IBM Mobile Systems
ThinkPad Computer
Hardware Maintenance Manual

October 2003

This manual supports:

ThinkPad T40/T40p, T41/T41p (MT 2373/2374/2375/2376/2378/2379)

ThinkPad Dock II (MT 2877)

Note

Before using this information and the product it supports, be sure to read the general information under “Notices” on page 184.

Second Edition (October 2003)

The following paragraph does not apply to the United Kingdom or any country where such provisions are inconsistent with local law:
INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION “AS IS” WITHOUT ANY WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE LIMITED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer or express or implied warranties in certain transactions; therefore, this statement may not apply to you.

This publication could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements or changes to the products or the programs described in this publication at any time.

It is possible that this publication may contain references to, or information about, IBM products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that IBM intends to announce such IBM products, programming, or services in your country.

Requests for technical information about IBM products should be made to your IBM authorized dealer or your IBM marketing representative.

© Copyright International Business Machines Corporation 2003. All rights reserved.
US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

About this manual 1

Introduction 3
Important service information 3
Strategy for replacing FRUs 3
How to use error messages 4
Diskette compatibility matrix 4
Safety notices: multilingual translations 4
Safety information. 16
General safety. 16
Electrical safety 17
Safety inspection guide 19
Handling devices that are sensitive to electrostatic discharge 20
Grounding requirements 21
Laser compliance statement. 22

General descriptions 25
Read this first 25
What to do first 25
Related service information 27
Service web site 27
Restoring the original contents of a hard disk drive 27
Passwords 30
Power management 32
Checkout guide 35
Testing the computer 35
Detecting system information with PC-Doctor. . . 38
Power system checkout 39

ThinkPad T40/T40p, T41/T41p Series 43
Product overview 45
Specifications 45
Status indicators 48
FRU tests 50
Fn key combinations 52
Symptom-to-FRU index 55
Numeric error codes 55
Error messages 60
Beep symptoms 61
No-beep symptoms 61
LCD-related symptoms 62
Intermittent problems 63
Undetermined problems 63
FRU replacement notices 64
Screw notices 64
Retaining serial numbers. 65
Removing and replacing a FRU. 67
1010 Battery pack. 68
1020 Ultrabay Slim device 70

© Copyright IBM Corp. 2003

1030 Hard disk drive 71
1040 DIMM (optional) 73
1050 Keyboard 75
1060 DIMM (standard) 79
1070 Modem daughter card (MDC) 80
1080 *Bluetooth*/Modem daughter card (BMDC) 82
1090 Palm rest 84
1100 Mini PCI adapter 86
1110 Fan assembly 89
1120 Backup battery 90
1130 Speaker assembly 92
1140 PC Card slot assembly 94
1150 Keyboard bezel 96
1160 LCD assembly 98
1170 CPU. 103
1180 Ultrabay Slim guide rail assembly 104
1190 VGA and Ultrabay Slim device eject button cable 106
1200 System board and base cover 108
2010 LCD front bezel 116
2020 Inverter card 118
2030 *Bluetooth* wireless antenna assembly . . . 119
2040 LCD panel, LCD cable assembly, wireless LAN antenna assembly, hinges, and LCD cover. 121
3010 ThinkPad Dock II PCI cover. 134
3020 ThinkPad Dock II top cover 135
Locations 138
Front view 138
Rear view. 140
Bottom view 141
Parts list 142
T40/T40p, T41/T41p series model matrix . . . 142
Overall 153
LCD FRUs 168
Keyboard 174
Recovery CDs 175
Miscellaneous parts 178
AC adapters 181
Optional FRUs 181
Common parts list 182
Notices 184
Trademarks 184

About this manual

This manual contains service and reference information for IBM ThinkPad T40/T40p, T41/T41p series (MT2373, 2374, 2375, 2376, 2378, and 2379), and ThinkPad Dock II (MT2877) 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 4, “Safety information” on page 16, and “Laser compliance statement” on page 22.

© Copyright IBM Corp. 2003

Introduction

Important service information

Important

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 diskette 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 diskette 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 a 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. Running Automatic Configuration may alter the settings. Note the current configuration settings (using the View Configuration option); then, when service has been completed, verify that those settings remain in effect.

© Copyright IBM Corp. 2003

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 whether 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.

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 מסוימות 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.

(continued)

(continuation of safety notice 3)

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

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

Safety notice 4

⚠ 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 lower part of the inverter card.

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

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

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 safety information with which you need to be familiar before you service 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. Make sure that 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 that you think is 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, make sure 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, about 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

  Attention: Metal objects are good electrical conductors.
- Wear safety glasses when you are hammering, drilling, soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.

- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.
- 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:

  - 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; Instructions for these precautions 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 the 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 to guard against ESD damage is desirable but not necessary.

  - Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
  - When working on a double-insulated or battery-operated system, use an ESD common ground or reference point. 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. Such devices are also sold separately as options. If one of these drives is installed, it 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.

If a CD-ROM drive, a DVD-ROM drive, or another laser device 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, the DVD-ROM drive, or any other optical storage device could result in exposure to hazardous laser radiation. There are no serviceable parts inside those drives. **Do not open.**

Laser compliance statement

A CD-ROM drive, a DVD-ROM drive, or any other storage device installed may 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 ľúča a vyhnite sa priamemu vystaveniu ľúčov.

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

General descriptions

The desciptions in this chapter apply to 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.**
- **Before replacing any FRU, read the entire page on removing and replacing FRUs.**
- **When you replace FRUs, use new nylon-coated screws.**
- **Be extremely careful during such write operations as copying, saving, or formatting.** Drives in the computer that you are servicing sequence might have been altered. If you select an incorrect drive, data or programs might be overwritten.
- **Replace an FRU only with another FRU of the correct model.** When you replace a FRU, make sure that 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

© Copyright IBM Corp. 2003

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

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. Following is a list of 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 list:

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
- Plastic parts, latches, pins, or connectors that have been cracked or broken 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
- Diskette drive damage caused by pressure on the diskette drive cover, foreign material in the drive, or 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 original contents of a hard disk drive”
- “Passwords” on page 30
- “Power management” on page 32

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/infotips`

Restoring the original contents of a hard disk drive

Recovering by Access IBM Predesktop Area

Hard disk of ThinkPad computer you are servicing has a hidden, protected area for backups. This area contains a complete backup of the hard disk as it was shipped from the factory and a program called the Access IBM Predesktop Area.

You can use the Access IBM Predesktop Area to restore the contents of the hard disk to an earlier state by using any of the backup images stored in the protected area. Access IBM Predesktop Area runs independently of the Windows operating system. Therefore, you can start it by pressing the blue Access IBM button when prompted during startup.

After the Access IBM Predesktop Area opens, you can perform a recovery operation, even if you are unable to start Windows.

To restore the original contents of the hard disk drive, do the following:

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.

Note: You might need to use a diskette drive in the recovery process. Use a drive that is compatible with the ThinkPad computer you are servicing.

1. If possible, save all the files and shut down the operating system.
2. Turn off the computer.
3. Turn on the computer. Watch the display until the following message is displayed: “To interrupt normal startup, press the blue Access IBM button.” When you see that message, press the blue Access IBM button to open the Access IBM Predesktop Area.
4. Double-click **Recover to factory contents**.
5. Follow the instructions on the screen.
6. When the recovery process finishes, press the Enter key. The computer will restart with the pre-installed operating system, drivers, and software.

Recovering by recovery CD

You can delete the Access IBM Predesktop Area by going into the BIOS (F1 at IBM Splash Screen), and then choosing **Security --> IBM Predesktop Area --> Disabled**. This will make the Service Partition 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 “bootkil2 /psa” to completely wipe the drive.

Ordering the recovery CD

When the hard disk drive is replaced because of a failure, no Access IBM Predesktop Area is on the new hard disk. In this case, you must use the recovery CD for the computer. Order the recovery CD and the hard disk drive at the same time so that, when they arrive, you can restore the pre-installed software on the new hard disk drive. For information on which CD to order, see “Recovery CDs” on page 175

To create the service partition and install the factory contents from the recovery CD, do the following:

To create the service partition:

1. Erase all partitions on the hard disk drive, using FDISK or a similar application.
2. For the proper removal of the Hidden Protected Area (HPA), refer to the white paper at `http://www.pc.ibm.com/qtechinfo/AIBM-TOOLS.html`
3. Boot with the recovery CD (and the boot diskette if required).
4. 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 partitions, you do not receive this message; go to step 1.
5. Press the Y key. The service partition is created and loaded with the files of the Product Recovery program.

   Note: If you do not want to create the service partition, press N key, and then go to step 9.
6. At the next window, press Enter to continue.
   - The service partition is created. The system automatically reboots during this process.
   - The recovery process copies some files to the service partition, and PKUNZIPs others.
   - Follow the prompts. You may be prompted to change CDs.
   - When the process is complete, the system reboots. Continue to step 7 to install preloaded system.

Install preloaded system from CD:

7. Boot with the recovery CD (and the boot diskette if required).
8. 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 service partition, go to step 5.
   - To preload the hard disk drive without installing the service partition, press N key.
9. If you get a message asking which operating system to install, select an operating system and press Enter.
10. A message is displayed: "**Full Recovery:**". Press Enter to select.
11. On each of the next three windows, press the Y key.
12. 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 user must enter the SVP in order to get access to the IBM BIOS Setup Utility and change the system configuration.

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 you have 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 68.
3. Remove the backup battery.

   For how to remove the backup battery, see “1120 Backup battery” on page 90.
4. Turn on the computer and wait until the POST ends.

   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 and watch the lower left of the screen for a message saying, “To interrupt normal startup, press the blue Access IBM button.” When that message appears, press the Access IBM button.
2. Enter the SVP. Double-click **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 and watch the lower left of the screen for a message saying, “To interrupt normal startup, press the blue Access IBM button.” When that message appears, press the Access IBM button.

2. For the ThinkPad T40 and T40p series, enter the master HDP. For the ThinkPad T41 and T41 series, press F1 while HDP icon is appearing on the screen; then enter the master HDP.
3. Select **Start setup utility**. Enter the SVP.
4. Select **Security**, using the cursor keys to move down the menu.
5. Select **Password**.
6. Select **Hard-disk** *x* **password**, where *x* is the letter of the hard disk drive. A pop-up window opens.
7. Select **Master HDP**.
8. Enter the master HDP; then leave the New Password field blank and press Enter twice.
9. Press F10.
10. 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 press Fn+F3, or if the time set on the “LCD off timer” in IBM BIOS Setup Utility expires,
   - The LCD backlight turns off.
   - The hard disk drive motor stops.
   - The speaker is muted.
2. If you are using the ACPI operating system and you press Fn+F3,
   - The LCD backlight turns off.
   - The hard disk drive motor stops.
3. 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: If you are using the ACPI operating system, you can change the action of Fn+F4.s

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.)

Note for the APM operating system:
Even if you do not set the low-battery alarm, the charge indicator notifies you when the battery is low, and then the computer enters the power-saving mode automatically. This default low-battery behavior is independent of the operating system; so if you have set the low-battery alarm, the computer may not do what you specified. It chooses either your setting or the default setting, whichever is appropriate.

If you are using the ACPI operating system, only the low-battery alarm is available.

To cause the computer to return from standby mode and resume operation, do one of the following:

- Press the Fn key.
- Open the LCD cover.
- Turn on the power switch.

Also, in either of the following events, the computer automatically returns from standby mode and resumes operation:

- The ring indicator (RI) is signaled by a serial device or a PC Card device.
- The time set on the resume timer elapses.

Note: The computer does not accept any input immediately after it enters standby mode. Wait a few seconds before taking any action to reenter operation mode.

Hibernation mode

Note for OS/2

If you are using OS/2 in the default format, HPFS, you cannot create a hibernation file. If you want to use hibernation mode, you will need to reinstall OS/2 with FAT format.

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.

Note: If the computer enters the hibernation mode while it is docked to the docking station, do not undock it before resuming normal operation. If you do undock it and then try to resume normal operation, you will get an error message, and you will have to restart the system.

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

- Press the Fn+F12 keys.
- If you are using the APM operating system and have set the mode to **Power switch mode [Hibernation]**, turn off the power switch.
- 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 if 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.
- If you are using the APM operating system and have set the mode to **Hibernate when battery becomes low**, and the battery charge becomes critically low.

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 45.

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.

PC-Doctor cannot be used to test a device that is in the docking station, even if the computer supports the docking station. To test a USB device, connect it to the USB connector of the computer.

Creating the PC-Doctor diagnostics diskette

To create the PC-Doctor disk from the Access IBM Predesktop Area, do as follows:

1. Enter the IBM Predesktop application by pressing the Access IBM button during POST.
2. When the Access IBM application finishes loading, double-click the “Create Diagnostic Diskettes” icon.
3. Authenticating the digital signature takes about 15 seconds; then the ThinkPad computer will reboot into PC-DOS.

4. A batch file automatically starts up to prompt you through the process of creating diskettes. You are notified of how many diskettes you will need.
   a. You are prompted to insert each diskette in sequence.
   b. Typically, all you need to do is to press the Enter key for the floppy drive; the system then formats and creates the diskette.
   c. Each diskette is erased and formatted with the PC-Doctor DOS boot image.
5. Once all the diskettes have been created, the ThinkPad computer will reboot. The user is asked to remove all diskettes from the drive, or to insert the first diskette created if it is desired to run the diagnostics.

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 pointer. 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 39, and check the power sources.

   If an error code appears, go to “Symptom-to-FRU index” on page 55.

   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.)

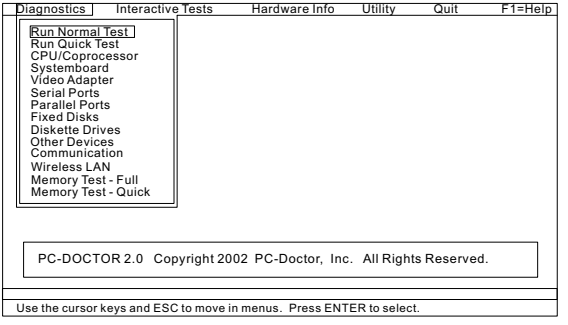
   Note: PC-Doctor menu does not mean the formal support device list. Some unsupported device names may appear in the PC-Doctor menu.

The options on the test menu are as follows:

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

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. If you have an external monitor attached to your computer, detach it before running PC-Doctor DOS.
- To test **Digital Signature Chip**, the chip must be enabled.
- When Legacy Floppy Drives is enabled in the IBM BIOS Setup Utility, the **Diskette Drives** test is activated even if no legacy diskette drive is attached to the ThinkPad computer.



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 running PC-Doctor, check the time and date on the system and reset them if they are incorrect.

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. Turn off the computer.
2. Remove the battery pack.
3. Connect the ac adapter.
4. Check that power is supplied when you turn on the computer.
5. Turn off the computer.
6. Disconnect the ac adapter and install the charged battery pack.
7. Check that the battery pack supplies power when you turn on the computer.

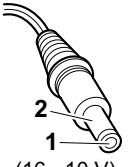
If you suspect a power problem, see the appropriate one of the following power supply checkouts:
- "Checking the ac adapter"
- "Checking operational charging" on page 40
- "Checking the battery pack" on page 40
- "Checking the backup battery" on page 41

Checking the ac adapter

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

- If the power problem occurs only when the port replicator is used, replace the port replicator.
- 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:



(16 - 10 V)

Pin	Voltage (V dc)
1	+15.5 to +17.0
2	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 45.

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

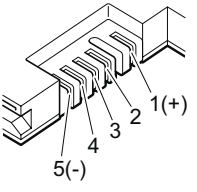
Battery charging does not start until the Power Meter shows that less than 95% of the total power remains; under this condition the battery pack can charge to 100% of its capacity. This protects the battery pack from being overcharged or from having a shortened life.

To check 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
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.

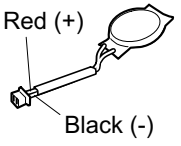
4. If the voltage is more than +11.0 V dc, measure the resistance between battery terminals 4 and 5. The resistance must be 4 to 30 K Ω.

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

Checking the backup battery

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 68).
4. Remove the backup battery (see “Checking the battery pack” on page 40).
5. Measure the voltage of the backup battery. See the following figure.



Wire	Voltage (V dc)
Red	+2.5 to +3.2
Black	Ground

- If the voltage is correct, replace the system board.
- If the voltage is not correct, replace the backup battery.
- If the backup battery discharges quickly after replacement, replace the system board.

ThinkPad T40/T40p, T41/T41p Series

Product overview 45
Specifications 45
Status indicators 48
FRU tests 50
Fn key combinations 52
Symptom-to-FRU index 55
Numeric error codes 55
Error messages 60
Beep symptoms 61
No-beep symptoms 61
LCD-related symptoms 62
Intermittent problems 63
Undetermined problems 63
FRU replacement notices 64
Screw notices 64
Retaining serial numbers. 65
Restoring the serial number of the system unit 65
Retaining the UUID 66
Removing and replacing a FRU. 67
1010 Battery pack. 68
1020 Ultrabay Slim device 70
1030 Hard disk drive 71
1040 DIMM (optional) 73
1050 Keyboard 75
1060 DIMM (standard) 79
1070 Modem daughter card (MDC) 80
1080 *Bluetooth*/Modem daughter card (BMDC) 82
1090 Palm rest 84
1100 Mini PCI adapter 86
1110 Fan assembly 89
1120 Backup battery 90
1130 Speaker assembly 92
1140 PC Card slot assembly 94
1150 Keyboard bezel 96
1160 LCD assembly 98
1170 CPU. 103
1180 Ultrabay Slim guide rail assembly 104
1190 VGA and Ultrabay Slim device eject button cable 106
1200 System board and base cover 108
2010 LCD front bezel 116
2020 Inverter card 118
2030 *Bluetooth* wireless antenna assembly . . . 119
2040 LCD panel, LCD cable assembly, wireless LAN antenna assembly, hinges, and LCD cover. 121
3010 ThinkPad Dock II PCI cover. 134
3020 ThinkPad Dock II top cover 135
Locations 138
Front view 138
Rear view. 140

© Copyright IBM Corp. 2003

Bottom view 141
Parts list 142
T40/T40p, T41/T41p series model matrix . . . 142
Overall 153
LCD FRUs 168
14.1-in. XGA TFT 169
14.1-in. SXGA+ TFT 172
Keyboard 174
Recovery CDs 175
For Windows XP Professional (T40/T40p series) 175
For Windows 2000 (T40/T40p series) . . . 176
For Windows XP Professional (T41/T41p series) 177
For Windows 2000 (T41 series) 178
Miscellaneous parts 178
AC adapters 181
Optional FRUs 181
Common parts list 182
Tools 182
Power cords (system) 182
Power cords (ThinkPad Dock and ThinkPad Dock II) 183
Notices 184
Trademarks 184

Product overview

This section presents the following product-unique information:

- “Specifications”
- “Status indicators” on page 48
- “FRU tests” on page 50
- “Fn key combinations” on page 52

Specifications

The following table lists the specifications of the ThinkPad T40/ T40p, T41/T41p series:

Feature	Description
Processor	**T40/T40p series:** • Intel® Pentium® M processor 1.3 GHz, L2 1-MB cache • Intel® Pentium® M processor 1.5 GHz, L2 1-MB cache • Intel® Pentium® M processor 1.6 GHz, L2 1-MB cache **T41/T41p series:** • Intel® Pentium® M processor 1.4 GHz, L2 1-MB cache • Intel® Pentium® M processor 1.6 GHz, L2 1-MB cache • Intel® Pentium® M processor 1.7 GHz, L2 1-MB cache
Bus architecture	**T40/T40p series:** • 400 MHz PSB (Processor System Bus) • 266 MHz DDR SDRAM (PC2100) • HUB link • PCI bus • LPC bus **T41/T41p series:** • 400 MHz PSB (Processor System Bus) • 333 MHz DDR SDRAM (PC2700) • HUB link • PCI bus • LPC bus
Graphic memory chip	**T40/T40p series:** • 16 MB DDR SDRAM (ATI M6-16) • 32 MB DDR SDRAM (ATI M7-32) • 32 MB DDR SDRAM (ATI M9-32) • 64 MB DDR SDRAM (ATI M9 GL-64) **T41/T41p series:** • 32 MB DDR SDRAM (ATI M7-32) • 32 MB DDR SDRAM (ATI M9-32) • 128 MB DDR SDRAM (ATI M10 GL-128)

(continued)

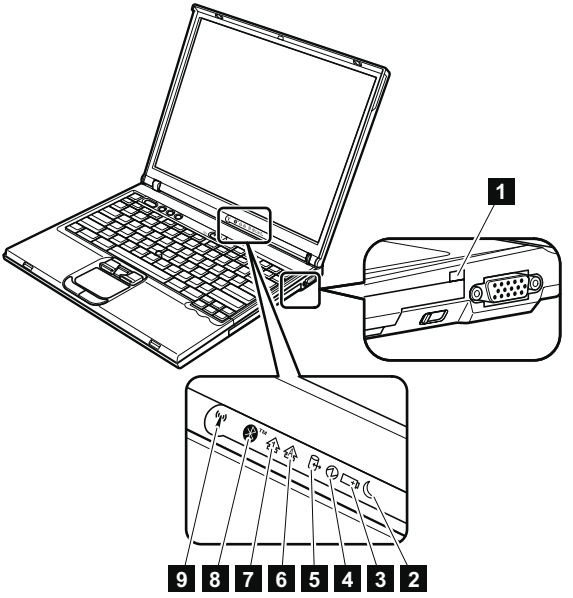
Feature	Description
Display	• 14.1-inch, 16M colors, XGA (1024 × 768 resolution) TFT color LCD • 14.1-inch, 16M colors, SXGA+ (1400 × 1050 resolution) TFT color LCD
Standard memory	**T40/T40p series:** • 256 MB DDR SDRAM SO-DIMM (PC2100) card × 1 • 512 MB DDR SDRAM SO-DIMM (PC2100) card × 1 • 1 GB DDR SDRAM SO-DIMM (PC2100) card × 1 **T41/T41p series:** • 256 MB DDR SDRAM SO-DIMM (PC2700) card × 1 • 512 MB DDR SDRAM SO-DIMM (PC2700) card × 1 • 1 GB DDR SDRAM SO-DIMM (PC2700) card × 1
Optional memory	**T40/T40p series:** • 128 MB DDR SDRAM SO-DIMM (PC2100) card • 256 MB DDR SDRAM SO-DIMM (PC2100) card • 512 MB DDR SDRAM SO-DIMM (PC2100) • 1 GB DDR SDRAM SO-DIMM (PC2100) **T41/T41p series:** • 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 • 1 GB DDR SDRAM SO-DIMM (PC2700) card × 1 (maximum of 2048 MB)
CMOS RAM	• 242 bytes
Hard disk drive	• 20.0 GB, 4200 rpm, 2.5-inch, IDE interface (supported by CTO in T40 series) • 30.0 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, 4200 rpm, 2.5-inch, IDE interface (option in T41 series)

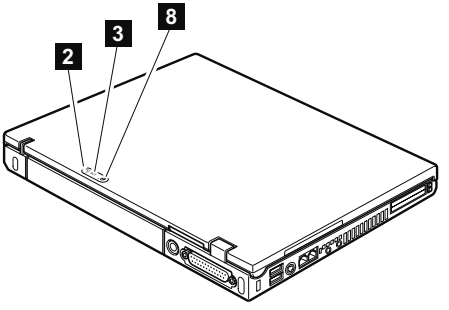
(continued)

Feature	Description
Ultrabay Slim device (standard)	• DVD drive, 9.5 mm high • DVD/CD-RW combo drive, 9.5 mm high
I/O port	• External monitor connector • Stereo headphone jack • Monaural microphone jack • Infrared port • Parallel connector • Docking connector • RJ11 connector • RJ45 connector • TV-out connector (S-Video) • Universal serial bus (USB) connector × 2 (compatible with USB 1.1 and 2.0)
Internal modem	• 56.6 Kbps
Audio	• Built-in stereo speakers • Software control volume
Infrared transfer	• IrDA 1.1
Mini PCI adapter	**T40/T40p series:** • IBM Dual-Band 11a/b Wi-Fi Wireless Mini PCI Adapter • Cisco Aironet Wireless 802.11b • Intel® PRO/Wireless LAN 2100 3B Mini PCI Adapter **T41/T41p series:** • Cisco Aironet Wireless 802.11b • Intel® PRO/Wireless LAN 2100 3B Mini PCI Adapter • IBM 11a/b/g Wireless LAN Mini PCI Adapter
PC Card	• One Type-III • Two Type-II
Ethernet (on the system board)	**T40/T40p series:** • 10/100Base Ethernet • Gigabit Ethernet **T41/T41p series:** • Gigabit Ethernet
Communication daughter card (CDC)	• V.90 modem daughter card (MDC) • IBM Integrated *Bluetooth* with 56K Modem (BMDC)
Touch pad	• UltraNav
ThinkLight	Yes
Battery	• Li-ion battery (6 cells) • Li-ion battery (9 cells) • Ultrabay Slim Li Polymer battery (option)
AC adapter	• 72-watt type
Preinstalled operating system	• Windows XP Professional • Windows 2000

Status indicators

The system status indicators show the status of the computer, as follows:





Indicator	Meaning
1 Ultrabay Slim status	**Green:** An Ultrabay Slim device is installed and in use. **Blinking green:** An Ultrabay Slim device is in the process of being detached. **Turn off:** An Ultrabay Slim device is ready to be attached or detached. **Note:** If you are using Windows 2000, the Ultrabay Slim status indicator does not blink while an Ultrabay Slim device is being detached. Instead, a message box pops up when the process is completed; then the indicator turns off.
2 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.
3 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.
4 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.
5 Drive in use	**Green:** Data is being read from or written to the hard disk drive, the diskette drive, or the drive in the Ultrabay Slim device. 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.

(continued)

Indicator	Meaning
6 Caps lock	**Green:** Caps Lock mode is enabled. To enable or disable Caps Lock mode, press the Caps Lock key.
7 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.
8 *Bluetooth* status	**Green:** *Bluetooth* wireless is operational. This indicator is on when *Bluetooth* wireless is on and not in suspend mode.
9 Wireless status	**Green:** The wireless feature (the IEEE 802.11 standard) is on, and the radio link is ready for use. **Blinking green:** Data is being transmitted.

FRU tests

The following table shows the test for each FRU.

FRU	Applicable test
System board	1. **Diagnostics** --> **CPU/Coprocessor** 2. **Diagnostics** --> **Systemboard** 3. If the docking station or the port replicator is attached to the ThinkPad computer, undock it. Place the computer on a horizontal surface, and run **Diagnostics** --> **Other Devices** --> **IBM HDD Active Protection Test**. **Note:** Do not apply any physical shock to the computer while the test is running.
Power	**Diagnostics** --> **Other Devices** --> **IBM AC Adapter**, **IBM Battery 1 (IBM Battery 2)**
LCD unit	1. **Diagnostics** --> **Video Adapter** 2. **Interactive Tests** --> **Video**
Modem daughter card (MDC or BMDC)	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**

(continued)

FRU	Applicable 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**
Hard disk drive	**Diagnostics** --> **Fixed Disks**
Diskette drive	1. **Diagnostics** --> **Diskette Drives** 2. **Interactive Tests** --> **Diskette**
DVD drive or DVD/CD-RW combo 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 PC Card slot. 2. Run **Diagnostics** --> **Other Devices** --> **IBM Fan**.
TrackPoint or pointing device	If the TrackPoint does not work, check the configuration as specified in the ThinkPad Configuration program. If the TrackPoint is disabled, select **Automatic** 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**
Touch Pad	If the Touch Pad does not work, check the configuration as specified in the ThinkPad Configuration program. If the Touch Pad is disabled, select **Automatic** to enable it. If enabling the Touch Pad does not correct the problem, continue with the following: • **Interactive Tests** --> **Mouse**

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 computer display, leaving the screen blank. To turn the computer display on again, press any key or press the TrackPoint pointing stick.
Fn+F4	Put the computer in standby mode. To return to normal operation, press the Fn key only, without pressing a function key. **Notes:** 1. This mode is called suspend mode in Windows NT. 2. In Windows 2000 and Windows XP, this combination of keys functions as a sleep button. The setting can be changed so that pressing it puts the computer into hibernation mode or even shuts the computer down.
Fn+F5	Control the power source of the built-in *Bluetooth* wireless device. This combination of the keys functions as a toggle switch of the power state. **Note:** In Windows 98, Windows 2000, or Windows XP, this combination of keys enables or disables the built-in wireless networking features (the IEEE 802.11 standard) and the *Bluetooth wireless* features. To use this function, the following drivers must be installed. • IBM ThinkPad Power Management driver • OnScreen Display utility • Wireless device drivers
Fn+F6	Reserved.

