ThinkPad 310, 310D (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.
- **Use only the correct FRUs.** 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.
- **Do not 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:

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

The following is not covered under warranty:

- LCD panel cracked by applying excessive force or by being dropped.
- Scratched (cosmetic) parts.
- Cracked or broken plastic parts, broken latches, broken pins, or broken connectors caused by excessive force.
- Damage caused by liquid spilled into the system.
- Damage caused by improperly inserting a 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.)

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 “System Switch Location” 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 by referring to “Keyboard” on page 46 and the thermal plate by referring to “ Thermal Plate” on page 47.
4. Move the password switch from Enable to Disable to bypass the password. For more information, refer to “Switch Locations” on page 68.
5. Plug in the AC Adapter, power-on the computer, then press **F2** while the ThinkPad logo is being displayed to enter the BIOS Utility.

Note: If the 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 the computer.
8. Unplug the power cable or battery.
9. Move the password switch from Disable to Enable.

Note: To set 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 Systems Checkout" on page 11.
POST does not complete. No beeps, error codes, or messages are indicated.	“Symptom-to-FRU Index” on page 18, then use the **No-Beep Symptoms** table on page 22.
POST detected an error and displayed numeric error code with error message.	“Symptom-to-FRU Index” on page 18.
Other symptoms (such as LCD display problems)	“Symptom-to-FRU Index” on page 18, then use the appropriate information on pages 23 to 28.

Memory Checkout

Optional DIMMs are available for increasing memory capacity. The following tables show the possible combinations of installed DIMMs.

DIMM	DIMM	Total Memory
0MB	0MB	0MB
8MB	0MB	8MB
0MB	8MB	8MB
8MB	8MB	16MB
16MB	0MB	16MB
0MB	16MB	16MB
16MB	8MB	24MB
8MB	16MB	24MB

DIMM	DIMM	Total Memory
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 30).
3. Select **Memory** 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 30).
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 30).
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 30).
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 30).
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.

Note: 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 30).
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, reseat 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 30).
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, reseat 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 Systems 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.

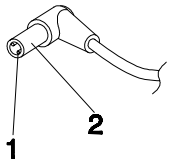
If you suspect a power problem, see an appropriate power supply check listed below:

- 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 check 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 28.
   - 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.

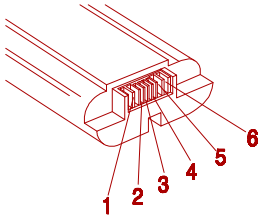
Checking Operational Charging: To check operational charging, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

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

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.

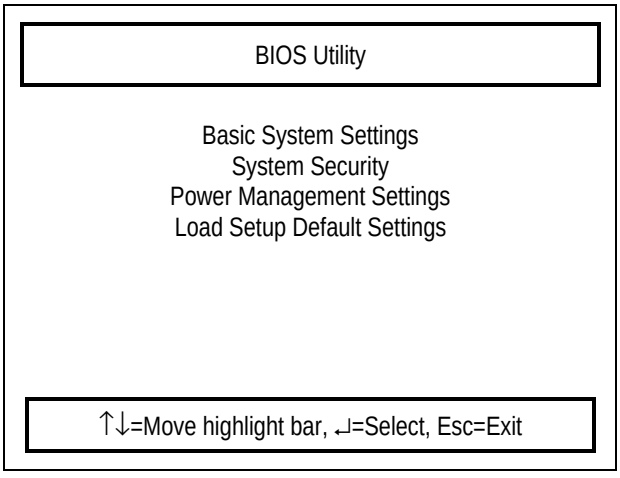
The computer is already correctly configured for you. If you make any changes to the computer or you receive an Equipment Configuration Error message (error code 246) after you power-on the computer, you need to run the BIOS Utility.

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.

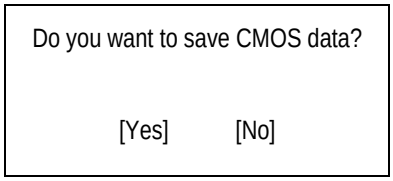


There are four main menu items:

- 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:



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 28.

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)	1. Go to " Memory Checkout" on page 7. 2. DIMM 3. System board
011	64KB System Management Memory Bad	1. Enter BIOS Utility to execute Load Setup Default Setting, then reboot system. 2. DIMM 3. System board
015	Battery is Critical Low	1. Go to "Checking the Battery Pack" on page 13. 2. Battery 3. Battery connector board 4. Charger board 5. System board

Error Code	Message	FRU/Action in Sequence
020	Keyboard Interface Error **Note:** The message only appears for a few seconds.	1. Go to “Keyboard and External Input Device Checkout” on page 8. 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.
021	Keyboard Error or Keyboard Not Connected **Note:** The message only appears for a few seconds.	1. Go to “Keyboard and External Input Device Checkout” on page 8. 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.	1. Go to “Keyboard and External Input Device Checkout” on 8. 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.	1. Go to “Keyboard and External Input Device Checkout” on page 8. 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.	1. Go to “Keyboard and External Input Device Checkout” on page 8. 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
040	Diskette Drive Controller Error	1. Go to “Diskette Drive Test” on page 10. 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	1. Enter BIOS Utility to execute Load Setup Default Setting, then reboot system. 2. Ensure the CPU frequency switches are set correctly.
047	Diskette Drive(s) Disabled	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	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	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	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	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	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

Error Code	Message	FRU/Action in Sequence
070	Real Time Clock Error	1. Reset Time in the Basic System Settings of BIOS Utility. 2. Backup battery (RTC battery) 3. System board
071	CMOS Battery Bad	1. Enter BIOS Utility to execute Load Setup Default Settings. 2. Backup battery (RTC battery) 3. System board
072	CMOS Checksum Error	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	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	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	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	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	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 not POST	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	1. Reseat the LCD Connectors 2. Power source (battery & adapter). See “Power Systems Checkout” on page 11. 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.	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

Symptom/Error	FRU/Action in Sequence
No beep, power-on indicator on, and a blinking cursor only during POST.	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.	System board **Note:** The speaker is on the system board.

