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IBM Mobile Systems

S05L-1935-00

**ThinkPad 310, 310D, 310E, 310ED
Hardware Maintenance Manual**

February 1998

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Note

Before using this information and the product it supports, be sure to read the general information under "Notices" at the back of this manual.

First Edition (February 1998)

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About This Manual

This manual contains service and reference information for IBM ThinkPad 310, 310D, 310E or 310ED (2600) products. Use this manual along with the advanced diagnostic tests to troubleshoot problems effectively.

The manual is divided into sections as follows:

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

Important

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

Before servicing an IBM mobile product, be sure to review the safety information under “Safety Notices (Multi-lingual Translations)” on page ix and “Safety Information” on page xvi.

Related Publications

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

| Publication | Part, Form Number |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Mobile Systems HMM Volume 1: Laptop, Notebook, Portable, and ThinkPad Computers (Models L40, CL57, N45, N51, P70/P75, ThinkPad 300, 350, 500, 510, 710T, Expansion Unit, Dock I, Dock II) | 30H2356, S82G-1501-01 |
| Mobile Systems HMM Volume 2: ThinkPad Computers (Model 340, 355, 360, 370, 700, 701, 720, 750, 755) | 30H2357, S82G-1502-03 |
| Mobile Systems HMM Volume 3: ThinkPad Computers (Model 365, 380, 385, 560, 760, SelectaDock | 84H8099, S82G-1503-05 |
| Mobile Systems HMM Volume 4: ThinkPad Computers (Model 365, 380, 385, 560, 760, 765, 770, SelectaDock | 05L1271, S05L-1270-01 |

Related Diskettes

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

| Diskette | Part, Form Number |
|--------------------------------------|--------------------|
| ThinkPad 310 Diagnostics Diskette | 05L1936, S05L-1936 |
| ThinkPad 310 Maintenance Diskette | 05L1770, S05L-1770 |

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Introduction

Important

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

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

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

| | |
|------------------|--------------|
| Montreal | 514-938-3022 |
| Toronto | 905-316-4255 |
| Vancouver | 604-664-6464 |
| Winnipeg | 204-934-2735 |

FRU Replacement Strategy

Ensure that all diskette fixes are installed prior to replacing any FRUs. And, use the following strategy to prevent unnecessary FRU replacement and service expense:

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

Attention

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

The advanced diagnostic tests are intended to test *only* IBM products. Non-IBM products or modified options can give false errors and invalid responses.

Hard Disk Drive Replacement Strategy:

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

Attention

The drive startup sequence in the computer you are servicing might have been changed. Be extremely careful during write operations such as copying, saving, or formatting. Data or programs can be overwritten if you select an incorrect drive.

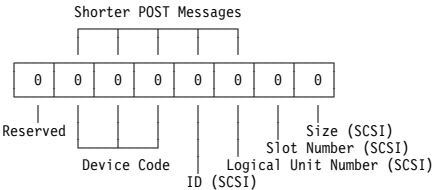
How to Use Error Messages

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

How to Read POST Error Messages

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

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



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

Safety Notices (Multi-lingual Translations)

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

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

Safety Notice 1

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

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

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

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

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

Safety Notice 2

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

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

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

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

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

Safety Notice 3

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

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

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

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

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

Safety Notice 4

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

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

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

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

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

Safety Notice 5

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

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

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

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

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

Safety Notice 6

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

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

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

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

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

Safety Notice 7

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

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

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

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

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

Safety Notice 8

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

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

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

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

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

Safety Information

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

General Safety

Follow these rules to ensure general safety:

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

Attention: Metal objects are good electrical conductors.

- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

Electrical Safety

Observe the following rules when working on electrical equipment.

Important

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

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

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

Attention: Another person must be there to switch off the power, if necessary.

- Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

Attention: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.

- When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
- Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

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

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

and similar units. (This practice ensures correct grounding of the units.)

- If an electrical accident occurs:
 - **Use caution; do not become a victim yourself.**
 - **Switch off power.**
 - **Send another person to get medical aid.**

Safety Inspection Guide

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

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

Consider these conditions and the safety hazards they present:

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

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

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
 - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
 - b. The power cord should be the appropriate type as specified in the parts listings.
 - c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling Electrostatic Discharge-Sensitive Devices

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

Notes

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

When handling ESD-sensitive parts:

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

Note

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

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

Grounding Requirements

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

Laser Compliance Statement

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

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



CAUTION:

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

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

凡未在这里指明的任何控制用法、调整、行为，
都会导致严重后果。

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

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

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

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

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

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

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

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

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

DANGER:

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

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

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

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

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

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

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

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

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

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

ThinkPad 310, 310D, 310E, 310ED (2600)

Read This First

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

Important Notes

- **Only certified, trained personnel should service the computer.**
- Read FRU service procedures before replacing any FRUs.
- **Be extremely careful during write operations such as copy, saving or formatting.** Drives in the computer that you are servicing might have been rearranged or the drive startup sequence might have been altered. If you select an incorrect drive, data or programs can be written over.
- **Replace FRUs only for the correct model.** When you replace the FRU, make sure the model of the machine and FRU part number are correct by referring to the part list.
- **FRUs should not be replaced because of a single, un-reproducible failure.** Single failures can occur from a variety of reasons that have nothing to do with a hardware defect such as: cosmic radiation, electrostatic discharge, or software errors. FRU replacement should be considered only when a recurring problem exists. If this is suspected, clear the error log and run the test again. Do not replace any FRUs if log errors do not reappear.
- **Be careful not to replace a non-defective FRU.**

How to Use Error Messages: Use the error codes displayed on the screen to diagnose failures. If more than one error code is displayed, begin the diagnosis with the first error code. The cause of the first error code can result in false error codes being displayed.

How to Diagnose Multiple FRUs: If the adapter or device has more than one FRU, the error code could be caused by either FRU. Before replacing multiple FRUs, try removing or exchanging each FRU, one by one in the designated sequence, to see if the symptoms change.

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

- ___1. Name and phone number of servicer.
- ___2. Date of service.
- ___3. Date when part failed.
- ___4. Date of purchase.
- ___5. Failure symptoms, error codes appearing on display, and beep symptoms.
- ___6. Procedure index and page number in which failing FRU was detected.
- ___7. Failing FRU name and part number.
- ___8. Machine type, model number, and serial number.
- ___9. Customer's name and address.

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

Note for Warranty:

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

Important

The following is not covered under warranty

- LCD panel cracked by applying excessive force or by being dropped.
- Scratched (cosmetic) parts.
- Cracked or broken plastic parts, broken latches, broken pins, or broken connectors caused by excessive force.
- Damage caused by liquid spilled into the system.
- Damage caused by improperly inserting a PCMCIA card or installation of an incompatible card.
- Diskette drive damage caused by pressing the diskette drive cover or inserting diskettes with multiple labels.
- Damaged or bent diskette eject button.
- CD-ROM drive damage caused by excessive force, shock, or by being dropped.
- Fuses blown by attaching a nonsupported device.
- Forgotten computer password (making computer unusable.)

Important

If the following symptoms are present, they may indicate damage caused by non-warranted activity:

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

How to Disable the Power-On Password:

To clear a password from the system, first identify the password switch by referring to “Switch Locations” on page 68, then follow the steps below.

1. Power-off the computer.
2. Unplug the AC Adapter and remove the main battery.
3. Remove the keyboard and thermal plate. See “Keyboard” on page 41 and “Thermal Plate/CPU” on page 42.
4. Move the switch from Enable to Disable to bypass the password.

Note: There is one microswitch used to disable the password. After removing the thermal plate, locate SW2 (a 4-bit switch) near the lower-left corner of the CPU socket. The second bit switch (counting from the lowest side) is the password enable/disable switch. Turning the switch to the left is enable; to the right is disable.

5. Plug the AC Adapter, turn on the system, then press **F2** while the ThinkPad logo is being displayed to enter the BIOS Utility.

Note: If your customer forgot the password, enter System Security and set Power On Password setting to **[None]** to clear password.

6. Save, then exit from the BIOS Utility.
7. Power off.
8. Unplug the power cable or battery.
9. Move the password switch from Disable to Enable.

Note: To reinstall the password, the user must enter a password in the BIOS Utility.

Checkout Guide

Use the following procedure as a guide for computer problems.

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

1. Obtain the failing symptoms in as much detail as possible.

2. Verify the symptoms by attempting to re-create the failure by running the diagnostic test or by repeating the same operation.
3. Use the following table with the verified symptom to determine which page to go to. Search the symptoms column and find the description that best matches your symptom; then go to the page shown in the "Go to" column.

| Symptoms (Verified) | Go to |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Power failure. (The power indicator does not go on or stay on.) | "Power System Checkout" on page 8. |
| POST does not complete. No beeps, error codes, or messages are indicated. | "Symptom-to-FRU Index" on page 14 then see " No Beep Symptoms " on page 18. |
| POST detected an error and displayed numeric error code with error message. | "Symptom-to-FRU Index" on page 14. |
| Other symptoms (such as LCD display problems) | "Symptom-to-FRU Index" on page 14 then use the appropriate information on pages 18 to 23. |

Memory Checkout

DIMMs are available for increasing memory capacity.

| DIMM | DIMM | Total Memory |
|------|------|--------------|
| 16MB | 0MB | 16MB |
| 0MB | 16MB | 16MB |
| 16MB | 16MB | 32MB |
| 32MB | 0MB | 32MB |
| 0MB | 32MB | 32MB |
| 32MB | 8MB | 40MB |
| 8MB | 32MB | 40MB |
| 32MB | 16MB | 48MB |
| 16MB | 32MB | 48MB |
| 32MB | 32MB | 64MB |

Warning: This system will not work without DIMM memory installed.

Memory errors might stop system operation, show error messages on the screen, or hang the system. Use the following procedure to isolate memory problems:

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

1. Power-off the computer and replace the DIMM.

2. Boot from the diagnostics diskette and start the PQA program (refer to “Running PQA Diagnostics Program” on page 25).
3. Select the **Memory** item to run the memory test.

If no error appears, install a new DIMM; if an error appears, replace the system board.

System Programs in Flash Memory: System setup programs are stored in flash memory.

Flash Memory Update: A flash memory update is required for the following conditions:

- New versions of system programs.
- New features or options are added.

To update the flash memory, do the following:

1. Get the appropriate diskette containing the update.
2. Insert the System Program Service Diskette into drive A: and power-on the computer.
3. Select Update system programs from the menu.

System Board Checkout

The processing functions are performed by the system board. Processor problems can also be caused by the system board.

1. Boot from the diagnostics diskette and start the PQA program (please refer to “Running PQA Diagnostics Program” on page 25).
2. Run the **System Board** test to verify the symptom. This test verifies both the system board and the CPU.

If the tests detect a system board problem, replace the system board.

Note: Do not touch the keyboard or pointing device when the system board test is running. This may cause an unexpected error.

Keyboard and External Input Device Checkout

Note: If an external keyboard is attached, remove it if the internal keyboard is to be tested.

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

If the tests do not detect a keyboard problem, run the **Keyboard** test by doing the following:

1. Boot from the diagnostics diskette and start the PQA program (please refer to “Running PQA Diagnostics Program” on page 25).
2. Go to the diagnostic menu screen; select **Keyboard** test and press **F2** in the test items.
3. Check that when each key is pressed, the key's position on the keyboard layout on the screen changes to a black square.

Note: Press **Y+Enter** to exit the test.

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

- Ensure the keyboard switch is correctly set
- Reseat the keyboard flexible cables
- Replace the keyboard connection board
- Replace the keyboard assembly
- Replace the system board

The following external input devices are supported for this computer:

- Numeric keypad
- Mouse (PS/2 compatible)
- Keyboard

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

If the problem is not corrected, replace the device, and then the system board.

Audio Board Checkout

1. Boot from the diagnostics diskette and start the PQA program (please refer to “Running PQA Diagnostics Program” on page 25).
2. Go to the diagnostic menu screen; select **Audio** and press **F2** in the test items.
3. If the test detects a audio board problem, do the following actions one at a time to correct the problem. Do not replace a non-defective FRU.
 - Audio board
 - System board

TrackPoint III Checkout

The TrackPoint does automatic compensations to adjust the pointer sensor. During this process, the pointer moves on the screen automatically for a short time. This self-acting pointer movement can occur when a slight, steady pressure is applied to the TrackPoint pointer while the computer is powered on or while the system is running, or when readjustment is required because the temperature

has exceeded its normal temperature range. This symptom does not indicate a hardware problem. No service actions are necessary if the pointer movement stops in a short period of time.

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

1. Boot from the diagnostics diskette and start the PQA program (please refer to "Running PQA Diagnostics Program" on page 25).
2. Go to the diagnostic **Manual Test** menu.
3. Press **F2** in the test items.
4. Press the left and right click buttons.
5. Use the pointing stick to move the cursor to the 4 corners.

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

- Reseat the keyboard flexible cables and the TrackPoint flexible cable.
- Reseat the flexible cable connecting the TrackPoint board via the system board.
- Replace the TrackPoint board (under the click buttons).
- Replace the keyboard.
- Replace the system board.

Diskette Drive Test

Do the following to isolate the problem to a controller, drive, or diskette. A scratch, write enabled, non-defective, high-density (2HD) diskette is required.

Warning: Make sure that the diskette does not have more than one label attached to it. Multiple labels can cause damage to the drive or can cause the drive to fail.

Do the following to select the test device:

1. Boot from the diagnostics diskette and start the PQA program (please refer to "Running PQA Diagnostics Program" on page 25).
2. Go to the diagnostic Diskette Drive in the test items.
3. Press F2 in the test items.
4. Follow the instructions in the message window.

If an error occurs with the internal diskette drive, reseat the connector on the system board.

If the error still remains:

1. Reseat the diskette drive cable.
2. Replace the diskette drive cable.

3. Replace the diskette drive flexible cable.
4. Replace the system board.

If an error occurs when the external diskette drive is attached through the external diskette drive connector and there is no internal diskette drive, reseal the connector. If the error still remains, perform the following actions, one at a time.

1. Replace the external FDD cable.
2. Replace the diskette drive.
3. Replace the system board.

CD-ROM Drive Test

Do the following to isolate the problem to a controller, drive, or CD-ROM. Make sure that the CD-ROM does not have a label attached to it. The label can cause damage to the drive or can cause the drive to fail.

Do the following to select the test device:

1. Boot from the diagnostics diskette and start the PQA program (please refer to "Running PQA Diagnostics Program" on page 25).
2. Go to the diagnostic **CD-ROM** in the test items.
3. Press **F2** in the test items.
4. Follow the instructions in the message window.

If an error occurs, reseal the connector on the system board.

If the error still remains:

1. Reseat the CD-ROM cable.
2. Replace the CD-ROM drive.
3. Replace the system board.

Power System Checkout

To verify the symptom of the problem, power-on the computer using each of the power sources as follows:

1. Remove the battery pack, diskette drive, and hard disk drive.
2. Connect the AC Adapter and check that power is supplied.
3. Install the diskette drive or hard disk drive one at a time, and check that power is supplied from each power source.

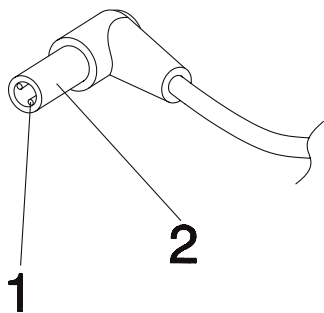
If you suspect a power problem, see an appropriate power supply check listed below:

- Checking the AC Adapter
- Checking Operational Charging
- Checking the Battery Pack

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

If the power-on indicator of the AC Adapter does not turn on, make sure of the following:

- Power cord is not damaged.
- Power cord is securely connected to the AC Adapter and AC power outlet.



If the above confirmation does not solve the problem, replace the AC Adapter.

If the power-on indicator of the AC Adapter is on, then proceed to the next step.

1. Unplug the AC Adapter cable from the computer and measure the output voltage at the plug of the AC Adapter cable.

| Pin | Voltage (V dc) |
|-----|----------------|
| 1 | 19.0 to 20.5 |
| 2 | Ground |

- Replace the system board.
 - If the problem is still not corrected, go to “Undetermined Problems” on page 23.
 - If the voltage is not correct, go to the next step.
2. Unplug the AC Adapter cable from the AC power outlet and wait five minutes or longer to allow the over-voltage protection circuit of the AC Adapter to be fully discharged and initialized.
 3. Plug the AC Adapter cable into the AC power outlet.
 4. Measure the output voltage of the AC Adapter.
 5. If the voltage is still not correct, replace the AC Adapter.

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

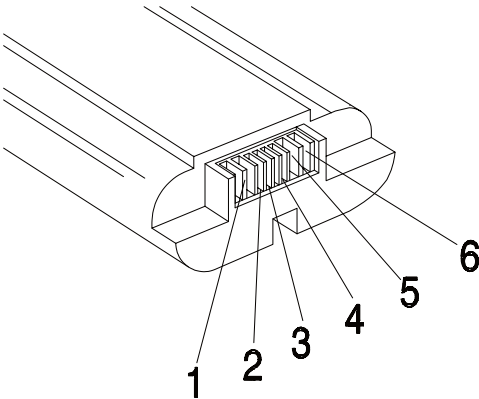
Checking Operational Charging: To check operational charging, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

Perform operational charging:

1. If the battery status indicator does not turn on, remove the battery pack and allow it to return to room temperature.
2. Reinstall the battery pack. If the charge indicator still does not turn on, replace the battery pack.

Checking 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 6 (-). See the following figure:



| Terminal | Voltage (V dc) / Signal |
|----------|-------------------------|
| 1 | 0 to 13 |
| 2 | ID |
| 3 | Thermal |
| 4 | Data |
| 5 | Reserved |
| 6 | Ground |

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

3. If the voltage is less than +11.0 V dc, the battery pack has been discharged. Recharge the battery pack.
If the voltage is still less than +11.0 V dc after recharging, replace the battery.

Note: If the voltage of the battery pack is 0 V dc, it is not defective.

BIOS Utility

Your computer has a BIOS Utility that allows you to configure the computer and its hardware settings.

Note: The computer is also bundled with a Windows 95-based computer management utility similar in function to the BIOS Utility called the Notebook Manager.