(continued)

Key combination	**Description**
Fn+F7	Switch a display output location • External monitor (CRT display) • Computer display and external monitor (LCD + CRT display) • Computer display (LCD) **Note:** For any operating system other than Windows 2000 or Windows XP, no additional procedure is needed; just press Fn+F7. **Notes:** 1. This function does not work when different desktop images are displayed on the computer display and the external monitor (the Extend desktop function). 2. This function does not work while a DVD movie or a video clip is playing. 3. For Windows 2000 or Windows XP, a hotkey application might take over the switching function.
Fn+F8	**Note:** This function is not supported in Windows 2000 and Windows XP. If the image displayed on the computer is smaller than the physical display, switch the computer screen size between expanded mode and normal mode.

(continued)

Key combination	Description
Fn+F9	Open the IBM ThinkPad EasyEject Utility screen. Buttons for the following choices are displayed: • **Eject ThinkPad PC from Dock**: This button is displayed only if the ThinkPad computer has been attached to a ThinkPad Dock II. The computer can be detached from the ThinkPad Dock II. • **Eject ThinkPad PC from Mini Dock**: This button is displayed only if the ThinkPad computer has been docked in a ThinkPad Mini Dock and one or more USB devices have been connected to the ThinkPad Mini Dock. You can stop and remove all the USB devices safely by clicking the button. **Note:** If a diskette drive is connected to the external-diskette-drive connector of the ThinkPad Mini Dock, you cannot connect a USB diskette drive. • **Run EasyEject Actions**: This button is used to select, stop, or remove external devices connected to the ThinkPad computer. • **Configure EasyEject Actions**: Opens the IBM ThinkPad EasyEject Utility main window. • **Fn+F9 Settings**: Configures the settings for the Fn+F9 function. You can use this utility to stop and remove all ejectable devices connected to the ThinkPad computer, the ThinkPad Mini Dock, or the ThinkPad Port Replicator II. You cannot use it to detach the computer from the ThinkPad Mini Dock or the ThinkPad Port Replicator II. **Note:** This function is supported only in Windows 2000 and Windows XP.
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 in Windows 2000 or Windows XP, you must have the IBM PM device driver installed on the computer.
Fn+PgUp	Turn the ThinkLight on or off. **Note:** This function is supported only on the ThinkPad computers that have the ThinkLight. The on or off status of the ThinkLight is shown on the screen for a few seconds when you press Fn+PgUp.
Fn+Home	The computer display becomes brighter.
Fn+End	The computer display becomes dimmer.
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 63.

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**.
0176 System Security—The system has been tampered with.	1. **Run IBM BIOS Setup Utility, and save the current setting by pressing F10.** 2. System board.
0177 Bad SVP data, stop POST task—The checksum of the supervisor password in the EEPROM is not correct.	**System board**

Symptom or error	FRU or action, in sequence
0182 Bad CRC2. Enter BIOS Setup and load Setup defaults.—The checksum of the CRS2 setting in the EEPROM is not correct.	1. **Run IBM BIOS Setup Utility. Press F9, and Enter to load the default setting. Then save the current setting by pressing F10.** 2. System board.
0185 Bad startup sequence settings. Enter BIOS Setup and load Setup defaults.	1. **Run IBM BIOS Setup Utility. Press F9, and Enter to load the default setting. Then save the current setting by pressing F10.**
0187 EAIA data access error—The access to EEPROM is failed.	**System board**.
0188 Invalid RFID Serialization Information Area.	**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.	1. **Run IBM BIOS Setup Utility, and then save current setting by pressing F10.** 2. System board.
0192 System Security—IBM Embedded Security hardware tamper detected.	**System board.**
0199 System Security—IBM Security password retry count exceeded.	1. **Run IBM BIOS Setup Utility, and then save the current setting by pressing F10.** 2. System board.
01C8 Two or more modem devices are found. Remove all but one of them. Press <Esc> to continue.	1. **Remove either a Mini-PCI Card or a modem daughter card. Otherwise, press Esc to ignore the warning message**. 2. System board.
01C9 More than one Ethernet devices are found. Remove one of them. Press <Esc> to continue.	1. **Remove the Ethernet device that you installed; or press Esc to ignore the warning message**. 2. System board.

Symptom or error	FRU or action, in sequence
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**.
0220 Monitor type error—Monitor type does not match the one specified in CMOS.	**Load Setup Defaults in IBM BIOS Setup Utility.**
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.
0250 System battery error—System battery is dead.	**Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date**.
0251 System CMOS checksum bad— Default configuration used.	**Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date**.
0252 Password checksum bad—The password is cleared.	**Reset the password by running IBM BIOS Setup Utility.**
0260 System timer error.	1. **Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date**. 2. System board.
0270 Real-time clock error.	1. **Replace the backup battery and run IBM BIOS Setup Utility to reset the time and date**. 2. 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.

Symptom or error	FRU or action, in sequence
02F4 EISA CMOS not writable.	1. **Load Setup Defaults in IBM BIOS Setup Utility**. 2. Replace the backup battery. 3. System board.
02F5 DMA test failed.	1. **DIMM**. 2. System board.
02F6 Software NMI failed	1. **DIMM**. 2. System board.
02F7 Fail-safe timer NMI failed	1. **DIMM**. 2. System board.
1802 Unauthorized network card is plugged in—Turn off and remove the miniPCI network card.	1. **Remove Mini PCI network card.** 2. System board.
1803 Unauthorized daughter card is plugged in—Turn off and remove the daughter card.	1. **Remove the daughter card that you installed.** 2. System board.

Symptom or error	FRU or action, in sequence
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 not 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 **Startup** in Access IBM Predesktop Area. Boot from the Recovery CD and perform full recovery from it. 5. If item 4 failed, replace the hard disk drive.
2000 IBM Hard Drive Active Protection sensor diagnostics failed. Press <Esc> to continue. Press <F1> to enter SETUP	1. Undock docking station or port replicator if it is attached to the ThinkPad computer, and place the computer on a horizontal surface. Do not apply any physical shock to the computer. 2. Run **Diagnostics** --> **Other Devices** --> **IBM HDD Active Protection Test**.

Error messages

Symptom or error	FRU or action, in sequence
Device address conflict.	1. **Load "Setup Defaults" in IBM BIOS Setup Utility**. 2. Backup battery. 3. System board.
Allocation error for device.	1. **Load "Setup Defaults" in IBM BIOS Setup Utility**. 2. Backup battery. 3. 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. Backup battery. 3. 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**.
Thermal sensing error.	**System board**.
Authentication of system services failed. Press <Esc> to resume.	**The IBM Predesktop Area in the HDD is corrupted. Restore it from a recovery CD.**

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 55.**
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 the cursor appears.	**Reinstall the operating system**.
Four cycles of four short beeps and a blank screen.	**System board** (IBM security chip)
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 than it should.	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). The presence of 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

If the diagnostic tests did not identify the adapter or device that has failed, if wrong devices are installed, or if the system simply is not operating, 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 39.)

1. Turn 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. Devices attached to the port replicator
   c. Printer, mouse, and other external devices
   d. Battery pack
   e. Hard disk drive
   f. External diskette drive
   g. DIMM
   h. CD-ROM and diskette drive in the Ultrabay
   i. PC Cards
4. Turn on the computer.
5. Determine whether the problem has been solved.
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 the IBM ThinkPad computer, 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.
- Each one should be used only once.

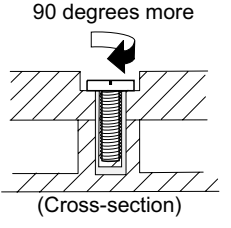
Do the following when you service this machine:

- Keep the screw kit (for the P/N, see “Miscellaneous parts” on page 178) in your tool bag.
- Always use new screws.
- Use a torque screwdriver if you have one.

Tighten screws as follows:

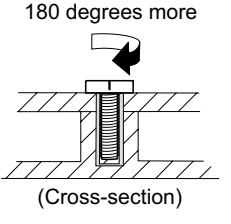
- **Plastic to plastic**

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



- **Logic card to plastic**

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



- **Torque driver**

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

- Make sure that 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 that all of 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" on page 66

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, 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 of each device in your computer is displayed; the serial number of the system unit is listed as follows:

20: Serial number

Write down that number.

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

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 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.

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, 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 64.
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 given in the drawings by the numbers in square callouts.
5. When turning a screw to replace a FRU, turn it in the direction as given by the arrow in the drawing.
6. When removing the FRU, move it in the direction as given 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 138.
8. When replacing a FRU, use the correct screw as shown in the procedures.

⚠ DANGER

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

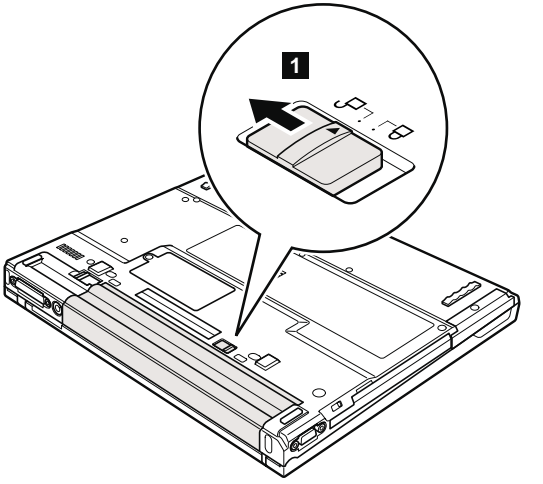
Attention: After replacing a FRU, do not turn on the computer until you have made sure that all screws, springs, and other small parts are in place and none are loose inside the computer. Verify this by shaking the computer gently and listening for rattling sounds. Metallic parts or metal flakes can 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

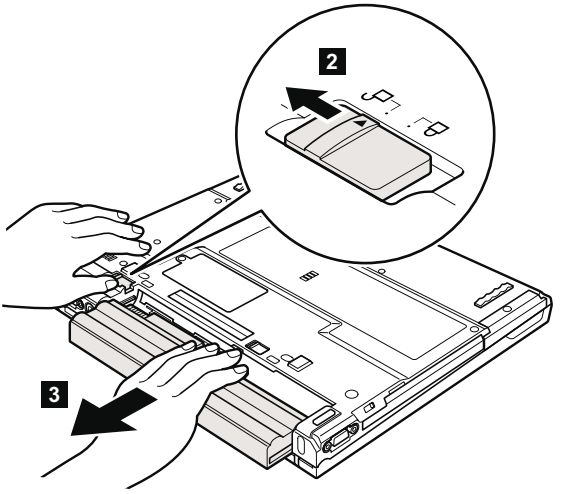
⚠ DANGER

Use only the battery specified in the parts list for your computer. Any other battery could ignite or explode.

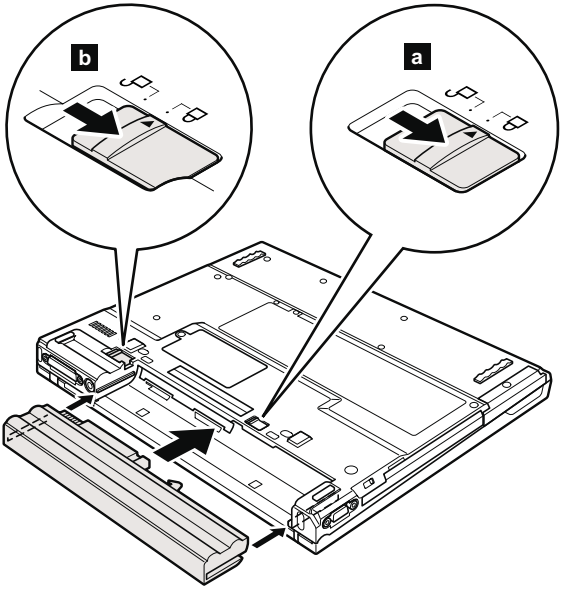


(continued)

Holding the battery release lever in the unlocked position **2** , remove the battery pack **3** .



When installing: Install the battery pack along the slide rails on the left and right sides of the battery-pack slot. Then make sure that both battery latches, **a** and **b** , are locked, as in the following figure.



1020 Ultrabay Slim device

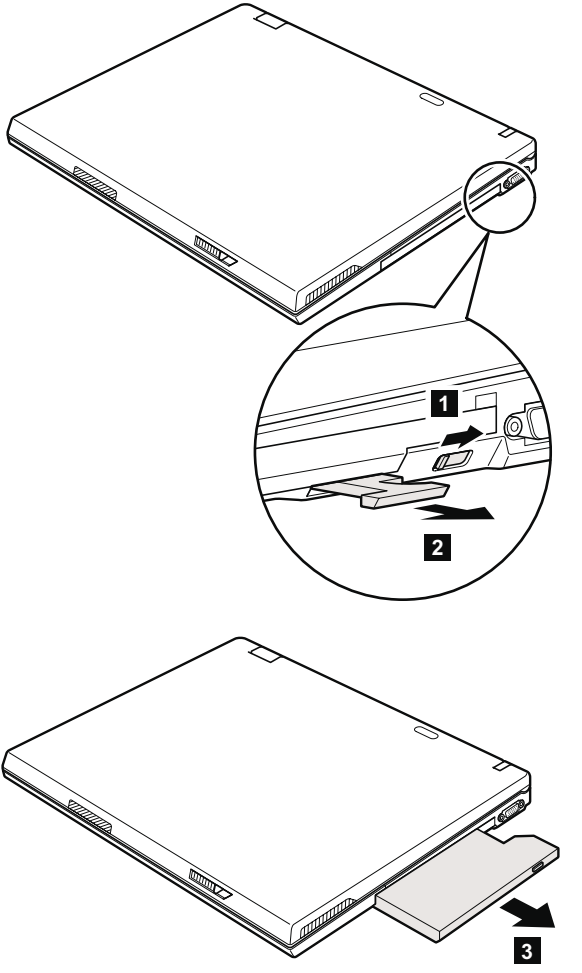
Note

Ultrabay Slim does not accept any of the following devices:

- Ultrabay Plus devices
- Ultrabay 2000 devices

For devices compatible with the Ultrabay Slim bay, see “Optional FRUs” on page 181.

Note: When you release the switch in step **1**, the lever pops out. In step **2**, pull the lever a little to release the device from the bay.

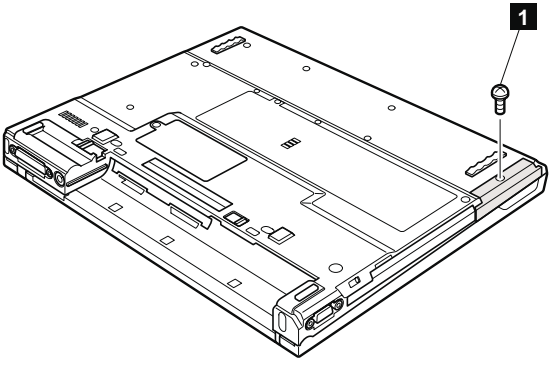


1030 Hard disk drive

Attention

- **Do not drop the hard disk drive or apply any physical shock to it.** 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 it if possible.
- Never remove the drive while the system is operating or is in suspend mode.

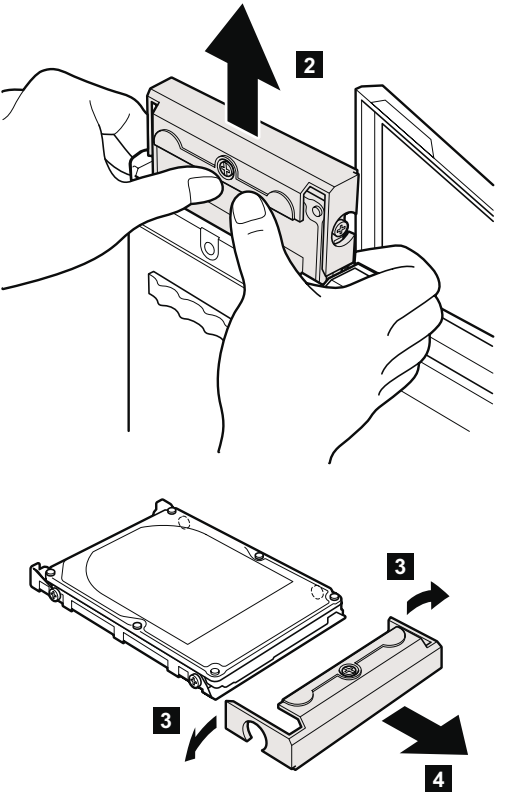
For access, remove this FRU:
- "1010 Battery pack" on page 68



Note: The hard disk is attached to the cover.

Step	Screw (quantity)
1	HDD screw (1) or security screw (1)
Note: Use a 2.5-mm Allen wrench to remove the security screw.	

(continued)



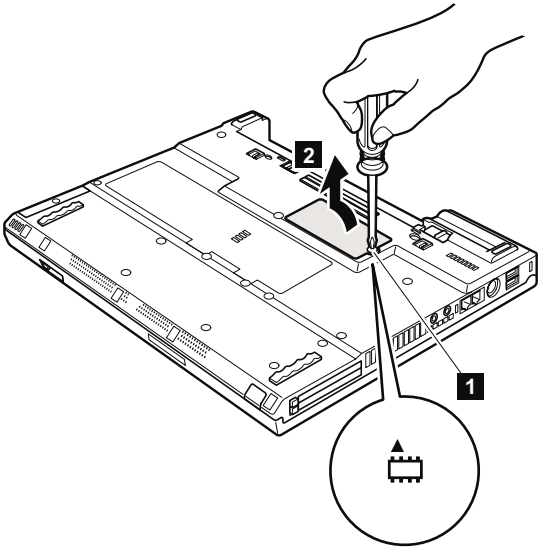
When installing: Make sure that the hard-disk connector is attached firmly.

1040 DIMM (optional)

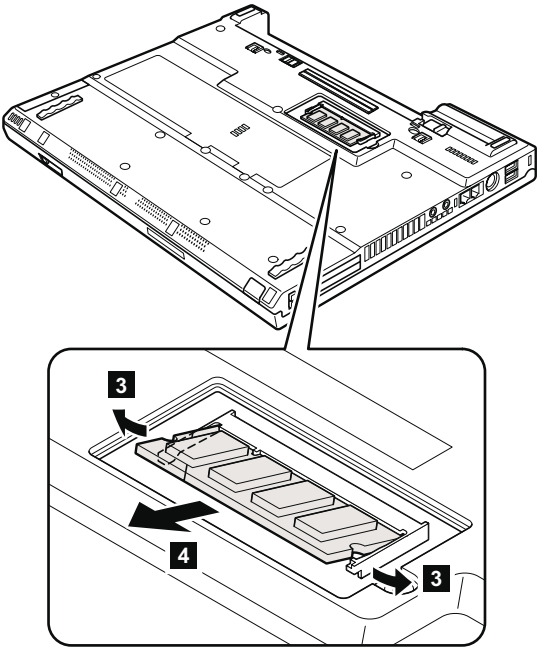
For access, remove this FRU:

- "1010 Battery pack" on page 68

Note: Loosen the screw **1**, but do not remove it.



(continued)

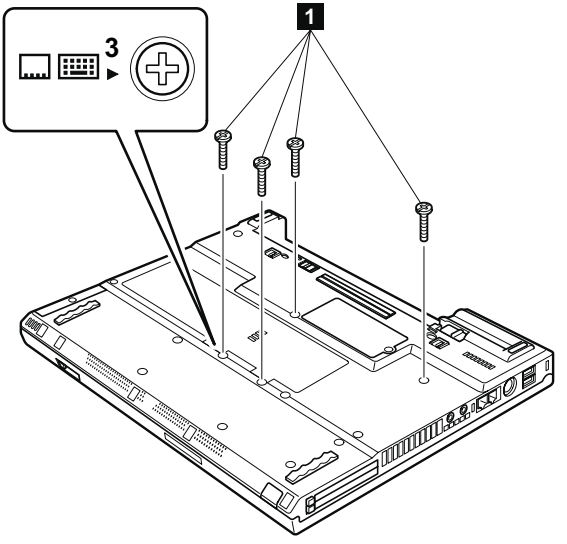


When installing: Insert the notched end of the DIMM into the socket. Press the DIMM firmly, and pivot it until it snaps into the place. Make sure that it is firmly fixed in the slot and does not move easily.

1050 Keyboard

For access, remove this FRU:

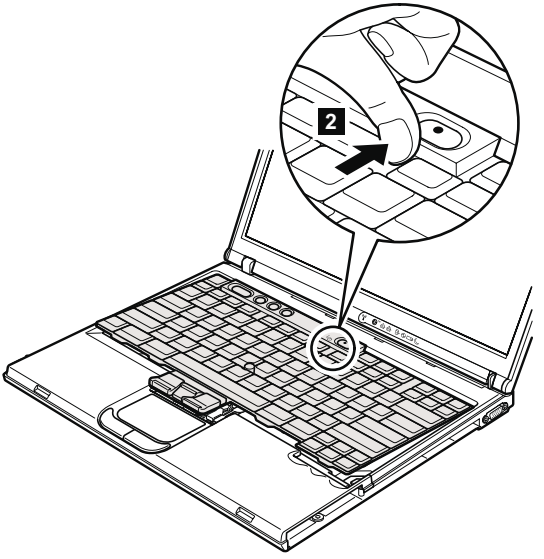
- “1010 Battery pack” on page 68



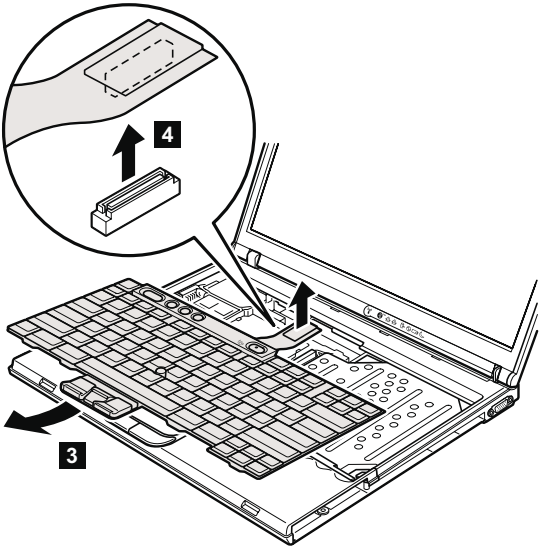
Step	Icon	Screw (quantity)	Color	Torque
1	3	M2 × 10 mm, flat-head, nylon-coated (4)	Black	0.245 Nm (2.5 kgfcm)

(continued)

Press the part indicated by the arrow **2** in the direction of the arrow. This releases the latches of the keyboard from the frame, so that the front side of the keyboard pops out.

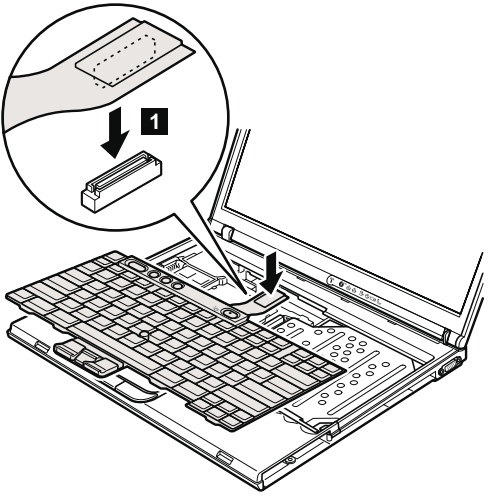


Pull the keyboard a little in the direction of the arrow **3**, and then detach the connector **4**.

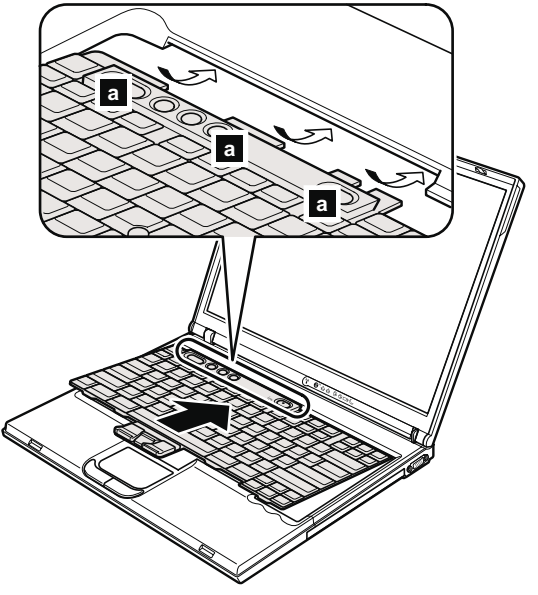


When installing:

1. Attach the connector **1** .



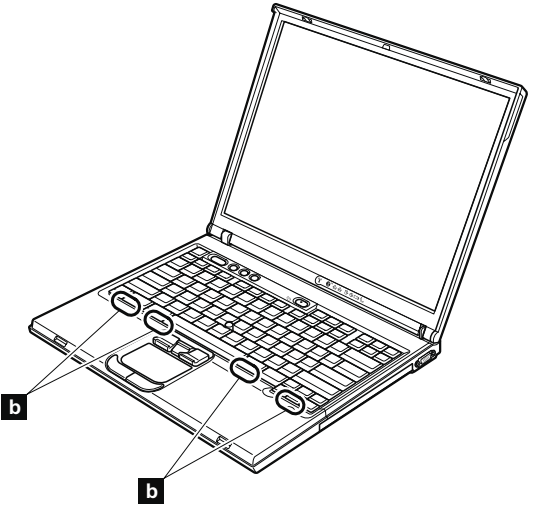
2. Make sure that the keyboard edges, marked **a** in the figure, are under the frame.



(continued)

3. To make sure that the front side of the keyboard is housed firmly, gently press the keys with your fingers and try to slide the keyboard towards you.