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	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
• LCD backlight not working • LCD too dark • LCD brightness cannot be adjusted • LCD contrast cannot be adjusted	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

Symptom/Error	FRU/Action in Sequence
• LCD screen unreadable • Characters missing pels • Screen abnormal • Wrong color displayed	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.	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.	1. Go to " Keyboard and external Input Device Checkout' on page 8. 2. Reseat the three keyboard cables. 3. Keyboard 4. System board
TrackPoint does not work.	1. Go to "TrackPoint III Checkout" on page 9. 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	1. Reseat the Audio connector board. 2. Audio connector board 3. System board

Power-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Power shuts down during operation.	1. Go to “Power Systems Checkout” on page 11. 2. AC Adapter 3. Battery Pack 4. Battery connector board 5. Charger board 6. System board
The system will not power-on.	1. Go to “Power System Checkout” on page 11. 2. AC Adapter 3. Charger board 4. System board
The system will not power-off.	1. Go to “Power System Checkout” on page 11. 2. Press the power shutdown switch for more than 3 seconds. 3. Charger board 4. System board
Battery can’t be charged.	1. Go to “Power System Checkout” on page 11. 2. Battery 3. Charger board 4. System board

PC Card (PCMCIA)-Related Symptoms

Symptom/Error	FRU/Action in Sequence
System cannot detect the PC Card (PCMCIA)	1. PC Card (PCMCIA) slots assembly 2. 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.	1. Go to " Memory Checkout" on page 7. 2. Enter BIOS Utility to execute Load Setup Default Settings, then reboot system. 3. DIMM 4. System board

Speaker-Related Symptoms

Symptom/Error	FRU/Action in Sequence
Speaker noisy or no sound comes from system	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.	1. Go to "Hibernation Mode" on page 16 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.	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.	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

Symptom/Error	FRU/Action in Sequence
The system will not resume after opening the LCD.	1. Chassis (LCD cover switch on chassis) 2. System board
Battery fuel gauge does not go higher than 90%.	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.	1. Enter BIOS Utility to execute Load Setup Default Settings, then reboot system. 2. Reseat Hard disk/diskette/CD-ROM drive connector.
System hangs intermittently.	1. Hard disk/diskette/CD-ROM drive connector 2. Fan (go to “Running Fan Diagnostics Program” on page 34). 3. System board
In DOS or Windows, multimedia programs, no sound comes from the computer. (Only system beeps are heard at power-on)	1. Go to “Audio Board Checkout” on page 9. 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.	1. Use BOTH display mode, press Fn+F3. 2. System board
Printer problems.	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.	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

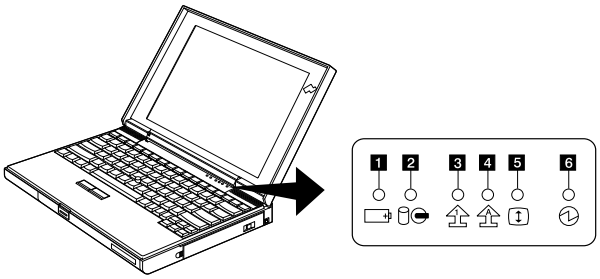
Related Service Procedures

This section provides information about the following:

- “Status Indicators”
- “Power Switch”
- “How to Run the Diagnostics” on page 30.
- “Fn Key Combinations” on page 35.

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.
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.

Symbol	Color	Meaning
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 Disk

Diagnostic Program Disk contains the following two programs:

- PQA Diagnostic Program
- Fan Diagnostic Program

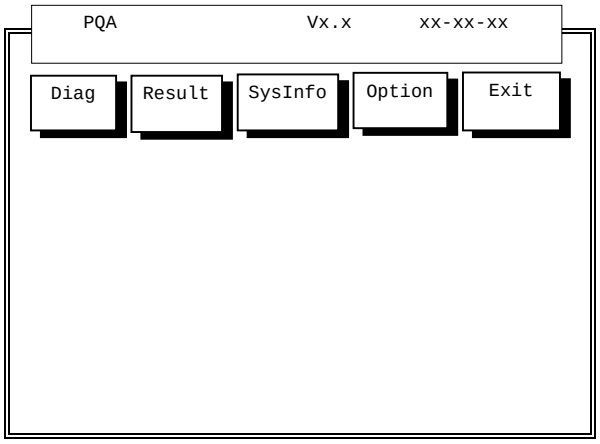
Running PQA Diagnostics Program

Important: Before running PQA Diagnostic Program, make sure that the write enable tab of the Diagnostic Program Disk 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 310/310D Diagnostics Diskette (P/N: 12J1009)
ThinkPad 310/310D Maintenance Utility Diskette (P/N: 12J1010)

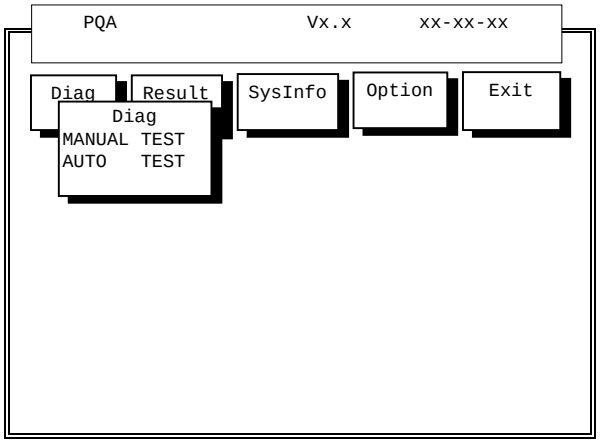
Boot from the Diagnostic Program Disk and select PQA System Diagnostics Program from PC DOS 7.0 Startup Menu, the PQA main menu appears on screen.



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.

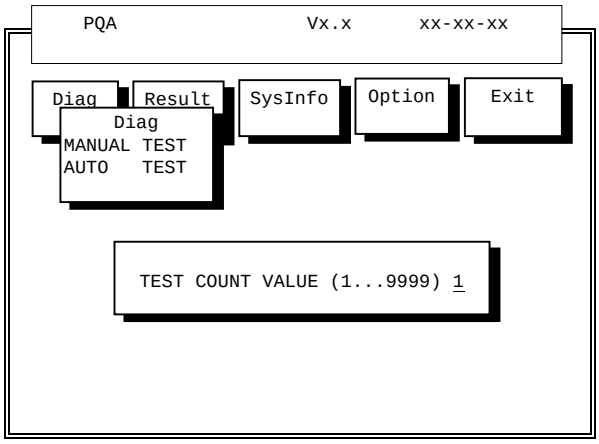
The following screen appears when you select Diag from the main menu.



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

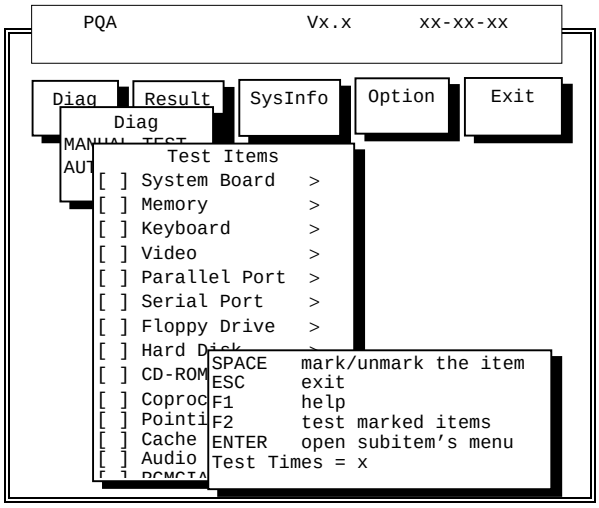
- **Manual Test** Performs a single test and checks the selected test items in sequence.
- **Auto Test** Performs multiple tests of the selected items and checks the selected test items in sequence.

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 Times** Indicates the number of tests to perform.

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

Error Code	Message	FRU/Action in Sequence
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
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.

For systems experiencing frequent auto sensor shutdown, you might need to reset the thermal sensor threshold (refer to “Setting Thermal Sensor Threshold” on page 34) 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 Disk.
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 Disk

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.