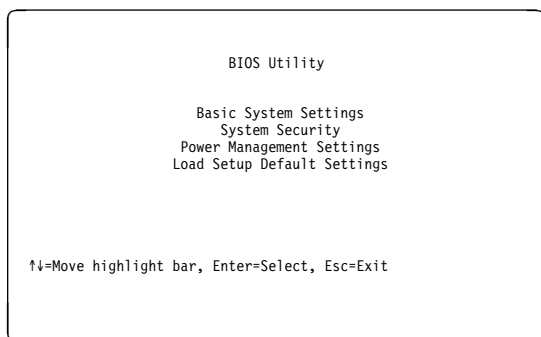
The computer is already correctly configured for you. If you make any changes to the computer or you receive an Equipment Configuration Error message (error code 246) after you power-on the computer, you need to run the BIOS Utility.

The BIOS Utility has the following functions:

- Change the system date or time
- Set the power-saving modes and timers
- Set, change, or remove a system password
- Change the system boot drive or display device
- Add or remove serial and parallel devices
- Set the video display features

Press **F2** while the ThinkPad logo is being displayed to enter the BIOS Utility. The main screen displays.

Note: If the Setup password is set, you need to enter the Setup password to gain access to the BIOS Utility.



There are four main menu items:

- Basic System Settings
- System Security
- Power Management Settings
- Load Setup Default Settings

Navigating the BIOS Utility Screens

- From the main menu screen, press **↑** or **↓** to move from one menu item to another and press **Enter** to select a menu.
- Parameters displayed in low brightness (grayed-out) are not user-configurable. The computer detects and sets the values for these parameters.
- Press **↑** or **↓** to move from one parameter to another. Press **←** or **→** to change parameter settings. You have to change some settings when you add a component to the computer.
- Most of the parameters are self-explanatory.
- To exit a main menu item, press **Esc**.
- When you press **Esc** to exit the BIOS Utility from the main menu screen, the following prompt appears:

Do you want to save CMOS data?

[Yes] [No]

Select **Yes** to save the changes you made to the configuration values or **No** to abandon the changes and retain the current values.

Power Management Features

Two power management modes are provided by the computer to reduce power consumption and prolong battery power.

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

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

Events that cause the computer to enter standby mode:

- Standby requested by the Fn key. (Fn+F7)
- The LCD is closed.
- The specified time (standby timer in the BIOS Utility) has elapsed from the last operation with the keyboard, mouse, hard disk drive, parallel connector, or diskette drive.
- The battery condition is low and hibernation is not enabled (when Sleep Manager is not installed and the

hibernation file is not present or invalid). The battery power indicator blinks amber.

Events that cause the computer to exit standby mode:

- The LCD is opened.
- The ring indicator (RI) is signaled by a serial or PCMCIA device.
- Any key or pointing device operation.

Note: If the computer enters standby mode and the computer is using a communication or I/O PC Card, the PC Card and application program remain active.

Hibernation Mode: When in hibernation mode, the following occurs:

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

Events that cause the computer to enter hibernation mode:

- Hibernation requested by the Fn key. (Fn+F8)
- The specified time (hibernation timer in the BIOS Utility) has elapsed from the last operation with the keyboard, mouse, hard disk drive, parallel connector, or diskette drive.
- A critical low battery condition occurs and hibernation is enabled (when Sleep Manager is installed and the hibernation file is present and valid).

Note: The computer cannot enter hibernation mode when a communication or I/O PC Card is being used by the computer.

Events that cause the computer to exit hibernation mode:

- The power-on switch is operated.

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

Symptom-to-FRU Index

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

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

This index can also be used to help you decide which FRUs to have available when servicing a computer.

Numeric error codes show the errors detected in POST or system operation (runtime). In the following error codes, X can be any number. If no codes are available, use narrative symptoms. If the symptom is not listed, go to “Undetermined Problems” on page 23.

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

Numeric Error Codes and Messages

| Error Code | Message | FRU/Action in Sequence |
|------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| POST | | |
| 010 | Memory Error at MMMM: SSSS: OOOOh (R:xxxxh, W:xxxxh) | <ol style="list-style-type: none">1. Go to “Memory Checkout” on page 4.2. DIMM3. System board |
| 011 | 64KB System Management Memory Bad | <ol style="list-style-type: none">1. Enter BIOS Utility to execute Load Setup Default Setting, then reboot system.2. DIMM3. System board |
| 015 | Battery is Critical Low | <ol style="list-style-type: none">1. Go to “Checking the Battery Pack” on page 10.2. Battery3. Battery connector board4. Charger board5. System board |
| 020 | Keyboard Interface Error Note: The message only appears for a few seconds. | <ol style="list-style-type: none">1. Go to “Keyboard and External Input Device Checkout” on page 5.2. Ensure that the keyboard switch is correctly set.3. Reseat the keyboard flexible cables.4. Replace the keyboard connection board.5. Replace the keyboard assembly.6. Replace the system board. |

| Error Code | Message | FRU/Action in Sequence |
|------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 021 | Keyboard Error or Keyboard Not Connected Note: The message only appears for a few seconds. | <ol style="list-style-type: none"> 1. Go to "Keyboard and External Input Device Checkout" on page 5. 2. Ensure that the keyboard switch is correctly set. 3. Reseat the keyboard flexible cables. 4. Replace the keyboard connection board. 5. Replace the keyboard assembly. 6. Replace the system board. |
| 022 | Keyboard Locked Note: The message only appears for a few seconds. | <ol style="list-style-type: none"> 1. Go to "Keyboard and External Input Device Checkout" on page 5. 2. Check the external keyboard lock at the rear, if the keyboard has security feature. |
| 030 | Pointing Device Error Note: The message only appears for a few seconds. | <ol style="list-style-type: none"> 1. Go to "Keyboard and External Input Device Checkout" on page 5. 2. Ensure that the keyboard switch is correctly set. 3. Reseat the keyboard flexible cables. 4. Replace the keyboard connection board. 5. Replace the keyboard assembly. 6. Replace the system board. |
| 031 | Pointing Device Interface Error Note: The message only appears for a few seconds. | <ol style="list-style-type: none"> 1. Go to "Keyboard and External Input Device Checkout" on page 5. 2. Ensure that the keyboard switch is correctly set. 3. Reseat the keyboard flexible cables. 4. Replace the keyboard connection board. 5. Replace the keyboard assembly. 6. Replace the system board. |
| 040 | Diskette Drive Controller Error | <ol style="list-style-type: none"> 1. Go to "Diskette Drive Test" on page 7. 2. Ensure the diskette drive configuration setting in BIOS Utility is correct. 3. Diskette drive cable 4. Diskette drive 5. System board |
| 045 | CPU Clock Mismatch | <ol style="list-style-type: none"> 1. Enter BIOS Utility to execute Load Setup Default Setting, then reboot system. 2. Ensure the CPU frequency switches are set correctly. |

| Error Code | Message | FRU/Action in Sequence |
|-------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 047 | Diskette Drive(s) Disabled | <ol style="list-style-type: none"> 1. Ensure the diskette drive is not set to [Disabled] in the "System Security" of BIOS Utility. 2. Diskette drive cable 3. Diskette drive |
| 048 | Diskette Write Protected | <ol style="list-style-type: none"> 1. Ensure the diskette drive is not set to [Write Protect All Sectors] in the "System Security" of BIOS Utility. 2. Diskette drive cable 3. Diskette drive |
| 050 | IDE Drive 0 Error | <ol style="list-style-type: none"> 1. Ensure the hard disk 0 is set to [Auto] in the Basic System Settings of BIOS Utility. 2. Hard disk connector board 3. Hard disk drive 4. System board |
| 054 | IDE Drive(s) Disabled | <ol style="list-style-type: none"> 1. Ensure the hard disk drive is not set to [Disabled] in the System Security of BIOS Utility. 2. Diskette drive cable 3. Diskette drive |
| 055 | Hard disk drive(s) Write Protected | <ol style="list-style-type: none"> 1. Ensure the hard disk drive is not set to [Write protect Boot Sector] in the System Security of BIOS Utility. 2. Hard disk connector board. 3. Hard disk drive 4. System board |
| 056 | IDE Drive 0 Auto Detection Failed | <ol style="list-style-type: none"> 1. Ensure the hard disk 0 is set to [Auto] in the Basic System Settings of BIOS Utility. 2. Hard disk connector board 3. Hard disk drive 4. System board |
| 070 | Real Time Clock Error | <ol style="list-style-type: none"> 1. Reset Time in the Basic System Settings of BIOS Utility. 2. Backup battery (RTC battery) 3. System board |
| 071 | CMOS Battery Bad | <ol style="list-style-type: none"> 1. Enter BIOS Utility to execute Load Setup Default Settings. 2. Backup battery (RTC battery) 3. System board |

| Error Code | Message | FRU/Action in Sequence |
|-----------------------------------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 072 | CMOS Checksum Error | <ol style="list-style-type: none"> 1. Enter BIOS Utility to execute Load Setup Default Settings, then reboot system. 2. Backup battery (RTC battery) 3. System board |
| 081 | System Resource Conflict | <ol style="list-style-type: none"> 1. Enter BIOS Utility to execute Load Setup Default Settings, then reboot system. 2. Remove the non-factory-installed adapter card and reboot system. |
| 082 | IRQ Setting Error | <ol style="list-style-type: none"> 1. Enter BIOS Utility to execute Load Setup Default Settings, then reboot system. 2. Remove the non-factory-installed adapter card and reboot system. |
| 246 | Equipment Configuration Error | <ol style="list-style-type: none"> 1. Ensure the equipment (diskette drive, hard disk drive, keyboard, external mouse, etc.) are connected properly and are set correctly in BIOS Utility. 2. Hard disk connector board 3. Hard disk drive 4. System board |
| System Operation (Runtime) | | |
| 103 | Press <Esc> to turn off NMI or other key to reboot | <ol style="list-style-type: none"> 1. Enter BIOS Utility to execute Load Setup Default Settings, then reboot system. 2. Remove the non-factory-installed adapter card and reboot system. |

Beep Symptoms

| Symptom/Error | FRU/Action in Sequence |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Insert system diskette and press <Enter> key to reboot | <ol style="list-style-type: none"> 1. Ensure the "System boot drive" in the System Security of BIOS Utility is not set to [Drive A]. 2. Ensure the diskette drive configuration setting in BIOS Utility is correct. 3. Diskette drive 4. Hard disk connector board 5. Hard disk drive 6. System board |

No Beep Symptoms

| Symptom/Error | FRU/Action in Sequence |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No beep, power-on indicator on, and a blank LCD during POST | <ol style="list-style-type: none"> 1. Ensure all connectors are securely seated. 2. Reseat the CPU 3. CPU 4. System board |
| No beep, power-on indicator not on, and a blank LCD during POST | <ol style="list-style-type: none"> 1. Reseat the LCD Connectors 2. Power source (battery & adapter). See "Power System Checkout" on page 8. 3. Audio connector board 4. Charger board 5. Hard disk drive 6. LCD inverter ID 7. LCD FPC Cable 8. LCD inverter 9. LCD 10. System board |
| No beep, power-on indicator on, and a blank LCD during POST. | <ol style="list-style-type: none"> 1. Reseat the DIMM. 2. Reseat the LCD Connectors. 3. Hard disk/CD-ROM/diskette drive connectors 4. Hard disk drive 5. Keyboard 6. LCD inverter ID 7. LCD FPC Cable 8. LCD inverter 9. LCD 10. System board |
| No beep, power-on indicator on, and a blinking cursor only during POST. | <ol style="list-style-type: none"> 1. Reseat the LCD Connectors 2. Reseat Hard disk/CD-ROM/diskette drive connectors 3. Hard disk drive 4. LCD inverter ID 5. LCD FPC Cable 6. LCD inverter 7. LCD 8. System board |
| No beep during POST but system runs correctly. | <p>System board</p> <p>Note: The buzzer is on the system board.</p> |

LCD-Related Symptoms

Important: The notebook computer LCD contains over 921,000 thin-film transistors (TFTs). A small number of missing, discolored, or lighted dots (on all the time) is characteristic of TFT LCD technology, but excessive pixel problems can cause viewing concerns. The LCD should be replaced if the number of missing, discolored, or lighted dots in any background is 21 or more.

| Symptom/Error | FRU/Action in Sequence |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No beep, power-on indicator on, and a blank LCD during POST | <ol style="list-style-type: none"> 1. Reseat the LCD Connectors. 2. Hard disk connector board. 3. Hard disk 4. Keyboard 5. LCD inverter ID 6. LCD FPC Cable 7. LCD inverter 8. LCD 9. System board |
| <ul style="list-style-type: none"> • LCD backlight not working • LCD too dark • LCD brightness cannot be adjusted • LCD contrast cannot be adjusted | <ol style="list-style-type: none"> 1. Enter BIOS Utility to execute Load Setup Default Settings, then reboot system. 2. Reseat the LCD Connectors. 3. Keyboard (if control is from the keyboard). 4. LCD inverter ID 5. LCD FPC Cable 6. LCD inverter 7. LCD 8. System board |
| <ul style="list-style-type: none"> • LCD screen unreadable • Characters missing pels • Screen abnormal • Wrong color displayed | <ol style="list-style-type: none"> 1. Reseat all LCD Connectors. 2. LCD inverter ID 3. LCD FPC Cable 4. LCD inverter 5. LCD 6. System board |
| LCD has extra horizontal or vertical lines displayed. | <ol style="list-style-type: none"> 1. LCD 2. LCD inverter ID 3. LCD inverter 4. System board |

Keyboard/TrackPoint-Related Symptoms

| Symptom/Error | FRU/Action in Sequence |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Keyboard (one or more keys) does not work. | <ol style="list-style-type: none"> 1. Go to "Keyboard and External Input Device Checkout" on page 5. 2. Reseat the three keyboard cables. 3. Keyboard 4. System board |
| TrackPoint does not work. | <ol style="list-style-type: none"> 1. Go to "TrackPoint III Checkout" on page 6. 2. Reseat TrackPoint cables. 3. Reseat the three keyboard cables. 4. TrackPoint board 5. Keyboard 6. System board |

Indicator-Related Symptoms

| Symptom/Error | FRU/Action in Sequence |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Indicator incorrectly remains off or on, but system runs correctly | <ol style="list-style-type: none">1. Reseat the Audio connector board.2. Audio connector board3. System board |

Power-Related Symptoms

| Symptom/Error | FRU/Action in Sequence |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power shuts down during operation. | <ol style="list-style-type: none">1. Go to "Power System Checkout" on page 8.2. AC Adapter3. Battery Pack4. Battery connector board5. Charger board6. System board |
| The system will not power-on. | <ol style="list-style-type: none">1. Go to "Power System Checkout" on page 8.2. AC Adapter3. Charger board4. System board |
| The system will not power-off. | <ol style="list-style-type: none">1. Go to "Power System Checkout" on page 8.2. Press the power shutdown switch for more than 3 seconds.3. Charger board4. System board |
| Battery cannot be charged. | <ol style="list-style-type: none">1. Go to "Power System Checkout" on page 8.2. Battery3. Charger board4. System board |

PC Card (PCMCIA)-Related Symptoms

| Symptom/Error | FRU/Action in Sequence |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------|
| System cannot detect the PC Card (PCMCIA) | <ol style="list-style-type: none">1. PC Card (PCMCIA) slots assembly2. System board |
| PCMCIA slot pin is damaged. | PC Card (PCMCIA) slots assembly |

Memory-Related Symptoms

| Symptom/Error | FRU/Action in Sequence |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Memory count (size) appears different from actual size. | <ol style="list-style-type: none">1. Go to "Memory Checkout" on page 4.2. Enter BIOS Utility to execute Load Setup Default Settings, then reboot system.3. DIMM4. System board |

Speaker-Related Symptoms

| Symptom/Error | FRU/Action in Sequence |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Speakers have noise or no sound comes from system | <ol style="list-style-type: none"> 1. Chassis (speaker on chassis) 2. Audio connector board 3. System board |

Power Management-Related Symptoms

| Symptom/Error | FRU/Action in Sequence |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The system will not enter hibernation. | <ol style="list-style-type: none"> 1. Go to "Hibernation Mode" on page 13 and see the note. 2. Ensure the "System Hibernation Timer" in the Power Management Settings of BIOS Utility is not set to [OFF]. 3. Boot an operating system and press Fn+F8 and see if the computer enters hibernation mode. 4. Keyboard connector board 5. Keyboard 6. Hard disk connector board 7. Hard disk drive 8. System board |
| The system will not wake up from hibernation. | <ol style="list-style-type: none"> 1. Keyboard connector board 2. Keyboard 3. Hard disk connector board 4. Hard disk drive 5. System board |
| The system will not enter standby after closing the LCD. | <ol style="list-style-type: none"> 1. Ensure the "System Standby Timer" in the Power Management Settings of BIOS Utility is not set to [OFF]. 2. Chassis (LCD cover switch on chassis) 3. System board |
| The system will not resume after opening the LCD. | <ol style="list-style-type: none"> 1. Chassis (LCD cover switch on chassis) 2. System board |
| Battery fuel gauge does not go higher than 90%. | <ol style="list-style-type: none"> 1. Remove battery pack and let it cool for 2 hours. 2. Refresh battery (continue to use battery until power off, then charge battery). 3. Battery 4. Charger board 5. System board |
| System configuration does not match the installed devices. | <ol style="list-style-type: none"> 1. Enter BIOS Utility to execute Load Setup Default Settings, then reboot system. 2. Reseat Hard disk/diskette/CD-ROM drive connector. |

| Symptom/Error | FRU/Action in Sequence |
|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System hangs intermittently. | <ol style="list-style-type: none"> 1. Hard disk/diskette/CD-ROM drive connector 2. Fan (go to "Running Fan Diagnostics Program" on page 29). 3. System board |
| In DOS or Windows, multimedia programs, no sound comes from the computer. (Only system beeps are heard at power-on) | <ol style="list-style-type: none"> 1. Go to "Audio Board Checkout" on page 6. 2. Audio connector board 3. Chassis (speaker on chassis) 4. System board |

Peripheral-Device-Related Symptoms

| Symptom/Error | FRU/Action in Sequence |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| External display does not work correctly. | <ol style="list-style-type: none"> 1. Use BOTH display mode, press Fn+F3. 2. System board |
| Printer problems. | <ol style="list-style-type: none"> 1. Run printer self-test. 2. Printer driver 3. Printer cable 4. Ensure the "On Board Communication Ports" in the System Security of BIOS Utility is correct. 5. System Board |
| Serial or parallel port device problems. | <ol style="list-style-type: none"> 1. Device driver 2. Device cable 3. Device 4. Ensure the "On Board Communication Ports" in the System Security of BIOS Utility is correct. 5. System board |

Intermittent Problems

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

When analyzing the intermittent problem, do the following:

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

Undetermined Problems

You are here because the diagnostic tests did not identify which adapter or device failed, installed devices are incorrect, a short circuit is suspected, or the system is inoperative. Follow the procedures below to isolate the failing FRU.