4. Make sure that all the projections on the front side of the keyboard **b** are firmly attached under the frame.

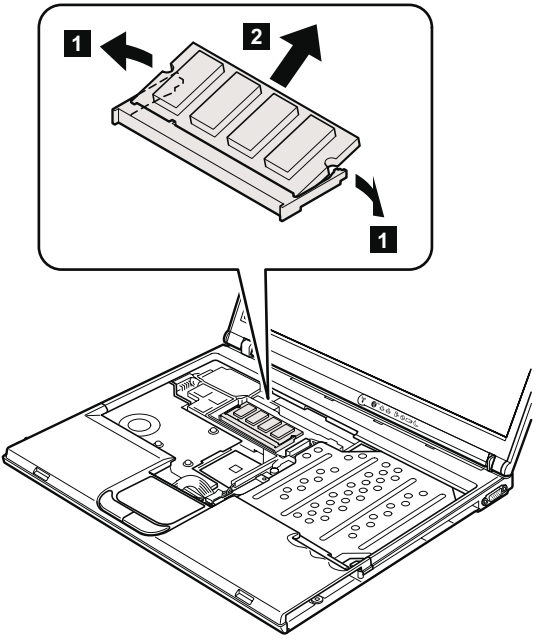


5. Secure the keyboard from the underside of the computer, using the new screws provided with the keyboard.

1060 DIMM (standard)

For access, remove these FRUs in order:

- “1010 Battery pack” on page 68
- “1050 Keyboard” on page 75

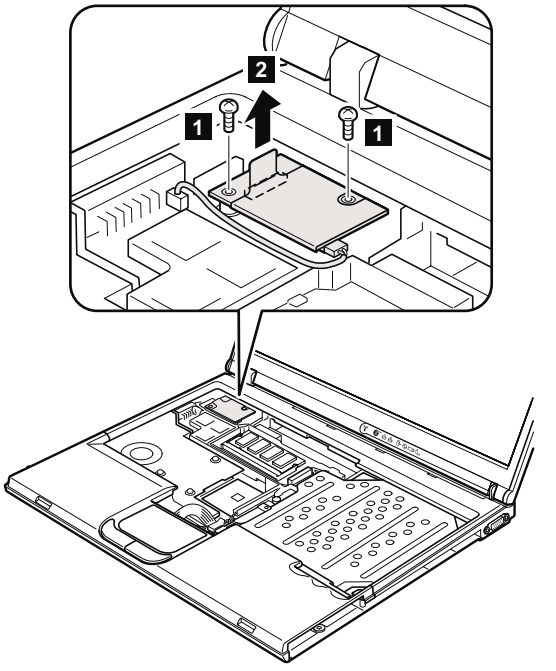


When installing: Insert the notched end of the DIMM into the socket. Press the DIMM firmly, and pivot it until it snaps into the place. Make sure that it is firmly fixed in the slot and does not move easily.

1070 Modem daughter card (MDC)

For access, remove these FRUs in order:

- “1010 Battery pack” on page 68
- “1050 Keyboard” on page 75

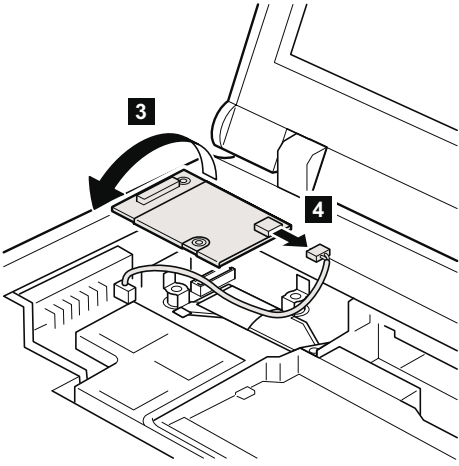


Step	Screw (quantity)	Color	Torque
1	M2 × 10 mm, flat-head, nylon-coated (2)	Black	0.245 Nm (2.5 kgfcm)

In step 2, remove the card by pulling the tab with your fingers in the direction of the arrow.

(continued)

Turn the card over **3** , and detach the modem connector **4** .

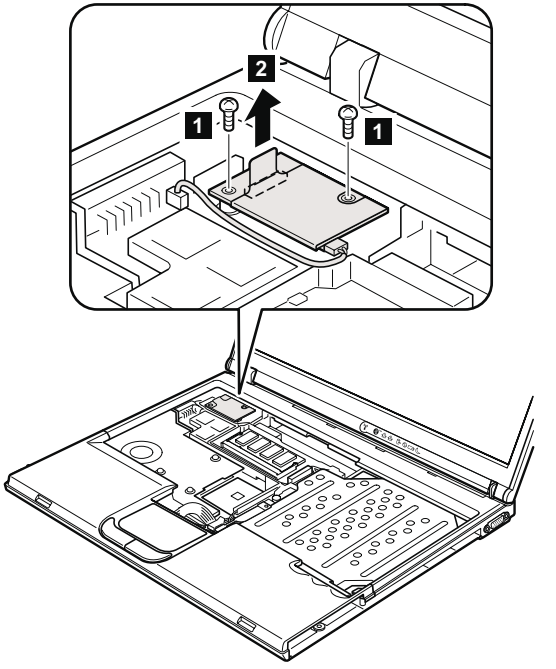


When installing: Make sure that connector **4** and the connector on the underside of the card are firmly attached.

1080 *Bluetooth*/Modem daughter card (BMDC)

For access, remove these FRUs in order:

- "1010 Battery pack" on page 68
- "1050 Keyboard" on page 75



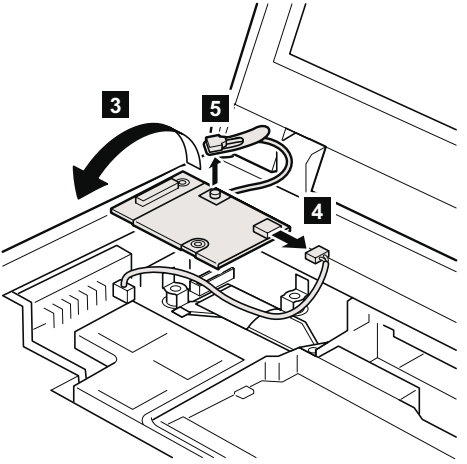
Step	Screw (quantity)	Color	Torque
1	M2 × 10 mm, flat-head, nylon-coated (2)	Black	0.245 Nm (2.5 kgfcm)

In step 2, remove the card by pulling the tab with your fingers in the direction of the arrow.

(continued)

Turn the card over 3 , and detach the modem connector 4 and the *Bluetooth* wireless antenna jack, which has a tab marked ″BT″ 5 .

Note: When unplugging the *Bluetooth* wireless antenna jack, do not pull the cable; it might snap. Unplug the jack by pulling the tab with your fingers.



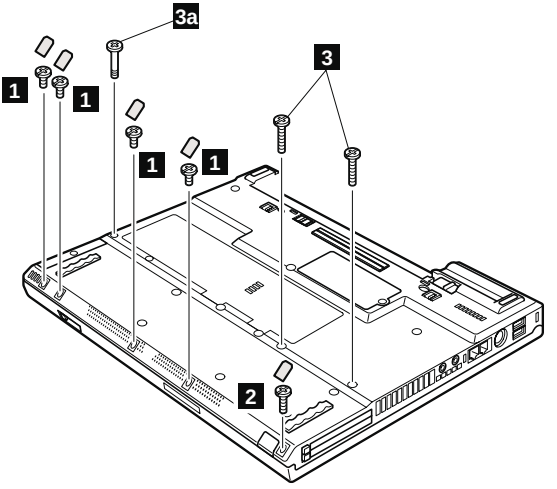
When installing: Make sure that connector 4 , the jack 5 , and the connector on the underside of the card are firmly attached.

1090 Palm rest

For access, remove these FRUs in order:

- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75

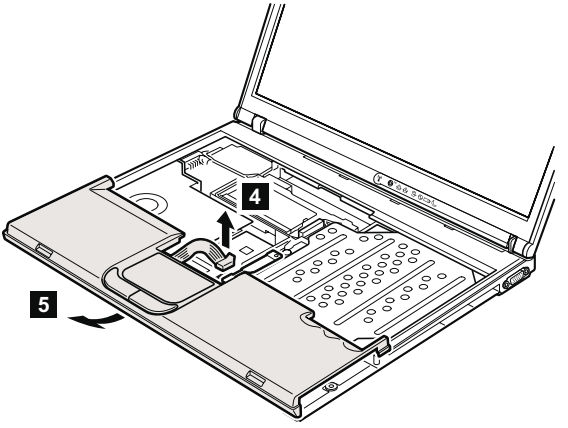
Note: For some models, this FRU is secured by using a tamper resistant torx head screw (TR7).



Step	Icon	Screw cap	Screw (quantity)	Color	Torque
1	1		M2 × 4 mm, small-head, nylon-coated (4)	Black	0.245 Nm (2.5 kgfcm)
2	2		M2 × 5 mm, bind-head, nylon-coated (1)	Silver	0.245 Nm (2.5 kgfcm)
3	Models with a 802.11b wireless LAN Mini PCI adapter				
	4	—	M2 × 14 mm, bind-head, nylon-coated (2)	Black	0.204 Nm (2.0 kgfcm)
	Models with a 802.11a/b wireless LAN Mini PCI adapter				
	4	—	M2 × 14 mm, TR7, nylon-coated (2)	Black	0.204 Nm (2.0 kgfcm)
3a	4	—	Special screw (1)	Black	0.245 Nm (2.5 kgfcm)

(continued)

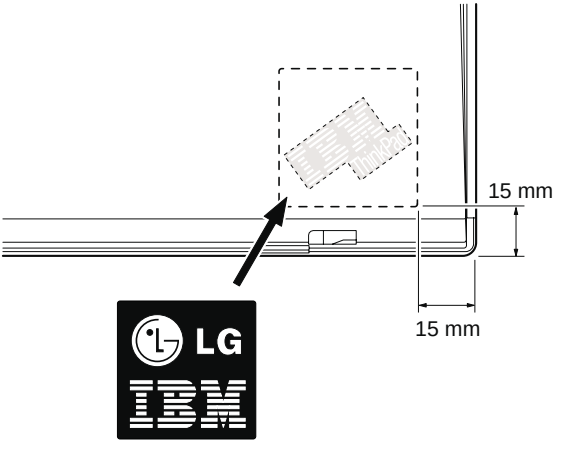
For a model with a touch pad, detach the touch pad connector by pulling the tab with your fingers in the direction of arrow **4** . Then remove the palm rest in the direction of arrow **5** . For other models, skip step **4** .



When installing: On a model with a touch pad, make sure that connector **4** is firmly attached.

Note for LG-IBM models (Korea) in T40/T40p series:

New palm rest FRU is shipped with the LG-IBM logo plate. When you replace the palm rest, you need to stick the LG-IBM logo plate as shown in this figure.

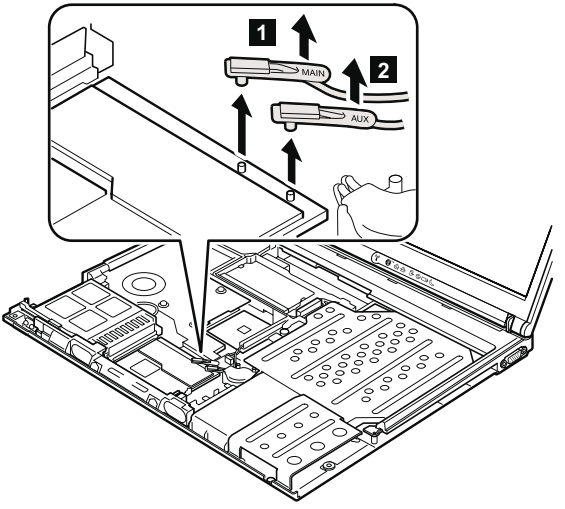


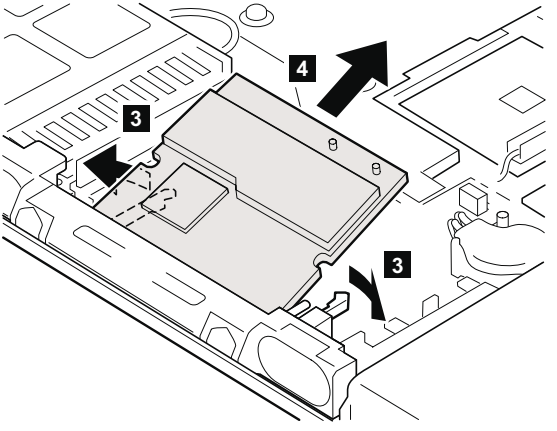
1100 Mini PCI adapter

For access, remove these FRUs in order:

- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1090 Palm rest” on page 84

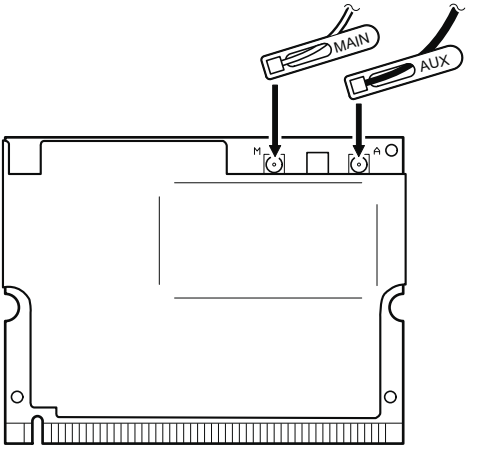
Note: When unplugging the antenna jack, do not pull the cable; it might snap. Unplug the jack by pulling the tab with your fingers.



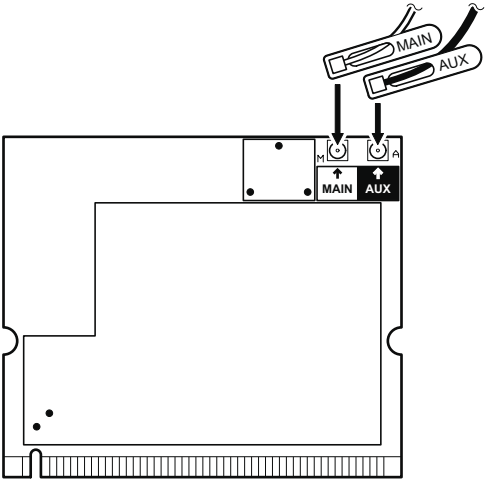


When installing: Plug in the wireless antenna cable as follows:

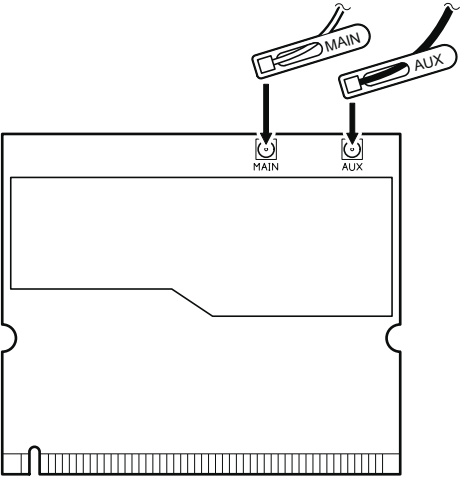
Intel® PRO/Wireless LAN 2100 3B Mini PCI Adapter
Plug the gray antenna cable with the tab marked **MAIN** into jack ***M***, and the black antenna cable with the tab marked **AUX** into jack ***A***.



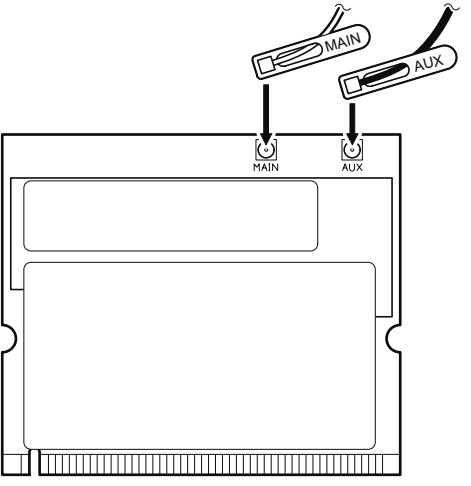
Cisco Aironet Wireless 802.11b
Plug the gray antenna cable with the tab marked **MAIN** into jack **M**, and the black antenna cable with the tab marked **AUX** into jack **A**.



IBM Dual-Band 11a/b Wi-Fi Wireless Mini PCI Adapter
Plug the gray antenna cable with the tab marked **MAIN** into jack **MAIN**, and the black antenna cable with the tab marked **AUX** into jack **AUX**.



IBM 11a/b/g Wireless LAN Mini PCI Adapter
Plug the gray antenna cable with the tab marked **MAIN** into jack **MAIN**, and the black antenna cable with the tab marked **AUX** into jack **AUX**.

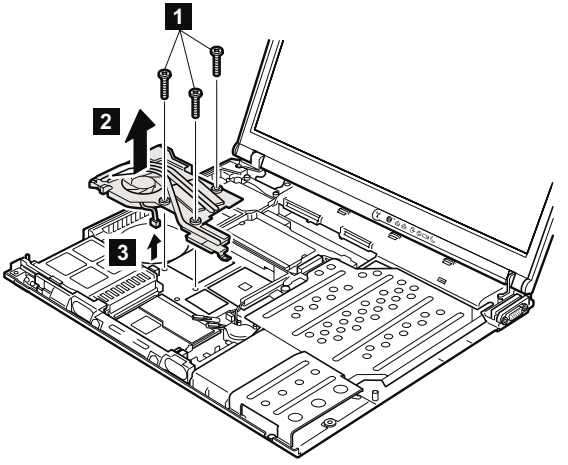


Insert the notched end of the card into the socket, and then press the card firmly. Pivot the card until it snaps into place. Make sure that it is firmly fixed in the slot and does not move easily.

1110 Fan assembly

For access, remove these FRUs in order:

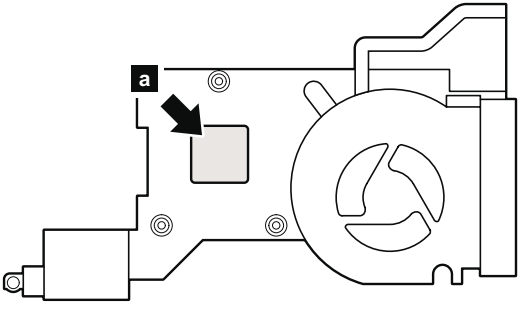
- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1090 Palm rest” on page 84



Step	Screw (quantity)	Color	Torque
1	M2 × 10 mm, flat-head, nylon-coated (3)	Black	0.245 Nm (2.5 kgfcm)

When installing:

1. Make sure that the connector 3 is firmly attached.
2. Apply thermal grease on the part marked a in this figure.



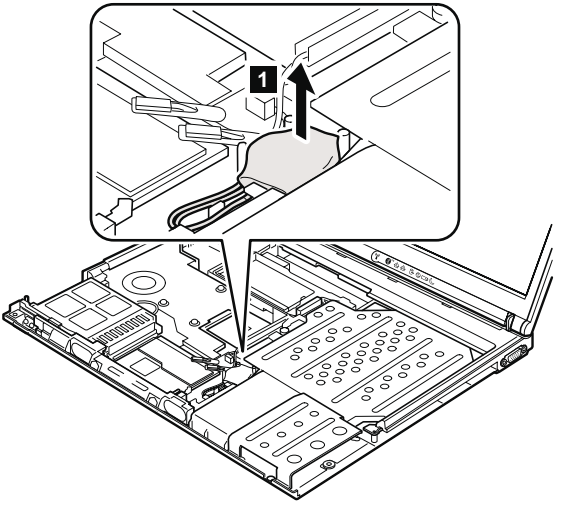
(Bottom view of the fan assembly)

1120 Backup battery

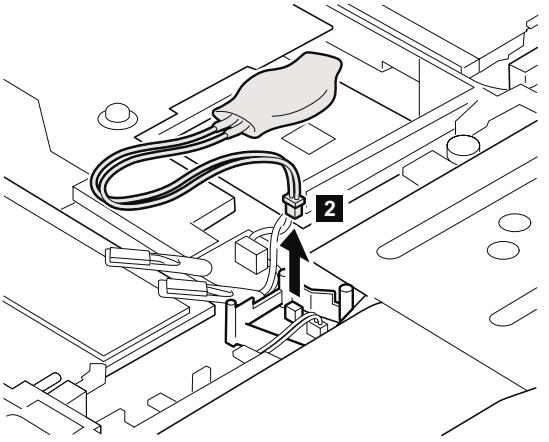
⚠ DANGER

Use only the battery specified in the parts list for your computer. Any other battery could ignite or explode.

For access, remove these FRUs in order:
- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1090 Palm rest” on page 84



(continued)

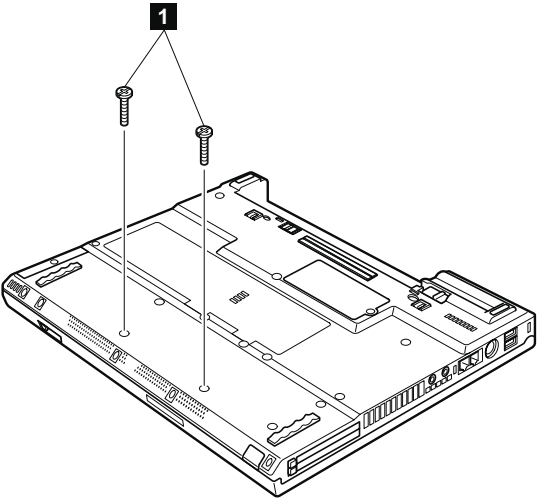


When installing: Make sure that the battery connector **2** is firmly attached.

1130 Speaker assembly

For access, remove these FRUs in order:

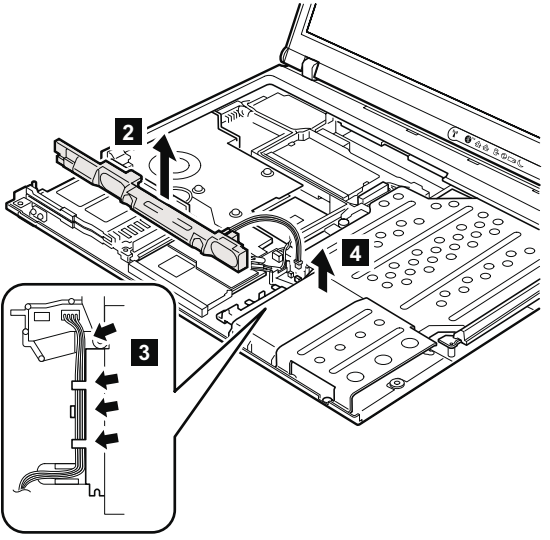
- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1090 Palm rest” on page 84



Step	Screw (quantity)	Color	Torque
1	M2 × 10 mm, flat-head, nylon-coated (2)	Black	0.245 Nm (2.5 kgfcm)

(continued)

In step **3** , release the speaker cables from the cable guide.

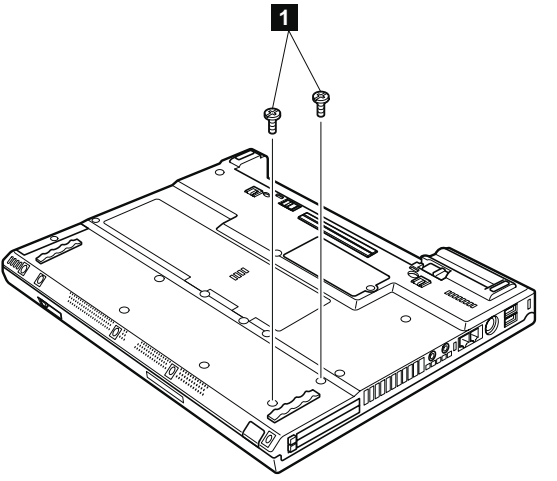


When installing: Make sure that the connector **4** is firmly attached. Then route the cable as in **3** .

1140 PC Card slot assembly

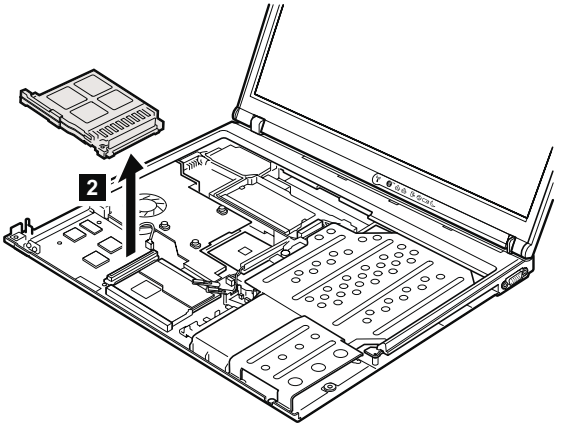
For access, remove these FRUs in order:

- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1090 Palm rest” on page 84
- “1130 Speaker assembly” on page 92



Step	Screw (quantity)	Color	Torque
1	M2 × 4 mm, bind-head, nylon-coated (2)	Black	0.204 Nm (2.0 kgfcm)

(continued)

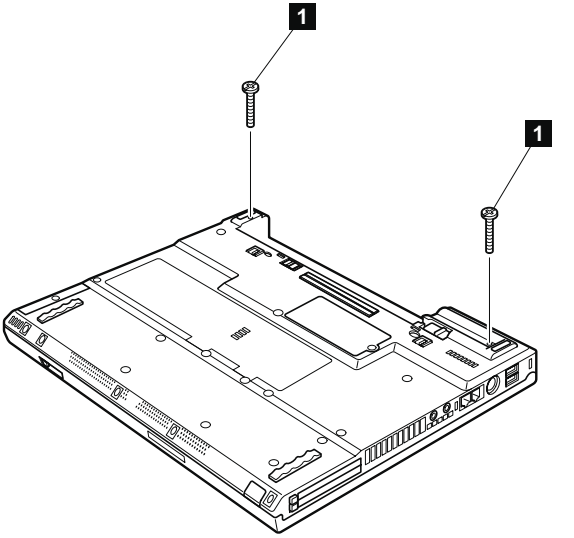


When installing: Make sure that the connector on the underside of the PC card slot **2** is firmly attached, and then secure the slot with the screws.

1150 Keyboard bezel

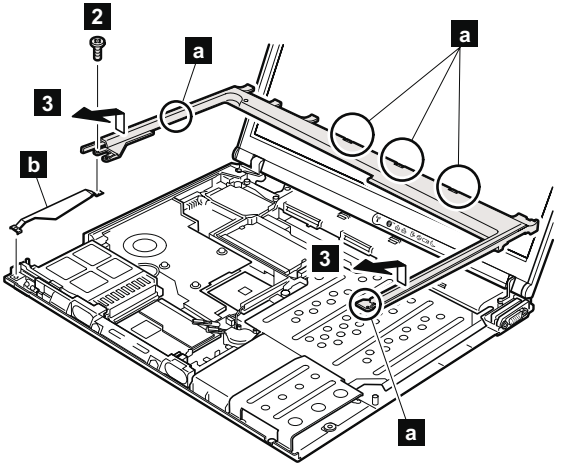
For access, remove these FRUs in order:

- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1090 Palm rest” on page 84



Step	Screw (quantity)	Color	Torque
1	M2 × 19 mm, bind-head, nylon-coated (2)	Black	0.245 Nm (2.5 kgfcm)

(continued)



Step	Screw (quantity)	Color	Torque
2	M2 × 4 mm, bind-head, nylon-coated (1)	Black	0.245 Nm (2.5 kgfcm)

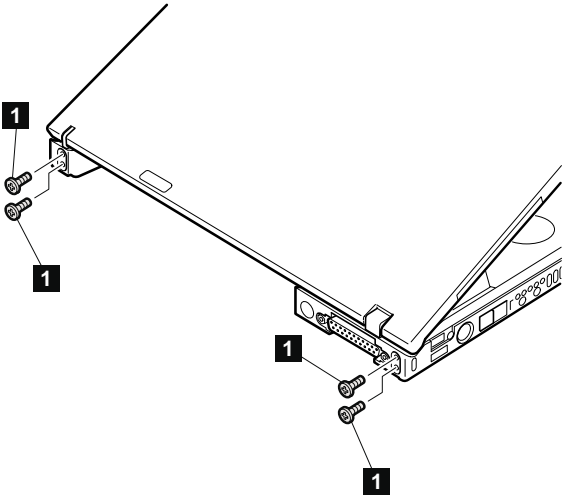
In step 3 , make sure that all the latches marked a are detached, and then remove the bezel.

