM SXGA Foxconn	91P6866	
7	LCD Inverter/LED card Sumida	91P7197	N
	LCD Inverter/LED card Ambit	91P7281	
8	Speaker ASM	91P8198	N

Keyboard

All of the keyboards listed below are Tier 2 CRUs
(customer replaceable units).

Language	P/N (NMB)	P/N (Chicony)
Arabic	91P8172	91P8116
Belgian	91P8166	91P8110
Chinese, Traditional	91P8192	91P8136
Czech	91P8180	91P8124
Danish	91P8160	91P8104
Dutch	91P8154	91P8098
English, U.K.	91P8150	91P8094
English, U.S.	91P8152	91P8086
French, Canadian	91P8144	91P8088
French, European	91P8152	91P8096
German	91P8148	91P8092
Greek	91P8184	91P8128
Hungarian	91P8182	91P8126
Hebrew	91P8176	91P8120
Italian	91P8162	91P8106
Japanese	91P8190	91P8134
Korean	91P8194	91P8138
Norwegian	91P8158	91P8102
Portuguese	91P8170	91P8114
Russian	91P8174	91P8118
Slovakian	91P8188	91P8132
Slovenian	91P8186	91P8130
Spanish, European	91P8164	91P8108
Spanish, Latin American	91P8146	91P8090
Swedish or Finnish	91P8156	91P8100
Swiss	91P8168	91P8112
Turkish	91P8178	91P8122

Recovery CDs

All of the Recovery CDs listed below are Tier 1 CRUs (customer replaceable units).

Windows XP Home Edition (for G40)

Windows XP Home Edition is preinstalled as the operating system in some models.

Language	P/N
Arabic	01R7751
Chinese, Simplified	01R7940
Chinese, Traditional	01R7939
Chinese, Traditional (Hong Kong S.A.R.)	01R7941
Czech	01R7752
Danish	01R7742
Dutch	01R7749
English, U.K.	01R7740
English, U.S.	01R7739
Finnish	01R7748
French	01R7743
German	01R7744
Greek	01R7756
Hebrew	01R7753
Hungarian	01R7757
Italian	01R7747
Japanese	01R7942
Norwegian	01R7750
Polish	01R7754
Portuguese	01R7741
Russian	01R7758
Spanish	01R7745
Swedish	01R7746
Turkish	01R7755

Windows XP Home Edition (for G41)

Windows XP Home Edition is preinstalled as the operating system in some models.

Language	P/N
Arabic	24R6043
Chinese, Simplified	24R6036
Chinese, Traditional	24R6037
Chinese, Traditional (Hong Kong S.A.R.)	24R6038

Parts list

Language	P/N
Czech	24R6042
Danish	24R6032
Dutch	24R6035
English, U.K.	24R6025
English, U.S.	24R6024
Finnish	24R6033
French	24R6026
German	24R6027
Greek	24R6047
Hebrew	24R6040
Hungarian	24R6046
Italian	24R6029
Japanese	24R6039
Norwegian	24R6034
Polish	24R6041
Portuguese	24R6030
Russian	24R6044
Spanish	24R6028
Swedish	24R6031
Turkish	24R6045

Windows XP Professional (for G40)

Windows XP Professional is preinstalled as the operating system in some models.

Language	P/N
Arabic	01R7851
Chinese, Simplified	01R7944
Chinese, Traditional	01R7943
Chinese, Traditional (Hong Kong S.A.R.)	01R7945
Czech	01R7852
Danish	01R7842
Dutch	01R7849
English, U.K.	01R7840
English, U.S.	01R7839
Finnish	01R7848
French	01R7843
German	01R7844
Greek	01R7856
Hebrew	01R7853

Language	P/N
Hungarian	01R7857
Italian	01R7847
Japanese	01R7946
Norwegian	01R7850
Polish	01R7854
Portuguese	01R7841
Russian	01R7858
Spanish	01R7845
Swedish	01R7846
Turkish	01R7855

Windows XP Professional (for G41)
Windows XP Professional is preinstalled as the operating system in some models.