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

1. Power-off the computer.
2. Check the cables, wires, and connectors for short circuits and open circuits. Visually check them for damage. If any problems are found, replace the FRU.
3. Remove or disconnect all of the following devices:
 - Non-IBM devices
 - Printer, external mouse, keyboard, and other external devices
 - Battery pack
 - Hard disk drive
 - Diskette drive/CD-ROM drive
 - DIMM
 - PC Card(PCMCIA)
4. Power-on the computer.
5. Determine if the problem has changed.
6. If the problem does not occur again, reconnect the removed devices one at a time until you find the failing FRU.
7. If the problem remains, replace the following FRUs one at a time. Do not replace a non-defective FRU.
 - Keyboard Connector Board
 - Charger Board
 - Audio Connector Board
 - LCD Assembly
 - System Board

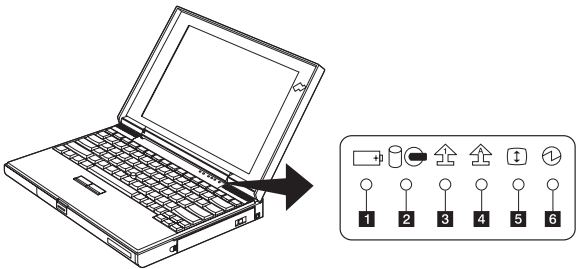
Related Service Procedures




This section provides information about the following:




- “Status Indicators.”
- “Power Switch” on page 25.
- “Running PQA Diagnostics Program” on page 25.
- “Fn Key Combinations” on page 30.

Status Indicators

The system status LED indicators show the current computer status in green and amber using symbols. The following shows the location of each symbol and the meaning of each indicator.



| Symbol | Color | Meaning |
|---------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Battery | Green | Enough battery power remains for operation. |
|  | Orange | The battery pack is being charged. |
| | Blinking orange | The battery pack needs charging. When the lamp starts blinking orange, the computer beeps three times. |
| 2 Hard disk or CD-ROM in use  | Orange | Appears when data is read from or written to the hard disk or read from the CD-ROM. Do not enter hibernation mode or turn off the computer when this indicator is on. |
| 3 Numeric lock  | Green | Indicates that the numeric keypad on the keyboard is enabled. The keypad is enabled and disabled by pressing and holding the Shift key , and pressing the NumLk key . |

| Symbol | Color | Meaning |
|-----------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 Caps lock  | Green | Indicates that the Caps Lock mode is enabled. All alphabetic characters (A- Z) are entered in capital letters without using the Shift key. The Caps Lock mode is enabled and disabled by pressing the Caps Lock key. |
| 5 Scroll lock  | Green | Alternately turns on and off each time the ScrLk key is pressed. While this indicator is on, the Arrow keys are used as screen-scroll function keys. In this state, the cursor cannot be moved with the Arrow keys. Not all application programs support this function. |
| 6 Power on  | Green | Indicates that the computer is operational. This indicator is on when the computer is on. |

Power Switch

The system has no Power Shutdown Switch. If the computer cannot be turned off by pressing the power switch, try holding it for more then 3 seconds to force system shutdown.

Diagnostic Program Diskette

Diagnostic Program Diskette contains the following two programs:

- PQA Diagnostic Program
- Fan Diagnostic Program

Running PQA Diagnostics Program

Important: Before running PQA Diagnostic Program, make sure that the write enable tab of the Diagnostic Program Diskette is set to enable.

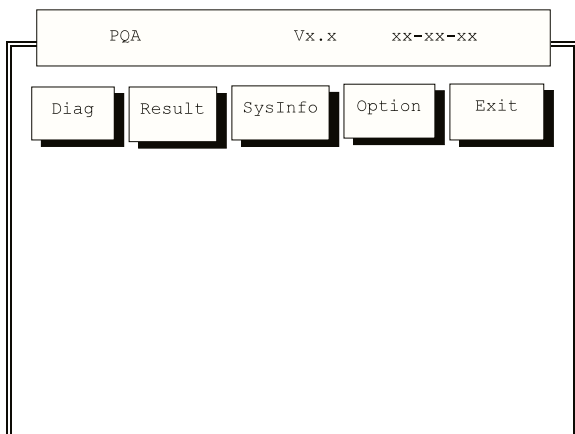
Important: Before using PCMCIA Diagnostic in PQA Diagnostic Program, press F2 while the ThinkPad logo is being displayed after power-on to enter the BIOS Utility. Select "System Security" and set enabled for "CardBus Support" by pressing the → key.

Note: Some test items require the tools below:

- FDD Erasable 2HD diskette
- Parallel Wrap plug (P/N: 72X8546)
- Serial Wrap plug (P/N: 72X8546)
- PCMCIA PC test card (P/N 35G4703)
- CD-ROM, Any data and audio CDs

- ThinkPad 310 Diagnostics Diskette (P/N 05L1936)
- ThinkPad 310 Maintenance Utility Diskette (P/N 05L1770)

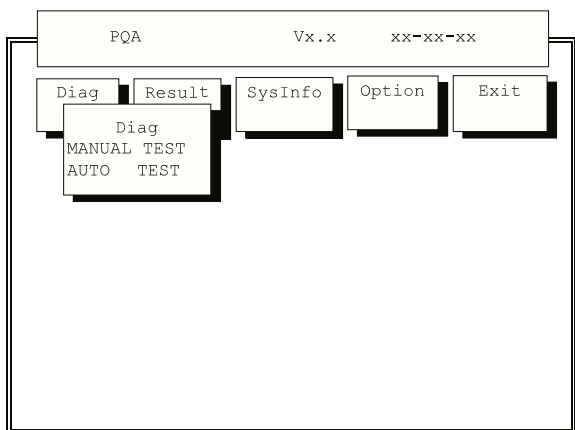
Boot from the Diagnostic Program Diskette and select PQA System Diagnostics Program from PC DOS 7.0 Startup Menu, the PQA main menu appears on screen.



Press → or ← to move around the main menu. Press **Enter** to enable the selected option. The main options are Diag, Result, SysInfo, Option and Exit.

The Diag option lets you select testing items and times.

The following screen appears when you select Diag from the main menu.



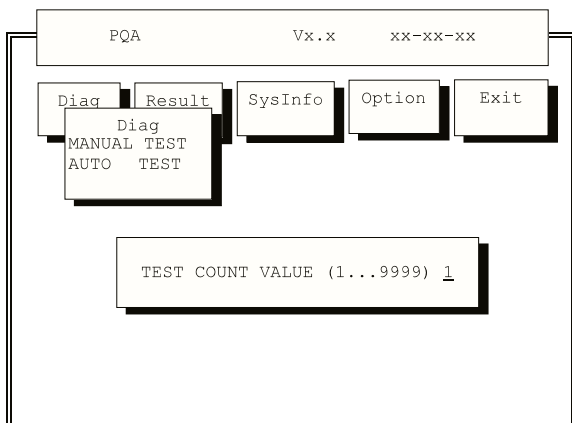
This screen allows you to specify the number of tests to perform. The options are as follows:

- **Manual Test** Performs a single test and checks the selected test items in sequence.

- **Auto Test** Performs multiple tests of the selected items and checks the selected test items in sequence.

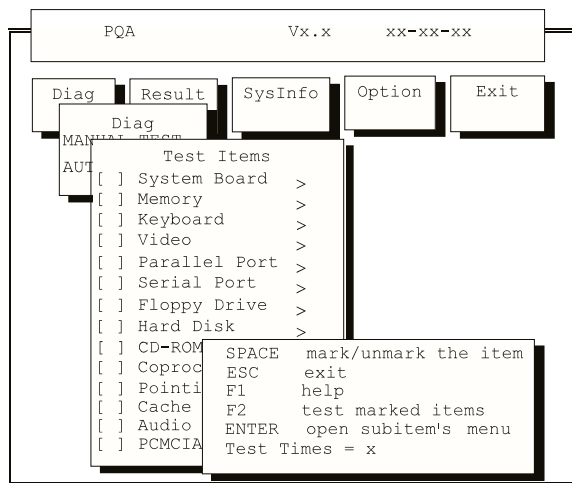
Note: PCMCIA Diagnostic supports manual test only. Do not select PCMCIA Diagnostic in Auto Test.

The screen below appears if you select AUTO Test.



Specify the desired number of tests and press **Enter**.

After you specify the number of tests to perform, the screen shows a list of test items (see below).



Press **↑** or **↓** to move the highlight bar from one item to another. Press **Space** to enable or disable the item. The **>** mark indicates that there are available suboptions. Press **Enter** to view the available suboptions of each selected item. Press **Esc** to close the submenu.

The right corner screen information gives you the available function keys and the specified test number.

| | |
|--------------|-------------------------------------------|
| Space | Enables/disables the item |
| Esc | Exits the program |
| F1 | Help |
| F2 | Tests the selected item(s) |
| Enter | Opens the available suboptions |
| Test | Indicates the number of tests to perform. |
| Times | |

Note: The F1 and F2 keys function only after you finish configuring the Test option.

PC Test Card LED

The green LED on the PC test card turns on when the PCMCIA test is running. If the LED does not turn on, check that the card is installed correctly by reseating the card. If it still does not turn on after it is reseated, try using another slot for the test. If the LED still does not turn on and the test fails, replace the FRU shown by the diagnostic error code.

PQA Diagnostic Program Error Codes and Messages

| Error Code | Message | FRU/Action in Sequence |
|---------------|-----------------------------------|------------------------------------------------------------------------------|
| System | | |
| 16XX | RTC(Backup battery error | Backup battery |
| 1XXX | CPU or System board error | 1. Reload BIOS default setting. 2. CPU 3. System board |
| 2XXX | Memory error | 1. Reseat CPU 2. DIMM 3. System board |
| 3XXX | Keyboard error | 1. Reseat Keyboard 2. Keyboard 3. System board |
| 4XXX | Video error | System board |
| 5XXX | Parallel Port error | System board |
| 6XXX | Serial port or system board error | System board |
| 7XXX | Diskette drive error | 1. Diskette drive 2. System board |
| 8XXX | Hard disk error | 1. Load BIOS Default Setting 2. Hard disk connector board 3. Hard disk |
| 9XXX | CD-ROM error | 1. Reseat CD-ROM cable 2. CD-ROM drive 3. System board |

| Error Code | Message | FRU/Action in Sequence |
|---------------------|---------------------------|----------------------------------------------------------------------------------------|
| 10XXX | CPU or System board error | 1. CPU 2. System board |
| 11XXX | Pointing device error | 1. TrackPoint board FPC cable 2. TrackPoint board 3. Keyboard 4. System board |
| PCMCIA X XXXX | PCMCIA error | 1. Replace PC Card 2. PCMCIA slots assembly 3. System board |

Running Fan Diagnostics Program

The system is equipped with sensors to protect against system overheating. By setting video controller and processor thermal thresholds, the system can turn on the cooling fan or shut down automatically when temperatures reach the defined threshold parameters.

Systems experiencing frequent auto sensor shutdown may need to reset the thermal sensor threshold (refer to “Setting Thermal Sensor Threshold”) and execute the fan test to ensure the cooling fan is operating normally.

Follow the steps below to use Fan Diagnostics Program:

1. Boot from the Diagnostic Program Diskette.
2. Select Fan Diagnostics from PC DOS 7.0 Startup Menu.
3. Follow the instruction on screen to execute fan diagnostics.

Note: If test failed, try reseating the fan connector or replacing the fan.

Utility Program Diskette

The Utility Program Diskette contains a variety of programs as further explained in this section.

Setting Thermal Sensor Threshold

The system is equipped with sensors to protect against system overheating. By setting video controller and processor thermal thresholds, the system can turn on the cooling fan or shut down automatically when temperatures reach the defined threshold parameters.

Systems experiencing frequent auto sensor shutdown may need to reset the thermal sensor threshold and execute the fan test to ensure the normal operation of the cooling fan (refer to “Running Fan Diagnostics Program”).

Follow the steps below to set thermal threshold:

1. Boot from the Utility Program Diskette.
2. Select Thermal Sensor Utility from PC DOS 7.0 Startup Menu, then the system thermal is executed.

Setting Inverter ID

There is an EEROM in the inverter which stores its supported LCD type ID code. If you replace the LCD with a different brand, the ID information in the inverter EEROM should be updated.

Follow the steps below to set the LCD Inverter ID:

1. Boot from the Utility Program Diskette.
2. Select Inverter ID Utility from PC DOS 7.0 Startup Menu.
3. Follow the instructions on screen to read current or to set a new inverter ID code.

Note: When you set a new inverter ID and the new LCD is not yet enabled (to function), connect an external monitor to see the program execution process.

Important: Make sure the new ID code you choose corresponds with the LCD brand and type. If you write a wrong ID into the inverter, just reboot and re-execute the program and input the correct ID code.

4. Restart computer - the new LCD should work normally.

Note: If LCD does not display after changing the ID code, make sure you write the correct ID code, or try reseating the LCD FPC cable connectors.

Fn Key Combinations

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

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

| Fn + | Description |
|------|--------------------------------|
| F1 | Hotkey help |
| F2 | Brightness/Contrast control |
| F3 | LCD/CRT/Both display switching |
| F4 | Fuel-Gauge display ON/OFF |
| F5 | Audio volume control |

1 Ctrl+Alt+F6 on the external keyboard if one is attached.

2 Ctrl+Alt+F7 on the external keyboard if one is attached.

3 Ctrl+Alt+F8 on the external keyboard if one is attached.

| Fn + | Description |
|-------------|----------------------------------------------------------|
| F61 | Power Management Settings and System Information screens |
| F72 | Standby invocation |
| F83 | Hibernation invocation |
| Right arrow | Scale increase (used with Fn+F2, Fn+F5) |
| Left arrow | Scale decrease (used with Fn+F2, Fn+F5) |
| Esc | Hotkey Icon Escape |

Product Overview

The following is an overview of the system features.

| Feature | Description |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor | <ul style="list-style-type: none">• 310/310D (2600-1xx/2xx/3xx/7xx) Intel® Pentium® Processor (133 MHz)• 310E/310ED (2600-4xx/5xx/6xx/8xx/Exx) Intel® Pentium® Processor with MMX™ Technology (133/150 MHz)• 310E/310ED (2600-Axx/Bxx/Cxx/Dxx/Fxx) Intel® Pentium® Processor with MMX™ Technology (166 MHz) |
| Bus architecture | PCI 5V |
| DIMM | <ul style="list-style-type: none">• 16MB, or 32MB DIMM card, maximum 64MB (144-pin EDO) |
| CMOS RAM | 256KB |
| SVGA Video | <ul style="list-style-type: none">• 11.3-inch, 65,536 colors, 800x600 pixel TFT color LCD• 11.3-inch, 256 colors, 800x600 pixel DSTN color LCD• 12.1-inch, 256 colors, 800x600 pixel DSTN color LCD• 12.1-inch, 65,536 colors, 800x600 pixel TFT color LCD |
| Audio | <ul style="list-style-type: none">• Yamaha Sound Chip• Internal speakers |
| Diskette drive | 1.44MB (3-mode), 3.5-inch |
| Hard disk drive | <ul style="list-style-type: none">• 310/310D (2600-1xx/2xx/3xx/7xx) 1.0GB, 2.5-inch, IDE interface• 310E/310ED (2600-4xx/5xx/6xx/8xx) 1.62GB, 2.5-inch, IDE interface• 310E/310ED (2600-Axx/Bxx/Cxx/Dxx/Exx/Fxx) 2.1GB, 2.5-inch, IDE interface |
| CD-ROM drive | <ul style="list-style-type: none">• 310/310D, 310E/310ED 5.25-inch, X10 speed, IDE interface• 310E/310ED (2600-Bxx/Dxx) 5.25-inch, X20 speed, IDE interface |
| PCMCIA Cards | <ul style="list-style-type: none">• One Type III or two Type II• CardBus, ZV Port |

FRU Removals and Replacements

This section contains information about removals and replacements.

- Do not damage any parts. Only certified and trained personnel should service the computer.
- The arrows in this section show the direction of movement to remove a FRU, or to turn a screw to release the FRU. The arrows are marked in numeric order, in square callouts, to show the correct sequence of removal.
- Any FRUs that must be removed in order to remove the failing FRU are listed at the top of the page.
- To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement. See “Locations” on page 65 for internal cable connections and arrangement information.
- When replacing a FRU, use the correct screw size, as shown in the procedure.

CAUTION:

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.

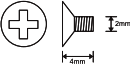
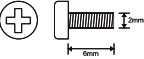
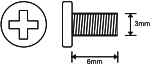
CAUTION:

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.

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

Warning: The system board is sensitive to, and can be damaged by electronic discharge. Establish personal grounding by touching a ground point with one hand before touching these units. An electrostatic discharge (ESD) strap must be used to establish personal grounding.

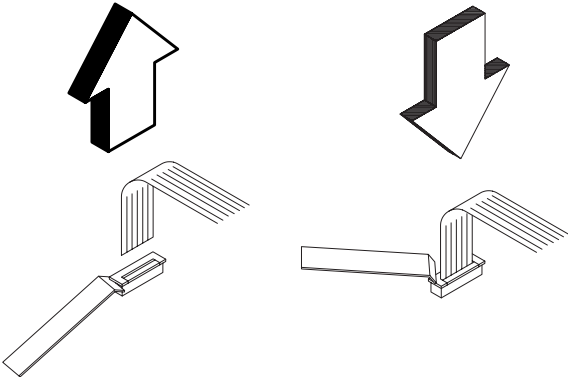
Screw Type Example Explanation

| Illustration | Size | Head and Color |
|----------------------------------------------------------------------------------|---------|----------------------------|
|  | M2 x 4L | Flat head, black or silver |
|  | M2 x 6L | Pan head, black or silver |
|  | M3 x 6L | Bind head, black or silver |

Note: Some screws have nylock paste (on the grooves) for better friction and increased stability.