When installing: Make sure that all the latches marked a are firmly attached. Attach harness left (b), and then secure the keyboard bezel with the screws.

1160 LCD assembly

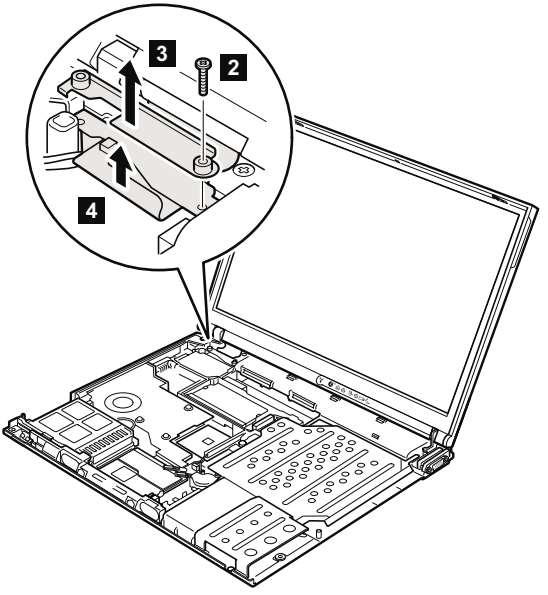
For access, remove these FRUs in order:

- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1080 *Bluetooth*/Modem daughter card (BMDC)” on page 82
- “1090 Palm rest” on page 84
- “1100 Mini PCI adapter” on page 86
- “1150 Keyboard bezel” on page 96



Step	Screw (quantity)	Color	Torque
1	M2.5 × 4.8 mm, bind-head, nylon-coated (4)	Black	0.245 Nm (2.5 kgfcm)

(continued)

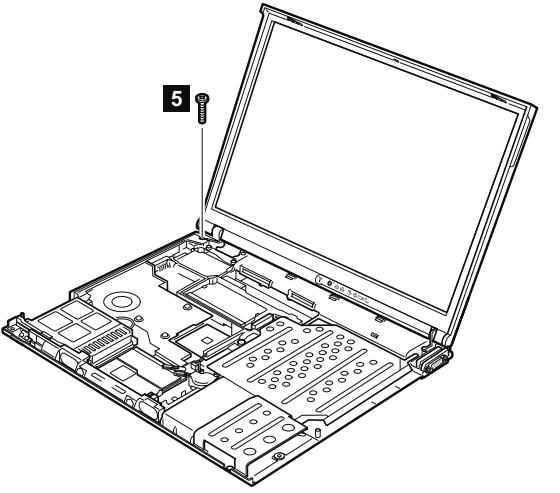


Step	Screw (quantity)	Color	Torque
2	M2 × 14 mm, bind-head, nylon-coated (1)	Black	0.245 Nm (2.5 kgfcm)

After removing the screw, remove bracket 3 . Then detach the LCD connector 4 .

When installing: Make sure that the bracket 3 and the connector 4 are firmly attached, and then secure them with the screw.

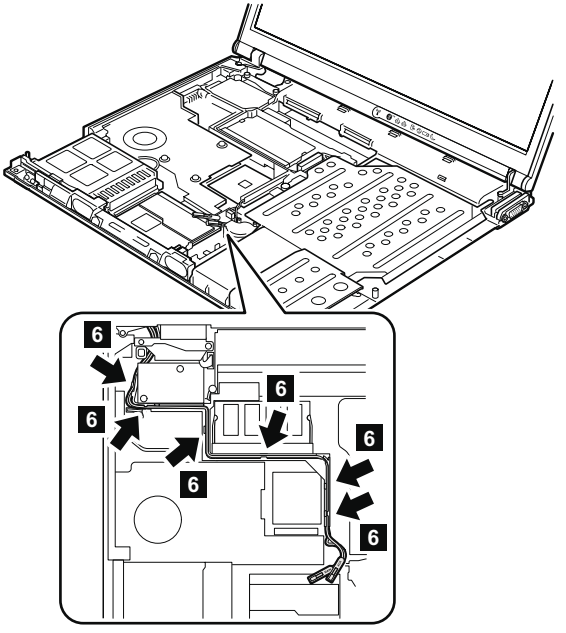
(continued)



Step	Screw (quantity)	Color	Torque
5	M2 × 10 mm, flat-head, nylon-coated (1)	Black	0.245 Nm (2.5 kgfcm)

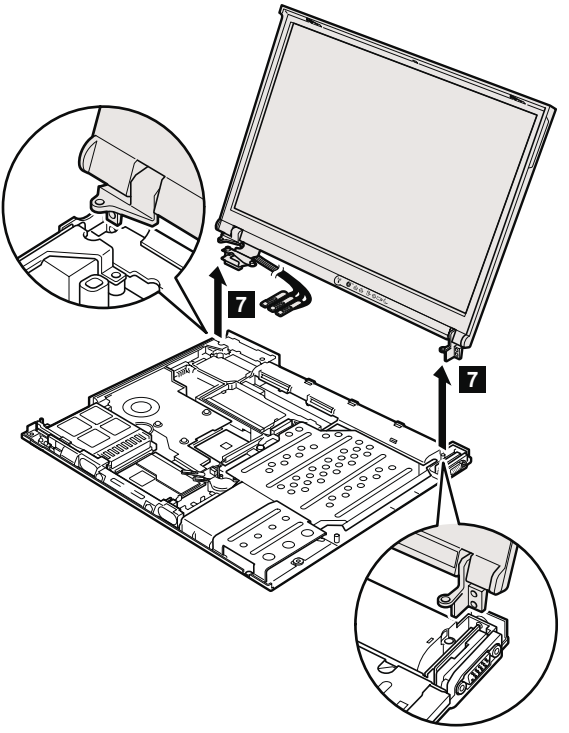
(continued)

Release the antenna cables from the cable guide **6** .



When installing: Make sure that the antenna cables are correctly routed and securely in place.

(continued)



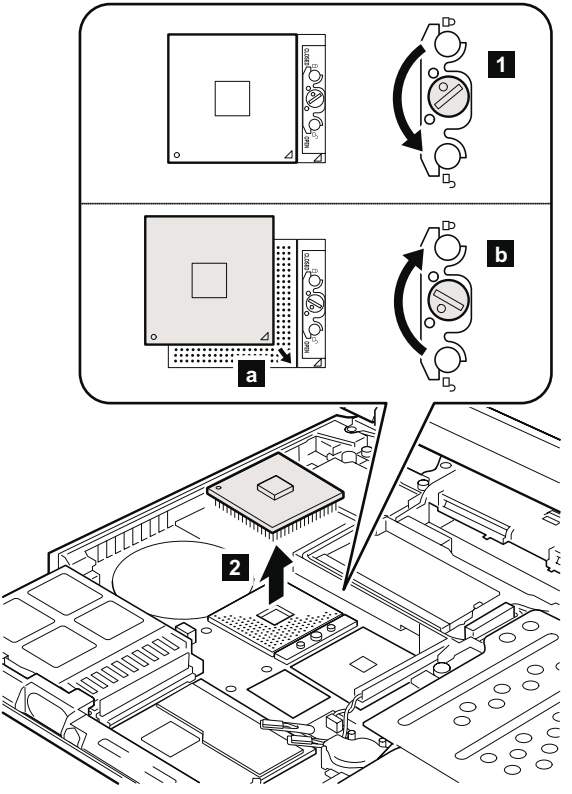
When installing: Make sure that the security keyhole which is on the left-rear corner of the base cover and the keyhole of the bracket inside are aligning firmly.

1170 CPU

For access, remove these FRUs in order:

- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1090 Palm rest” on page 84
- “1150 Keyboard bezel” on page 96
- “1160 LCD assembly” on page 98
- “1110 Fan assembly” on page 89

Rotate the head of the screw in the direction shown by arrow **1** to release the lock; then remove the CPU **2**.

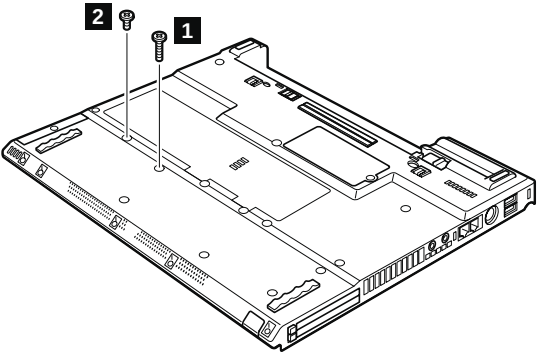


When installing: Place the CPU on the CPU socket **a**, and then rotate the head of the screw in the direction shown by arrow **b** to secure the CPU.

1180 Ultrabay Slim guide rail assembly

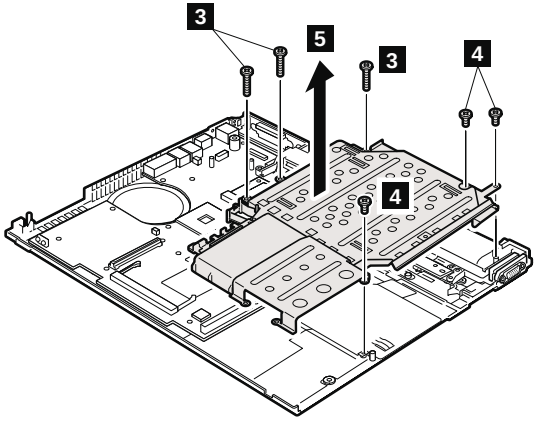
For access, remove these FRUs in order:

- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1090 Palm rest” on page 84
- “1130 Speaker assembly” on page 92
- “1140 PC Card slot assembly” on page 94
- “1150 Keyboard bezel” on page 96
- “1160 LCD assembly” on page 98



Step	Screw (quantity)	Color	Torque
1	M2 × 14 mm, bind-head, nylon-coated (1)	Black	0.204 Nm (2.0 kgfcm)
2	M2 × 4 mm, bind-head, nylon-coated (1)	Black	0.204 Nm (2.0 kgfcm)

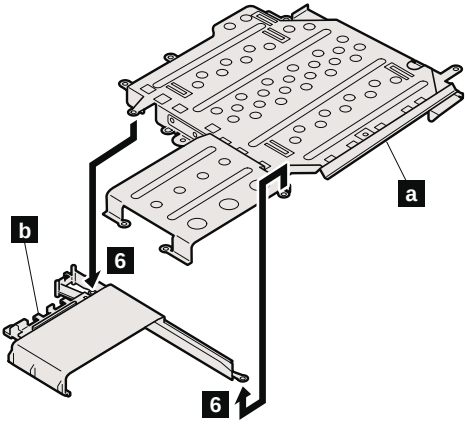
(continued)



Step	Screw (quantity)	Color	Torque
3	M2 × 10 mm, flat-head, nylon-coated (3)	Black	0.245 Nm (2.5 kgfcm)
4	M2 × 3 mm, small-head, nylon-coated (3)	Silver	0.245 Nm (2.5 kgfcm)

In step 5 , remove the Ultrabay Slim guide rail assembly and the hard disk drive guide rail together.

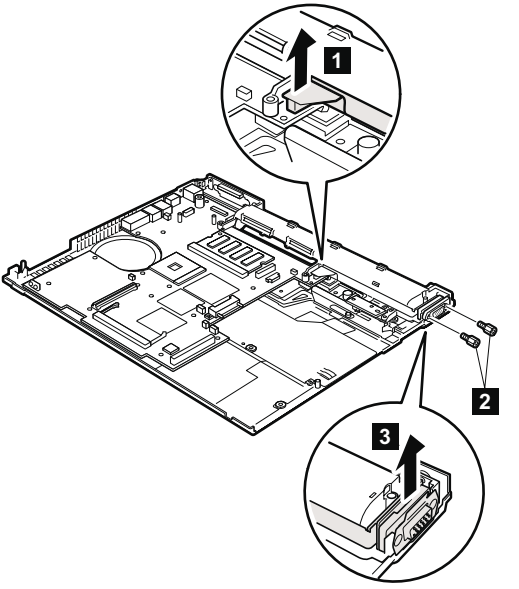
Separate the Ultrabay Slim guide rail assembly a and the hard disk drive guide rail b .



1190 VGA and Ultrabay Slim device eject button cable

For access, remove these FRUs in order:

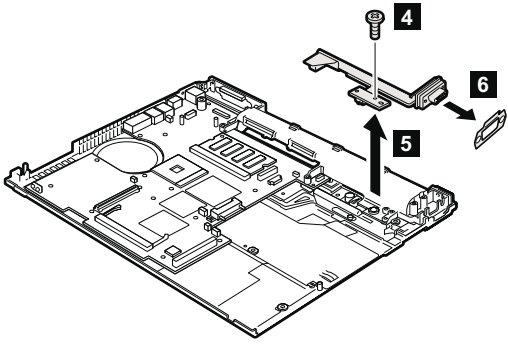
- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1090 Palm rest” on page 84
- “1150 Keyboard bezel” on page 96
- “1160 LCD assembly” on page 98
- “1180 Ultrabay Slim guide rail assembly” on page 104



Step	Screw (quantity)	Color	Torque
2	Hex stud (2)	Silver	0.392 Nm (4 kgfcm)

When installing: Make sure that the connector 1 is firmly attached.

(continued)



Step	Screw (quantity)	Color	Torque
4	M2 × 4 mm, bind-head, nylon-coated (1)	Black	0.245 Nm (2.5 kgfcm)

1200 System board and base cover

For access, remove these FRUs, in order:

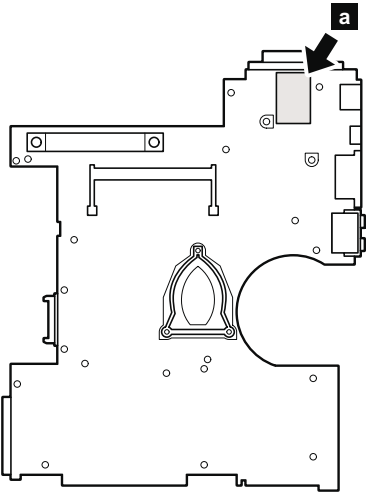
- “1010 Battery pack” on page 68
- “1020 Ultrabay Slim device” on page 70
- “1030 Hard disk drive” on page 71
- “1040 DIMM (optional)” on page 73
- “1050 Keyboard” on page 75
- “1060 DIMM (standard)” on page 79
- “1070 Modem daughter card (MDC)” on page 80
- “1080 *Bluetooth*/Modem daughter card (BMDC)” on page 82
- “1090 Palm rest” on page 84
- “1100 Mini PCI adapter” on page 86
- “1110 Fan assembly” on page 89
- “1120 Backup battery” on page 90
- “1130 Speaker assembly” on page 92
- “1140 PC Card slot assembly” on page 94
- “1150 Keyboard bezel” on page 96
- “1160 LCD assembly” on page 98
- “1170 CPU” on page 103
- “1180 Ultrabay Slim guide rail assembly” on page 104
- “1190 VGA and Ultrabay Slim device eject button cable” on page 106

Important notice for handling the system board in ThinkPad T40 series:

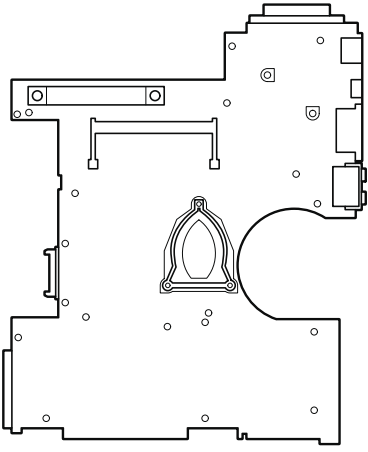
There are two types of system board FRU for the ThinkPad T40 series, as follows:

- System board with IBM security chip (bottom view)

Note: The security chip **a** is embedded on the underside of the system board.



- System board without IBM security chip (bottom view)



Begin by checking the FRU number of the system board, and be sure to use the correct system board for the computer. For the FRU numbers, see “Parts list” on page 142.

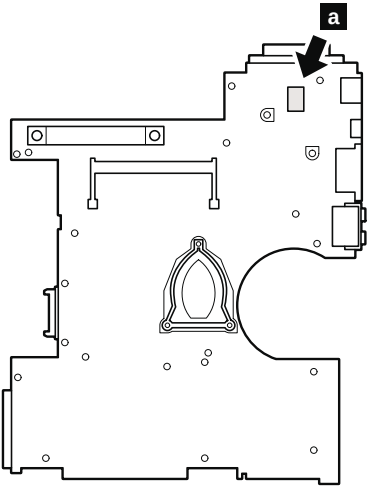
Important

If the ThinkPad computer you are servicing has a security chip, bear the following in mind:

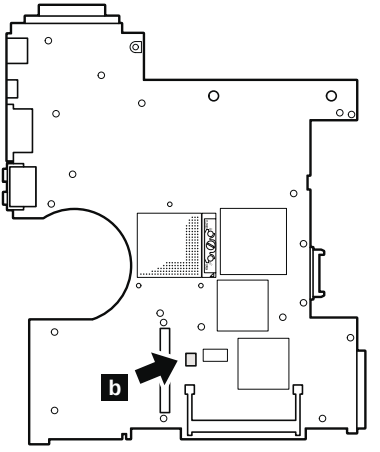
- **Do not remove the security chip from the system board**. If the security chip is removed by accident, reinstall it on the system board immediately. Make sure that it is firmly fixed on the system board and does not move easily.
- The security chip **cannot** be used with any other system board.
- The system board **cannot** be used with any other security chip.
- The system board **cannot** be used without the security chip.
- If you return a defective system board, you must check whether the security chip is embedded. If it is not, the board may not be covered under warranty.

Important notice for handling the system board in ThinkPad T41 series:

In ThinkPad T41 series, the security chip **a** is soldered on the underside of the system board as in this figure.



In ThinkPad T41 series, accelerometer chip for the IBM HDD Active Protection System **b** is also soldered on the topside of the system board.



Important

When handling the system board in ThinkPad T41 series, bear the following in mind.

- The system board of the ThinkPad T41 series has an accelerometer, which can be broken by applying several thousands of G-forces.

  Note: Dropping a system board from a height of as little as 6 inches so that it falls flat on a hard bench can subject the accelerometer to as much as 6,000 G's of shock.

- Be careful not to drop the system board on a bench top that has a hard surface, such as metal, wood, or composite.
- If a system board is dropped, you must test it, using PC-Doctor DOS, to make sure that the IBM HDD Active Protection still functions (see below).

  Note: If the test shows that IBM HDD Active Protection is not functioning, be sure to document the drop in any reject report, and replace the system board.

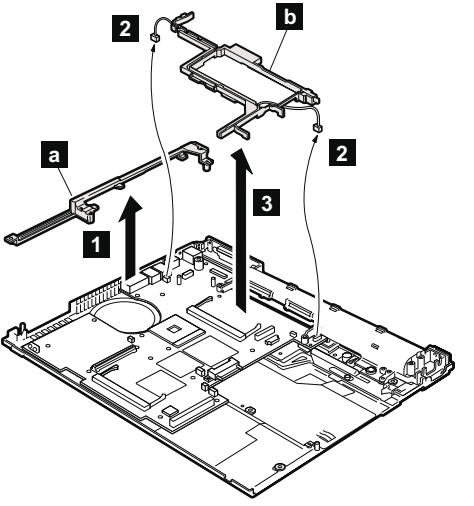
- Avoid rough handling of any kind.
- At every point in the process, be sure not to drop or stack the system board.
- If you put a system board down, be sure to put it only on a padded surface such as an ESD mat or conductive corrugated material.

After replacing the system board, run PC-Doctor DOS to make sure that IBM HDD Active Protection still functions. The procedure is as follows:

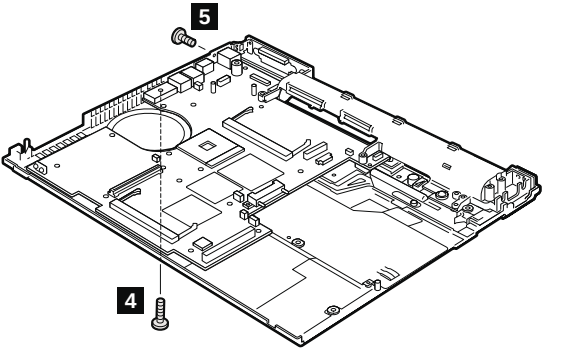
1. Place the computer on a horizontal surface.
2. Run **Diagnostics** --> **Other Devices** --> **IBM HDD Active Protection Test**.

   Attention: Do not apply physical shock to the computer while the test is running.

Before removing the system board, remove the support structure (**a**) and the cable guide (**b**).

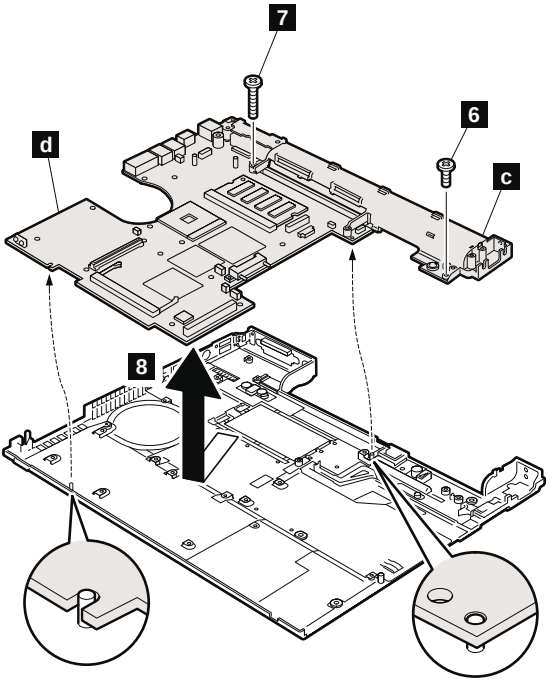


When installing: Make sure that the connectors **2** are firmly attached to the system board.



Step	Screw (quantity)	Color	Torque
4	M2 × 10 mm, flat-head, nylon-coated (1)	Black	0.245 Nm (2.5 kgfcm)
5	M2.5 × 4 mm, bind-head, nylon-coated (1)	Black	0.392 Nm (4 kgfcm)

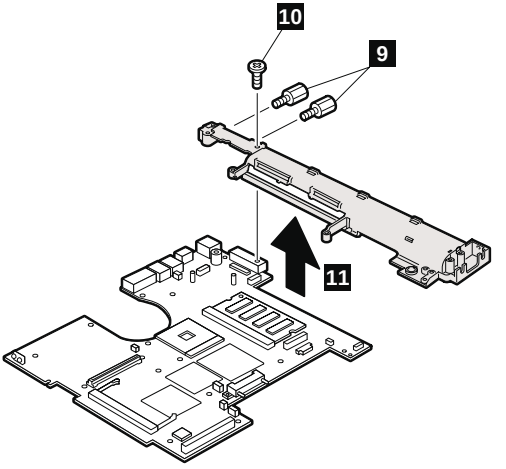
(continued)



Step	Screw (quantity)	Color	Torque
6	M2 × 3 mm, small-head, nylon-coated (1)	Silver	0.245 Nm (2.5 kgfcm)
7	M2 × 10 mm, flat-head, nylon-coated (1)	Black	0.245 Nm (2.5 kgfcm)

In step 8, remove the I/O plate bracket (c) and the system board (d) together.

(continued)



Step	Screw (quantity)	Color	Torque
9	Hex stud (2)	Silver	0.392 Nm (4 kgfcm)
10	M2.5 × 3 mm, bind-head, nylon-coated (1)	Gold	0.392 Nm (4 kgfcm)

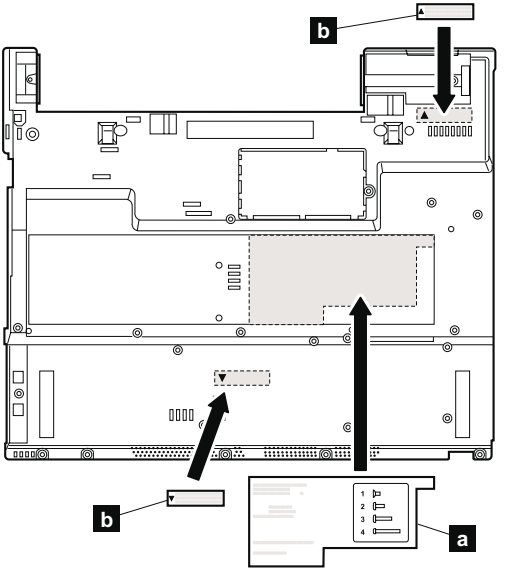
When installing: Attach the system board so that the two small projections on the base cover fit into the holes provided, and then secure the system board with the screw.

Note for sticking a label kit on the base cover

New base cover FRU is shipped with several kinds of label kit. When you replace the base cover, you need to stick a homologation label **a** which has the same part no. with the label on the old base cover (defective FRU) on the new base cover.

In some models, you also need to stick one or two FCC labels **b** . Check the old base cover and if there is one or two FCC labels on it, find the same one from the label kit and stick it on the new base cover.

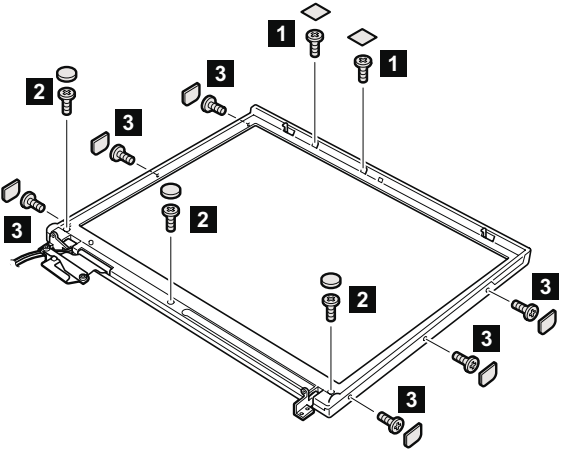
Stick the labels on the new base cover as shown in this figure.