For systems experiencing frequent auto sensor shutdown, you might 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” on page 34).

Follow the steps below to set thermal threshold:

1. Boot from the Utility Program Disk.
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 Disk.
2. Select Inverter ID Utility from PC DOS 7.0 Startup Menu.
3. Follow the instructions on screen to read the current inverter ID code or to set the 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 select a wrong ID into the inverter, reboot and rerun the program to 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 select 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

Fn +	Description
F4	Fuel-Gauge display ON/OFF
F5	Audio volume control
F6[1]	Power Management Settings and System Information screens
F7[2]	Standby mode
F8[3]	Hibernation mode
Right arrow	Scale increase (used with Fn+F2, Fn+F5)
Left arrow	Scale decrease (used with Fn+F2, Fn+F5)
Esc	Hotkey Icon Escape

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.

Product Overview (310, 310D)

The following is an overview of the system features.

Feature	Description
Processor	• Intel® Pentium® 133 MHz
Bus architecture	• PCI 5V
DIMM	• 16MB • 8MB, 16MB, or 32MB DIMM card, maximum 64MB (144-pin EDO)
CMOS RAM	• 256KB
SVGA Video	• 11.3-inch, 65,536 colors, 800x600 pixel TFT color LCD • 11.3-inch, 256 colors, 800x600 pixel DSTN color LCD
Audio	• Yamaha Sound Chip • Internal speakers
Diskette drive	• 1.44MB (3-mode), 3.5-inch
Hard disk drive	• 1.0GB, 2.5-inch, IDE interface
CD-ROM drive	• 5.25-inch, 10X speed, IDE interface
PCMCIA Cards	• 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.

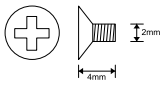
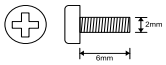
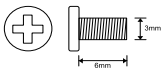
CAUTION:
The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations.

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.

FRU Removal and Replacement Notes

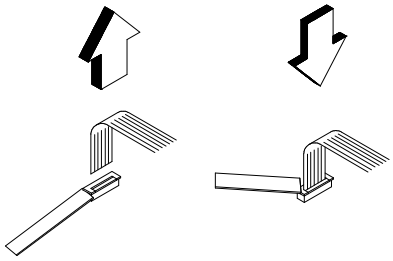
Screw Type Example Explanation

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.

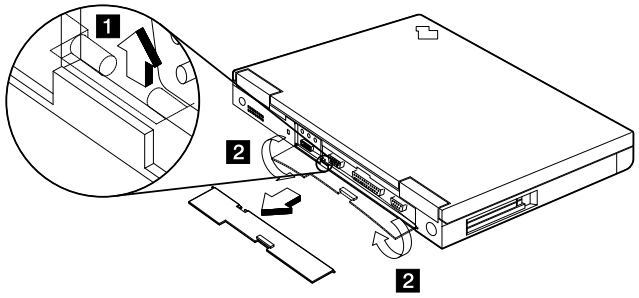
Plugging the Cable

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.

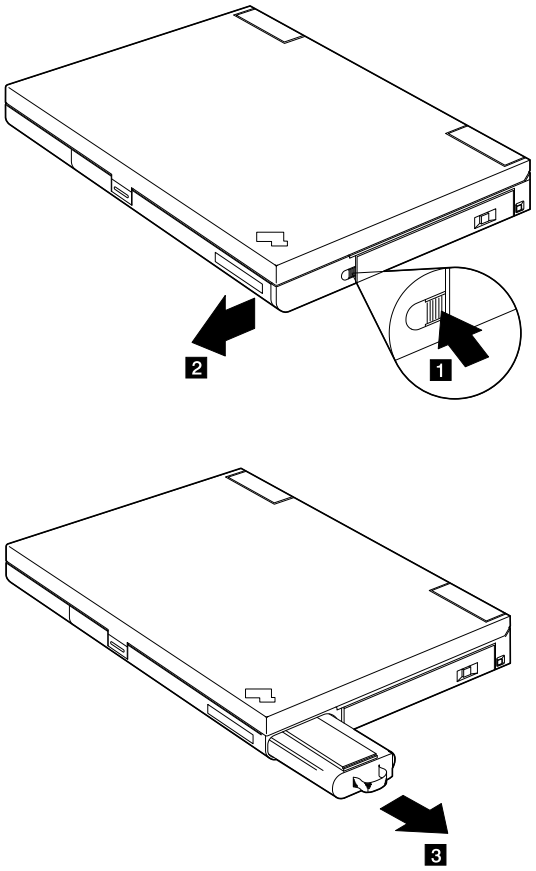
1 I/O Door

Press the rear connector door latch to open the door.

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



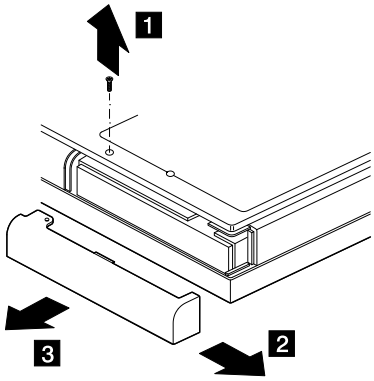
2 Battery Pack and Battery Pack Door



Reverse the steps above to install a battery pack.

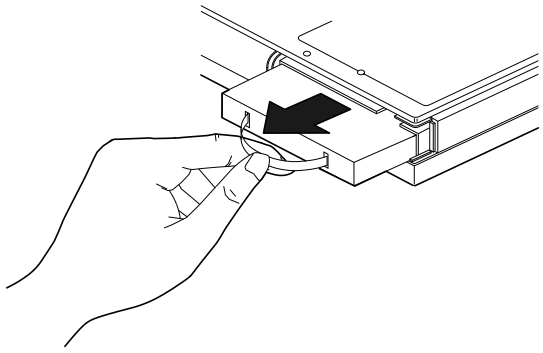
3 Hard Disk Drive and Hard Disk Drive Door

Turn the computer upside down.



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

Note: Be sure to use the correct screw when replacing.

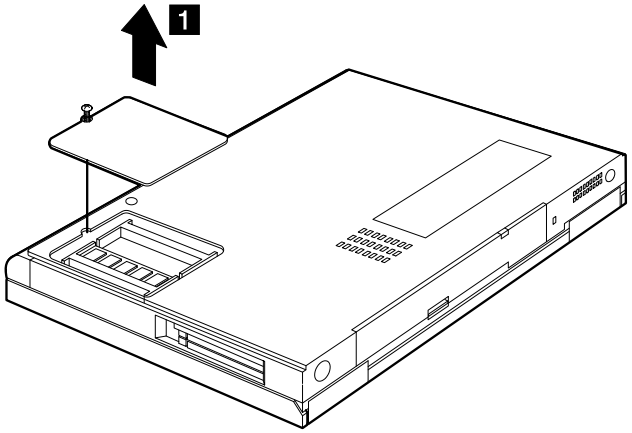


Reverse the steps above to install a hard disk drive.

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.