Some screws have bracket supports.

FPC Cable Connector Type



Unplugging the Cable

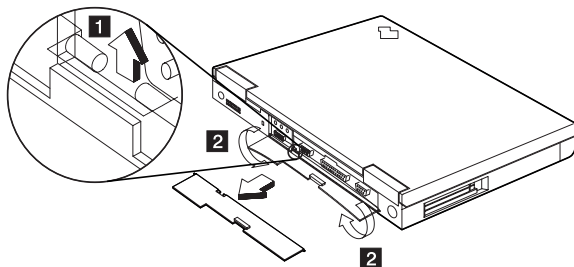
To unplug the cable, first unlock the connector by pulling up the two clasps on both sides of the connector with a plastic tool. Then carefully pull out the cable from the connector.

Plugging the Cable

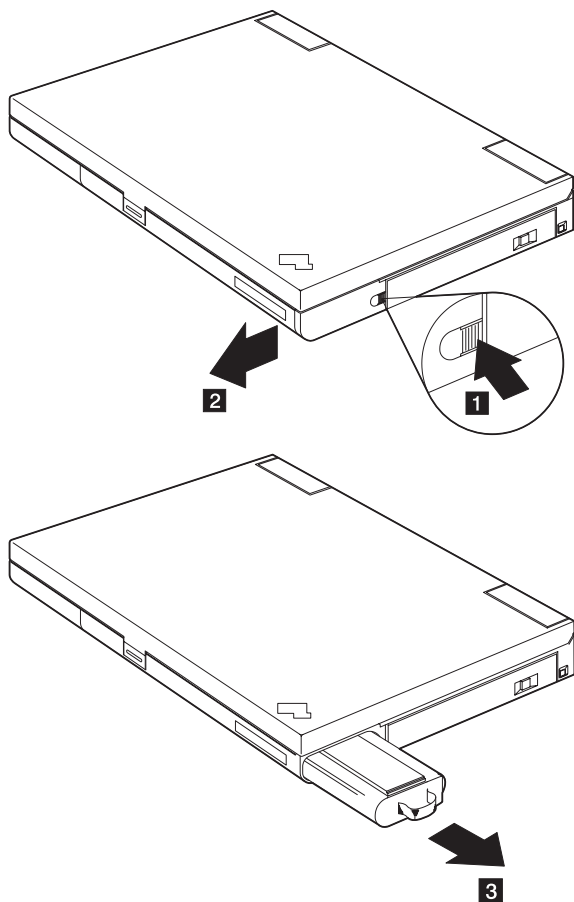
To plug the cable back, first make sure that the connector is unlocked, then plug the cable into the connector. With a plastic tool, press the two clasps on both sides of the connector to secure the cable in place.

I/O Door

Press the rear connector door latch to open the door.
Remove the center latch; then remove the rear connector door by flexing it.



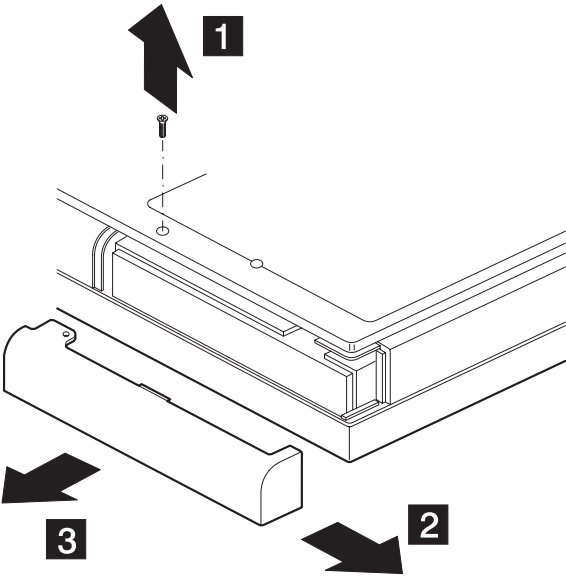
Battery Pack and Battery Pack Door



Reverse the steps above to install a battery pack.

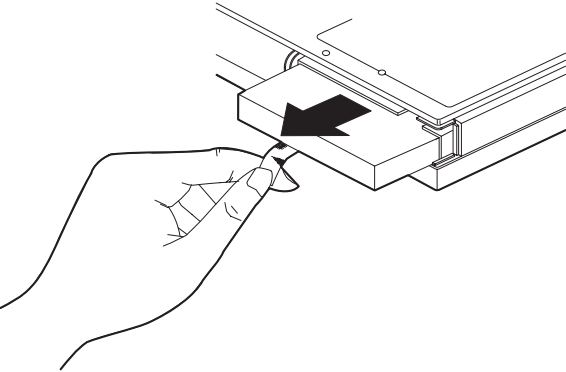
Hard Disk Drive and Hard Disk Drive Door

Turn the computer upside down.



| Step | Size (Quantity) | Head and Color | Memo |
|------|--------------------|---------------------|------|
| 1 | M2 x 6L (1) | Flat head, black | |

Note: Make sure you use the correct screw when replacing.

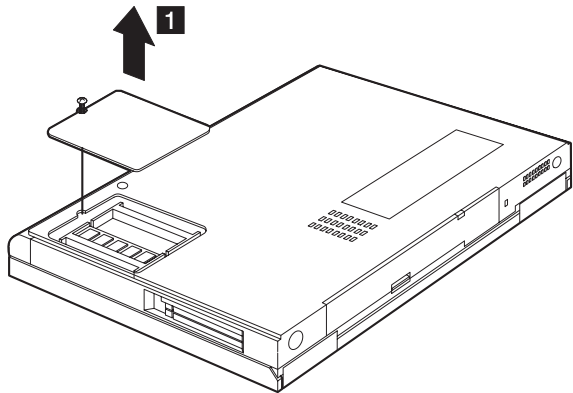


Reverse the steps above to install a hard disk drive.

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

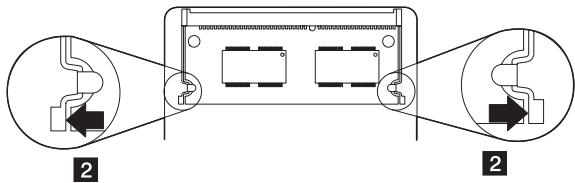
DIMM and DIMM Door

Turn the computer upside down.



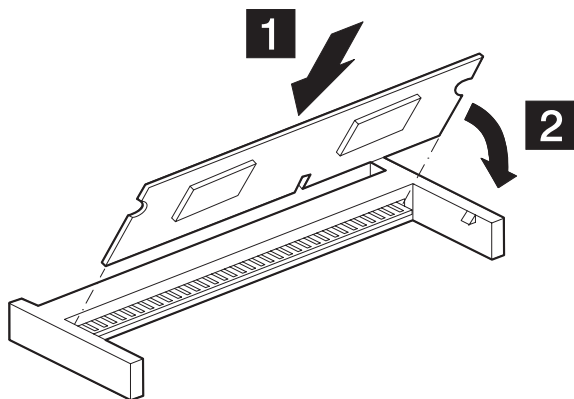
| Step | Size (Quantity) | Head and Color | Memo |
|------|--------------------|---------------------|------|
| 1 | M2 x 5L (1) | Bind head, black | |

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

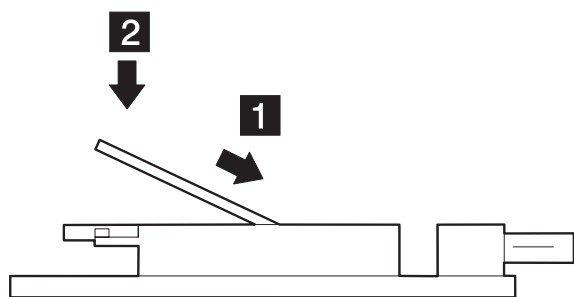


Note: When installing the DIMM, do the following:

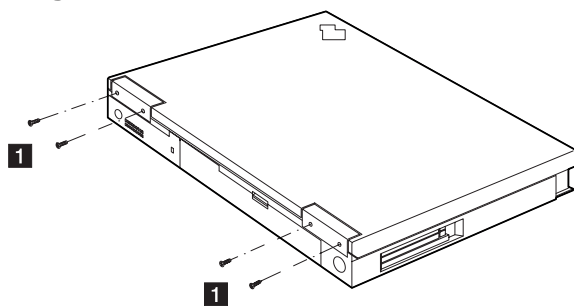
1. Find the notch on the side of the DIMM.
2. With the notched end of the DIMM toward the right side of the socket, insert the DIMM, at an angle of approximately 20° , into the socket; then press it firmly.
3. Pivot the DIMM until it snaps into place.

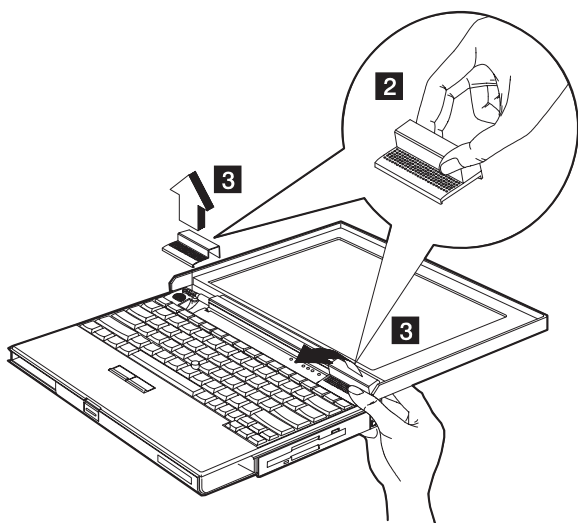


Side View



Hinge Cover



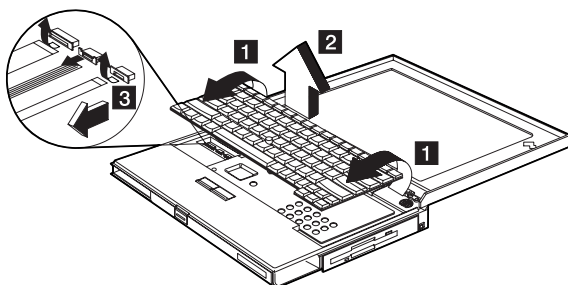


| Step | Size (Quantity) | Head and Color | Memo |
|------|--------------------|---------------------|------|
| 1 | M2 x 4L (4) | Flat head, black | |

Note: Make sure you use the correct screw when replacing.

Keyboard

- Hinge Covers (5)



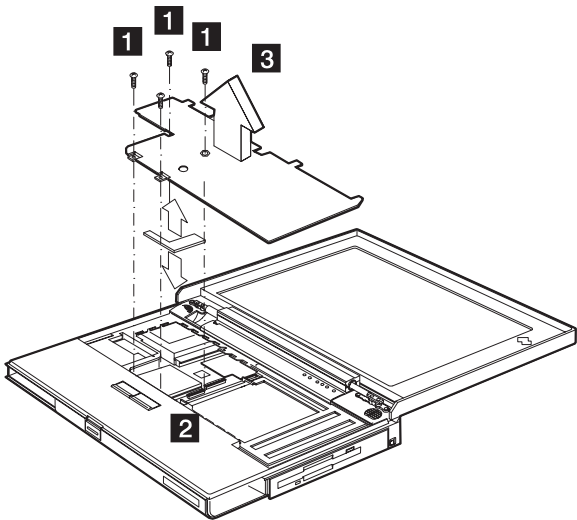
When replacing the keyboard unit, connect the keyboard connector as shown in the figure; then replace the keyboard. (The leftmost and rightmost connectors should be unlocked by lifting the clasps from under them. Unlock the center connector by pulling on the left and right of the clasp.)

Warning: Hold down the keyboard connection board when pulling out the cables, so as not to damage the cables.

Note: The orientation of the center lock connector is different (opposite) from the left and right lock connectors. Unlock this connector from the bottom, as shown in the figure.

Thermal Plate/CPU

- Hinge Covers (5)
- Keyboard Unit (6)



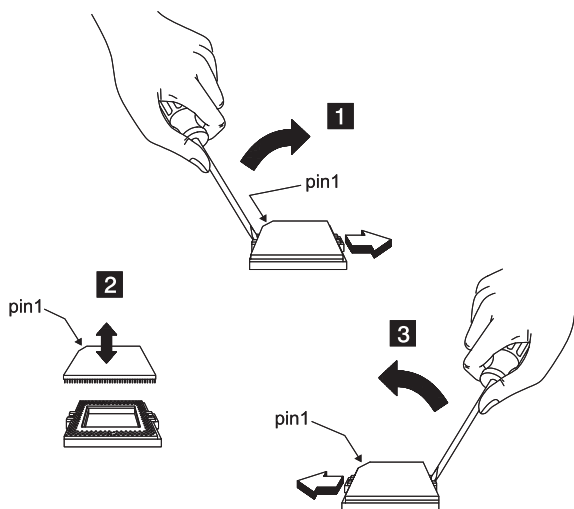
| Step | Size (Quantity) | Head and Color | Memo |
|------|--------------------|---------------------|------|
| 1 | M2.5 x 18L (4) | Pan head, silver | |

Note: Make sure you use the correct screw when replacing.

Note: For 310E/ED, machine type 2600-Axx/Bxx/Cxx/Dxx/Exx/Fxx model, a pad is found between the thermal plate and the PC Card slots. When reinstalling the thermal plate, first place the pad on top of the PC Card slots before you proceed.

Installing CPU

1. Insert a flat-blade screwdriver into the opening at the left end of the socket and push towards the other end of the socket.
2. Pull out the CPU; then insert the replacement CPU. Ensure the CPU is properly aligned before pressing it into the socket.
3. Insert a flat-blade screwdriver into the opening at the right end of the socket and push towards the other end of the socket.

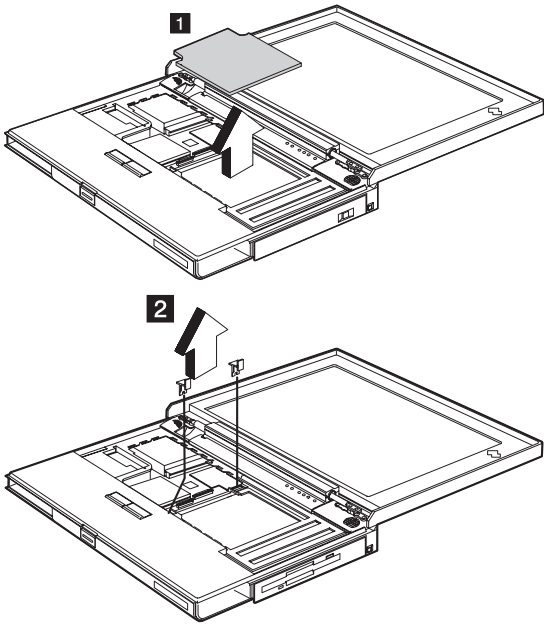


Important:

A sponge pad is found underneath the CPU. When installing a replacement CPU, make sure the sponge pack is in place. If you need to replace the sponge pad, it is part of the mylar pack FRU.

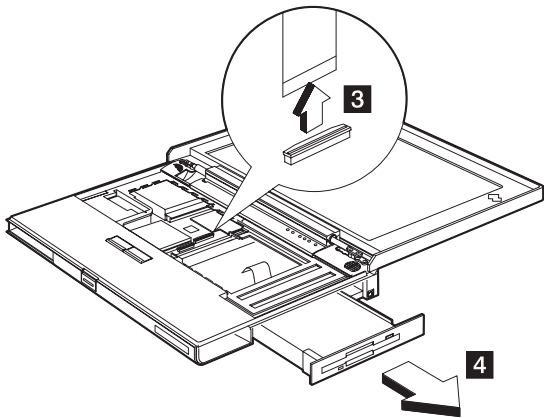
Diskette Drive/CD-ROM Drive

- Hinge Covers (5)
- Keyboard Unit (6)
- Thermal plate / CPU (7)



Important: When removing the module locks, pull them up at an angle. They cannot be removed when pulled straight up.

Diskette Drive (Model Unique)



CD-ROM Drive (Model Unique)

Warning: Do not open the CD-ROM; no user adjustments or serviceable parts are inside. Use of controls, adjustments, or the performance of procedures other than those specified may result in hazardous radiation exposure.

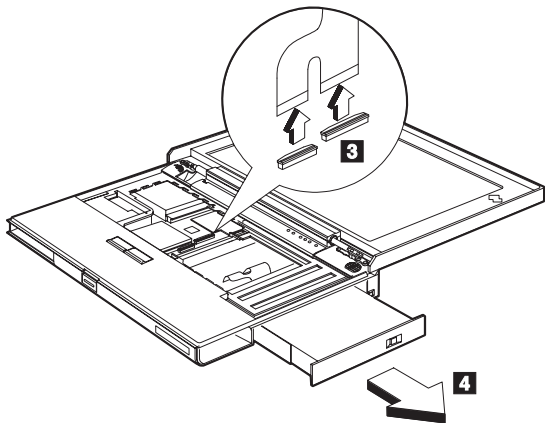


Figure A

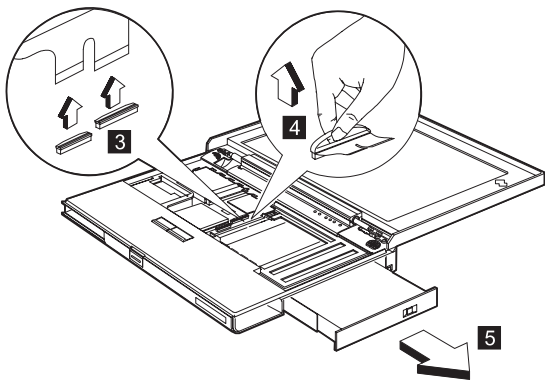


Figure B

CAUTION:

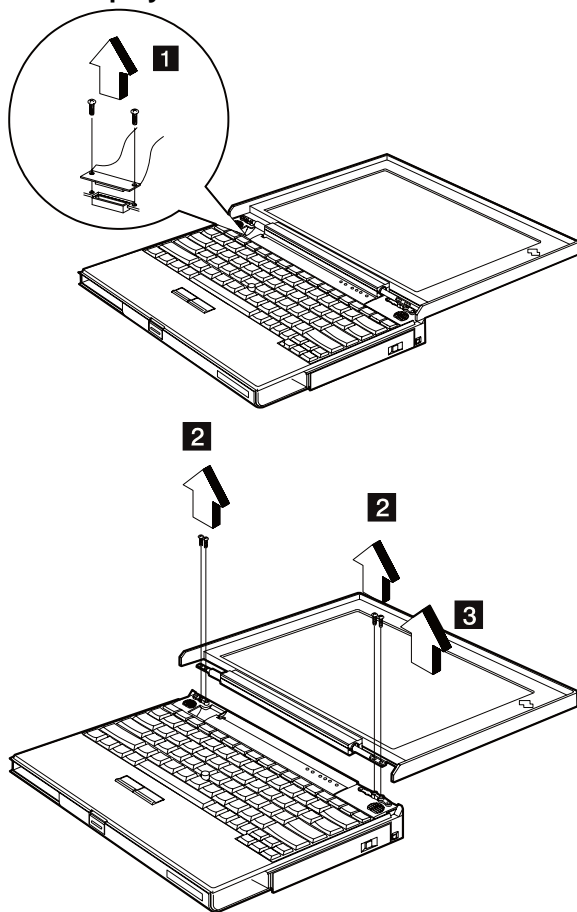
Do not push on the top surface of the CD-ROM drive.