2010 LCD front bezel

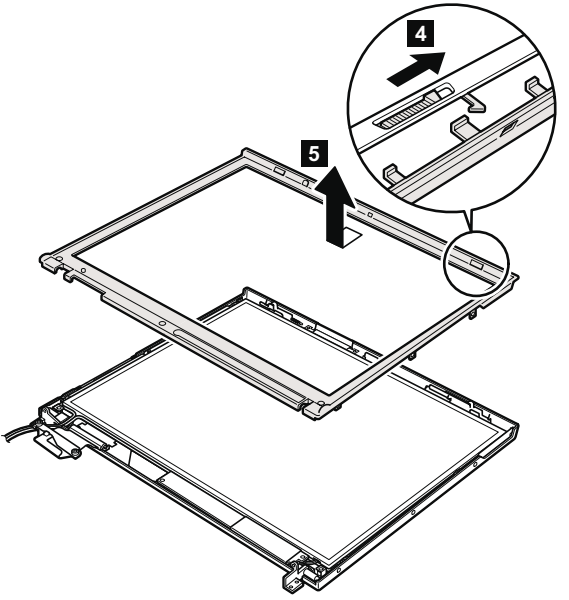
For access, remove these FRUs in order:

- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1080 *Bluetooth*/Modem daughter card (BMDC)” on page 82
- “1090 Palm rest” on page 84
- “1100 Mini PCI adapter” on page 86
- “1150 Keyboard bezel” on page 96
- “1160 LCD assembly” on page 98



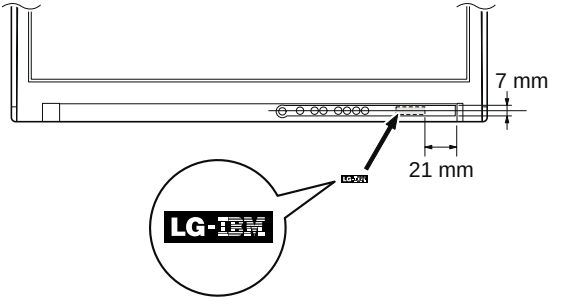
Step	Screw cap	Screw (quantity)	Color	Torque
1	□	M2 × 3 mm, pan-head, nylon-coated (2)	Black	0.245 Nm (2.5 kgfcm)
2	○	M2.5 × 4.8 mm, bind-head, nylon-coated (3)	Black	0.392 Nm (4 kgfcm)
3	⌓	M2 × 3 mm, pan-head, nylon-coated (6)	Black	0.245 Nm (2.5 kgfcm)

(continued)



Note for LG-IBM models (Korea) in T41/T41p series:

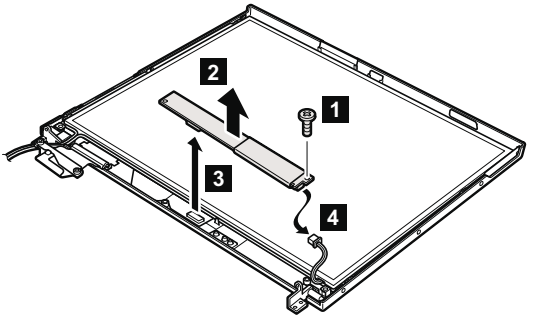
New LCD front bezel FRU is shipped with the LG-IBM logo kit. When you replace the LCD front bezel, you need to stick the LG-IBM logo plate as shown in this figure.



2020 Inverter card

For access, remove these FRUs in order:

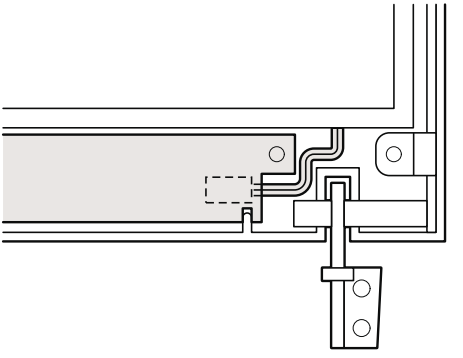
- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1080 *Bluetooth*/Modem daughter card (BMDC)” on page 82
- “1090 Palm rest” on page 84
- “1100 Mini PCI adapter” on page 86
- “1150 Keyboard bezel” on page 96
- “1160 LCD assembly” on page 98
- “2010 LCD front bezel” on page 116



Step	Screw (quantity)	Color	Torque
1	M2 × 3 mm, small-head, nylon-coated (1)	Silver	0.245 Nm (2.5 kgfcm)

When installing: Make sure that connectors 2 and 3 are firmly attached.

Cable routing: When replacing the inverter card, route the connector cable as in this figure:



2030 *Bluetooth* wireless antenna assembly

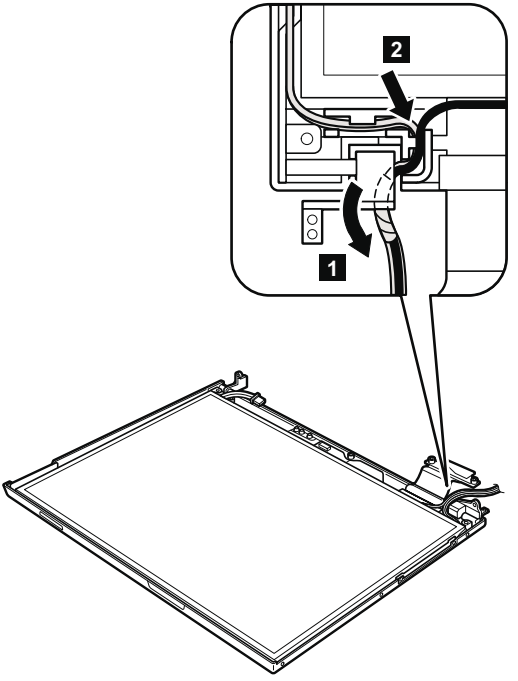
Note

This section is only for the models with the *Bluetooth* wireless features. Other models do not have this antenna.

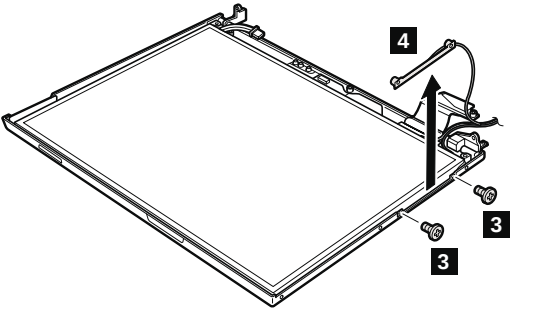
For access, remove these FRUs in order:

- “1010 Battery pack” on page 68
- “1030 Hard disk drive” on page 71
- “1050 Keyboard” on page 75
- “1080 *Bluetooth*/Modem daughter card (BMDC)” on page 82
- “1090 Palm rest” on page 84
- “1100 Mini PCI adapter” on page 86
- “1150 Keyboard bezel” on page 96
- “1160 LCD assembly” on page 98
- “2010 LCD front bezel” on page 116

Slide the spiral tube binding the antenna cables (**1**) first, and then release the cables from the cable guide (**2**).



(continued)



Step	Screw (quantity)	Color	Torque
3	M2 × 3 mm, small-head, nylon-coated (2)	Silver	0.245 Nm (2.5 kgfcm)

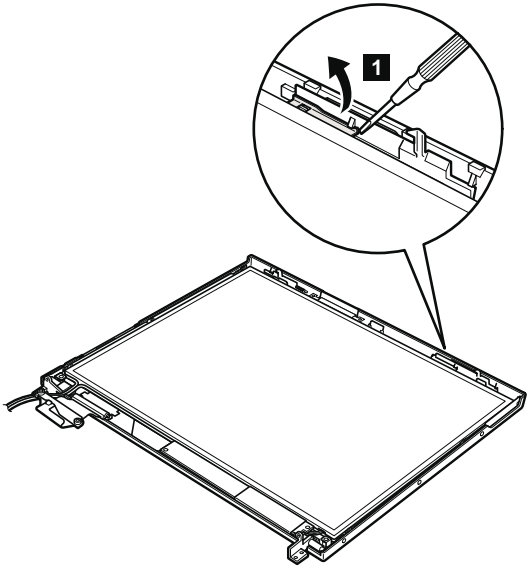
2040 LCD panel, LCD cable assembly, wireless LAN antenna assembly, hinges, and LCD cover

For access, remove these FRUs in order:

- "1010 Battery pack" on page 68
- "1030 Hard disk drive" on page 71
- "1050 Keyboard" on page 75
- "1080 *Bluetooth*/Modem daughter card (BMDC)" on page 82
- "1090 Palm rest" on page 84
- "1100 Mini PCI adapter" on page 86
- "1150 Keyboard bezel" on page 96
- "1160 LCD assembly" on page 98
- "2010 LCD front bezel" on page 116
- "2020 Inverter card" on page 118
- "2030 *Bluetooth* wireless antenna assembly" on page 119

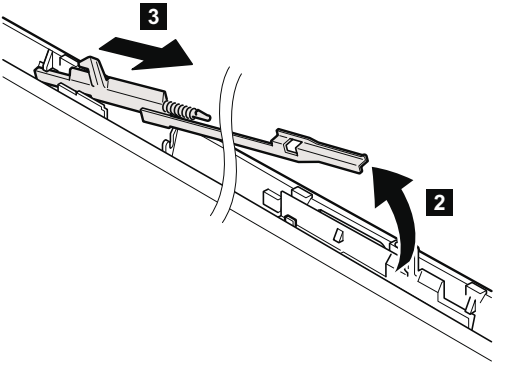
Before removing the LCD panel, remove the left latch first.

In step **1** , unlatch the latch bar as in this figure.

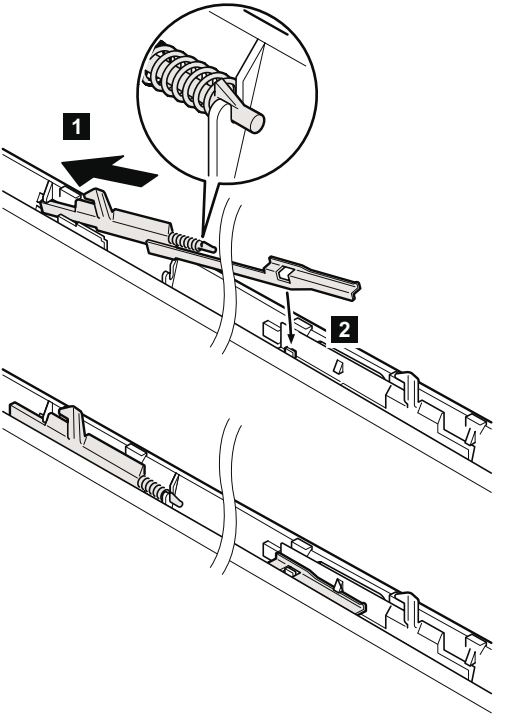


(continued)

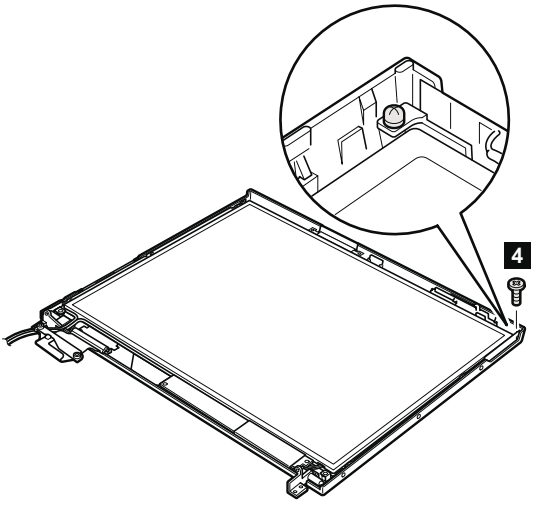
Lift the latch bar in the direction of the arrow **2** , and then remove the left latch in the direction of the arrow **3** .



When installing: Attach the left latch to the LCD cover as follows:



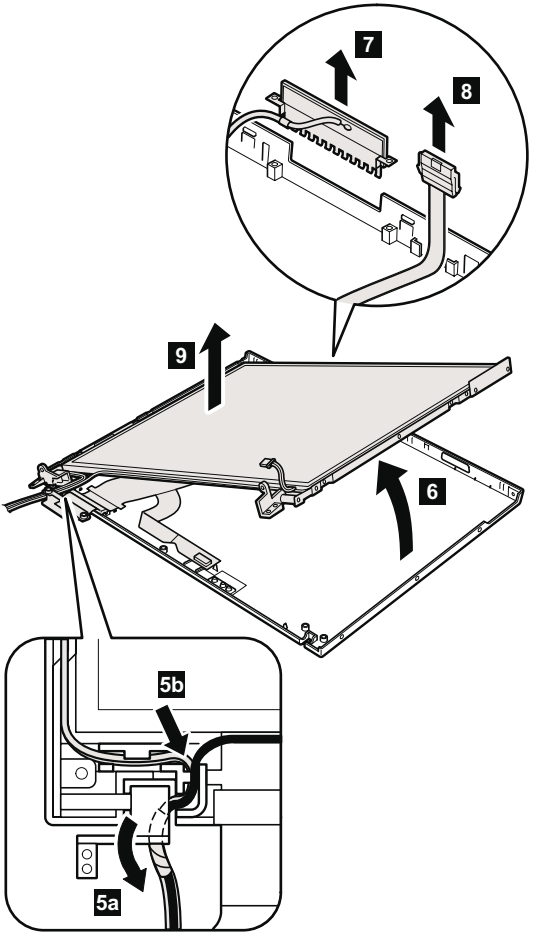
(continued)



Step	Screw (quantity)	Color	Torque
4	M2 × 3 mm, small-head, nylon-coated (1)	Silver	0.245 Nm (2.5 kgfcm)

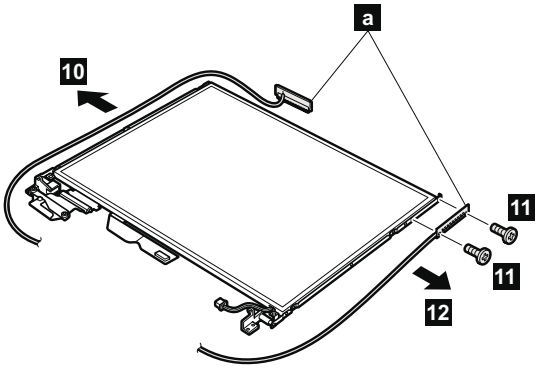
(continued)

Slide the spiral tube binding the antenna cables (**5a**), and then release the cables from the cable guide (**5b**). Lift the LCD panel in the direction of arrow **6** , and detach the wireless LAN antenna **7** and the ThinkLight **8** . Then remove the LCD panel in the direction of arrow **9** .



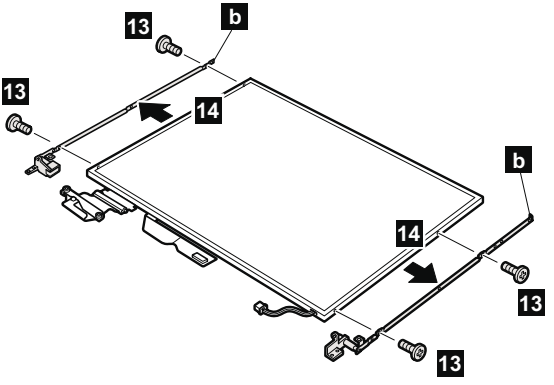
(continued)

Remove the antenna assembly (**a**).



Step	Screw (quantity)	Color	Torque
11	M2 × 3 mm, small-head, nylon-coated (2)	Silver	0.245 Nm (2.5 kgfcm)

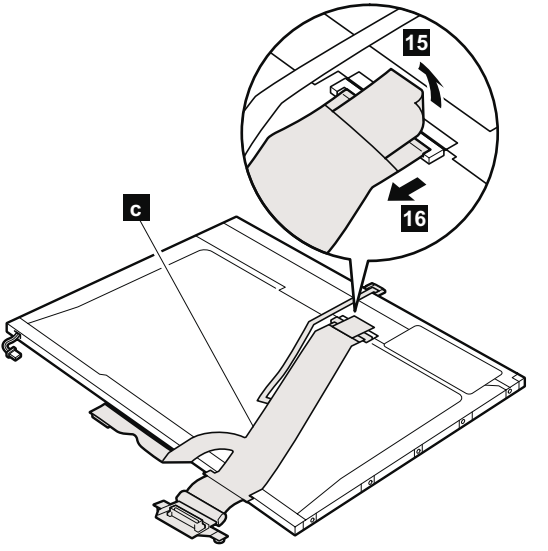
Remove the hinges (**b**) from the LCD assembly.



Step	Screw (quantity)	Color	Torque
13	M2 × 3 mm, small-head, nylon-coated (4)	Silver	0.245 Nm (2.5 kgfcm)

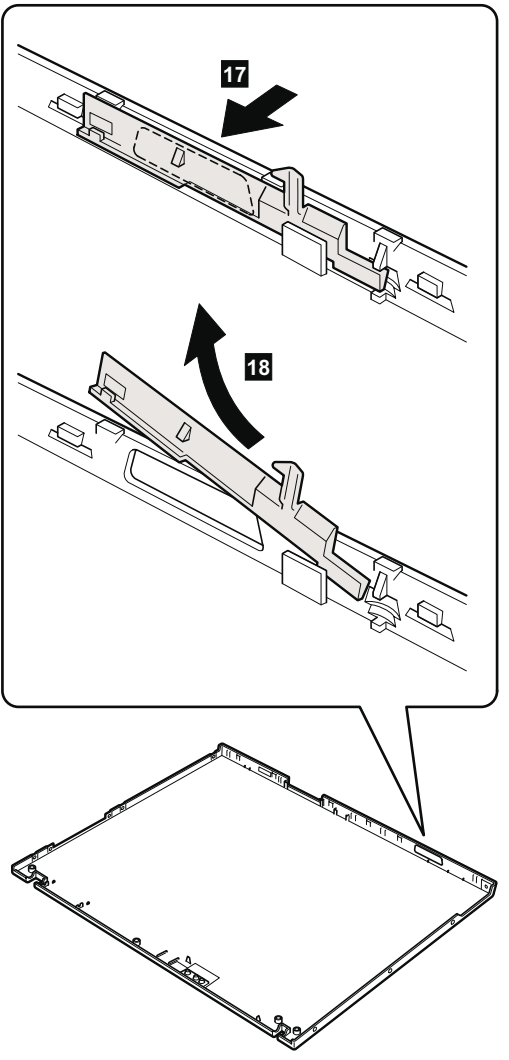
(continued)

Turn over the LCD panel and strip off the tape **15** securing the FPC (**c**). Then detach the connector **16** in the direction of the arrow.

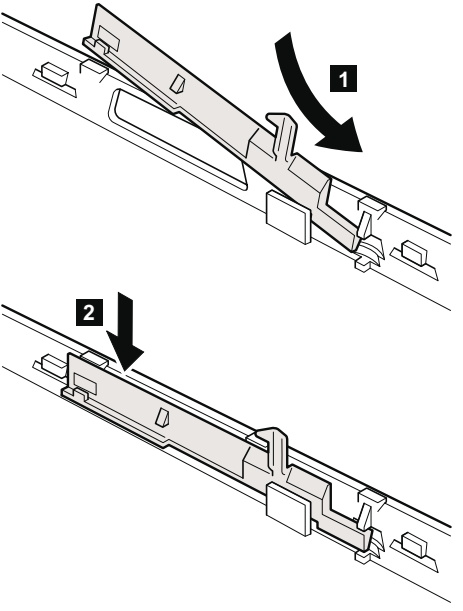


(continued)

Remove the right latch from the LCD cover.

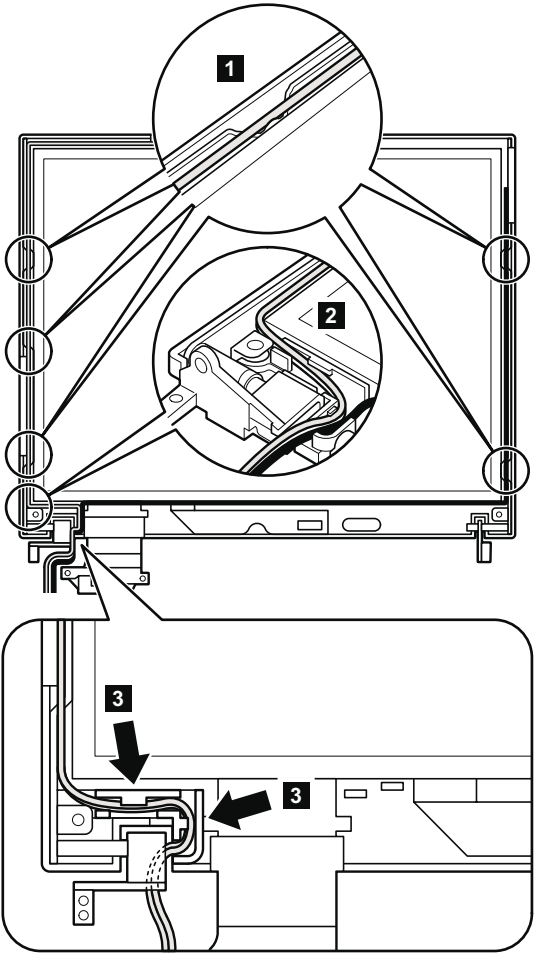


When installing: Attach the right latch to the LCD cover as follows:

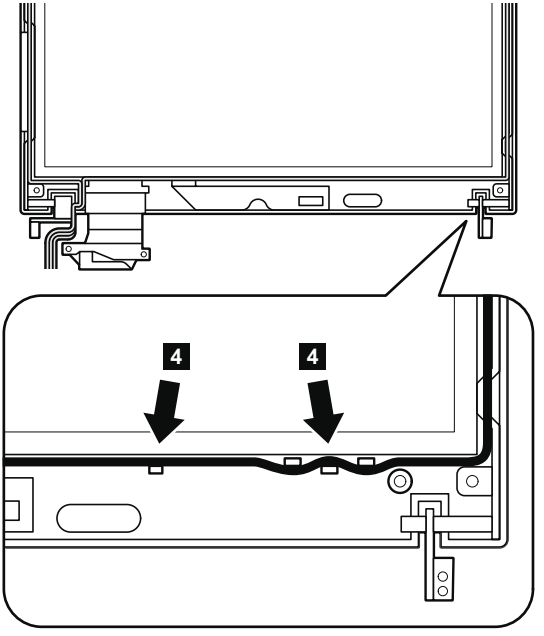


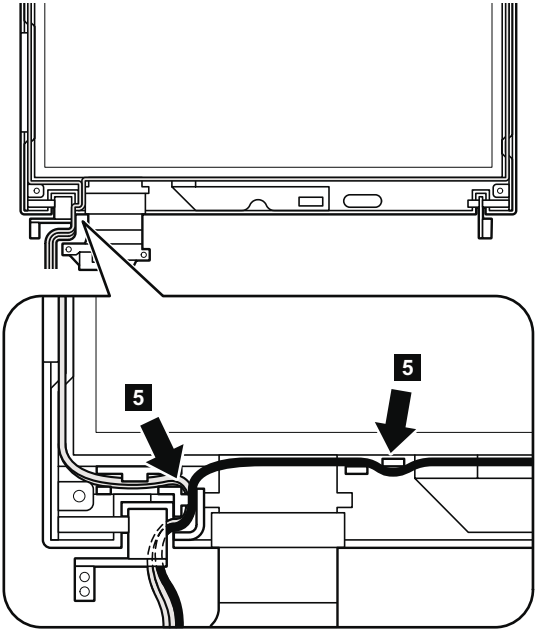
Routing the cables of the wireless LAN antenna:

Route the antenna cables as in the following drawings:



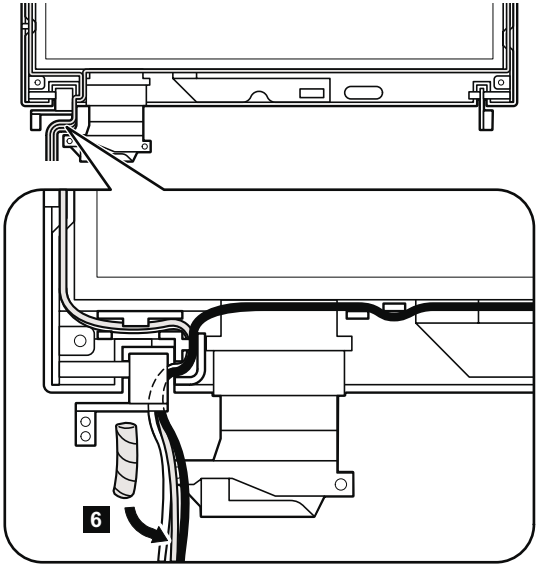
(continued)



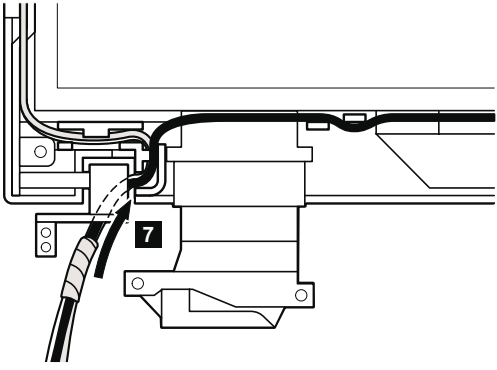


(continued)

Coil the spiral tube round the antenna cables.

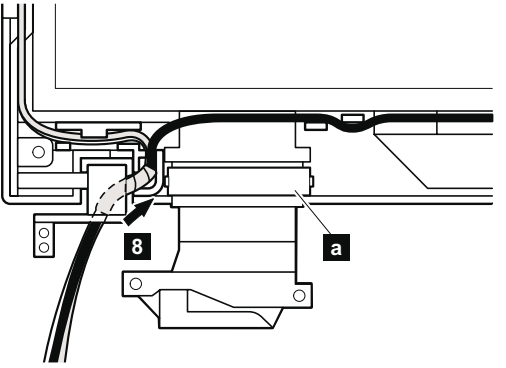


Slide the spiral tube in the direction shown by arrow **7** .



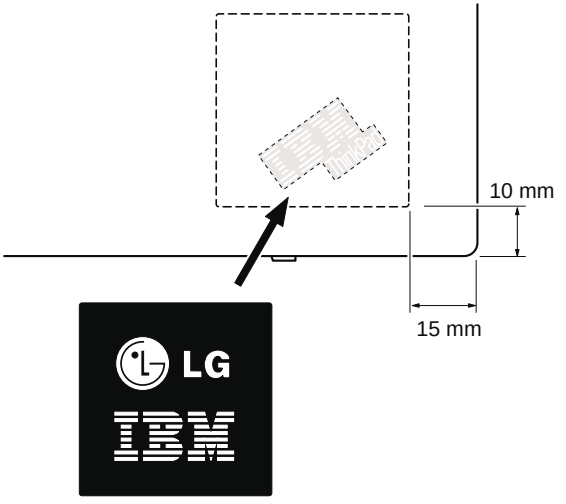
(continued)

Move the spiral tube until it reaches at the cable guide of the LCD cover as in this figure. Make sure that the antenna cable is not pinched by cable clip (**a**).



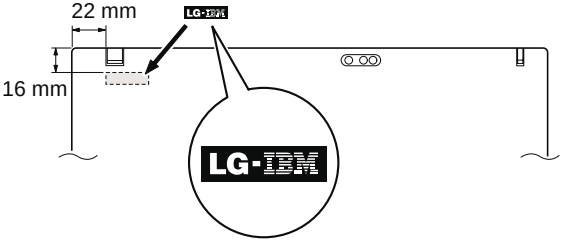
Note for LG-IBM models (Korea) in T40/T40p series:

New LCD cover FRU is shipped with the LG-IBM logo plate. When you replace the LCD cover, you need to stick the LG-IBM logo plate as shown in this figure.

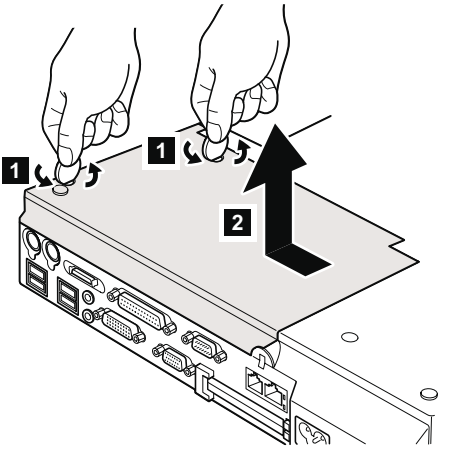


Note for LG-IBM models (Korea) in T41/T41p series:

New LCD cover FRU is shipped with the LG-IBM logo kit. When you replace the LCD cover, you need to stick the LG-IBM logo plate as shown in this figure.