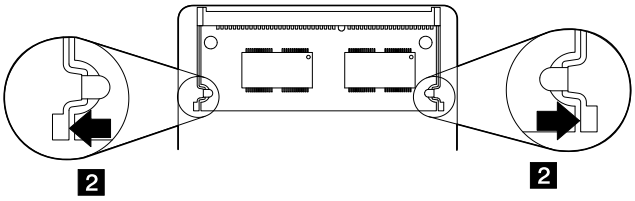
4 DIMM and DIMM Door

Turn the computer upside down.



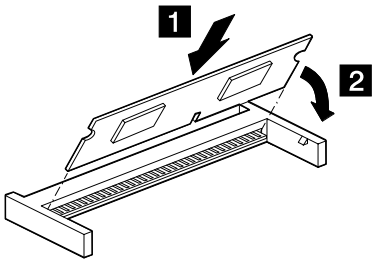
Step	Size (Quantity)	Head and Color	Memo
1	M2 x 5L (1)	Bind head, black	

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

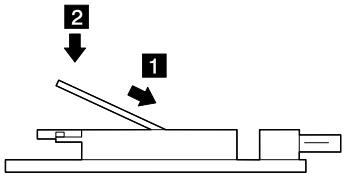


Note: When installing the DIMM, do the following:

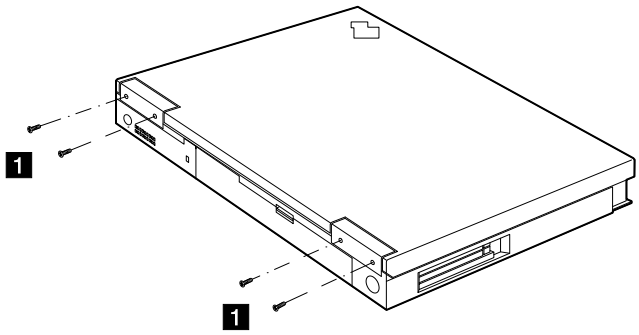
1. Find the notch on the side of the DIMM.
2. With the notched end of the DIMM toward the right side of the socket, insert the DIMM, at an angle of approximately 20°, into the socket; then press it firmly.
3. Pivot the DIMM until it snaps into place.

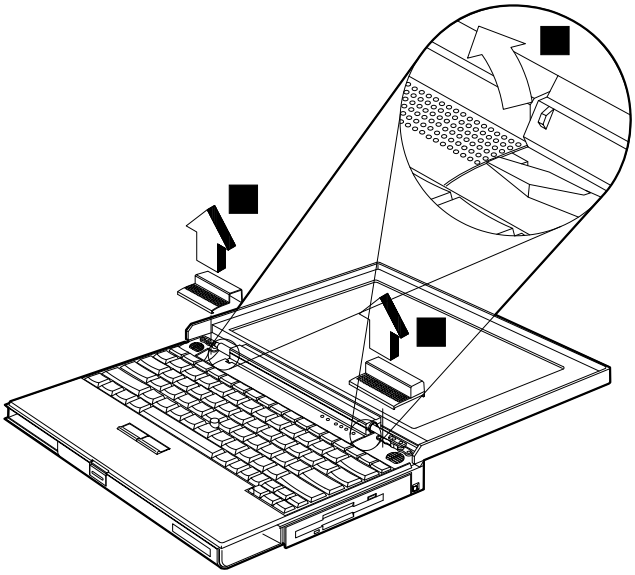


Side View



5 Hinge Cover



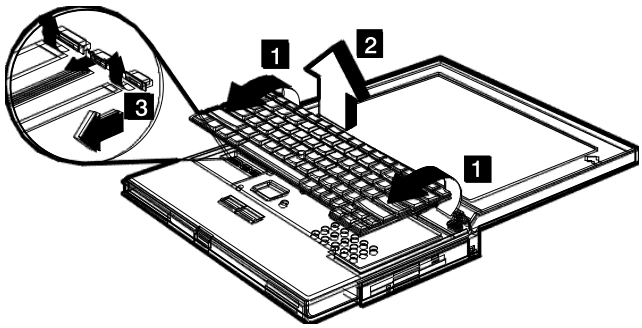


Step	Size (Quantity)	Head and Color	Memo
1	M2 x 4L (4)	Flat head, black	

Note: Be sure to use the correct screw when replacing.

6 Keyboard

- Hinge Covers (5)



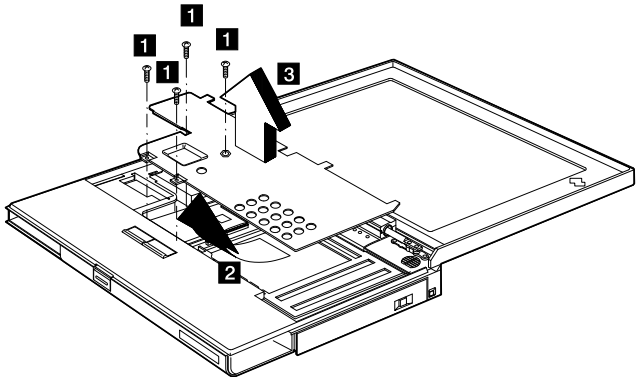
When replacing the keyboard unit, connect the keyboard connector as shown in the figure; then replace the keyboard. (The leftmost and rightmost connectors should be unlocked by lifting the clasps from under them. Unlock the center connector by pulling on the left and right of the clasp.)

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.

7 Thermal Plate/CPU

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

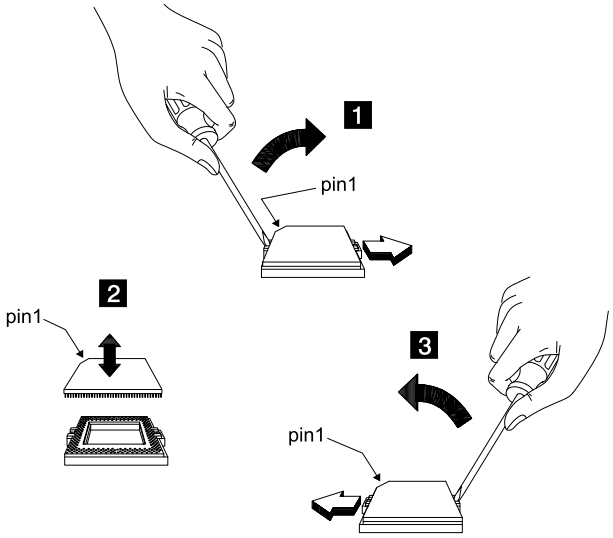


Step	Size (Quantity)	Head and Color	Memo
1	M2.5 x 18L (4)	Pan head, silver	

Note: Be sure to use the correct screw when replacing.

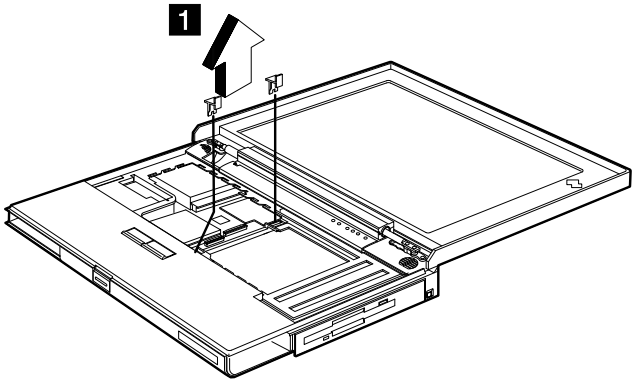
CPU

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.