Note: For 310E/ED, machine type 2600-Bxx/Dxx model, you need to perform an extra step as shown in the illustration above. This step removes the CD-ROM drive cable before you pull out the CD-ROM drive.

LCD Removal and Replacement

- Hinge Covers (5)

LCD Display Module



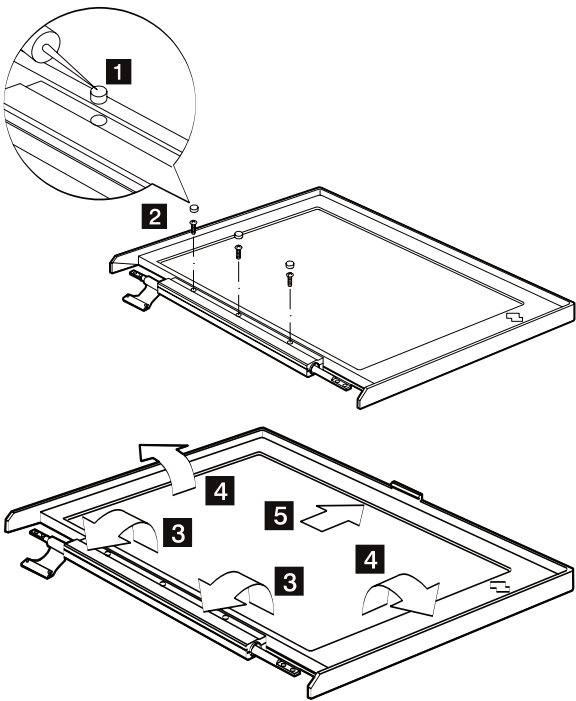
| Step | Size (Quantity) | Head and Color | Memo |
|----------|--------------------|------------------------|--------------------|
| 1 | M2 x 5L (2) | Pan head, Yellow Zn | |
| 2 | M2.5 x 8L (4) | Pan head, silver | w/ nylock paste |

Note: Make sure you use the correct screw when replacing.

LCD Bezel:

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

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

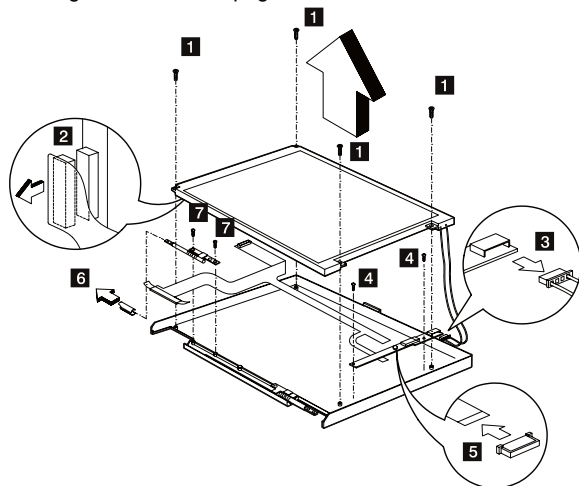


| Step | Size (Quantity) | Head and Color | Memo |
|------|-----------------|-----------------|-----------------|
| 2 | M2.5 x 6L (3) | Pan head, black | w/ nylock paste |

Note: Make sure you use the correct screw when replacing.

LCD, LCD Cover, LCD FPC Cable, LCD Left

Hinge, and Inverter: **Important:** After you replace the LCD or inverter, follow the instructions in “Setting Inverter ID” on page 30.



Note: For DSTN LCDs, a tape is used to secure the LCD FPC cable after it is connected to the LCD. This tape is a special tape with safety characteristics, and is part of the Mylar FRU. **Removing Procedures:**

Remove LCD: **1** → **2** → **3**

Remove Inverter: **1** → **2** → **3** → **4** → **5**

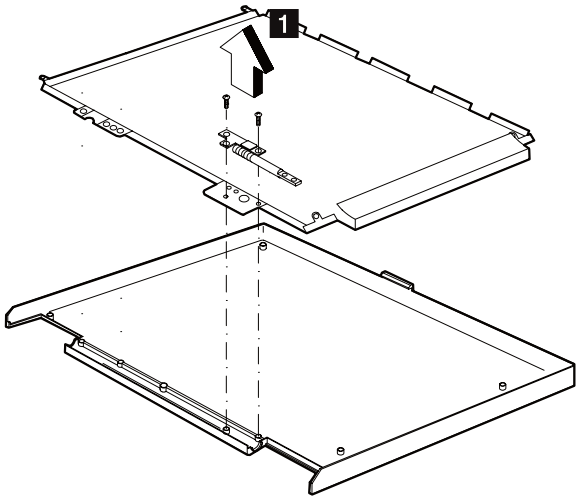
Remove Left Hinge: **6** → **7**

Remove LCD FPC cable: **1** → **2** → **3** → **4**
→ **5** → **6** → **7**

| Step | Size (Quantity) | Head and Color | Memo |
|----------|-----------------|-------------------|-----------------|
| 1 | M3 x 6L (4) | Bind head, silver | |
| 4 | M2 x 3L (2) | Pan head, silver | |
| 7 | M2.5 x 6L (2) | Pan head, black | w/ nylock paste |

Note: Make sure you use the correct screw when replacing.

LCD Right Hinge and LCD Diaper



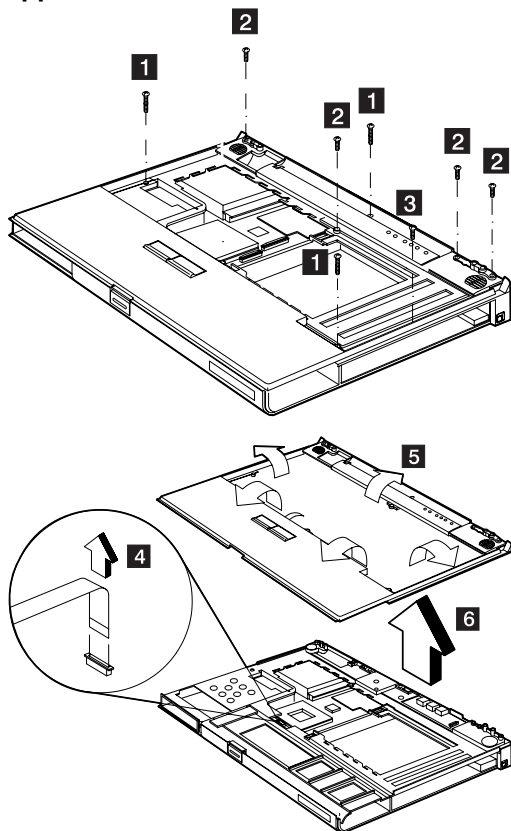
| Step | Size (Quantity) | Head and Color | Memo |
|------|--------------------|--------------------|--------------------|
| 1 | M2.5 x 6L (2) | Pan head, black | w/ nylock paste |

Note: Make sure you use the correct screw when replacing.

Inside Assembly

- Hinge Covers (5)
- Keyboard Unit (6)
- LCD Unit (9)
- Thermal plate and CPU (7)

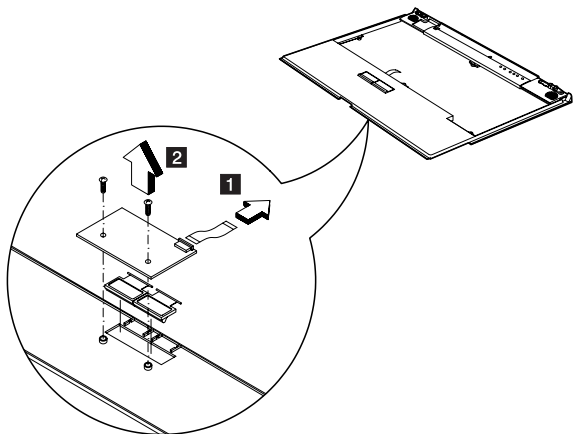
Upper Base



| Step | Size (Quantity) | Head and Color | Memo |
|----------|--------------------|---------------------|--------------------|
| 1 | M2.5 x 18L (3) | Pan head, silver | |
| 2 | M2.5 x 6L (4) | Pan head, black | w/ nylock paste |
| 3 | M2 x 4L (1) | Flat head, black | |

Note: Make sure you use the correct screw when replacing.

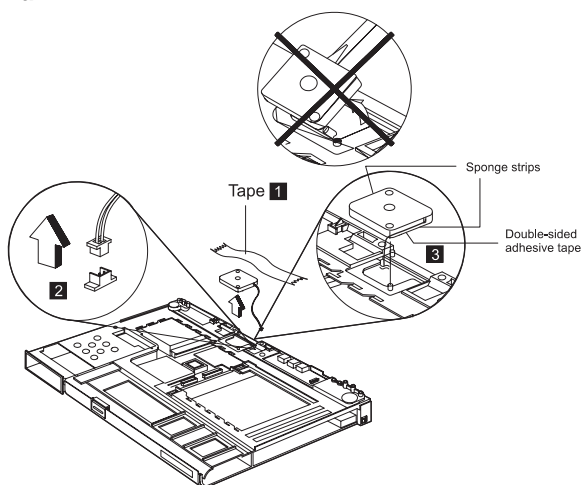
**TrackPoint Board, TrackPoint Button and
TrackPoint Board FPC Cable**



| Step | Size (Quantity) | Head and Color | Memo |
|------|--------------------|---------------------|------|
| 1 | M2 x 4L (2) | Pan head, silver | |

Note: Make sure you use the correct screw when replacing.

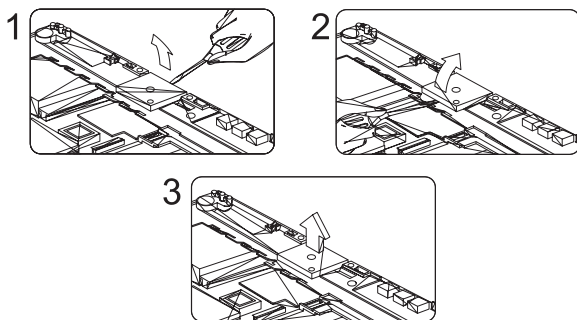
Fan



Note: The tape used to secure the fan is not ordinary tape, but a special tape with safety characteristics. This tape is part of the Mylar FRU.

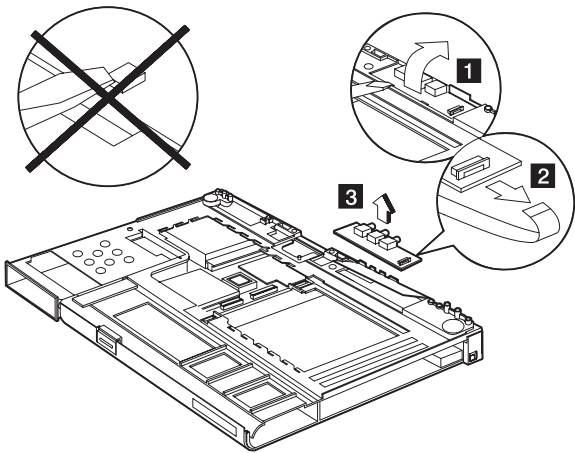
If you need to replace the fan, besides the new fan, you need to get from the Mylar FRU the following: the tape mentioned above, two sponge strips to stick on the sides of the fan, and a double-sided adhesive tape to attach on the underside of the fan. Refer to the old fan.

Warning: The fan cable should follow the path shown in the figure. If the fan cable gets pressed or weighed down and is damaged, the chassis might get short-circuited.



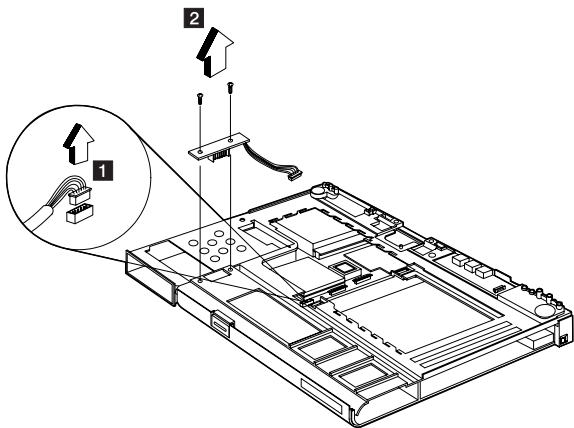
Warning: When removing the fan, do not tilt the fan too much to any one side. The post that steadies the fan is delicate and will break if too much pressure is exerted on it. Take care in removing the fan, it should be done as vertically as possible.

Audio Connector Board



Warning: Take care in removing the audio connection board (see figure) to avoid damaging the LEDs.

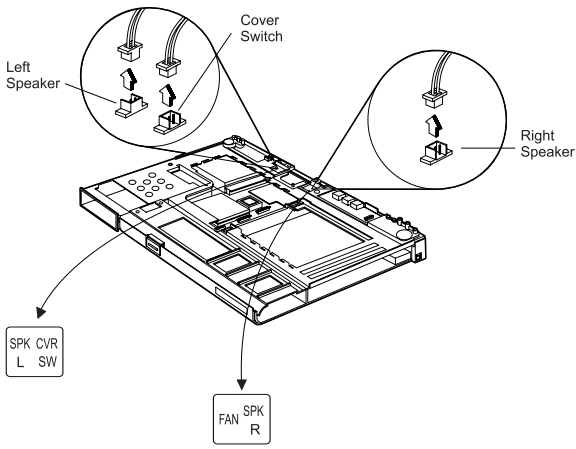
Battery Connector Board



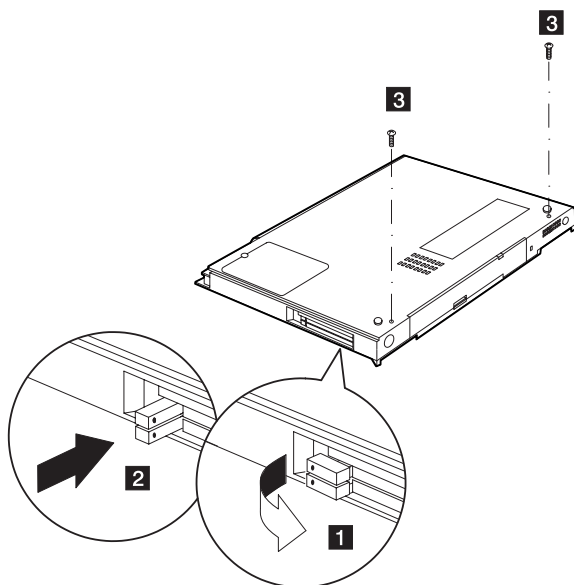
| Step | Size (Quantity) | Head and Color | Memo |
|------|--------------------|--------------------|--------------------|
| 2 | M2.5 x 6L (2) | Pan head, black | w/ nylock paste |

Note: Make sure you use the correct screw when replacing.

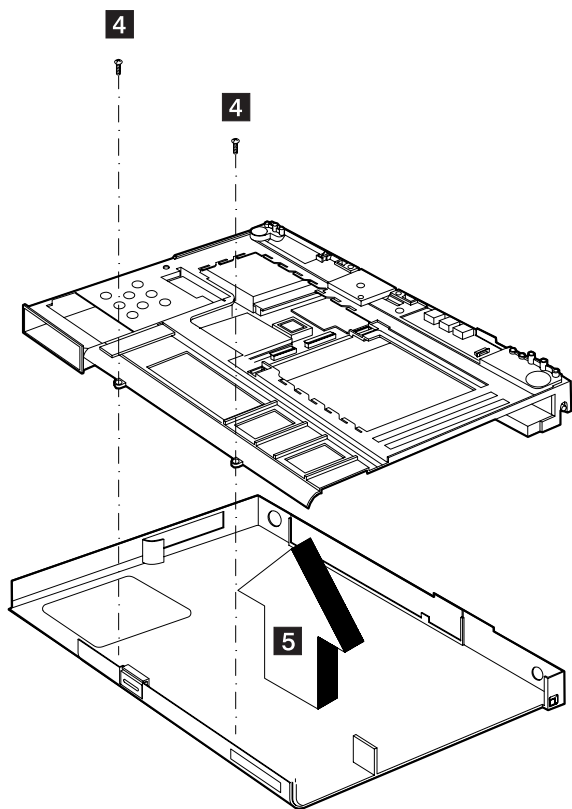
Speaker and Cover Switch Cables



Lower Base



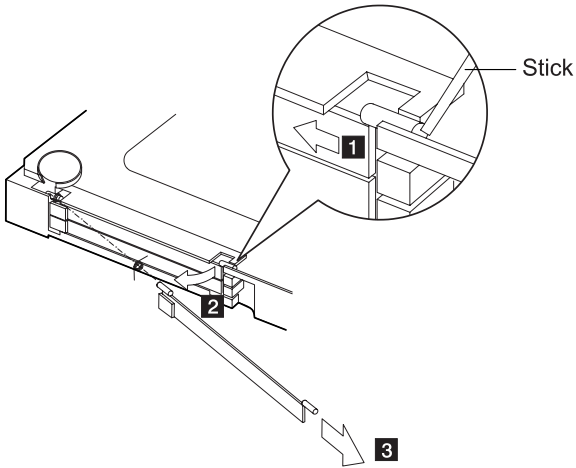
Important: To remove the chassis with the system board out of the lower base, the PCMCIA slot buttons should be upright then pushed in (**1** → **2**) before you begin this removal procedure.