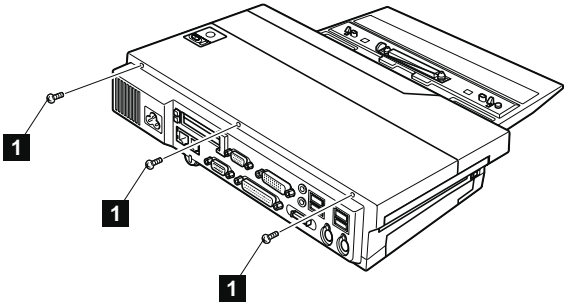


3010 ThinkPad Dock II PCI cover



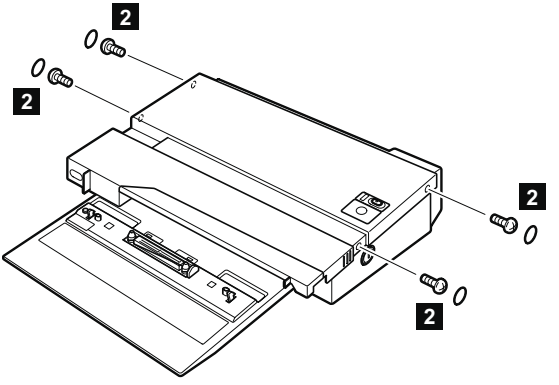
(Bottom view)

3020 ThinkPad Dock II top cover



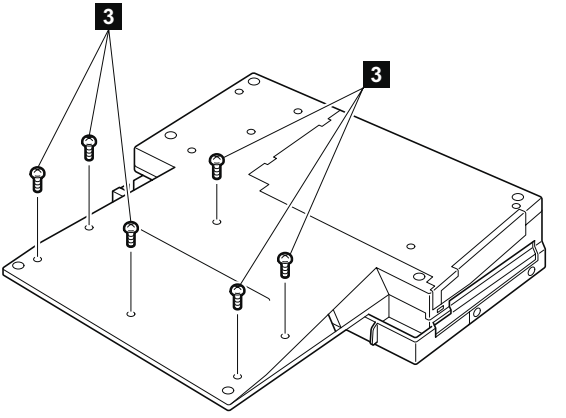
(Rear view)

Step	Screw (quantity)	Torque
1	M2.5 × 4.8 mm (3)	0.392 Nm (4 kgfcm)



Step	Screw (quantity)	Torque
2	M2.5 × 4.8 mm (4)	0.392 Nm (4 kgfcm)

(continued)

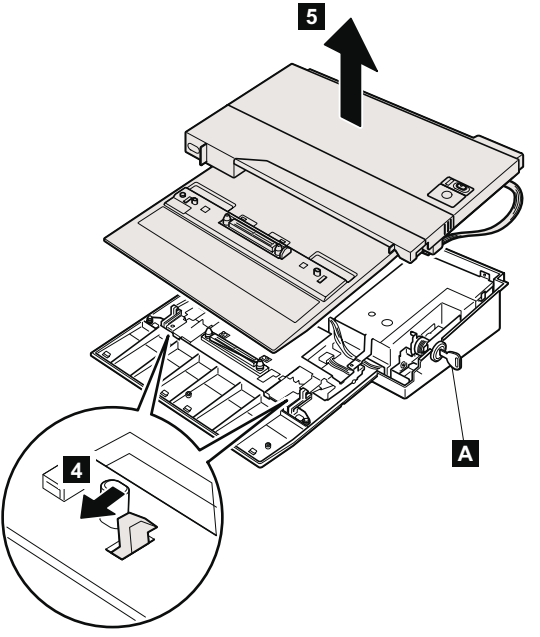


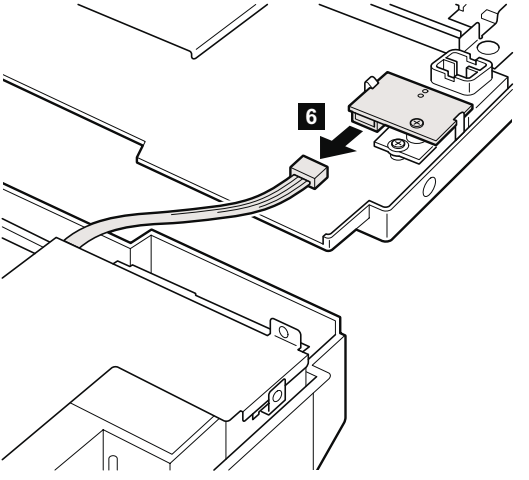
(Bottom view)

Step	Screw (quantity)	Torque
3	M2.5 × 4.8 mm (6)	0.392 Nm (4 kgfcm)

(continued)

Make sure that the system lock key **A** is set to the Unlock position. Release the front latches in step **4**, and then remove the top cover **5**. Then detach the connector cable **6** as in the figure.

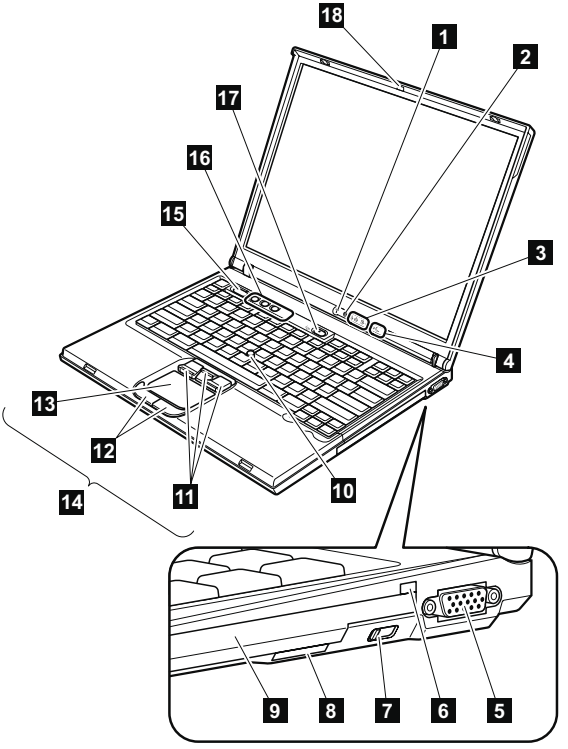




Locations

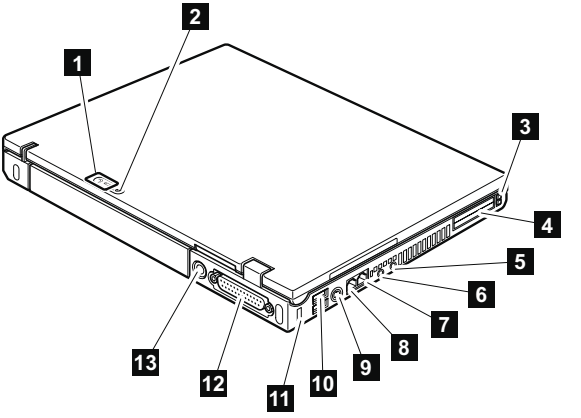
Front view

1 Wireless status indicator
2 *Bluetooth* wireless status indicator (for some models)
3 System status indicators
4 Power status indicators
5 External monitor connector
6 Ultrabay Slim status indicator
7 Ultrabay Slim latch
8 Ultrabay Slim device eject lever
9 Ultrabay Slim
10 TrackPoint pointing stick
11 TrackPoint buttons
12 Touch pad buttons
13 Touch pad
14 UltraNav
15 Access IBM button
16 Volume control buttons
17 Power switch
18 ThinkLight


18
1
2
17
16
15
3
4
13
12
14
11
10
9
8
7
6
5

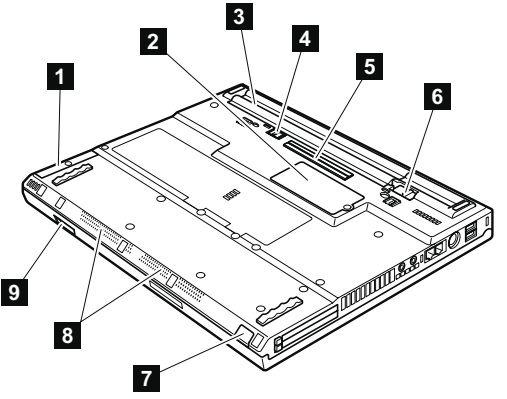
Rear view

1. Power status indicators
2. *Bluetooth* wireless status indicator
3. PC Card eject buttons
4. PC Card slots
5. Microphone jack
6. Stereo headphone jack
7. RJ-45 (Ethernet) connector
8. RJ-11 (modem) connector
9. TV-out connector
10. Universal serial bus (USB) connectors
11. Security keyhole
12. Parallel connector
13. AC power connector



Bottom view

1. Hard disk drive
2. Optional DIMM slot
3. Battery pack
4. Battery pack lock
5. Docking connector
6. Battery pack latch
7. Infrared port
8. Built-in stereo speakers
9. LCD latch



Parts list

T40/T40p, T41/T41p series model matrix

The T40/T40p, T41/T41p series includes several models. The following table summarizes the characteristics of each model, to help you determine which FRU in the part list meets your need.

Model	Bay device	Mini PCI adapter	Ethernet	CDC	HDD
T40 (CPU, Ban 1.3G; memory, 256 MB; video chip, M6-16; LCD, 14.1-in. XGA)					
2373-51x	DVD/ CD-RW combo	—	10/100	MDC	30 GB (4200 rpm)
2373-61x, 66x	DVD-ROM				
2373-6Bx, 6Dx SC		802.11b (Intel)			
2373-54x		—			40 GB (5400 rpm)
T40 (CPU, Ban 1.3G; memory, 256 MB; video chip, M7-32; LCD, 14.1-in. XGA)					
2373-24x	DVD-ROM	—	10/100	MDC	40 GB (5400 rpm)
2373-2Bx SC		802.11b (Intel)			
2373-29x SC	DVD/ CD-RW combo				
2373-2Ax, 2374-2Ax SC		802.11 a/b combo			
2373-22x, 25x SC		802.11b (Intel)			
2373-17x		—	Gigabit		30 GB (4200 rpm)
2373-1Bx SC	DVD-ROM	802.11b (Intel)	10/100		
2373-19x SC	DVD/ CD-RW combo				
2373-14x, 16x, C1x, 2374-14x SC	DVD-ROM	—			
2373-12x, 2374-12x SC	DVD/ CD-RW combo				
2378-D1x	DVD-ROM	—			
2379-D2x SC		802.11b (Intel)			
2379-D3x SC	DVD/ CD-RW combo				

(continued)

Model	Bay device	Mini PCI adapter	Ethernet	CDC	HDD
T40 (CPU, Ban 1.3G; memory, 256 MB; video chip, M9-32; LCD, 14.1-in. SXGA+)					
2373-58x SC	DVD-ROM	—	Gigabit	MDC	30 GB (4200 rpm)
T40 (CPU, Ban 1.5G; memory, 256 MB; video chip, M7-32; LCD, 14.1-in. XGA)					
2373-7Cx, 2374-7Cx SC	DVD/ CD-RW combo	—	10/100	MDC	40 GB (5400 rpm)
2373-71x, 7Ax					
2373-72x, 2374-72x, 2375-72x, 2376-72x SC		802.11b (Intel)	Gigabit		
2373-75x SC		802.11b (Cisco)			
2373-8Cx, 2374-8Cx SC	DVD-ROM	—	10/100		
2373-81x, 8Ax					
2373-82x, 2374-82x SC		802.11b (Intel)	Gigabit		
2373-85x SC		802.11b (Cisco)			
2373-76x SC	DVD/ CD-RW combo	802.11b (Intel)	10/100		
2373-78x SC		802.11b (Cisco)			
2373-86x SC	DVD-ROM	802.11b (Intel)			
2373-88x SC		802.11b (Cisco)			
2373-49x SC	—	—	Gigabit		
2373-8Dx, BDx SC	DVD-ROM				
2373-B2x SC	DVD/ CD-RW combo	802.11b (Intel)			
2373-B5x SC		802.11b (Cisco)			
2374-7Dx SC		—			
2373-4Ax SC, BT		802.11b (Intel)		BMDC	
2373-79x SC, BT		802.11b (Cisco)			
2373-C3x SC		802.11b (Intel)		MDC	
2373-C4x SC		—	10/100		

(continued)

Model	Bay device	Mini PCI adapter	Ethernet	CDC	HDD
T40 (CPU, Ban 1.5G; memory, 256 MB; video chip, M7-32; LCD, 14.1-in. XGA)					
2373-C7x SC	DVD-ROM	802.11b (Cisco)	Gigabit	MDC	40 GB (5400 rpm)
2373-C8x SC		—	10/100		
2373-CAx SC			Gigabit		
2374-72x SC	DVD/ CD-RW combo	802.11b (Intel)			
2374-7Cx SC		—	10/100		
2374-82x SC	DVD-ROM	802.11b (Intel)	Gigabit		
2374-8Cx SC		—	10/100		
2375-72x SC	DVD/ CD-RW combo	802.11b (Intel)	Gigabit		
2376-72x SC					
2379-D4x SC			10/100		
T40 (CPU, Ban 1.5G; memory, 256 MB; video chip, M7-32; LCD, 14.1-in. SXGA+)					
2373-32x SC, BT	DVD/ CD-RW combo	802.11b (Intel)	Gigabit	BMDC	80 GB (4200 rpm)
T40 (CPU, Ban 1.5G; memory, 512 MB; video chip, M7-32; LCD, 14.1-in. XGA)					
2373-47x SC	DVD-ROM	802.11b (Intel)	Gigabit	MDC	40 GB (5400 rpm)
2373-42x SC, BT	DVD/ CD-RW combo			BMDC	
2373-4Bx SC		—	10/100	MDC	
2373-44x, 2374-44x SC		802.11 a/b combo			
T40 (CPU, Ban 1.5G; memory, 256 MB; video chip, M9-32; LCD, 14.1-in. SXGA+)					
2373-33x SC, BT, 9C	DVD/ CD-RW combo	802.11 a/b combo	Gigabit	BMDC	80 GB (4200 rpm)
T40 (CPU, Ban 1.5G; memory, 512 MB; video chip, M9-32; LCD, 14.1-in. SXGA+)					
2373-91x SC, 9C	DVD/ CD-RW combo	—	Gigabit	MDC	80 GB (4200 rpm)
2373-92x SC, BT, 9C		802.11 a/b combo		BMDC	

(continued)

Model	Bay device	Mini PCI adapter	Ethernet	CDC	HDD
T40 (CPU, Ban 1.6G; memory, 512 MB; video chip, M9-32; LCD, 14.1-in. SXGA+)					
2373-93x SC, BT	DVD/ CD-RW combo	802.11 a/b combo	Gigabit	BMDC	80 GB (4200 rpm)
2373-94x SC, BT, 9C		802.11b (Intel)			
2373-96x SC, BT, 9C		802.11b (Cisco)			
2373-9Cx, 2374-9Cx SC, BT		802.11 a/b combo			
2379-D5x SC, BT, 9C					
2373-9Ax SC, 9C		—		MDC	40 GB (5400 rpm)
2373-9Bx SC, BT, 9C		802.11 a/b combo		BMDC	
T40p (CPU, Ban 1.6G; memory, 512 MB; video chip, M9 GL-64; LCD, 14.1-in. SXGA+)					
2373-G1x SC, BT, 9C	DVD/ CD-RW combo	802.11 a/b combo	Gigabit	BMDC	40 GB (5400 rpm)
2373-G2x SC, BT, 9C		—			
2373-G3x SC, BT, 9C		802.11 a/b combo			60 GB (7200 prm)
2373-G5x SC, BT, 9C		802.11b (Intel)			
T40p (CPU, Ban 1.6G; memory, 1 GB; video chip, M9 GL-64; LCD, 14.1-in. SXGA+)					
2373-G4x SC, BT, 9C	DVD/ CD-RW combo	802.11 a/b combo	Gigabit	BMDC	60 GB (7200 prm)
2373-G6x SC, BT, 9C		802.11b (Intel)			

Ban xxx G: Intel® Pentium® M processor xxx GHz
SC: models featuring security chip
BT: models featuring *Bluetooth* wireless
9C: models featuring 9cell battery

(continued)

Model	CPU	Video chip	Ethernet	CDC	LCD
T40 Odyssey/Open bay model					
2373-A7x SC	Ban 1.3 GHz	M6-16	10/100	MDC	14.1-in. XGA
2373-A6x					
2373-A5x	Ban 1.5 GHz	M7-32	10/100		
2373-A4x SC			Gigabit		
2373-A3x SC			10/100		
2373-A2x SC, BT			Gigabit	BMDC	
2373-A8x SC	Ban 1.6 GHz	M9-32		MDC	14.1-in. SXGA+
2373-A1x SC				BMDC	
2373-A9x SC, BT		M9 GL-64			
SC: models featuring security chip BT: models featuring *Bluetooth* wireless					

Model	Bay device	Mini PCI adapter	Ethernet	CDC	HDD
T41 (CPU, Ban 1.4G*1; memory, 256 MB; Video chip, M7-32; LCD, 14.1-in. XGA)					
2373-1Lx SC	DVD-ROM	—	Gigabit	MDC	30 GB (4200 rpm)
2373-1Hx, 2374-1Hx SC		802.11b (Intel)			
2373-1Ex SC	DVD/ CD-RW combo	—			
2373-1Fx, 2374-1Fx, 2378-DMx SC		802.11b (Intel)			
2373-6Kx SC	DVD-ROM	—			
2373-6Sx SC		802.11b (Intel)			
2373-2Qx SC	DVD/ CD-RW combo				40 GB (5400 rpm)
2373-2Ex SC		—			
2373-5Hx SC	DVD-ROM				
T41 (CPU, Ban 1.4G*1; memory, 256 MB; Video chip, M7-32; LCD, 14.1-in. SXGA+)					
2373-5Qx, 5Rx SC, BT	DVD/ CD-RW combo	802.11b (Intel)	Gigabit	MDC	30 GB (4200 rpm)

(continued)

Model	Bay device	Mini PCI adapter	Ethernet	CDC	HDD
T41 (CPU, Ban 1.6G[*1]; memory, 256 MB; Video chip, M7-32; LCD, 14.1-in. XGA)					
2373-4Nx SC	—	—	Gigabit	MDC	40 GB (5400 rpm)
2373-8Kx SC	DVD-ROM	802.11b (Intel)			
2373-8Rx, 2374-8RxSC		—			
2373-7Ex SC	DVD/ CD-RW combo				
2373-7Kx, 2378-DLxSC		802.11b (Intel)			
2373-7Mx SC		802.11b (Cisco)			
2373-4Px SC, BT		802.11b (Intel)		BMDC	
T41 (CPU, Ban 1.6G[*1]; memory, 512 MB; Video chip, M7-32; LCD, 14.1-in. XGA)					
2373-8Px, 2374-8Rx SC	DVD-ROM	—	Gigabit	MDC	40 GB (5400 prm)
2373-8Sx SC					
2373-8Jx SC		802.11b (Cisco)			
2373-4Qx, 7Px SC	DVD/ CD-RW combo	—			
2373-4Hx, 2374-4HxSC		802.11 a/b/g			
2373-7Fx, 2374-7Fx SC		802.11b (Intel)			
2373-7Jx, 2374-7Jx SC		802.11b (Cisco)			
2373-BFx SC		802.11b (Intel)			
2373-BJx SC		802.11b (Cisco)			
2373-4Fx SC, BT		802.11b (Intel)		BMDC	
2373-4Gx SC, BT		802.11 a/b/g			
2373-4Sx SC		—		MDC	60 GB (7200 prm)

(continued)

Model	Bay device	Mini PCI adapter	Ethernet	CDC	HDD
T41 (CPU, Ban 1.6G*1; memory, 256 MB; Video chip, M7-32; LCD, 14.1-in. SXGA+					
2373-3Fx SC, BT	DVD/ CD-RW combo	802.11b (Intel)	Gigabit	BMDC	60 GB (7200 prm)
T41 (CPU, Ban 1.6G*1; memory, 512 MB; Video chip, M7-32; LCD, 14.1-in. SXGA+					
2373-3Px, BHx SC, BT	DVD/ CD-RW combo	802.11b (Intel)	Gigabit	MDC	40 GB (5400 prm)
T41 (CPU, Ban 1.6G*1; memory, 512 MB; Video chip, M7-32; LCD, 14.1-in. XGA)					
2373-2Px SC	DVD-ROM	802.11 a/b/g	Gigabit	MDC	40 GB (5400 prm)
T41 (CPU, Ban 1.6G*1; memory, 512 MB; video chip, M9-32; LCD, 14.1-in. SXGA+)					
2373-3Hx, 2374-3Hx SC, BT	DVD/ CD-RW combo	802.11b (Intel)	Gigabit	MDC	40 GB (5400 prm)
T41 (CPU, Ban 1.7G*1; memory, 512 MB; video chip, M9-32; LCD, 14.1-in. SXGA+)					
2373-9Ex SC, BT	DVD/ CD-RW combo	—	Gigabit	MDC	60 GB (7200 prm)
2373-9Jx SC, BT		802.11b (Intel)		BMDC	
2373-9Kx SC, BT		802.11b (Cisco)			
2373-9Fx, 9Gx SC, BT		802.11 a/b/g			
T41 (CPU, Ban 1.7G*1; memory, 1 GB; video chip, M9-32; LCD, 14.1-in. SXGA+)					
2373-9Hx, 9Jx SC, BT	DVD/ CD-RW combo	802.11b (Intel)	Gigabit	BMDC	60 GB (7200 prm)
T41p (CPU, Ban 1.7G*1; memory, 512 MB; video chip, M10 GL-128; LCD, 14.1-in. SXGA+)					
2373-GKx SC, BT	DVD/ CD-RW combo	802.11b (Intel)	Gigabit	BMDC	60 GB (7200 prm)
2373-GHx SC, BT		802.11 a/b/g			
2373-GGx, 2374-GGx SC, BT, 9C		802.11b (Intel)			
2373-GEx SC, BT, 9C		802.11 a/b/g			

(continued)

Model	Bay device	Mini PCI adapter	Ethernet	CDC	HDD
T41p (CPU, Ban 1.7G*1; memory, 512 MB; video chip, M10 GL-128; LCD, 14.1-in. SXGA+)					
2373-GMx SC, BT, 9C	DVD/ CD-RW combo	802.11b (Intel)	Gigabit	BMDC	80 GB (4200 prm)
T41p (CPU, Ban 1.7G*1; memory, 1 GB; video chip, M10 GL-128; LCD, 14.1-in. SXGA+)					
2373-GLx SC, BT, 9C	DVD/ CD-RW combo	802.11b (Intel)	Gigabit	BMDC	60 GB (7200 prm)
2373-GJx SC, BT, 9C		802.11 a/b/g			
*1 (Ban xxx G): Intel® Pentium® M processor xxx GHz SC: models featuring security chip BT: models featuring *Bluetooth* wireless 9C: models featuring 9cell battery					

Model	CPU	Video chip	Ethernet	CDC	LCD
T41/T41p Odyssey/Open bay model					
2373-ALx SC	Ban 1.4 GHz	M7-32	10/100	MDC	14.1-in. XGA
2373-AJx SC, BT					14.1-in. SXGA+
2373-AHx SC	Ban 1.6 GHz		Gigabit		14.1-in. XGA
2373-AFx SC, BT				BMDC	
2373-AKx SC, BT				MDC	14.1-in. SXGA+
2373-AMx SC, BT	Ban 1.7 GHz	M9-32			
2373-AEx SC, BT				BMDC	
2373-ANx SC, BT		M10 GL-128			
SC: models featuring security chip BT: models featuring *Bluetooth* wireless					

T41 series Express models

Model	Bay device	Mini PCI adapter	Ethernet	CDC	HDD
T41 (CPU, Ban 1.4G*1; memory, 256 MB; Video chip, M7-32; LCD, 14.1-in. XGA)					
2378-DFx SC	DVD-ROM	—	10/100	MDC	40 GB (5400 prm)
2378-DGx SC	DVD/ CD-RW combo	802.11b (Intel)			
2378-DHx SC					
2373-2Fx SC, BT			Gigabit	BMDC	
T41 (CPU, Ban 1.4G*1; memory, 256 MB; Video chip, M9-32; LCD, 14.1-in. SXGA+)					
2378-DEx SC, BT	DVD-ROM	—	Gigabit	MDC	30 GB (4200 rpm)
T41 (CPU, Ban 1.6G*1; memory, 512 MB; Video chip, M7-32; LCD, 14.1-in. XGA)					
2379-DKx SC	DVD/ CD-RW combo	802.11 a/b/g	10/100	MDC	40 GB (5400 prm)
T41 (CPU, Ban 1.6G*1; memory, 256 MB; video chip, M9-32; LCD, 14.1-in. SXGA+)					
2379-DJx SC, BT	DVD/ CD-RW combo	802.11b (Intel)	Gigabit	MDC	40 GB (5400 prm)

*1 (Ban xxx G): Intel® Pentium® M processor xxx GHz
SC: models featuring security chip
BT: models featuring *Bluetooth* wireless

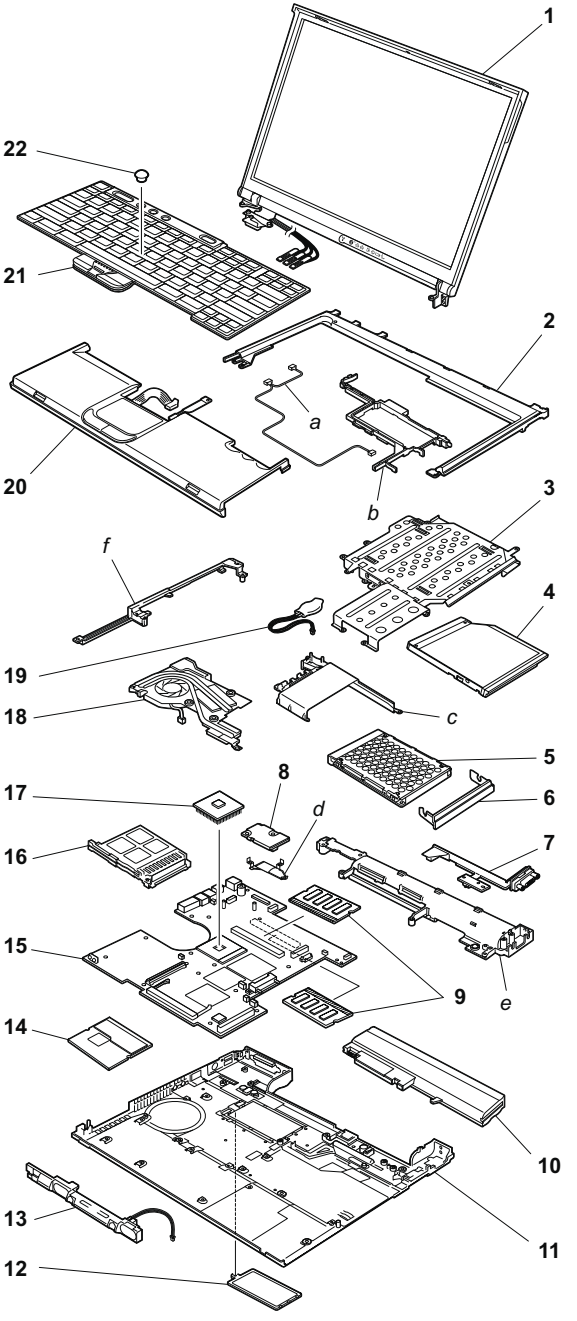
Model	CPU	Video chip	Ethernet	CDC	LCD
T41 Express Open bay model					
2378-EFx SC	Ban 1.4 GHz	M7-32	Gigabit	MDC	14.1-in. XGA
2378-EEx SC, BT		M9-32			14.1-in. SXGA+
2378-ELx, 2379-ERx SC	Ban 1.6 GHz	M7-32			14.1-in. XGA
2378-EJx SC					
2378-EKx SC, BT					14.1-in. SXGA+
2378-EMx SC, BT				BMDC	14.1-in. XGA
2379-ESx SC, BT		M9-32		MDC	14.1-in. SXGA+
2378-ENx SC, BT	Ban 1.7 GHz				
2378-EPx SC, BT				BMDC	
SC: models featuring security chip BT: models featuring *Bluetooth* wireless					

- 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 that the part is not a CRU. A single asterisk (*) means that the part is a Tier 1 CRU; two asterisks (**) mean that the part is a Tier 2 CRU.