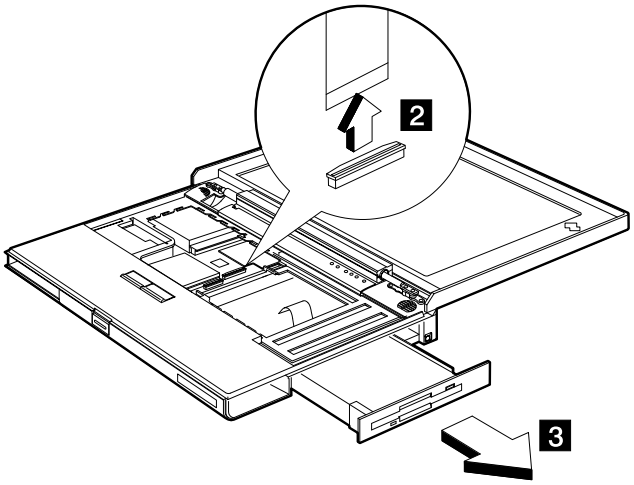
8 Diskette Drive/CD-ROM Drive

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



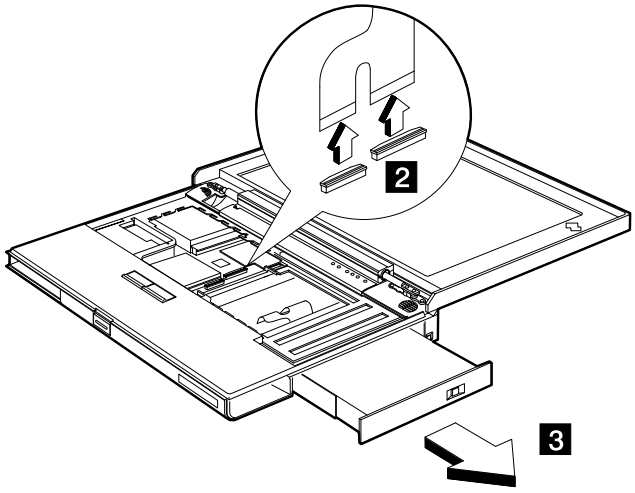
Important: When removing the module locks, pull them up at an angle. They cannot be removed when pulled straight up.

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.

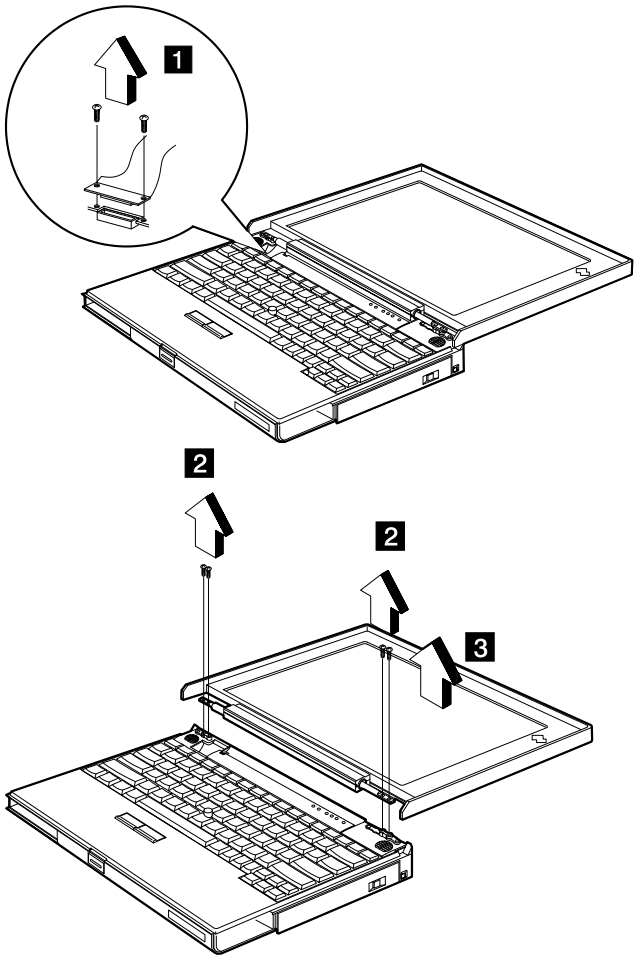


Caution: Do not push on the top surface of the CD-ROM drive.

9 LCD Removal and Replacement

- Hinge Covers (5)

9-1 LCD Display Module



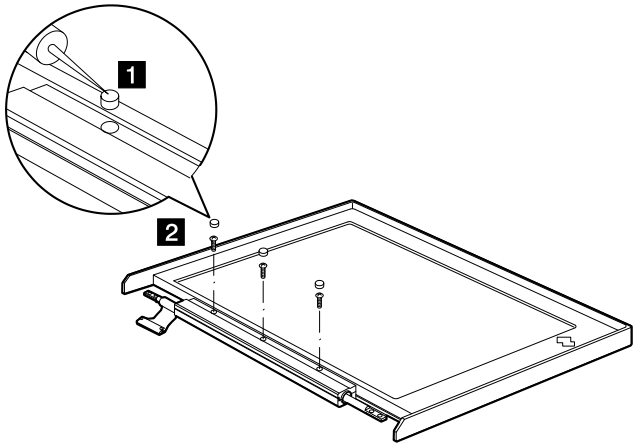
Step	Size (Quantity)	Head and Color	Memo
1	M2 x 5L (2)	Pan head, Yellow Zn	
2	M2.5 x 8L (4)	Pan head, silver	w/ nylock paste

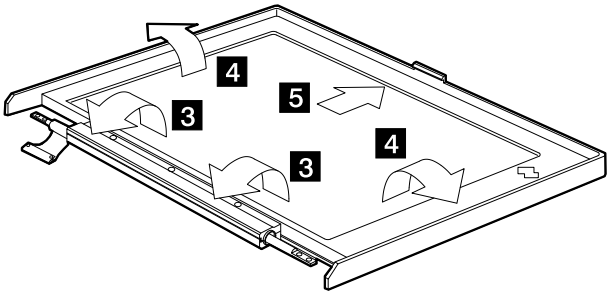
Note: Be sure to use the correct screw when replacing.

9-2 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.