Language	P/N
Arabic	24R5851
Chinese, Simplified	24R5844
Chinese, Traditional	24R5845
Chinese, Traditional (Hong Kong S.A.R.)	24R5846
Czech	24R5850
Danish	24R5840
Dutch	24R5843
English, U.K.	24R5833
English, U.S.	24R5832
Finnish	24R5841
French	24R5834
German	24R5835
Greek	24R5855
Hebrew	24R5848
Hungarian	24R5854
Italian	24R5837
Japanese	24R5847
Norwegian	24R5842
Polish	24R5849
Portuguese	24R5838
Russian	24R5852
Spanish	24R5836
Swedish	24R5839
Turkish	24R5853

Windows 2000 (for G40)

Windows 2000 is preinstalled as the operating system in some models.

Language	P/N
Japanese	01R7979

Miscellaneous parts

FRU	P/N
Screw kit (including nylon-coated screws)	91P8555
Screw kit (including nylon-coated screws, M3 HDD shield, M2.5 middle cover wireless)	26R8041
Rubber/mylar kit	91P8556
Thermal grease	91P9542
LG/IBM Logo kit	08K5860
LG/IBM Logo kit - New	91P8690

AC adapters

All of the ac adapters listed below are Tier 1 CRUs (customer replaceable units).

FRU	P/N
AC ADAPTER 120W 2-prong Non-PFC Delta	02K7086
AC ADAPTER 120W 2-prong Non-PFC Liteon	02K7092
AC ADAPTER 120W 3-prong PFC Delta	02K7088
AC ADAPTER 120W 3-prong PFC Liteon	02K7094
AC ADAPTER 120W 2-prong PFC Delta	02K7090
AC ADAPTER 120W 2-prong PFC Liteon	02K7096

Telephone cable

All of the telephone cables listed below are Tier 1 CRUs (customer replaceable units).

FRU	P/N
Telephone cable (Australia)	27L0467
Telephone cable (Austria)	27L0449
Telephone cable (BE/BK/BS/BD/BF)	27L0451
Telephone cable (DK/DE/PO)	27L0447
Telephone cable (FI/NO/NS)	27L0446
Telephone cable (France)	27L0443
Telephone cable (Germany)	27L0441
Telephone cable (Italy)	27L0448

FRU	P/N
Telephone cable (ND/NU)	27L0444
Telephone cable (SF/SI/SG/SE)	27L0462
Telephone cable (Spain)	27L0450
Telephone cable (SW/SU)	27L0445
Telephone cable (UK/IR/NZ)	27L0442
Telephone cable (US/CAN/TWN/APS/LA/BRZL)	27L0465

Optional FRUs

All Optional FRUs are classified as Tier 1 CRUs (customer replaceable units).

FRU	P/N
Main Battery Li-Ion 4P3S Option	08K8178

Common parts list

Tools

Triconnector wrap plug	72X8546
PC test card	35G4703
Audio wrap cable	66G5180
USB parallel test cable	05K2580
Screwdriver kit	95F3598
Torque screwdriver	05K4695
5 mm socket wrench	05K4694
Screwdriver	27L8126
Thermal grease	91P9152
ThinkPad hardware maintenance diskette version 1.69 or later **Note:** Download the file from the following Web site: `http://www.ibm.com/pc/partner/infotips`	—

Power cords

All of the power cords listed below are Tier 1 CRUs (customer replaceable units).

IBM power cords for a specific country or region are usually available only in that country or region:

For 2-pin power cords:

Region	P/N
Canada, U.S.	13H5264
Japan	74P4331
Argentina	36L8870
Brazil	49P2095

For 3-pin power cords:

Region	P/N
Australia, New Zealand	76H3514
Canada, U.S.	76H3516
Italy	76H3530
Denmark	76H3520
U.K., China (Hong Kong S.A.R.)	76H3524
European countries	76H3518
India, South Africa	76H3522
Israel	76H3532
Korea	76H3535

Region	P/N
China (P.R.C.) (other than Hong Kong S.A.R.)	02K0539
Switzerland	76H3528

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