  Tier 1 CRU:
  (Example: Mouse, external keyboard, and hard disk drive with coin screw)
  - NO TOOLS ARE REQUIRED.
  - A coin or a thumb screw is acceptable.
  - Minimal technical expertise is required.
  - Minimal problem determination is required—less than 5 minutes.

  Tier 2 CRU:
  (Example: Adapter card, ThinkPad memory)
  - Up to 4 screws or fasteners have to be removed.
  - Some technical experience is required.
  - HelpCenter assistance may be used.
  - Problem determination can be done by the customer, either on site or with HelpCenter assistance.
- FRUs marked with **OP** are available as options.

Overall



No.	FRU	P/N	CRU ID
a- f	See “Miscellaneous parts” on page 178.		
1	LCD unit (see “LCD FRUs” on page 168).		N
2	Keyboard bezel assembly	91P9540	N
3	Ultrabay guide rail assembly	91P8394	N
4	DVD drive 8x (HLDS) for T40 series **OP** • 2373-14x, 16x, 1Bx, 24x, 2Bx, 47x, 54x, 58x, 61x, 66x, 6Bx, 6Dx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, BDx, C1x, C7x, C8x, CAx • 2373-8HU • 2374-14x, 82x, 8Cx • 2378-D1U, D2U	08K9864	*
	DVD drive 8x (HLDS) for T41/T41p series **OP** • 2373-1Hx, 1Lx, 5Hx, 6Kx, 6Sx, 8Hx, 8Jx, 8Kx, 8Px, 8Rx, 8Sx • 2374-1Hx, 8Rx • 2378-DEx, DFx	92P6579	*
	DVD drive 8x (TEAC) for T41/T41p series **OP** • 2373-1Hx, 1Lx, 5Hx, 6Kx, 6Sx, 8Hx, 8Jx, 8Kx, 8Px, 8Rx, 8Sx • 2374-1Hx, 8Rx • 2378-DEx, DFx	92P5991	*
	DVD/CD-RW combo drive (KME) **OP** • 2373-12x, 19x, 22x, 25x, 29x, 2Ax, 2Cx, 33x, 42x, 44x, 4Ax, 4Bx, 4Cx, 51x, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 91x, 92x, 93x, 94x, 96x, 9Cx, B2x, B5x, C3x, C4x, G1x, G2x, G3x, G4x, G5x, G6x • 2373-1Ex, 1Fx, 2Ex, 2Fx, 2Qx, 3Fx, 3Hx, 3Px, 4Fx, 4Gx, 4Hx, 4Px, 4Qx, 4Sx, 5Qx, 5Rx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 9Ex, 9Fx, 9Gx, 9Hx, 9Kx, BFx, BHx, BJx, GEx, GGx, GHx, GJx, GKx, GLx, GMx • 2374-12x, 72x, 7Cx • 2374-1Fx, 3Hx, 4Hx, 7Fx, 7Jx, GGx • 2375-72x • 2376-72x • 2378-DGx, DHx, DJx, DKx • 2379-D3x, D4x, D5x, D6x	92P6581	*

(continued)

No.	FRU	P/N	CRU ID
4	DVD/CD-RW combo drive (TOSHIBA) **OP** • 2373-12x, 19x, 22x, 25x, 29x, 2Ax, 2Cx, 33x, 42x, 44x, 4Ax, 4Bx, 4Cx, 51x, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 91x, 92x, 93x, 94x, 96x, 9Cx, B2x, B5x, C3x, C4x, G1x, G2x, G3x, G4x, G5x, G6x • 2373-1Ex, 1Fx, 2Ex, 2Fx, 2Qx, 3Fx, 3Hx, 3Px, 4Fx, 4Gx, 4Hx, 4Px, 4Qx, 4Sx, 5Qx, 5Rx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 9Ex, 9Fx, 9Gx, 9Hx, 9Kx, BFx, BHx, BJx, GEx, GGx, GHx, GJx, GKx, GLx, GMx • 2374-12x, 72x, 7Cx • 2374-1Fx, 3Hx, 4Hx, 7Fx, 7Jx, GGx • 2375-72x • 2376-72x • 2378-DGx, DHx, DJx, DKx • 2379-D3x, D4x, D5x, D6x	92P5993	*
	Travel cover • All models with suffix -xxE and xxJ	13N5108	*
	For optional Ultrabay devices, see “Optional FRUs” on page 181.		
5	Hard disk drive, 20 GB, 9.5 mm, 4,200 rpm, IBM STD for T40/T40p series **OP** • Supported by CTO	92P6327	*
	Hard disk drive, 20 GB, 9.5 mm, 4,200 rpm, FUJITSU for T40/T40p series • Supported by CTO	27L4385	*
	Hard disk drive, 30 GB, 9.5 mm, 4,200 rpm, IBM STD for T40/T40p series • 2373-12x, 14x, 16x, 19x, 1Bx, 51x, 58x, 61x, 66x, 6Bx, 6Dx, C1x • 2374-12x, 14x • 2378-D1U, D2U • 2379-D3U	92P6330	*
	Hard disk drive, 30 GB, 9.5 mm, 4,200 rpm, FUJITSU • 2373-12x, 14x, 16x, 19x, 1Bx, 51x, 58x, 61x, 66x, 6Bx, 6Dx, C1x • 2373-1Ex, 1Fx, 1Hx, 1Lx, 5Qx, 5Rx, 6Kx, 6Sx • 2374-12x, 14x • 2374-1Hx, 1Fx • 2378-D1U, D2U • 2378-DEx • 2379-D3U	92P6036	*
	Hard disk drive, 30 GB, 9.5 mm, 4,200 rpm, HGST for T41/T41p series • 2373-1Fx, 1Hx, 6Kx, 6Sx, 5Qx, 5Rx • 2374-1Hx, 1Fx	13N6703	*

(continued)

No.	FRU	P/N	CRU ID
5	Hard disk drive, 40 GB, 9.5 mm, 5,400 rpm, IBM STD **OP** • 2373-22x, 24x, 25x, 29x, 2Ax, 2Bx, 42x, 44x, 47x, 49x, 4Ax, 4Bx, 54x, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, B2x, B5x, BDx, C3x, C4x, C7x, C8x, CAx, G1x, G2x • 2374-2Ax, 2Cx, 44x, 4Cx, 72x, 75x, 7Cx, 82x, 8Cx • 2375-72x • 2376-72x • 2379-D4U, D6U	92P6342	*
	Hard disk drive, 40 GB, 9.5 mm, 5,400 rpm, HITACHI for T40/T40p series • 2373-22x, 24x, 25x, 29x, 2Ax, 2Bx, 42x, 44x, 47x, 49x, 4Ax, 4Bx, 54x, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, B2x, B5x, BDx, C3x, C4x, C7x, C8x, CAx, G1x, G2x • 2374-2Ax, 2Cx, 44x, 4Cx, 72x, 75x, 7Cx, 82x, 8Cx • 2375-72x • 2376-72x • 2379-D4U, D6U	08K9834	*
	Hard disk drive, 40 GB, 9.5 mm, 5,400 rpm, IBM STD • 2373-2Ex, 2Fx, 2Px, 2Qx, 3Hx, 3Px, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Rx, 5Hx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8HU, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, BFx, BJx, BHx • 2374-4Hx, 7Fx, 7Jx, 8Rx • 2378-DEx, DFx, DGx, DHx, DKx	92P6342	*
	Hard disk drive, 40 GB, 9.5 mm, 5,400 rpm, HGST for T41/T41p series • 2373-2Ex, 2Fx, 2Px, 2Qx, 3Hx, 3Px, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Rx, 5Hx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8HU, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, BFx, BJx, BHx • 2374-4Hx, 7Fx, 7Jx, 8Rx • 2378-DEx, DFx, DGx, DHx, DKx	92P6545	*
	Hard disk drive, 60 GB, 9.5 mm, 7,200 rpm, HGST for T41/T41p series • 2373-3Fx, 4Sx, 9Ex, 9Fx, 9Gx, 9Jx, 9Hx, 9Kx, GEx, GGx, GHx, GJx, GKx, GLx • 2374-GGx	92P6551	*

(continued)

No.	FRU	P/N	CRU ID
5	Hard disk drive, 80 GB, 9.5 mm, 4,200 rpm, IBM STD for T40 series **OP** • 2373-32x, 33x, 91x, 92x, 93x, 94x, 96x, 9Cx • 2374-9Cx • 2379-D5U	13N6709	*
	Hard disk drive, 80 GB, 9.5 mm, 4,200 rpm, IBM STD for T41p series **OP** • 2373-GMx	92P6549	*
6	Cover, Hard disk drive	13N5530	N
7	VGA and Ultrabay eject button cable	91P6788	N
8	Modem daughter card (MDC) • 2373-12x, 14x, 16x, 19x, 1Bx, 22x, 24x, 25x, 29x, 2Ax, 2Bx, 2Cx, 3Cx, 44x, 47x, 49x, 4Bx, 4Cx, 51x, 54x, 58x, 61x, 66x, 6Bx, 6Dx, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, 91x, A3x, A4x, A5x, A6x, A7x, A8x, B2x, B5x, BDx, C1x, C3x, C4x, C7x, C8x, CAx • 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Qx, 3Hx, 3Px, 4Hx, 4Nx, 4Qx, 4Sx, 5Hx, 5Qx, 5Rx, 6Kx, 6Sx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8Hx, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, 9Ex, AHx, AJx, AKx, ALx, AMx, BFx, BHx, BJx • 2374-12x, 14x, 2Ax, 2Cx, 44x, 4Cx, 72x, 75x, 7Cx, 82x, 8Cx • 2374-1Hx, 1Fx, 3Hx, 4Hx, 7Fx, 7Jx, 8Rx • 2375-72x • 2376-72x • 2378-D1U, D2U • 2378-DEx, DFx, DGx, DHx, EEx, EFx, EJx, EKx, ELx, ENx • 2379-D3U, D4U, D6U • 2379-DJx, DKx, ERx, ESx	91P7657	**
	IBM Integrated *Bluetooth* with 56K Modem (BMDC) • 2373-32x, 33x, 42x, 4Ax, 92x, 93x, 94x, 96x, A1x, A2x, A9x, G1x, G2x, G3x, G4x, G5x, G6x, 9Cx • 2373-2Fx, 3Fx, 4Fx, 4Gx, 4Px, 9Fx, 9Gx, 9Jx, 9Hx, 9Kx, AFx, AEx, ANx, GEx, GGx, GHx, GJx, GKx, GLx, GMx • 2374-9Cx • 2374-GGx • 2379-D5x • 2378-EMx, EPx	91P7315	**

(continued)

No.	FRU	P/N	CRU ID
9	256-MB DDR SDRAM SO DIMM (PC2100) for T40/T40p series **OP** • 2373-12x, 14x, 16x, 19x, 1Bx, 22x, 24x, 25x, 29x, 2Bx, 32x, 33x, 49x, 4Ax, 51x, 54x, 58x, 61x, 66x, 6Bx, 6Dx, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, B2x, B5x, BDx, C1x, C3x, C4x, C7x, C8x, CAx • 2374-12x, 14x, 72x, 75x, 7Cx, 82x, 8Cx • 2375-72x • 2376-72x • 2378-D1U, D2U • 2379-D3x, D4x, D5x, D6x	10K0031	*
	512-MB DDR SDRAM SO DIMM (PC2100) for T40/T40p series **OP** • 2373-2Ax, 2Cx, 42x, 44x, 47x, 4Bx, 4Cx, 91x, 92x, 93x, 94x, 96x, 9Cx, G1x, G2x, G3x, G5x • 2374-2Ax, 2Cx, 44x, 4Cx, 9Cx • 2379-D5x	10K0033	*
	128-MB DDR SDRAM SO DIMM (PC2700) for T41/T41p series **OP** • Supported by CTO	31P9829	*
	256-MB DDR SDRAM SO DIMM (PC2700) for T41/T41p series **OP** • 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Fx, 2Qx, 3Fx, 4Nx, 4Px, 5Hx, 5Qx, 5Rx, 6Kx, 6Sx, 7Ex, 7Kx, 7Mx, 8Kx, 8Rx • 2374-1Fx, 1Hx, 8Rx • 2378-DEx, DFx, DGx, DHx • 2379-DJx,	31P9831	*
	512-MB DDR SDRAM SO DIMM (PC2700) for T41/T41p series **OP** • 2373-3Hx, 3Px, 4Fx, 4Gx, 4Hx, 4Qx, 4Sx, 7Fx, 7Jx, 7Px, 8HU, 8Jx, 8Px, 8Sx, 9Ex, 9Fx, 9Gx, 9Jx, 9Kx, BFx, BHx, BJx, GEx, GGx, GHx, GKx, GMx • 2374-4Hx, 7Fx, 7Jx, GGx • 2379-DKx	31P9833	*
	1-GB DDR SDRAM SO DIMM (PC2700) for T41/T41p series **OP** • 2373-GLx, GJx, 9Hx	31P9835	*

(continued)

No.	FRU	P/N	CRU ID
10	Battery pack, Li-ion (6 cell) 4.4 Ah, SANYO **OP** • 2373-12x, 14x, 16x, 19x, 1Bx, 22x, 24x, 25x, 29x, 2Ax, 2Bx, 2Cx, 32x, 3Cx, 42x, 44x, 47x, 49x, 4Ax, 4Bx, 4Cx, 51x, 54x, 58x, 61x, 66x, 6Bx, 6Dx, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, 93x, 9Cx, B2x, B5x, BDx, C1x, C3x, C4x, C7x, C8x, CAx • 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Fx, 2Qx, 3Fx, 3Hx, 3Px, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Sx, 5Hx, 5Qx, 5Rx, 6Kx, 6Sx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8Hx, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, 9Ex, 9Fx, 9Gx, 9Hx, 9Jx, 9Kx, BFx, BHx, BJx, GHx, GKx • 2374-12x, 14x, 2Ax, 2Cx, 44x, 4Cx, 72x, 7Cx, 82x, 8Cx, 9Cx, • 2374-1Hx, 1Fx, 3Hx, 4Hx, 7Fx, 7Jx, 8Rx • 2375-72x, 2376-72x • 2378-D1U, D2U • 2378-DEx, DFx, DGx, DHx • 2379-D3U, D4U, D5U, D6U • 2379-DJx, DKx	08K8193	*
	Battery pack, Li-ion (6 cell) 4.4 Ah, SONY **OP** • 2373-12x, 14x, 16x, 19x, 1Bx, 22x, 24x, 25x, 29x, 2Ax, 2Bx, 2Cx, 32x, 3Cx, 42x, 44x, 47x, 49x, 4Ax, 4Bx, 4Cx, 51x, 54x, 58x, 61x, 66x, 6Bx, 6Dx, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, 93x, 9Cx, B2x, B5x, BDx, C1x, C3x, C4x, C7x, C8x, CAx • 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Fx, 2Qx, 3Fx, 3Hx, 3Px, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Sx, 5Hx, 5Qx, 5Rx, 6Kx, 6Sx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8Hx, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, 9Ex, 9Fx, 9Gx, 9Hx, 9Jx, 9Kx, BFx, BHx, BJx, GHx, GKx • 2374-12x, 14x, 2Ax, 2Cx, 44x, 4Cx, 72x, 7Cx, 82x, 8Cx, 9Cx, • 2374-1Hx, 1Fx, 3Hx, 4Hx, 7Fx, 7Jx, 8Rx • 2375-72x, 2376-72x • 2378-D1U, D2U • 2378-DEx, DFx, DGx, DHx • 2379-D3U, D4U, D5U, D6U • 2379-DJx, DKx	93P5002	*

(continued)

No.	FRU	P/N	CRU ID
10	Battery pack, Li-ion (9 cell) 6.6 Ah, SANYO **OP** • 2373-33x, 91x, 92x, 94x, 96x, G1x, G2x, G3x, G4x, G5x, G6x • 2373-GEx, GGx, GLx, GJx, GMx • 2374-GGx	08K8198	*
	Battery pack, Li-ion (9 cell) 6.6 Ah, SONY **OP** • 2373-33x, 91x, 92x, 94x, 96x, G1x, G2x, G3x, G4x, G5x, G6x • 2373-GEx, GGx, GLx, GJx, GMx • 2374-GGx	93P5003	*
	Dummy battery pack • Supported by CTO	91P9719	*
	For optional battery packs, see “Optional FRUs” on page 181.		
11	Base cover assembly 2373		
	WW (T40/T40p, T41 series) • 2373-all except xxK, Gxx, ANx	13N5542	N
	WW M10 (T41p series) • 2373-ANx, GEx except GEK, GGx except GGK, GHx, GKx, GLx, GJx	13N5531	N
	Korea (T40/T40p series) • 2373-12K, 14K, 29K, 2BK, 6BK, 72K, 75K, 7CK, 82K, 8CK, 94K, G1K, G3K, G5K	13N5093	N
	Korea (T41 series) • 2373-1FK, 1HK, 2QK, 3HK, 7FK, 7JK, 8RK, 9HK	13N5715	N
	Korea M10 (T41p series) • 2373-GEK, GGK, GMK	13N5671	N
	Base cover assembly 2374		
	WW (T40, T41 series) • 2374-all except xxK	13N5543	N
	WW M10 (T41p series) • 2374-GGx except GGK	13N5668	N
	Korea (T40 series) • 2374-12K, 14K, 72K, 75K, 7CK, 82K, 8CK	91P8565	N
	Korea (T41 series) • 2374-1FK, 1HK, 3HK, 7FK, 7JK, 8RK	13N5716	N
	Korea M10 (T41p series) • 2374-GGK	13N5672	N

(continued)

No.	FRU	P/N	CRU ID
11	Base cover assembly 2375		
	WW (T40, T41 series) • 2375-all except xxK	13N5544	N
	WW M10 (T41p series) • Supported by CTO	13N5669	N
	Korea (T40 series) • 2375-xxK	13N5044	N
	Base cover assembly 2376		
	WW (T40, T41 series) • 2376-all except xxK	13N5545	N
	WW M10 (T41p series) • Supported by CTO	13N5670	N
	Korea (T40 series) • 2376-xxK	13N5045	N
	Base cover assembly 2378		
	WW (T40, T41 series) • 2378-all	13N5546	N
	Base cover assembly 2379		
	WW (T40, T41 series) • 2379-all	13N5547	N
12	Cover, DIMM slot for T40/T40p, T41	13N5529	N
	Cover, DIMM slot for T41p	13N5667	N
13	Speaker	91P8396	N
14	IBM Dual-Band 11a/b Wi-Fi Wireless Mini PCI Adapter		
	• 2373-2Ax, 33x, 44x, 92x, 93x, 9Cx, G1x, G3x, G4x except xxE, xxJ • 2374-2Ax, 44x, 9Cx except xxE, xxJ • 2379-D5x	91P7265	N
	• 2373-2AJ, 33J, 44J, 92J, 93J, 9CJ, G1E,2AE, 33E, 44E, 92E, 93E, 9CE, G1E	26P8447	N
	Cisco Aironet Wireless 802.11b		
	• 2373-75x, 78x, 85x, 88x, 96x, B5x, C7x except xxC, xxE, xxG, xxJ, xxK • 2373-7Jx except 7JG, 7JA, 7JK, 7JE, 7JJ, 7JC, 9KU, 7MM, 7MB, 7MH, 8JV • 2374-75x except xxC, xxE, xxG, xxJ, xxK • 2374-7Jx except xxG, xxA, xxK, xxE, xxJ, xxC	91P7406	**

(continued)

No.	FRU	P/N	CRU ID
14	Cisco Aironet Wireless 802.11b		
	• 2373-75G, 78G, 79G, 85G, 88G, 96G, B5G, C7G, 75K, 78K, 85K, 88K, 96K, B5K, C7K • 2373-7JG, 7JA, 7JK, 7MA • 2374-75G, 75K • 2374-7JG, 7JA, 7JK	91P7408	**
	• 2373-75J, 78J, 79J, 85J, 88J, 96J, B5J, C7J, 75E, 78E, 85E, 88E, 96E, B5E, C7E • 2373-7JE, 7JJ, BJJ • 2374-75J • 2374-7JE, 7JJ	91P7410	**
	• 2373-75C, 78C, 85C, 88C, 96C, B5C, C7C • 2373-7JC, 7MC • 2374-7JC	91P7412	**
	Intel® PRO/Wireless LAN 2100 3B Mini PCI Adapter • 2373-19x, 1Bx, 22x, 25x, 29x, 2Bx, 2Cx, 32x, 3Cx, 42x, 47x, 4Ax, 4Cx, 6Bx, 6Dx, 72x, 76x, 82x, 86x, 94x, B2x, C3x, G5x, G6x • 2373-1Fx, 1Hx, 2Fx, 2Qx, 3Fx, 3Hx, 3Px, 4Fx, 4Px, 5Qx, 5Rx, 6Sx, 7Fx, 7Kx, 8HU, 8Kx, 9Jx, 9Hx, BFx, BHx, GGx, GLx, GKx, GMx • 2374-2Cx, 4Cx, 72x, 82x • 2374-1Hx, 3Hx, 1Fx, 7Fx, GGx • 2375-72x • 2376-72x • 2378-D2U • 2378-DHx • 2379-D3U, D4U, D6U • 2379-DJx	91P7267	**
	IBM 11a/b/g Wireless LAN Mini PCI Adapter		
	• 2373-4Gx, 4HU, 9Fx, 9RU, GEx, GHx except xxE, xxJ, xxP, xxS, xxY, xxC, xxK • 2374-4Hx	91P7301	**
	• 2373-9FE, 9FJ, 9GJ, GEE, GEJ, GJE, GJJ	91P7303	**
15	System board assembly, ATI M6-16, 10/100 Ethernet for T40 series • 2373-51x, 54x, 61x, 66x, A6x	91P7701	N
	System board assembly, ATI M6-16, 10/100 Ethernet with security chip for T40 series • 2373-6Bx, 6Dx, A7x	91P7704	N

(continued)

No.	FRU	P/N	CRU ID
15	System board assembly, ATI M7-32, 10/100 Ethernet for T40 series • 2373-16x, 24x, 71x, 7Ax, 81x, 8Ax, A5x, C1x • 2378-D1U	91P7707	N
	System board assembly, ATI M7-32, 10/100 Ethernet with security chip for T40 series • 2373-12x, 14x, 19x, 1Bx, 22x, 25x, 29x, 2Ax, 2Bx, 2Cx, 44x, 4Bx, 4Cx, 76x, 78x, 7Cx, 86x, 88x, 8Cx, A3x, C4x, C8x • 2374-12x, 14x, 2Ax, 2Cx, 44x, 4Cx, 7Cx, 8Cx • 2378-D2U • 2379-D3U, D4U	91P7710	N
	System board assembly, ATI M7-32, Gigabit Ethernet for T40 series • Supported by CTO	91P7713	N
	System board assembly, ATI M7-32, Gigabit Ethernet with security chip for T40 series • 2373-32x, 42x, 47x, 49x, 4Ax, 72x, 75x, 82x, 85x, 8Dx, A2x, A4x, B2x, B5x, BDx, C3x, C7x, CAx • 2374-72x, 75x, 82x • 2375-72x • 2376-72x	91P7716	N
	System board assembly, ATI M9-32, Gigabit Ethernet with security chip for T40 series • 2373-33x, 58x, 91x, 92x, 93x, 94x, 96x, 9Cx, A1x, A8x • 2374-9Cx • 2379-D5x, D6x	91P7719	N
	System board assembly, ATI M9 GL-64, Gigabit Ethernet with security chip for T40p series • 2373-G1x, G2x, G3x, G4x, G5x, G6x, A9x	91P7722	N

(continued)

No.	FRU	P/N	CRU ID
15	System board assembly, ATI M7-32, Gigabit Ethernet with security chip for T41 series • 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Fx, 2Qx, 3Fx, 3Px, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Sx, 5Hx, 5Qx, 5Rx, 6Kx, 6Sx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8HU, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, AFx, AHx, AJx, AKx, ALx, BFx, BHx, BJx • 2374-1Fx, 1Hx, 4Hx, 7Fx, 7Jx, 8Rx • 2378-DFx, DGx, DHx, EFx, EJx, EKx, ELx, EMx • 2379-DKx, ERx	91P7370	N
	System board assembly, ATI M9-32, Gigabit Ethernet with security chip for T41 series • 2373-3Hx, 9Ex, 9Fx, 9Gx, 9Hx, 9Jx, 9Kx, AMx, AEx • 2374-3Hx • 2378-DEx, EEx, ENx, EPx • 2379-DJx, ESx	91P7371	N
	System board assembly, ATI M10 GL-128, Gigabit Ethernet with security chip for T41p series • 2373-ANx, GEx, GGx, GHx, GLx, GJx, GKx, GMx • 2374-GGx	91P7372	N
16	PC Card slot	91P8391	N
17	CPU assembly, Intel® Pentium® M processor, 1.3 GHz for T40 series • 2373-12x, 14x, 16x, 19x, 1Bx, 22x, 24x, 25x, 29x, 2Ax, 2Bx, 51x, 54x, 58x, 61x, 66x, 6Bx, 6Dx, A6x, A7x, C1x • 2374-12x, 14x, 2Ax • 2378-D1U, D2U	26P8532	N
	CPU assembly, Intel® Pentium® M processor, 1.4 GHz for T40/T40p, T41/T41p series • 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Fx, 2Qx, 5Hx, 5Qx, 5Rx, 6Kx, 6Sx, ALx, AJx • 2374-1Hx, 1Fx • 2378-DEx, DFx, DGx, DHx, EEx, EFx • 2379-D3x, D6x	26P8482	N

(continued)

No.	FRU	P/N	CRU ID
17	CPU assembly, Intel® Pentium® M processor, 1.5 GHz for T40/T40p, T41/T41p series • 2373-32x, 33x, 3Cx, 42x, 44x, 47x, 49x, 4Ax, 4Bx, 4Cx, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, A2x, A3x, A4x, A5x, B2x, B5x, BDx, C3x, C4x, C7x, C8x, CAx • 2373-8HU • 2374-44x, 72x, 75x, 7Cx, 82x, 8Cx • 2375-72x • 2376-72x	26P8533	N
	CPU assembly, Intel® Pentium® M processor, 1.6 GHz for T40/T40p, T41/T41p series • 2373-91x, 92x, 93x, 94x, 96x, 9Cx, A1x, A8x, A9x, G1x, G2x, G3x, G4x, G5x, G6x • 2373-3Fx, 3Hx, 3Px, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Sx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, AFx, AHx, AKx, BFx, BHx, BJx • 2374-9Cx • 2374-3Hx, 4Hx, 7Fx, 7Jx, 8Rx • 2378-EJx, EKx, ELx, EMx • 2379-D4x, D5x • 2379-DJx, DKx, ERx, ESx	26P8483	N
	CPU assembly, Intel® Pentium® M processor, 1.7 GHz for T41/T41p series • 2373-9Ex, 9Fx, 9Gx, 9Hx, 9Jx, 9Kx, AMx, AEx, ANx, GEx, GGx, GHx, GJx, GKx, GLx, GMx • 2374-GGx • 2378-ENx, EPx	91P7387	N