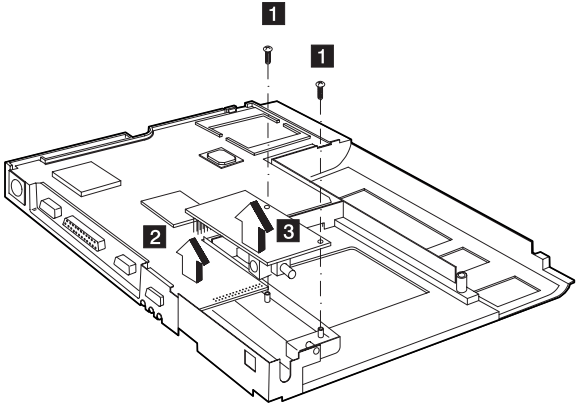
| Step | Size (Quantity) | Head and Color | Memo |
|----------|--------------------|---------------------|--------------------|
| 3 | M2.5 x 6L (2) | Pan head, black | w/ nylock paste |
| 4 | M2 x 4L (2) | Pan head, silver | |

Note: Make sure you use the correct screw when replacing.

PCMCIA Door and PCMCIA Door Spring



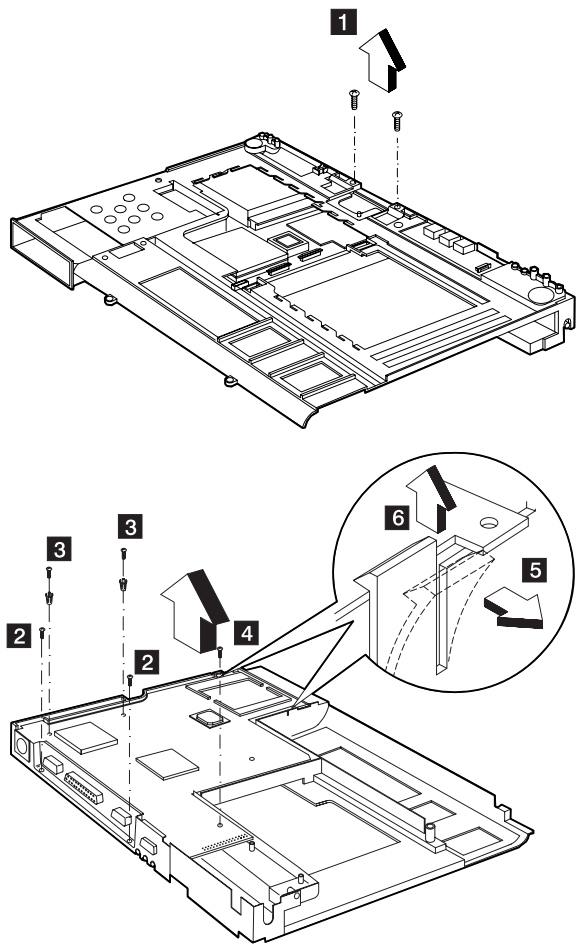
Charger Board



| Step | Size (Quantity) | Head and Color | Memo |
|------|--------------------|---------------------|------|
| 1 | M2 x 4L (2) | Pan head, silver | |

Note: Make sure you use the correct screw when replacing.

System Board: **Important:** After replacing the system board, follow the instructions in “Setting Thermal Sensor Threshold” on page 29.



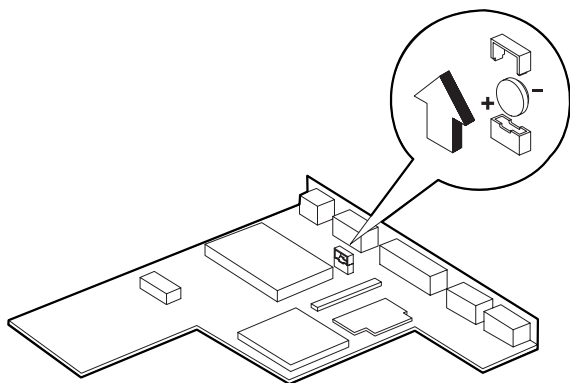
| Step | Size (Quantity) | Head and Color | Memo |
|------|--------------------|---------------------|--------------------|
| 1 | M2 x 4L (2) | Pan head, silver | |
| 2 | M2 x 4L (2) | Pan head, black | w/ nylock paste |
| 3 | M2 x 4L (2) | Pan head, silver | w/ brackets |
| 4 | M2 x 4L (1) | Pan head, silver | |

Note: Make sure you use the correct screw when replacing.

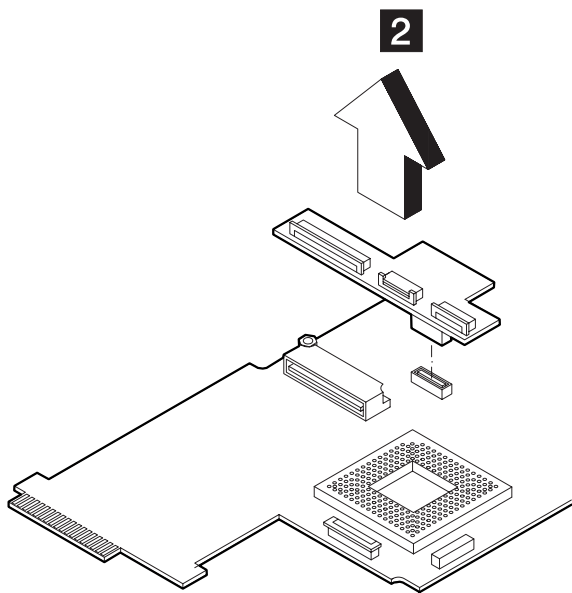
Backup Battery: Warning:

The backup battery is a lithium battery and can cause a fire, explosion, or severe burns. Do not charge it, heat it higher than 100 C (212 F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use of an incorrect battery can result in ignition or explosion of the battery.

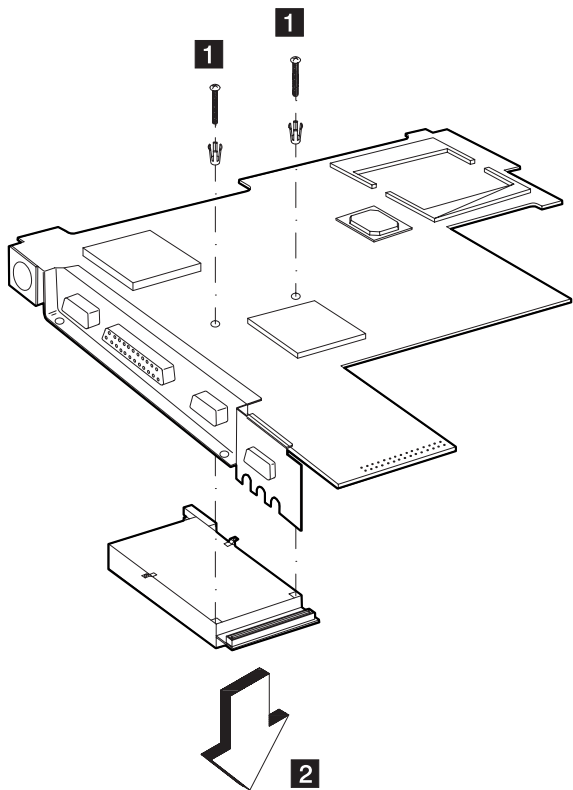
Replacement batteries can be ordered from IBM or IBM authorized dealers.



Keyboard Connector Board



PCMCIA Slot Assembly



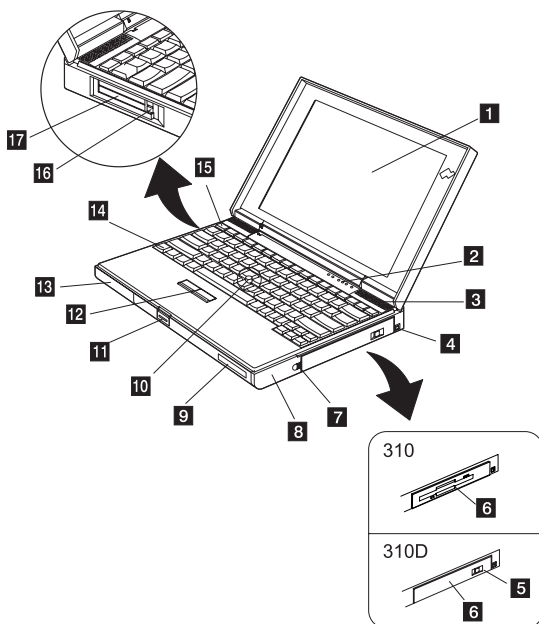
| Step | Size (Quantity) | Head and Color | Memo |
|------|--------------------|---------------------|-------------|
| 1 | M2 x 14L (2) | Pan head, silver | w/ brackets |

Note: Make sure you use the correct screw when replacing.

Locations

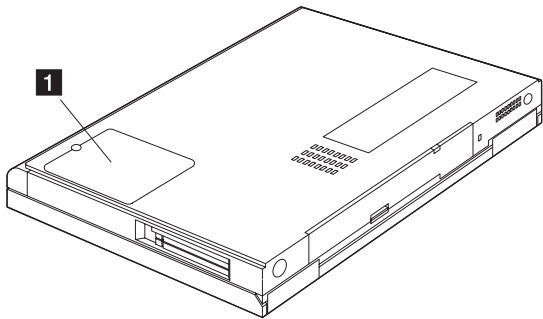
Front View

- 1** LCD
- 2** Indicator panel
- 3** Speakers
- 4** Power switch
- 5** CD-ROM eject button
- 6** CD-ROM drive (310E/310ED) or
diskette drive (310/310E)
- 7** Battery cover release latch
- 8** Battery bay
- 9** Personalization nameplate
- 10** TrackPoint III
- 11** LCD release latch
- 12** Click buttons
- 13** Hard disk drive bay
- 14** Fn key
- 15** Function keys
- 16** PC Card eject buttons
- 17** PC Card slots



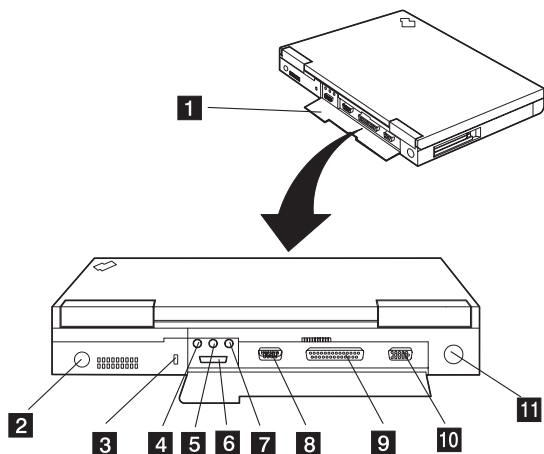
Bottom View

1 DIMM door



Rear View

- 1** I/O door
- 2** Power jack
- 3** Security keyhole
- 4** Microphone-in jack
- 5** Line-in jack
- 6** External diskette drive connector
- 7** Line-out/headphone jack
- 8** Serial connector
- 9** Parallel connector
- 10** External display connector
- 11** External input device connector

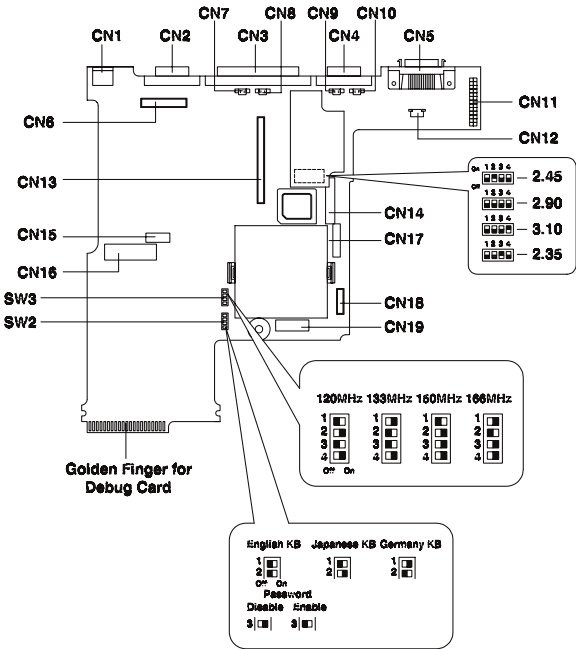


Switch Locations

There are two switches on the system board.

- CPU speed
- Keyboard select, password enable/disable and BIOS screen select
- and another switch on the DC-DC converter.
- CPU voltage

Refer to the figure and tables below on how to set these switches.



CPU Settings

| CPU Type | Voltage | Speed |
|-------------------------|---------|--------|
| Intel P54CSLM-133 CPU | 3.1V | 133MHZ |
| Intel P55C-133 CPU, MMX | 2.45V | 133MHZ |
| Intel P55C-150 CPU, MMX | 2.45V | 150MHZ |
| Intel P55C-166 CPU, MMX | 2.45V | 166MHZ |

CPU Voltage (S1) Settings

| CPU Voltage | 2.35V | 2.45V | 2.9V | 3.1V |
|-------------|-------|-------|------|------|
| Switch 1 | Off | Off | Off | Off |
| Switch 2 | Off | On | Off | Off |
| Switch 3 | On | Off | Off | Off |
| Switch 4 | Off | Off | Off | On |

CPU Speed (SW3) Settings

| CPU Speed | 133MHz | 150MHz | 166MHz |
|-----------|--------|--------|--------|
| Switch 1 | On | Off | On |
| Switch 2 | Off | On | Off |
| Switch 3 | Off | On | On |
| Switch 4 | On | On | On |

Keyboard Language (SW2, Switch 1 and 2) Settings

| Keyboard Language | European | U.S. | Japanese |
|-------------------|----------|------|----------|
| Switch 1 | On | Off | Off |
| Switch 2 | Off | Off | On |

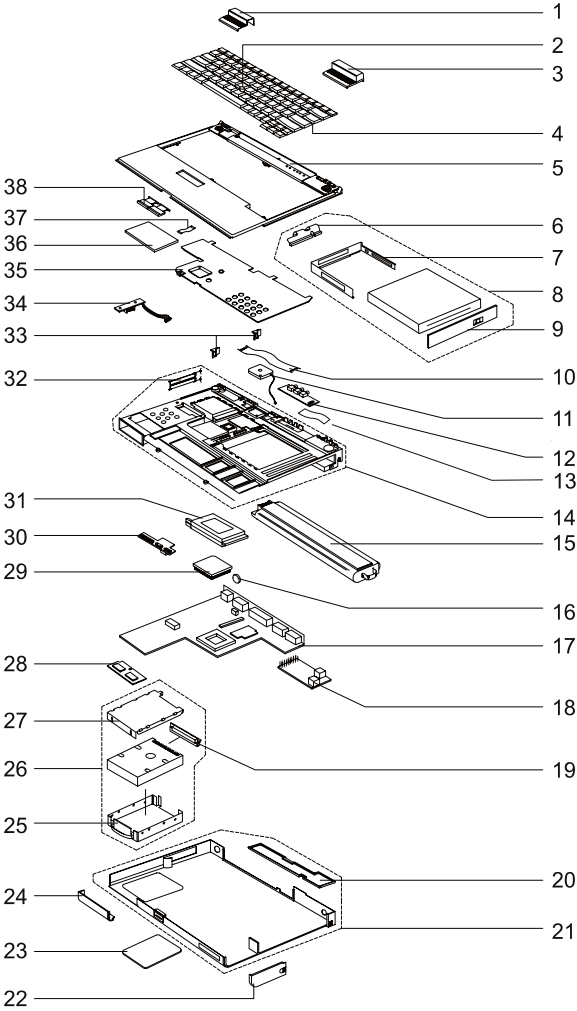
Password (SW2, Switch 3) Settings

| Password | ON | OFF |
|----------|--------|-------|
| Switch 3 | Bypass | Check |