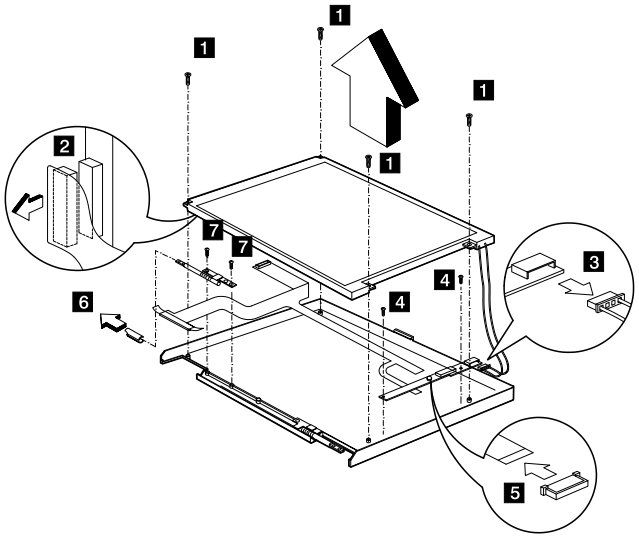


Step	Size (Quantity)	Head and Color	Memo
2	M2.5 x 6L (3)	Pan head, black	w/ nylock paste

Note: Be sure to use the correct screw when replacing.

9-3 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 35.



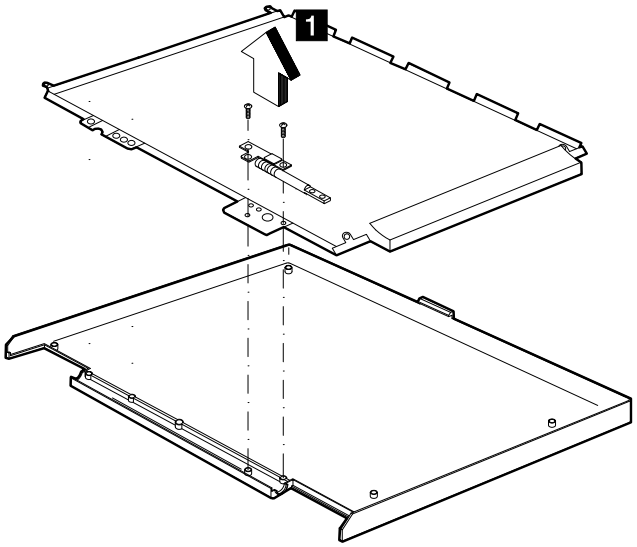
Removing Procedures:

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: Be sure to use the correct screw when replacing.

9-4 LCD Right Hinge and LCD Diaper



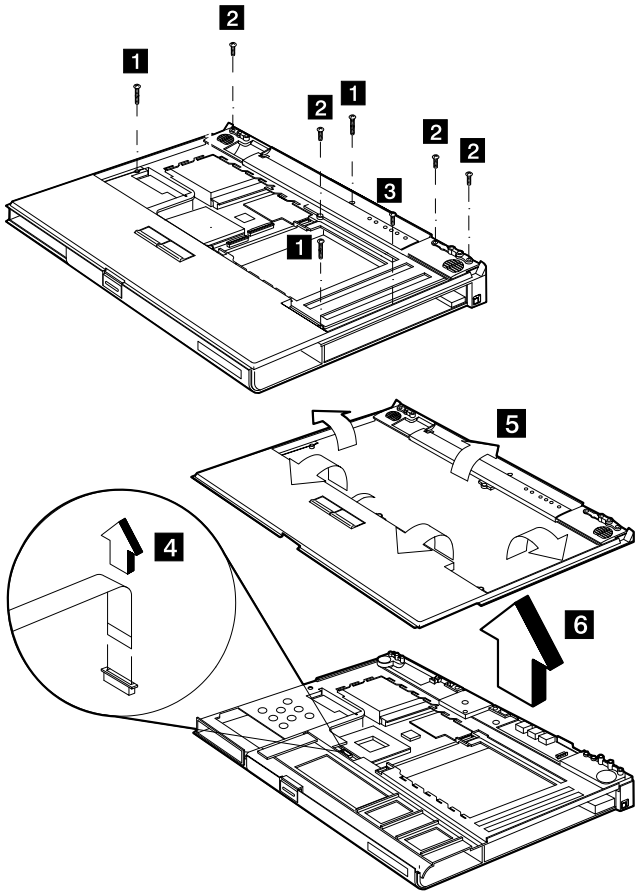
Step	Size (Quantity)	Head and Color	Memo
1	M2.5 x 6L (2)	Pan head, black	w/ nylock paste

Note: Be sure to use the correct screw when replacing.

10 Inside Assembly

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

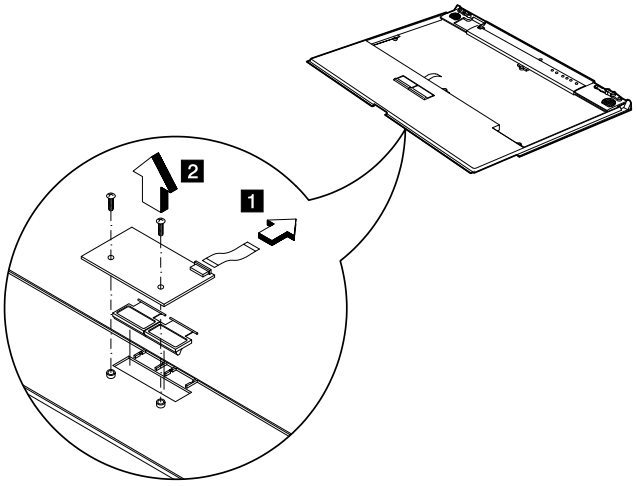
10-1 Upper Base



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: Be sure to use the correct screw when replacing.

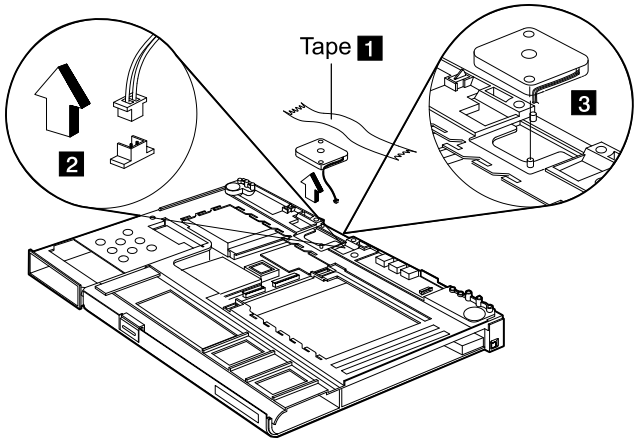
10-1A **TrackPoint Board, TrackPoint Button and TrackPoint Board FPC Cable**



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

Note: Be sure to use the correct screw when replacing.