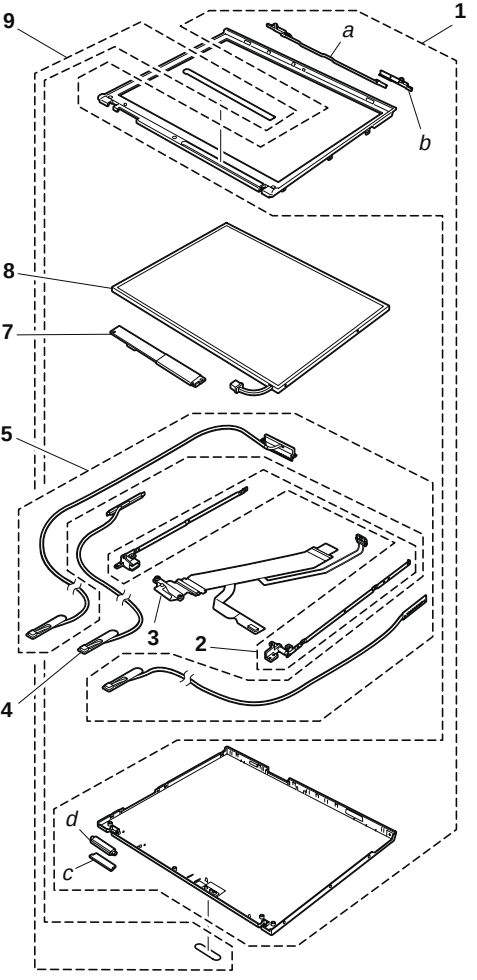
(continued)

No.	FRU	P/N	CRU ID
18	Fan assembly (short) • 2373-12x, 14x, 16x, 19x, 1Bx, 22x, 24x, 25x, 29x, 2Ax, 2Bx, 2Cx, 42x, 44x, 47x, 49x, 4Ax, 4Bx, 4Cx, 51x, 54x, 61x, 66x, 6Bx, 6Dx, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, A2x, A3x, A4x, A5x, A6x, A7x, B2x, B5x, BDx, C1x, C3x, C4x, C7x, C8x, CAx • 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Fx, 2Qx, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Sx, 5Hx, 6Kx, 6Sx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8HU, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, AFx, AHx, ALx, BFx, BJx • 2374-12x, 14x, 72x, 75x, 7Cx, 82x, 8Cx • 2374-1Hx, 1Fx, 4Hx, 7Fx, 7Jx, 8Rx • 2375-72x • 2376-72x • 2378-D1U, D2U • 2378-DFx, DGx, DHx, EFx, EJx, ELx, EMx • 2379-D3U, D4U • 2379-DKx, ERx	91P8393	N
	Fan assembly (long) • 2373-32x, 33x, 3Cx, 58x, 91x, 92x, 93x, 94x, 96x, 9Cx, A1x, A8x, A9x, G1x, G2x, G3x, G4x, G5x, G6x • 2373-3Fx, 3Hx, 3Px, 5Qx, 5Rx, 9Ex, 9Fx, 9Gx, 9Hx, 9Jx, 9Kx, AJx, AKx, AMx, AEx, BHx • 2374-9Cx • 2374-3Hx • 2378-DEx, EEx, EKx, ENx, EPx, ESx • 2379-D5U, D6U • 2379-DJx	13N5442	N
	Fan assembly (long) M10 • 2373-ANx, GEx, GGx, GHx, GLx, GJx, GKx, GMx • 2374-GGx	13N5347	N
19	Backup battery	92P0986	*

(continued)

No.	FRU	P/N	CRU ID
20	Palmrest assembly with touch pad (WW) • 2373-all except xxK • 2374-all except xxK	91P8398	** (*1)
	Palmrest assembly without touch pad (WW) • Supported by CTO	91P8399	
	Palmrest assembly with touch pad (Korea) • 2373-xxK • 2374-xxK	91P8400	
	*1: Palmrest in the models with IBM Dual-Band 11a/b Wi-Fi Wireless Mini PCI Adapter is not a Tier2 CRU, since it is secured with tamper proof screws.		
21	Keyboard (see “Keyboard” on page 174)		**
22	Track point stick caps	91P9642	*
—	Screw for drive bay for T40/T40p series	13N5107	*
—	Telephone cable (SAN TAI)	91P6839	*
—	Video cable	27L0531	*
—	Thermal grease	46L4855	N
—	AC adapter (see “AC adapters” on page 181)		*

LCD FRUs



14.1-in. XGA TFT

No.	FRU	P/N	CRU ID
a- d	See “Miscellaneous parts” on page 178.		
1	LCD cover kit (WW) • 2373-all except xxK • 2374-all except xxK • 2378-all • 2379-D2x, D3x, D4x	13N5746	N
	LCD cover kit (Korea) for T40/T40p series • 2373-xxK • 2374-xxK	13N5747	N
2	Hinges	91P8388	N
3	LCD cable assembly, 14.1-in. XGA • 2373-12x, 14x, 16x, 19x, 1Bx, 22x, 24x, 25x, 29x, 2Ax, 2Bx, 2Cx, 42x, 44x, 47x, 49x, 4Ax, 4Bx, 4Cx, 51x, 54x, 61x, 66x, 6Bx, 6Dx, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, A2x, A3x, A5x, A6x, A7x, B2x, B5x, BDx, C1x, C3x, C4x, C7x, C8x, CAx • 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Fx, 2Qx, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Sx, 5Hx, 6Kx, 6Sx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8HU, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, AFx, AHx, ALx, BFx, BJx • 2374-12x, 14x, 2Ax,2Cx, 44x, 4Cx, 72x, 75x, 7Cx, 82x, 8Cx • 2374-1Hx, 1Fx, 4Hx, 7Fx, 7Jx, 8Rx • 2375-72x • 2376-72x • 2378-D1U, D2U • 2378-DFx, DGx, DHx, EFx, EJx, ELx, EMx • 2379-D3U, D4U • 2379-DKx, ERx	91P6786	N
4	*Bluetooth* wireless antenna assembly • 2373-42x, 4Ax, A2x • 2373-2Fx, 4Fx, 4Gx, 4Px, AFx • 2378-EMx	13N5515	N
5	Antenna assembly	91P8389	N
6	Tape on *Bluetooth* wireless antenna • 2373-42x, 4Ax • 2373-2Fx, 4Fx, 4Gx, 4Px, AFx • 2378-EMx	13N5105	N
7	Inverter card	26P8464	N

(continued)

No.	FRU	P/N	CRU ID
8	LCD panel, 14.1-in. XGA, ID TECH for T40 series • 2373-12x, 14x, 16x, 19x, 1Bx, 22x, 24x, 25x, 29x, 2Ax, 2Bx, 2Cx, 42x, 44x, 47x, 49x, 4Ax, 4Bx, 4Cx, 51x, 54x, 61x, 66x, 6Bx, 6Dx, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, A2x, A3x, A5x, A6x, A7x, B2x, B5x, BDx, C1x, C3x, C4x, C7x, C8x, CAx • 2374-12x, 14x, 2Ax,2Cx, 44x, 4Cx, 72x, 75x, 7Cx, 82x, 8Cx • 2375-72x • 2376-72x • 2378-D1U, D2U • 2379-D3U, D4U	11P8350	N
	LCD panel, 14.1-in. XGA, SAMSUNG for T40, T41 series • 2373-12x, 14x, 16x, 19x, 1Bx, 22x, 24x, 25x, 29x, 2Ax, 2Bx, 2Cx, 42x, 44x, 47x, 49x, 4Ax, 4Bx, 4Cx, 51x, 54x, 61x, 66x, 6Bx, 6Dx, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, A2x, A3x, A5x, A6x, A7x, B2x, B5x, BDx, C1x, C3x, C4x, C7x, C8x, CAx • 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Fx, 2Qx, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Sx, 5Hx, 6Kx, 6Sx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8HU, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, AFx, AHx, ALx, BFx, BJx • 2374-12x, 14x, 2Ax,2Cx, 44x, 4Cx, 72x, 75x, 7Cx, 82x, 8Cx • 2374-1Hx, 1Fx, 4Hx, 7Fx, 7Jx, 8Rx • 2375-72x • 2376-72x • 2378-D1U, D2U • 2378-DFx, DGx, DHx, EFx, EJx, ELx, EMx • 2379-D3U, D4U • 2379-DKx, ERx	11P8352	N

(continued)

No.	FRU	P/N	CRU ID
8	LCD panel, 14.1-in. XGA, LG for T40, T41 series • 2373-12x, 14x, 16x, 19x, 1Bx, 22x, 24x, 25x, 29x, 2Ax, 2Bx, 2Cx, 42x, 44x, 47x, 49x, 4Ax, 4Bx, 4Cx, 51x, 54x, 61x, 66x, 6Bx, 6Dx, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, A2x, A3x, A5x, A6x, A7x, B2x, B5x, BDx, C1x, C3x, C4x, C7x, C8x, CAx • 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Fx, 2Qx, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Sx, 5Hx, 6Kx, 6Sx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8HU, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, AFx, AHx, ALx, BFx, BJx • 2374-12x, 14x, 2Ax,2Cx, 44x, 4Cx, 72x, 75x, 7Cx, 82x, 8Cx • 2374-1Hx, 1Fx, 4Hx, 7Fx, 7Jx, 8Rx • 2375-72x • 2376-72x • 2378-D1U, D2U • 2378-DFx, DGx, DHx, EFx, EJx, ELx, EMx • 2379-D3U, D4U • 2379-DKx, ERx	11P8354	N
	LCD panel, 14.1-in. XGA, CMO for T41 series • 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Fx, 2Qx, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Sx, 5Hx, 6Kx, 6Sx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8HU, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, AFx, AHx, ALx, BFx, BJx • 2374-12x, 14x, 2Ax,2Cx, 44x, 4Cx, 72x, 75x, 7Cx, 82x, 8Cx • 2378-DFx, DGx, DHx, EFx, EJx, ELx, EMx • 2379-DKx, ERx	92P6675	N
9	Clear plate for T40/T40p series	91P8387	N
	Clear plate for T41 series	13N5410	N
	Clear plate for T41p series	13N5666	N
—	LG-IBM logo kit for T41/T41p series	13N5714	N

14.1-in. SXGA+ TFT

No.	FRU	P/N	CRU ID
a- d	See “Miscellaneous parts” on page 178.		
1	LCD cover kit (WW) • 2373-all except xxK • 2374-all except xxK • 2379-D5x	13N5746	N
	LCD cover kit (Korea) for T40/T40p series • 2373-xxK • 2374-xxK	13N5747	N
2	Hinges	91P8388	N
3	LCD cable assembly, 14.1-in. SXGA+ • 2373-32x, 33x, 3Cx, 58x, 91x, 92x, 93x, 94x, 96x, 9Cx, A1x, A8x, A9x, G1x, G2x, G3x, G4x, G5x, G6x • 2373-3Fx, 3Hx, 3Px, 5Qx, 5Rx, 9Ex, 9Fx, 9Gx, 9Jx, 9Hx, 9Kx, AEx, AJx, AKx, AMx, BHx, ANx, GEx, GGx, GHx, GJx, GKx, GLx, GMx • 2374-9Cx • 2374-3Hx, GGx • 2378-DEx, EEx, EKx, ENx, EPx • 2379-D5U, D6U • 2379-DJx, ESx	91P6787	N
4	*Bluetooth* wireless antenna assembly • 2373-32x, 33x, 3Cx, 42x, 4Ax, 58x, 91x, 92x, 93x, 94x, 96x, 9Cx, A1x, A8x, A9x, G1x, G2x, G3x, G4x, G5x, G6x • 2373-3Fx, 3Hx, 3Px, 5Qx, 5Rx, 9Ex, 9Fx, 9Gx, 9Jx, 9Hx, 9Kx, AEx, AJx, AKx, AMx, BHx, ANx, GEx, GGx, GHx, GJx, GKx, GLx, GMx • 2374-9Cx • 2374-3Hx, GGx • 2378-DEx, EEx, EKx, ENx, EPx • 2379-D5U, D6U • 2379-DJx, ESx	13N5515	N
5	Antenna assembly	91P8389	N
6	Tape on *Bluetooth* wireless antenna • 2373-32x, 33x, 3Cx, 58x, 91x, 92x, 93x, 94x, 96x, 9Cx, G1x, G2x, G3x, G4x, G5x, G6x • 2373-3Fx, 3Hx, 3Px, 5Qx, 5Rx, 9Ex, 9Fx, 9Gx, 9Jx, 9Hx, 9Kx, AEx, AJx, AKx, AMx, BHx, ANx, GEx, GGx, GHx, GJx, GKx, GLx, GMx • 2374-9Cx • 2374-3Hx, GGx • 2378-DEx, EEx, EKx, ENx, EPx • 2379-D5x, D6x • 2379-DJx, ESx	13N5105	N

(continued)

No.	FRU	P/N	CRU ID
7	Inverter card	26P8464	N
8	LCD panel, 14.1-in. SXGA+, ID TECH for T40/T40p, T41/T41p series • 2373-32x, 33x, 3Cx, 58x, 91x, 92x, 93x, 94x, 96x, 9Cx, A1x, A8x, A9x, G1x, G2x, G3x, G4x, G5x, G6x • 2373-3Fx, 3Hx, 3Px, 5Qx, 5Rx, 9Ex, 9Fx, 9Gx, 9Jx, 9Hx, 9Kx, AEx, AJx, AKx, AMx, BHx, ANx, GEx, GGx, GHx, GJx, GKx, GLx, GMx • 2374-9Cx • 2374-3Hx, GGx • 2378-DEx, EEx, EKx, ENx, EPx • 2379-D5U, D6U • 2379-DJx, ESx	11P8346	N
	LCD panel, 14.1-in. SXGA+, SAMSUNG for T40/T40p, T41/T41p series • 2373-32x, 33x, 3Cx, 58x, 91x, 92x, 93x, 94x, 96x, 9Cx, A1x, A8x, A9x, G1x, G2x, G3x, G4x, G5x, G6x • 2373-3Fx, 3Hx, 3Px, 5Qx, 5Rx, 9Ex, 9Fx, 9Gx, 9Jx, 9Hx, 9Kx, AEx, AJx, AKx, AMx, BHx, ANx, GEx, GGx, GHx, GJx, GKx, GLx, GMx • 2374-9Cx • 2374-3Hx, GGx • 2378-DEx, EEx, EKx, ENx, EPx • 2379-D5U, D6U • 2379-DJx, ESx	11P8348	N
9	Clear plate for T40/T40p series	91P8387	N
	Clear plate for T41 series	13N5410	N
	Clear plate for T41p series	13N5666	N
—	LG-IBM logo kit for T41/T41p series	13N5714	N

Keyboard

Language	P/N (NMB)	CRU ID
Arabic	08K5065	**
Belgian	08K5060	
Chinese, Traditional	08K5062	
Czech	08K5066	
Danish	08K5053	
Dutch	08K5050	
English, U.K.	08K5046	
English, U.S.	08K5044	
English, U.S. (International)	93P4719	
French, Canadian	08K5047	
French, European	08K5049	
German	08K5048	
Greek	08K5068	
Hungarian	08K5067	
Hebrew	93P4711	
Italian	08K5054	
Japanese	08K5045	
Korean	08K5059	
Norwegian	08K5052	
Polish	08K5070	
Portuguese	08K5057	
Russian	08K5063	
Slovak	08K5069	
Slovenian	08K5071	
Spanish, European	08K5055	
Spanish, Latin American	08K5058	
Swedish or Finnish	08K5051	
Swiss	08K5056	
Thailand	08K5072	
Turkish	08K5061	

Recovery CDs

For Windows XP Professional (T40/T40p series)

Windows XP Professional is preinstalled as the operating system in the following models:

- 2373-12x, 14x, 19x, 1Bx, 22x, 24x, 29x, 2Ax, 2Bx, 2Cx, 32x, 33x, 3Cx, 42x, 44x, 47x, 49x, 4Ax, 4Bx, 4Cx, 51x, 54x, 58x, 61x, 6Bx, 71x, 72x, 75x, 76x, 78x, 7Ax, 7Cx, 81x, 82x, 85x, 86x, 88x, 8Ax, 8Cx, 8Dx, 91x, 92x, 94x, 96x, 9Cx, C3x, C4x, C7x, C8x, CAx, G1x, G2x, G3x, G4x, G5x, G6x
- 2374-12x, 14x, 72x, 75x, 7Cx, 82x, 8Cx
- 2375-72x
- 2376-72x
- 2378-D1U, D2U
- 2379-D3U, D4U, D5U, D6U

Language	P/N	CRU ID
Arabic	01R8058	*
Chinese, Simplified	01R8253	
Chinese, Traditional	01R8252	
Chinese, Traditional (Hong Kong S.A.R.)	01R8254	
Czech	01R8059	
Danish	01R8049	
Dutch	01R8056	
English, U.K.	01R8047	
English, U.S.	01R8046	
Finnish	01R8055	
French	01R8050	
German	01R8051	
Greek	01R8063	
Hebrew	01R8060	
Hungarian	01R8064	
Italian	01R8054	
Japanese	01R8255	
Norwegian	01R8057	
Polish	01R8061	
Portuguese	01R8048	
Russian	01R8065	
Spanish	01R8052	
Swedish	01R8053	
Turkish	01R8062	

For Windows 2000 (T40/T40p series)

Windows 2000 is preinstalled as the operating system in the following models:

- 2373-16x, 25x, 66x, 6Dx, 93x, B2x, B5x, BDx, C1x

Language	P/N	CRU ID
Arabic	01R8158	*
Chinese, Simplified	01R8249	
Chinese, Traditional	01R8248	
Chinese, Traditional (Hong Kong S.A.R.)	01R8250	
Czech	01R8159	
Danish	01R8149	
Dutch	01R8156	
English, U.K.	01R8147	
English, U.S.	01R8146	
Finnish	01R8155	
French	01R8150	
German	01R8151	
Greek	01R8163	
Hebrew	01R8160	
Hungarian	01R8164	
Italian	01R8154	
Japanese	01R8251	
Norwegian	01R8157	
Polish	01R8161	
Portuguese	01R8148	
Russian	01R8165	
Spanish	01R8152	
Swedish	01R8153	
Turkish	01R8162	

For Windows XP Professional (T41/T41p series)

Windows XP Professional is preinstalled as the operating system in the following models:

- 2373-1Ex, 1Fx, 1Hx, 1Lx, 2Ex, 2Fx, 2Qx, 2Rx, 3Fx, 3Hx, 3Px, 4Fx, 4Gx, 4Hx, 4Nx, 4Px, 4Qx, 4Sx, 5Hx, 5Qx, 7Ex, 7Fx, 7Jx, 7Kx, 7Mx, 7Px, 8Hx, 8Jx, 8Kx, 8Px, 8Rx, 8Sx, 9Ex, 9Fx, 9Hx, 9Jx, 9Kx, 9Px, 9Rx, GEx, GGx, GHx, GJx, GKx, GLx, GMx
- 2374-1Hx, 1Fx, 3Hx, 7Fx, 7Jx, 8Rx, GGx
- 2378-DEx, DFx, DGx, DHx
- 2379-DJx, DKx

Language	P/N	CRU ID
Arabic	01R8807	*
Chinese, Simplified	01R8800	
Chinese, Traditional	01R8801	
Chinese, Traditional (Hong Kong S.A.R.)	01R8802	
Czech	01R8806	
Danish	01R8796	
Dutch	01R8799	
English, U.K.	01R8789	
English, U.S.	01R8788	
Finnish	01R8797	
French	01R8780	
German	01R8791	
Greek	01R8811	
Hebrew	01R8804	
Hungarian	01R8810	
Italian	01R8793	
Japanese	01R8803	
Norwegian	01R8798	
Polish	01R8850	
Portuguese, Brazilian	01R8794	
Russian	01R8808	
Spanish	01R8792	
Swedish	01R8795	
Turkish	01R8809	

For Windows 2000 (T41 series)

Windows 2000 is preinstalled as the operating system in the following models:

- 2373-5RJ, 6KJ, 6SJ, 9GJ, BFJ, BJJ, BHJ

Language	P/N	CRU ID
Japanese	01R8784	*

Miscellaneous parts

FRU	P/N	CRU ID
Screw kit (including nylon-coated screws): • M2 × 2.7 mm (silver), small head (10) • M2 × 3 mm (silver), small head (20) • M2 × 3 mm (from outside), pan head (10) • M2 × 4 mm (black), bind head (10) • M2 × 4 mm (black), small head (10) • M2 × 5 mm (gold), bind head (2) • M2 × 10 mm (black), flat head (20) • M2 × 14 mm (black), bind head (10) • M2 × 14 mm (black), TR7 (5) • M2 × 14.9 mm for drive bay (5) • M2 × 19 mm (black), bind head (5) • M2.5 × 3 mm (gold), flat head (5) • M2.5 × 4.8 mm (black), bind head (10) • M3 × 3 mm (PHILLIPS/slotted) (2) • Hex stud (5) • Security screw (1) • Screw caps (square, thin) • Screw caps (oval, not painted) • Screw caps (not painted) • Screw caps (square) • Tape on *Bluetooth* wireless antenna	91P8405	N
System miscellaneous parts: • Cable, RJ11-docking connector on system board • DC in cable • (*c*) Hard disk drive guide rail • Spacer for DSP connector • (*e*) I/O plate bracket • (*f*) Support structure • Harness (left) • (*b*) Antenna cable guide • Bracket holder, LCD cable • (*d*) EMI spring, CDC • Connector bag • Screw cap (square, thin) **Note:** Italicized letters in parentheses are references to the exploded view on page 153.	13N5528	N

(continued)

FRU	P/N	CRU ID
Base miscellaneous parts: • Lens, IR • Lower shield • Cover, PC Card slot • Spacer, PC Card slot • Spring, PC Card slot cover • Rubber foot (rear) • Rubber foot (front) • Insulation sheet • Battery lock knob L • Battery lock latch L • Battery lock knob R • Battery lock latch R • Spring, battery lock • Slide lever • Slide lever spring • Pull lever • Pull lever spring • Puller • RJ11 cover • Rubber, shock absorber • Insulation, bottom • Foam under fan • Cu tape under fan • Cu tape • Insulation, louver • Screw caps (square, thin)	13N5104	N
System board miscellaneous parts for T40/T40p series: • Insulator, PC Card slot • Insulator, louver • Insulator, docking latch • Insulator, docking connector • Insulator, fan • Insulator, Mg • S-video gasket • Form on system board • Insulator, louver, hard disk drive • Mic rubber • Stud, triangle • Audio connector bracket • Security chip spacer • Stud, system board • Screw cap (square, thin)	91P8502	N

(continued)

FRU	P/N	CRU ID
System board miscellaneous parts for T41/T41p series: • Insulator, PC Card slot • Insulator, louver • Insulator, docking latch • Insulator, docking connector • Insulator, fan • Insulator, Mg • S-video gasket • Form on system board • Insulator, louver, hard disk drive • Mic rubber • Stud, triangle • Audio connector bracket • Security chip spacer • Stud, system board • Screw cap (square, thin)	13N5437	N
LCD miscellaneous parts: • Tape, LCD FPC • Tape on *Bluetooth* wireless antenna • (*a*) LCD latch R • (*b*) LCD latch L assembly • (*c*) Cable bushing (lower) • (*d*) Cable bushing (upper) • LED lens • Cable clip • Spiral tube • Screw caps (square, thin) • Screw caps (oval, not painted) • Screw caps (not painted) • Screw caps (square) **Note:** Italicized letters in parentheses are references to the exploded view on page 168.	13N5409	N
Base, PC Card slot kit for T40/T40p series • Cover, PC Card slot • Spacer, PC Card slot • Spring, PC Card slot cover	13N5345	N

AC adapters

FRU	P/N	CRU ID
3-pin (72W) slim adapter for PFC model (models xxA, xxB, xxC, xxG, xxH, xxK, xxM, xxV)		
ASTEC OP	08K8203	*
DELTA OP	08K8207	*
SANKEN OP	08K8211	*
2-pin (72W) slim adapter for non-PFC model (models xxE, xxF, xxJ, xxP, xxS, xxU, xxY)		
ASTEC OP	08K8205	*
DELTA OP	08K8209	*
SANKEN OP	08K8213	*

Optional FRUs

FRU	P/N	CRU ID
1-GB DDR SDRAM SO DIMM (PC2100)	10K0035	*
Hard disk drive, 80 GB, 9.5 mm, 4200 rpm, IBM STD	08K9863	*
Ultrabay Slim hard disk drive adapter	62P4553	*
Ultrabay Slim Li Polymer battery (2nd bay battery), SANYO (WW)	08K8191	*
ThinkPad Dock II	67P9010	*
Top cover and screw kit for ThinkPad Dock II	46P3085	**
PCI cover for ThinkPad Dock II	46P3086	*
ThinkPad Mini Dock	67P9011	*
AC adapter (2 pin, 120 W), DELTA for ThinkPad Mini Dock	02K7086	*
AC adapter (2 pin, 120 W), LITEON for ThinkPad Mini Dock	02K7092	*
AC adapter (3 pin, 120 W), LITEON for ThinkPad Mini Dock	02K7094	*
AC adapter (3 pin, 120 W), LITEON for ThinkPad Mini Dock	02K7096	*
ThinkPad Port Replicator II	74P6735	*
ThinkPad Slim Drive Adapter for Ultrabay 2000	62P4556	*
Multiple battery charger	02K6642	*
Diskette drive cable	27L0525	*
Diskette drive (TEAC)	08K9606	*
Diskette drive (SONY)	08K9607	*

Common parts list

Tools

Tool	P/N
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
1/4" drive spinner handle	1650840
1/4" Sq. to 1/4" hex torx adapter	93F2838
TR7-TR-10 tamper resistant torx bits	00P6967
ThinkPad Hardware Maintenance Diskette Version 1.69 **Note:** Download the file from the following Web site: `http://www.ibm.com/pc/partner/infotips`	—

Power cords (system)

An IBM power cord for a specific country or region is usually available only in that country or region:

For 2-pin power cords:

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

For 3-pin power cords:

Region	P/N	CRU ID
Australia, New Zealand	76H3514	*
Taiwan, Thailand	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	
China (P.R.C.) (other than Hong Kong S.A.R.)	02K0539	
Switzerland	76H3528	

Power cords (ThinkPad Dock and ThinkPad Dock II)

An IBM power cord for a specific country or region is usually available only in that country or region:

For 3-pin power cords:

Region	P/N	CRU ID
Argentina	36L8868	*
Australia, New Zealand	75H8988	
Brazil	49P2101	
Canada, Thailand, U.S.	75H8989	
Denmark	75H8992	
European countries	75H8990	
India, South Africa	75H8993	
Israel	75H8999	
Italy	75H8998	
Japan	75H8996	
Korea	76H3536	
China (P.R.C.) (other than Hong Kong S.A.R)	02K0540	
Switzerland	75H8997	
U.K.	75H8994	

Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any of the intellectual property rights of IBM may be used instead of the IBM product, program, or service. The evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, are the responsibility of the user.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the IBM Director of Licensing, IBM Corporation, 500 Columbus Avenue, Thornwood, NY 10594, U.S.A.

Trademarks

The following terms are trademarks of the IBM Corporation in the United States or other countries or both:

IBM
IBM (logo)
Asset ID
HelpCenter
OS/2
ThinkLight
ThinkPad
TrackPoint
Ultrabay
UltraNav

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States and/or other countries.

Intel, Pentium, and SpeedStep are trademarks of Intel Corporation in the United States and/or other countries. (For a complete list of Intel trademarks, see the legal information on `http://www.intel.com/`)

Other company, product, or service names may be the trademarks or service marks of others.

Part Number: 13N5911

(1P) P/N: 13N5911