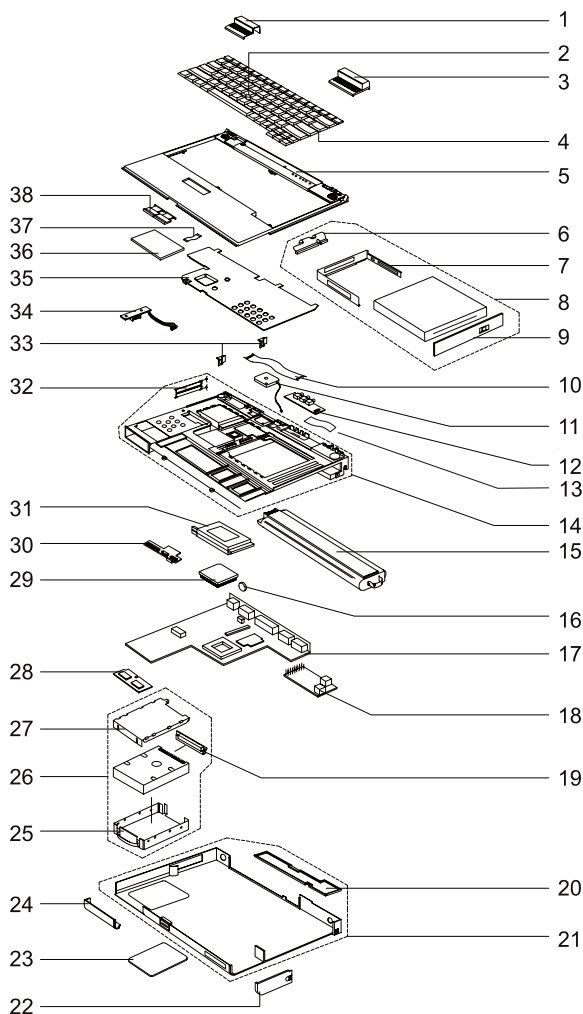
Reserved switch (SW2, Switch 4)

| Reserved | ON | OFF |
|----------|----|-----|
| Switch 4 | -- | -- |

310 - System Unit Parts Listing



310D - System Unit Parts Listing



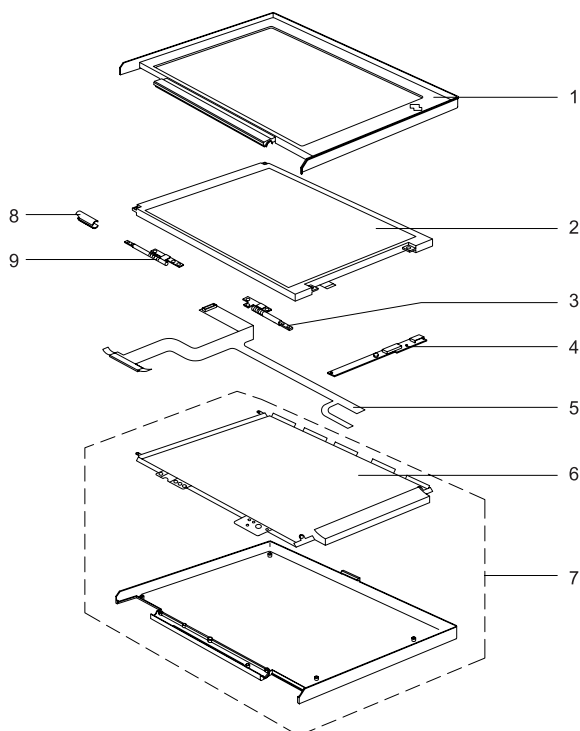
310/310D - System Unit FRU List

| No. | Description | FRU No. | Q'ty |
|-----|---------------------------------------------------------------------------------------|---------|------|
| 1 | Hinge cover (L) | 12J0533 | 1 |
| 2 | TrackPoint rubber cap | 84G6536 | 2 |
| 3 | Hinge cover (R) | 12J0534 | 1 |
| 4 | Keyboard (Japan) (with TrackPoint rubber cap) | 11J8608 | 1 |
| | Keyboard (Germany) (with TrackPoint rubber cap) | 11J8609 | 1 |
| | Keyboard (Slovakia) (with TrackPoint rubber cap) | 12J0504 | 1 |
| | Keyboard (Portugal) (with TrackPoint rubber cap) | 11J8622 | 1 |
| | Keyboard (Netherlands) (with TrackPoint rubber cap) | 11J8612 | 1 |
| | Keyboard (Hungary) (with TrackPoint rubber cap) | 12J0506 | 1 |
| | Keyboard (France) (with TrackPoint rubber cap) | 11J8610 | 1 |
| | Keyboard (Italy) (with TrackPoint rubber cap) | 11J8611 | 1 |
| | Keyboard (Czech) (with TrackPoint rubber cap) | 12J0507 | 1 |
| | Keyboard (Russia) (with TrackPoint rubber cap) | 12J0503 | 1 |
| | Keyboard (Spain) (with TrackPoint rubber cap) | 11J8614 | 1 |
| | Keyboard (U.K.) (with TrackPoint rubber cap) | 11J8607 | 1 |
| 5 | Upper base | 11J8565 | 1 |
| 6 | Diskette drive FPC cable | 12J0522 | 1 |
| | CD-ROM drive FPC cable | 12J0521 | 1 |
| 7 | Diskette drive bracket | 12J0520 | 1 |
| | CD-ROM drive bracket | 12J0519 | 1 |
| 8 | Internal diskette drive module (with bracket, bezel, FPC cable and information label) | 11J8570 | 1 |
| | Internal CD-ROM drive module (with bracket, bezel, FPC cable and information label) | 11J8569 | 1 |
| 9 | Diskette drive bezel | 12J0524 | 1 |
| | CD-ROM drive bezel | 12J0523 | 1 |
| 10 | See Miscellaneous/ Mylar pack | | |
| 11 | Fan | 11J8592 | 1 |
| 12 | Audio connector board (with Mylar) | 11J8584 | 1 |

| No. | Description | FRU No. | Q'ty |
|-----|----------------------------------------------------------------------------------------------------------------|---------|------|
| 13 | Audio connector board FPC cable | 11J8585 | |
| 14 | Chassis (with speaker, LCD cover switch, PCMCIA door and Mylar) | 11J8566 | 1 |
| 15 | Battery pack (NiMH) (with information label) | 11J8604 | 1 |
| 16 | Backup battery | 11J8591 | 1 |
| 17 | System board (without charger, CPU, PCMCIA socket and Mylar) | 11J8581 | 1 |
| 18 | Charger board (with Mylar) | 11J8582 | 1 |
| 19 | Hard disk drive module connector board | 11J8583 | 1 |
| 20 | I/O door | 12J0529 | 1 |
| 21 | Lower base (with I/O door and robber foot, without information label, TrackPoint board and TrackPoint buttons) | 11J8564 | 1 |
| 22 | Battery pack door | 12J0530 | 1 |
| 23 | DIMM door (with screw) | 12J0532 | 1 |
| 24 | Hard disk drive door | 12J0531 | 1 |
| 25 | Hard disk drive module lower cover plate | 12J0512 | 1 |
| 26 | 1.0GB hard disk drive module (with upper and lower cover plates, connector board, Mylar and information label) | 11J8624 | 1 |
| | 1.4GB hard disk drive module (with upper and lower cover plates, connector board, Mylar and information label) | 12J0496 | 1 |
| | 2.1GB hard disk drive module (with upper and lower cover plates, connector board, Mylar and information label) | 11J8625 | 1 |
| 27 | Hard disk drive module upper cover plate (with information label and inside Mylar) | 11J8568 | 1 |
| 28 | DIMM 16 MB EDO | 11J8602 | 1 |
| | DIMM 32 MB EDO | 11J8603 | 1 |
| 29 | Intel P54CSLM -133 CPU | 11J8600 | 1 |
| 30 | Keyboard connector board (with Mylar) | 11J8586 | 1 |
| 31 | PCMCIA slots assembly | 11J8634 | 1 |
| 32 | See Miscellaneous / Miscellaneous pack 2 | | |

| No. | Description | FRU No. | Q'ty |
|-----|---------------------------------------------|---------|------|
| 33 | See Miscellaneous / Miscellaneous pack 2 | | |
| 34 | Battery connector board (with cable) | 11J8588 | 1 |
| 35 | Thermal plate | 11J8567 | 1 |
| 36 | TrackPoint board (with Mylar) | 11J8587 | 1 |
| 37 | TrackPoint board FPC cable | 12J0497 | 1 |
| 38 | See Miscellaneous/ Miscellaneous pack 3 | | |

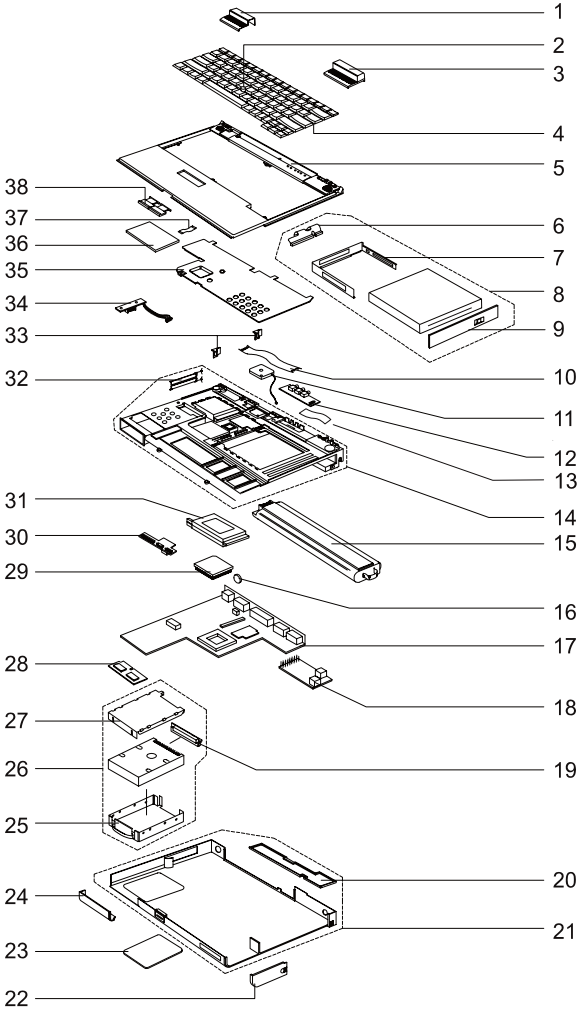
310/310D LCD Unit Parts Listing



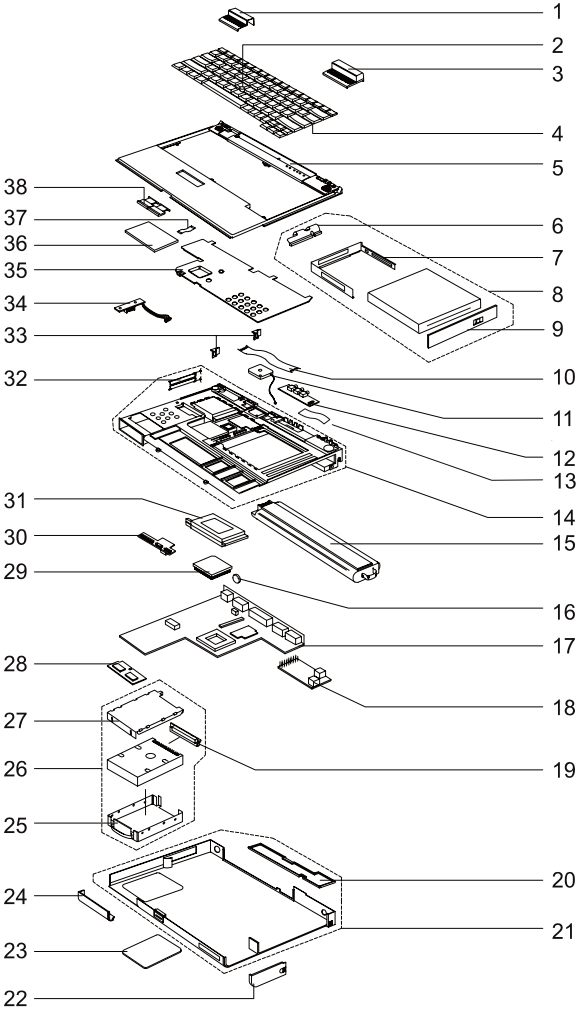
| No. | Description | FRU No. | Q'ty |
|-----|--------------------------------------------------|---------|------|
| 1 | 11.3" DSTN/TFT LCD bezel (with logo) | 11J8576 | 1 |
| 2 | 11.3" DSTN LCD | 11J8593 | 1 |
| | 11.3" TFT LCD | 11J8594 | 1 |
| 3 | LCD hinge (R) | 11J8652 | 1 |
| 4 | LCD inverter (DSTN/TFT) | 11J8589 | 1 |
| 5 | 11.3" DSTN LCD FPC cable (with LCD cable diaper) | 11J8577 | 1 |
| | 11.3" TFT LCD FPC cable (with LCD cable diaper) | 11J8578 | 1 |
| 6 | See Miscellaneous/ Mylar pack | | |

| No. | Description | FRU No. | Q'ty |
|-----|----------------------------------------------------------------------|---------|------|
| 7 | 11.3" DSTN LCD cover (with logo and LCD diaper and left hinge) | 11J8573 | 1 |
| | 11.3" TFT LCD cover (with logo and LCD diaper and left hinge) | 11J8574 | 1 |
| 8 | See Miscellaneous/ Miscellaneous pack 2 | | |
| 9 | LCD hinge (L) | 12J0527 | 1 |

310E System Unit Parts Listing



310ED System Unit Parts Listing



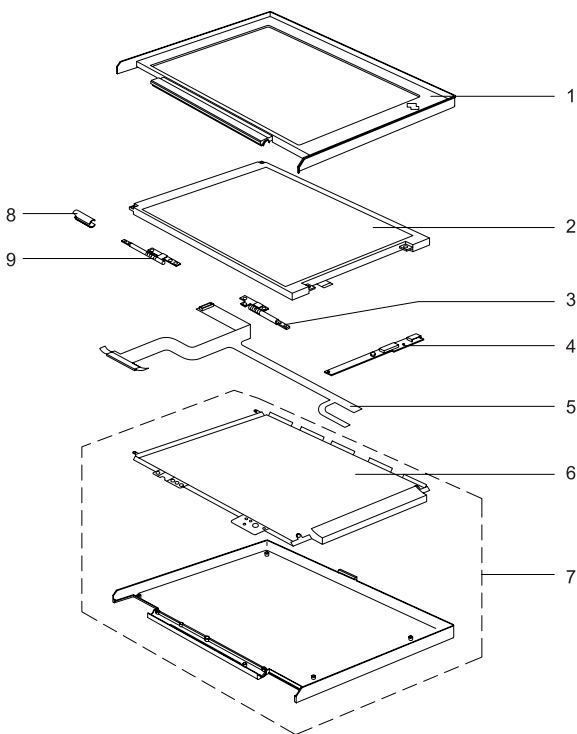
310E/310ED System Unit FRU List

| No. | Description | FRU No. | Q'ty |
|-----|--------------------------------------------------------|---------|------|
| 1 | Hinge cover (L) | 12J0533 | 1 |
| 2 | TrackPoint rubber cap | 84G6536 | 2 |
| 3 | Hinge cover (R) | 12J0534 | 1 |
| 4 | Keyboard (Japan) (with TrackPoint rubber cap) | 11J8608 | 1 |
| | Keyboard (Germany) (with TrackPoint rubber cap) | 11J8609 | 1 |
| | Keyboard (Slovakia) (with TrackPoint rubber cap) | 12J0504 | 1 |
| | Keyboard (Portugal) (with TrackPoint rubber cap) | 11J8622 | 1 |
| | Keyboard (Netherlands) (with TrackPoint rubber cap) | 11J8612 | 1 |
| | Keyboard (Hungary) (with TrackPoint rubber cap) | 12J0506 | 1 |
| | Keyboard (France) (with TrackPoint rubber cap) | 11J8610 | 1 |
| | Keyboard (Italy) (with TrackPoint rubber cap) | 11J8611 | 1 |
| | Keyboard (Czech) (with TrackPoint rubber cap) | 12J0507 | 1 |
| | Keyboard (Russia) (with TrackPoint rubber cap) | 12J0503 | 1 |
| | Keyboard (Spain) (with TrackPoint rubber cap) | 11J8614 | 1 |
| | Keyboard (US) (with TrackPoint rubber cap) | 11J8606 | 1 |
| | Keyboard (U.K.) (with TrackPoint rubber cap) | 11J8607 | 1 |
| | Keyboard (Denmark) (with TrackPoint rubber cap) | 02K4322 | 1 |
| | Keyboard (Norway) (with TrackPoint rubber cap) | 02K4323 | 1 |
| | Keyboard (Sweden/Finland) (with TrackPoint rubber cap) | 02K4324 | 1 |
| | Keyboard (Swiss) (with TrackPoint rubber cap) | 02K4325 | 1 |
| | Keyboard (Belgium) (with TrackPoint rubber cap) | 02K4326 | 1 |
| 5 | Upper base | 11J8565 | 1 |
| 6 | Diskette drive FPC cable | 12J0522 | 1 |
| | CD-ROM drive FPC cable | 12J0521 | 1 |
| 7 | Diskette drive bracket | 12J0520 | 1 |
| | CD-ROM drive bracket | 12J0519 | 1 |

| No. | Description | FRU No. | Q'ty |
|-----|----------------------------------------------------------------------------------------------------------------|---------|------|
| 8 | Internal diskette drive module (with bracket, bezel, FPC cable and information label) | 11J8570 | 1 |
| | Internal CD-ROM drive module (with bracket, bezel, FPC cable and information label) | 05K8826 | 1 |
| 9 | Diskette drive bezel | 12J0524 | 1 |
| | CD-ROM drive bezel | 05K4607 | 1 |
| 10 | See Miscellaneous/ Mylar pack | | |
| 11 | Fan | 05K4605 | 1 |
| 12 | Audio connector board (with Mylar) | 11J8584 | 1 |
| 13 | Audio connector board FPC cable | 11J8585 | |
| 14 | Chassis (with speaker, LCD cover switch, PCMCIA door and Mylar) | 05K4655 | 1 |
| 15 | Battery pack (NiMH) (with information label) | 11J8604 | 1 |
| 16 | Backup battery | 11J8591 | 1 |
| 17 | System board (without charger, CPU, PCMCIA socket and Mylar) | 05K3143 | 1 |
| 18 | Charger board (with Mylar) | 11J8582 | 1 |
| 19 | Hard disk drive module connector board | 11J8583 | 1 |
| 20 | I/O door | 12J0529 | 1 |
| 21 | Lower base (with I/O door and robber foot, without information label, TrackPoint board and TrackPoint buttons) | 11J8564 | 1 |
| 22 | Battery pack door | 12J0530 | 1 |
| 23 | DIMM door (with screw) | 12J0532 | 1 |
| 24 | Hard disk drive door | 12J0531 | 1 |
| 25 | Hard disk drive module lower cover plate (for 12.7 mm high hard drive 11J8625 use) | 12J0512 | 1 |
| | Hard disk drive module lower cover plate (for 9.5 mm high hard drive 05K8825 use) | 05K4606 | 1 |
| 26 | 1.6GB hard disk drive module assembly | 05K8825 | 1 |
| | 2.1GB hard disk drive module assembly | 11J8625 | 1 |
| 27 | Hard disk drive module upper cover plate (with information label and inside Mylar) | 11J8568 | 1 |

| No. | Description | FRU No. | Q'ty |
|-----|------------------------------------------|---------|------|
| 28 | DIMM 16 MB EDO | 11J8602 | 1 |
| | DIMM 32 MB EDO | 11J8603 | 1 |
| 29 | Intel P55C-133 CPU, MMX | 05K3600 | 1 |
| | Intel P55C-150 CPU, MMX | 05K3601 | 1 |
| 30 | Keyboard connector board (with Mylar) | 11J8586 | 1 |
| 31 | PCMCIA slots assembly | 11J8634 | 1 |
| 32 | See Miscellaneous / Miscellaneous pack 2 | | |
| 33 | See Miscellaneous / Miscellaneous pack 2 | | |
| 34 | Battery connector board (with cable) | 11J8588 | 1 |
| 35 | Thermal plate | 05K4604 | 1 |
| 36 | TrackPoint board (with Mylar) | 11J8587 | 1 |
| 37 | TrackPoint board FPC cable | 12J0497 | 1 |
| 38 | See Miscellaneous/ Miscellaneous pack 3 | | |