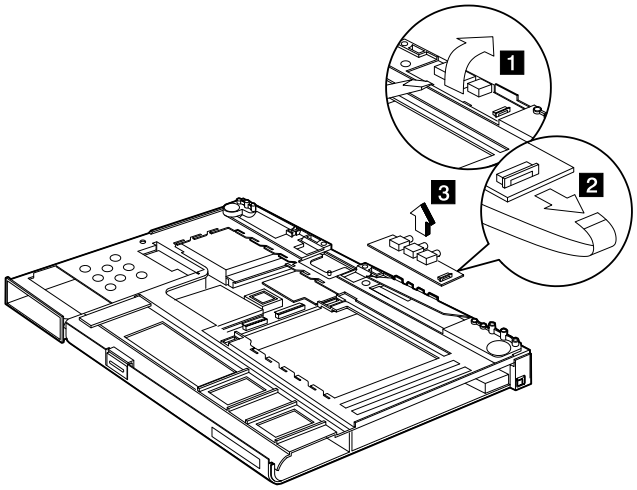
10-1B Fan



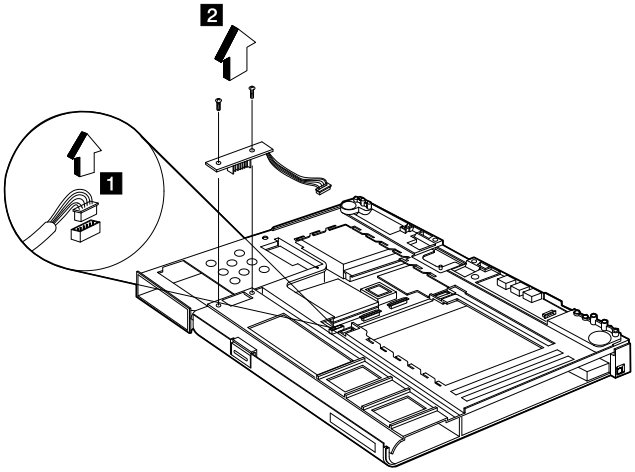
Note: The tape used to secure the fan is not ordinary tape, but a special tape with safety characteristics. This tape is part of the Mylar FRU.

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 as a result.

10-1C Audio Connector Board



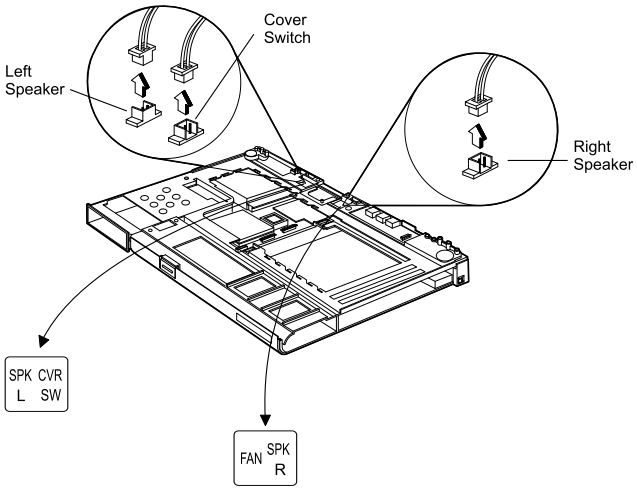
10-1D Battery Connector Board



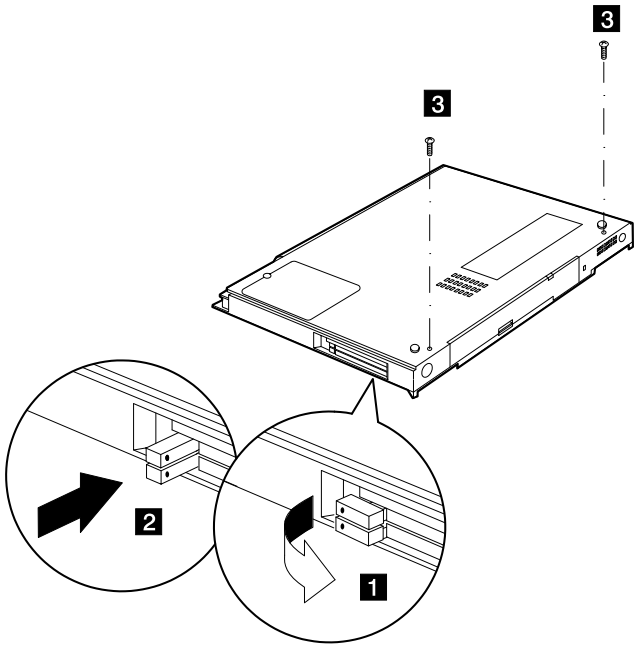
Step	Size (Quantity)	Head and Color	Memo
2	M2.5 x 6L (2)	Pan head, black	w/ nylock paste

Note: Be sure to use the correct screw when replacing.

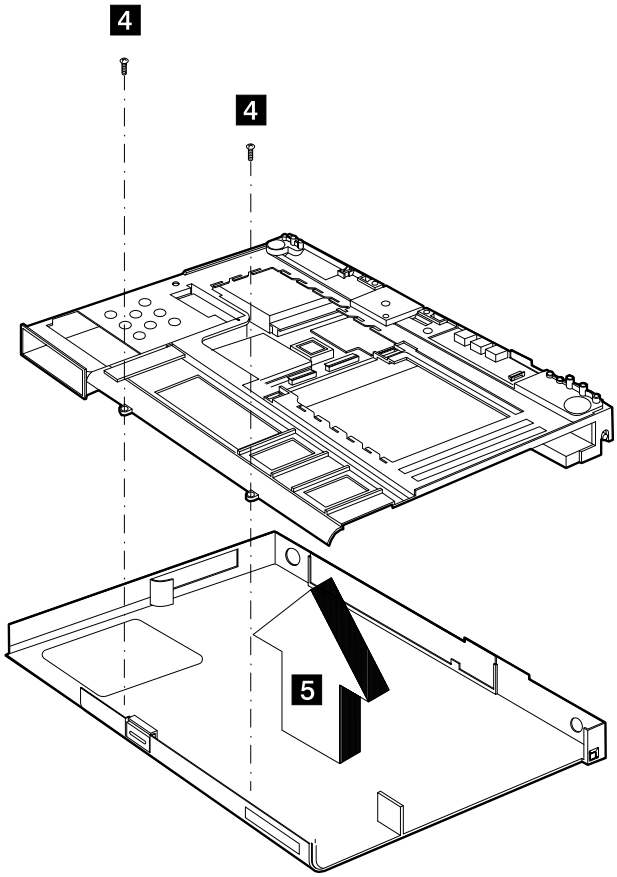
10-1E Speaker and Cover Switch Cables



10-2 Lower Base



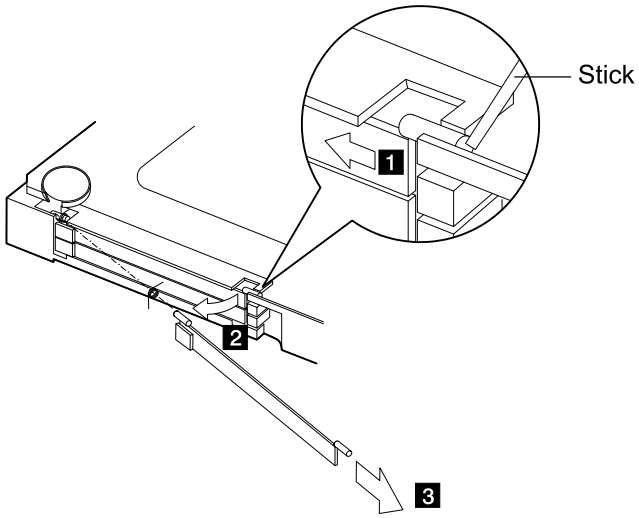
Important: To remove the chassis with the system board out of the lower base, the PCMCIA slot buttons should be upright then pushed in (1 → 2) before you begin this removal procedure.