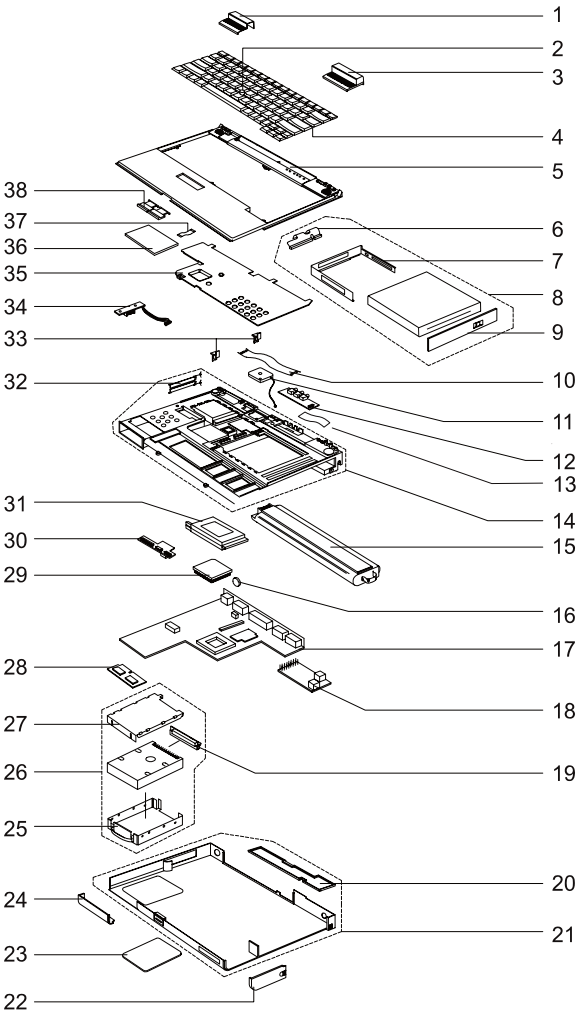
310E/310ED LCD Unit Parts Listing



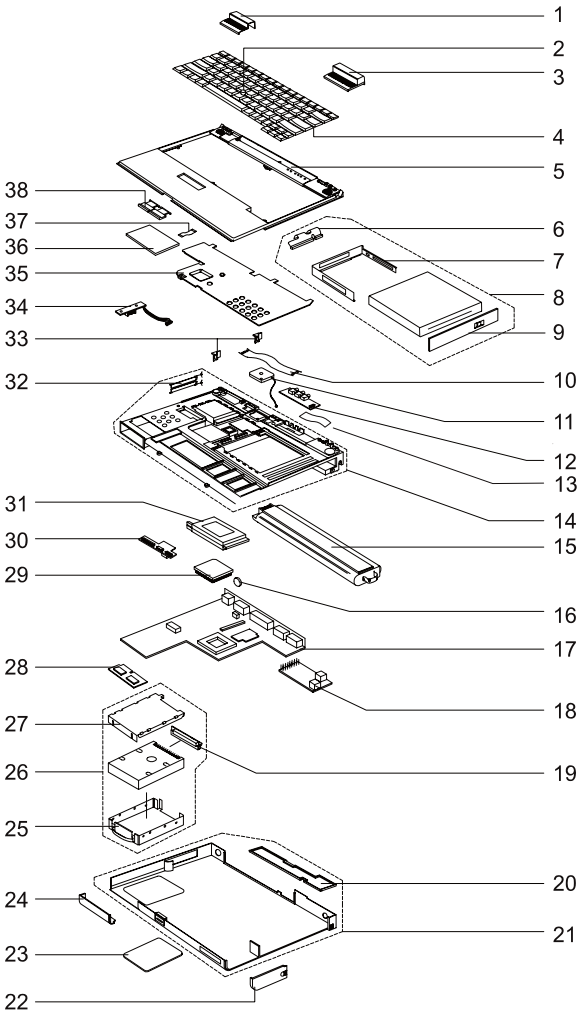
310E/310ED LCD Module FRU list

| No. | Description | FRU No. | Q'ty |
|-----|----------------------------------------------------------------------|---------|------|
| 1 | 11.3" TFT LCD bezel (with logo) | 11J8576 | 1 |
| 2 | 11.3" TFT LCD | 11J8594 | 1 |
| | 12.1" DSTN LCD | 12J0492 | 1 |
| 3 | LCD hinge (R) | 11J8652 | 1 |
| 4 | LCD inverter | 11J8589 | 1 |
| 5 | 11.3" TFT LCD FPC cable (with LCD cable diaper) | 11J8578 | 1 |
| | 12.1" DSTN LCD FPC cable (with LCD cable diaper) | 12J0493 | 1 |
| 6 | See Miscellaneous/ Mylar pack | | |
| 7 | 11.3" TFT LCD cover (with logo and LCD diaper and left hinge) | 11J8574 | 1 |
| | 12.1" DSTN LCD cover (with logo and LCD diaper and left hinge) | 12J0495 | 1 |
| 8 | See Miscellaneous/ Miscellaneous pack 2 | | |
| 9 | LCD hinge (L) | 12J0527 | 1 |

310E (2600-Axx/Cxx/Exx/Fxx) System Unit Parts Listing



310ED (2600-Bxx/Dxx) System Unit Parts Listing



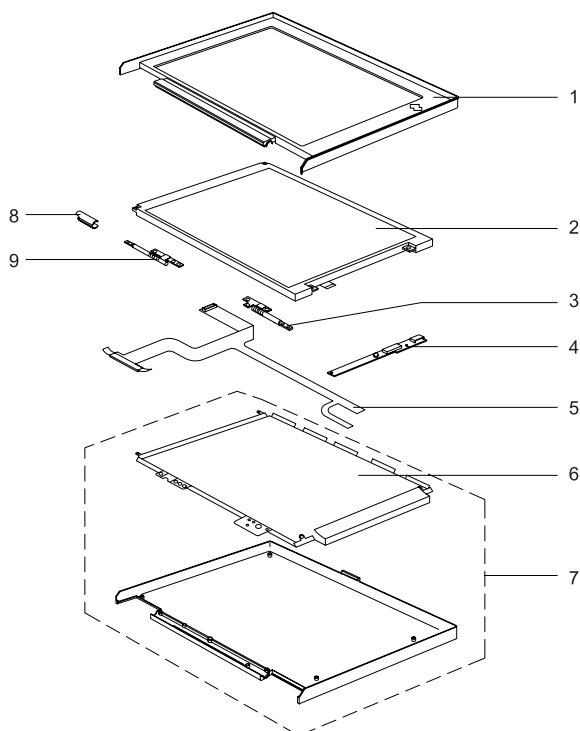
310E/310ED (2600-Axx/Bxx/Cxx/Dxx/Exx/Fxx) System Unit FRU List

| No. | Description | FRU No. | Q'ty |
|-----|--------------------------------------------------------|---------|------|
| 1 | Hinge cover (L) | 05K4870 | 1 |
| 2 | TrackPoint rubber cap | 84G6536 | 2 |
| 3 | Hinge cover (R) | 05K4871 | 1 |
| 4 | Keyboard (Japan) (with TrackPoint rubber cap) | 11J8608 | 1 |
| | Keyboard (Germany) (with TrackPoint rubber cap) | 11J8609 | 1 |
| | Keyboard (Slovakia) (with TrackPoint rubber cap) | 12J0504 | 1 |
| | Keyboard (Portugal) (with TrackPoint rubber cap) | 11J8622 | 1 |
| | Keyboard (Netherlands) (with TrackPoint rubber cap) | 11J8612 | 1 |
| | Keyboard (Hungary) (with TrackPoint rubber cap) | 12J0506 | 1 |
| | Keyboard (France) (with TrackPoint rubber cap) | 11J8610 | 1 |
| | Keyboard (Italy) (with TrackPoint rubber cap) | 11J8611 | 1 |
| | Keyboard (Czech) (with TrackPoint rubber cap) | 12J0507 | 1 |
| | Keyboard (Russia) (with TrackPoint rubber cap) | 12J0503 | 1 |
| | Keyboard (Spain) (with TrackPoint rubber cap) | 11J8614 | 1 |
| | Keyboard (US) (with TrackPoint rubber cap) | 11J8606 | 1 |
| | Keyboard (U.K.) (with TrackPoint rubber cap) | 11J8607 | 1 |
| | Keyboard (Denmark) (with TrackPoint rubber cap) | 02K4322 | 1 |
| | Keyboard (Norway) (with TrackPoint rubber cap) | 02K4323 | 1 |
| | Keyboard (Sweden/Finland) (with TrackPoint rubber cap) | 02K4324 | 1 |
| | Keyboard (Swiss) (with TrackPoint rubber cap) | 02K4325 | 1 |
| | Keyboard (Belgium) (with TrackPoint rubber cap) | 02K4326 | 1 |
| 5 | Upper base | 05K4865 | 1 |
| 6 | Diskette drive FPC cable | 12J0522 | 1 |
| | CD-ROM drive FPC cable | 05K2649 | 1 |

| No. | Description | FRU No. | Q'ty |
|-----|----------------------------------------------------------------------------------------------------------------|---------|------|
| 7 | Diskette drive bracket | 12J0520 | 1 |
| | CD-ROM drive bracket | 05K4878 | 1 |
| 8 | Internal diskette drive module assembly | 11J8570 | 1 |
| | Internal CD-ROM drive module assembly label) | 05K8865 | 1 |
| 9 | Diskette drive bezel | 12J0524 | 1 |
| | CD-ROM drive bezel | 05K4879 | 1 |
| 10 | See Miscellaneous/ Mylar pack | | |
| 11 | Fan | 05K4605 | 1 |
| 12 | Audio connector board (with Mylar) | 11J8584 | 1 |
| 13 | Audio connector board FPC cable | 11J8585 | |
| 14 | Chassis (with speaker, LCD cover switch, PCMCIA door and Mylar) | 05K4655 | 1 |
| 15 | Battery pack (NiMH) (with information label) | 11J8604 | 1 |
| 16 | Backup battery | 11J8591 | 1 |
| 17 | System board (without charger, CPU, PCMCIA socket and Mylar) | 10L0892 | 1 |
| 18 | Charger board (with Mylar) | 11J8582 | 1 |
| 19 | Hard disk drive module connector board | 11J8583 | 1 |
| 20 | I/O door | 05K4867 | 1 |
| 21 | Lower base (with I/O door and rubber foot, without information label, TrackPoint board and TrackPoint buttons) | 05K4866 | 1 |
| 22 | Battery pack door | 05K4868 | 1 |
| 23 | DIMM door (with screw) | 05K5220 | 1 |
| 24 | Hard disk drive door | 05K4869 | 1 |
| 25 | Hard disk drive module lower cover plate (for 12.7 mm high hard drive 11J8625 use) (2600-EXX) | 12J0512 | 1 |
| | Hard disk drive module lower cover plate (for 9.5mm high hard drive 05K8881 and 05K8862 use) | 05K4606 | 1 |

| No. | Description | FRU No. | Q'ty |
|-----|------------------------------------------------------------------------------------|---------|------|
| 26 | 2.1GB hard disk drive module assembly | 05K8881 | 1 |
| | 2.1GB hard disk drive module assembly (2600-Exx) | 11J8625 | 1 |
| | 3.0GB hard disk drive module assembly | 05K8862 | 1 |
| 27 | Hard disk drive module upper cover plate (with information label and inside Mylar) | 11J8568 | 1 |
| 28 | DIMM 16 MB EDO | 11J8602 | 1 |
| | DIMM 32 MB EDO | 11J8603 | 1 |
| 29 | Intel P55C-166 CPU, MMX | 10L0870 | 1 |
| | Intel P55C-150 CPU, MMX (2600-EXX) | 05K3601 | 1 |
| 30 | Keyboard connector board (with Mylar) | 11J8586 | 1 |
| 31 | PCMCIA slots assembly | 11J8634 | 1 |
| 32 | See Miscellaneous / Miscellaneous pack 2 | | |
| 33 | See Miscellaneous / Miscellaneous pack 2 | | |
| 34 | Battery connector board (with cable) | 11J8588 | 1 |
| 35 | Thermal plate | 05K4604 | 1 |
| 36 | TrackPoint board (with Mylar) | 11J8587 | 1 |
| 37 | TrackPoint board FPC cable | 12J0497 | 1 |
| 38 | See Miscellaneous/ Miscellaneous pack 3 | | |

310E/310ED LCD Unit Parts Listing



| No. | Description | FRU No. | Q'ty |
|-----|--------------------------------------------|---------|------|
| 1 | 12.1" DSTN LCD bezel (with logo) | 12J0494 | 1 |
| | 12.1" TFT LCD bezel (with logo) | 05K4863 | 1 |
| | 11.3" TFT LCD bezel (with logo) (2600-EXX) | 11J8576 | 1 |
| 2 | 12.1" DSTN LCD | 12J0492 | 1 |
| | 12.1" TFT LCD | 05J9338 | 1 |
| | 11.3" TFT LCD (2600-EXX) | 05K9356 | 1 |
| 3 | LCD hinge (R) | 11J8652 | 1 |
| 4 | LCD inverter | 11J8589 | 1 |

| No. | Description | FRU No. | Q'ty |
|-----|--------------------------------------------------------------------------|---------|------|
| 5 | 12.1" DSTN LCD FPC cable (with LCD cable diaper) | 12J0493 | 1 |
| | 12.1" TFT LCD FPC cable (with LCD cable diaper) | 05K2647 | 1 |
| | 11.3" TFT LCD FPC cable (with LCD cable diaper) (2600-EXX) | 11J8578 | 1 |
| 6 | See Miscellaneous/ Mylar pack | | |
| 7 | 12.1" DSTN LCD cover (with logo and LCD diaper and left hinge) | 12J0495 | 1 |
| | 12.1" TFT LCD cover (with logo and LCD diaper and left hinge) | 05K4864 | 1 |
| | 11.3" TFT LCD cover (with logo and LCD diaper and left hinge) (2600-EXX) | 05K5231 | 1 |
| 8 | See Miscellaneous/ Miscellaneous pack 2 | | |
| 9 | LCD hinge (L) | 12J0527 | 1 |

310/310E/310D/310ED Miscellaneous and Other Parts

Miscellaneous

| Item | Description | FRU No. | Q'ty |
|--------------------------|-----------------------------|---------|------|
| Misc. Parts Pack 1 | Foot (long) | 12J0515 | 2 |
| | Foot | | 2 |
| | LCD screw cap | | 6 |
| Misc. Parts Pack 2 | PCMCIA door spring(U) | 12J0516 | 5 |
| | PCMCIA door spring(L) | | 5 |
| | PCMCIA door (U) | | 2 |
| | PCMCIA door (L) | | 2 |
| | LCD hinge cable cover | | 2 |
| | Diskette Drive/CD-ROM latch | | 2 |
| Misc. Parts Pack 3 | TrackPoint button(L) | 12J0517 | 1 |
| | TrackPoint button(R) | | 1 |

| Item | Description | FRU No. | Q'ty |
|------------|----------------------------------------------------------------------------------|---------|------|
| Mylar pack | 11.3" DSTN LCD diaper | 05K4881 | 1 |
| | 11.3" TFT LCD diaper | | 1 |
| | 12.1" DSTN LCD diaper | | 1 |
| | 12.1" TFT LCD diaper | | 1 |
| | Hard disk drive module Mylar(outside) | | 10 |
| | Fan tape | | 10 |
| | Fan tape (on bottom of fan, square) | | 10 |
| | Fan sponge (on both sides of fan, rectangle) | | 20 |
| | Sponge pad (above the CD-ROM, below the thermal plate) | | 5 |
| | Sponge pad (above the CD-ROM, below the thermal plate for 2600-Bxx/Dxx) | | 5 |
| | CPU thermal sense pad (on the bottom of CPU) | | 10 |

| Item | Description | FRU No. | Q'ty |
|------------|----------------------------------------|---------|------|
| Screw pack | M2 x 3L, Pan head, silver | 11J8580 | 5 |
| | M2 x 4L, Flat head, black | | 5 |
| | M2 x 4L, Pan head, silver | | 5 |
| | M2 x 4L, Pan head, black, w/ nylock | | 5 |
| | M2 x 6L, Flat head, black | | 5 |
| | M2 x 6L, Pan head, silver | | 5 |
| | M2 x 14L, Pan head, silver | | 5 |
| | M2.5 x 6L, Pan head, black, w/ nylock | | 10 |
| | M2.5 x 8L, Pan head, silver, w/ nylock | | 5 |
| | M2.5 x 18L, Pan head, silver | | 5 |
| | M3 x 6L, Bind head, silver | | 5 |
| | Screw bracket | | 10 |

Others

| Description | FRU No. | Q'ty |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|
| AC adapter 45W (2 PIN) (with information label) | 12J0538 | 1 |
| AC adapter 45W (3 PIN) (with information label) | 12J0539 | 1 |
| Power cord (Japan 2 PIN) | 13H5273 | 1 |
| Power cord (Argentina, Australia, Papua New Guinea, New Zealand, Paraguay, Uruguay) | 76H3514 | |
| Power cord (Bahamas, Barbados, Bermuda, Bolivia, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Korea (South), Mexico, Netherlands, Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), U.S.A., Venezuela) | 76H3516 | 1 |
| Power cord (Austria, Belgium, Bulgaria, Czech Republic, Egypt, Finland, France, Germany, Greece, Hungary, Iceland, Indonesia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Turkey, former Yugoslavia) | 76H3518 | 1 |
| Power cord (Denmark) | 76H3520 | 1 |
| Power cord (Bangladesh, Pakistan, South Africa, Sri Lanka) | 76H3522 | 1 |
| Power cord (Thailand) | 76H4866 | 1 |
| Power cord (Abu Dhabi, Albania, Antigua, Bahrain, Brunei, Dubai, Fiji, Hong Kong, India, Ireland, Kenya, Kuwait, Macao, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Singapore, United Kingdom) | 76H3524 | |
| Power cord (Switzerland) | 76H3528 | 1 |
| Power cord (Israel) | 76H3532 | 1 |
| Power cord (Chile, Italy) | 76H3530 | 1 |
| External FDD cable | 11J8629 | 1 |
| External FDD module (310E/310ED) | 05K8827 | 1 |
| External FDD module (310/310D) | 11J8628 | 1 |

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