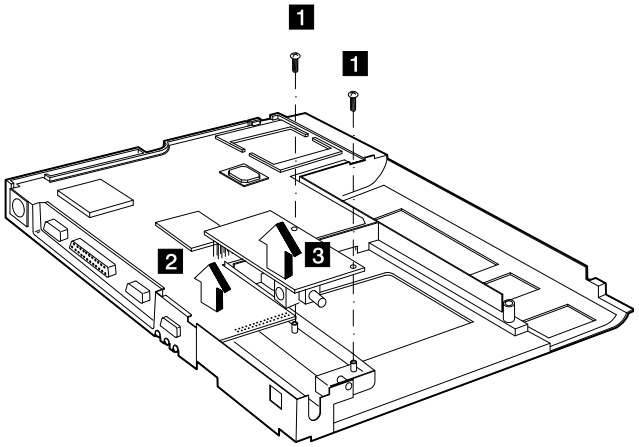
Step	Size (Quantity)	Head and Color	Memo
3	M2.5 x 6L (2)	Pan head, black	w/ nylock paste
4	M2 x 4L (2)	Pan head, silver	

Note: Be sure to use the correct screw when replacing.

10-2A PCMCIA Door and PCMCIA Door Spring



10-2B Charger Board

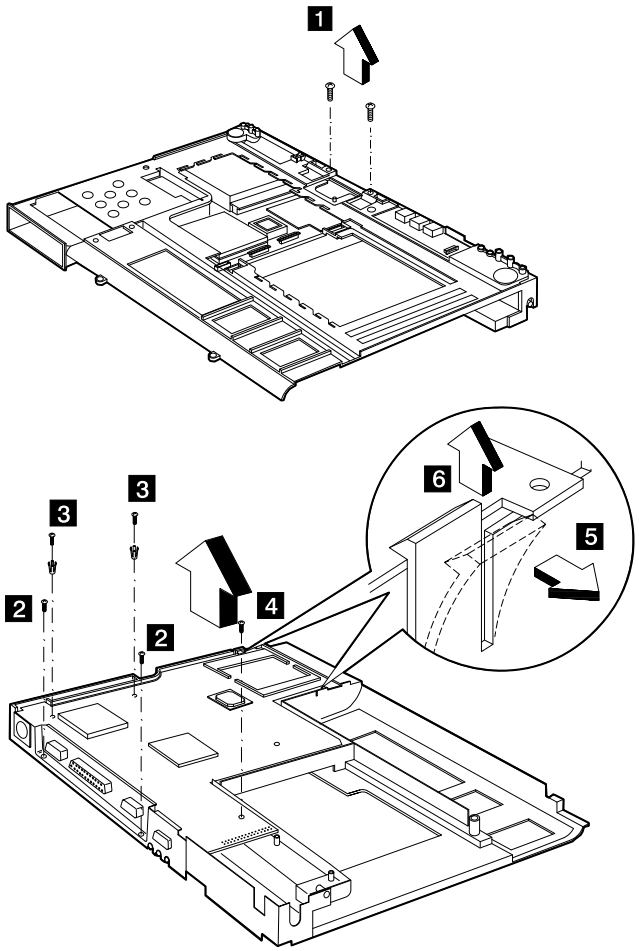


Step	Size (Quantity)	Head and Color	Memo
1	M2 x 4L (2)	Pan head, silver	

Note: Be sure to use the correct screw when replacing.

10-3 System Board

Important: After replacing the system board, follow the instructions in “Setting Thermal Sensor Threshold” on page 34.

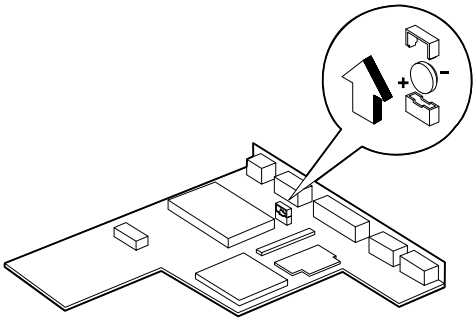


Step	Size (Quantity)	Head and Color	Memo
1	M2 x 4L (2)	Pan head, silver	
2	M2 x 4L (2)	Pan head, black	w/ nylock paste
3	M2 x 4L (2)	Pan head, silver	w/ brackets
4	M2 x 4L (1)	Pan head, silver	

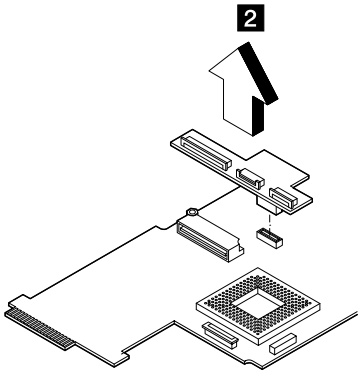
Note: Be sure to use the correct screw when replacing.

10-3A Backup Battery

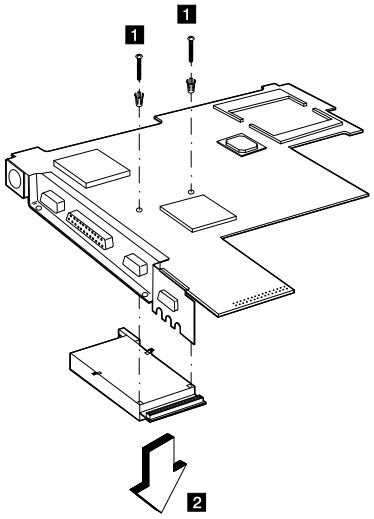
Warning: The backup battery is a lithium battery and can cause a fire, explosion, or severe burns. Do not charge it, heat it higher than 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use of an incorrect battery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



10-3B Keyboard Connector Board



10-3C PCMCIA Slot Assembly



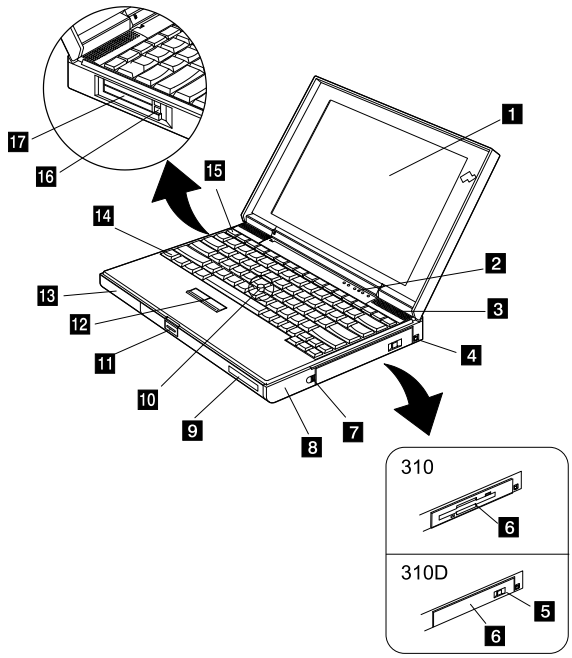
Step	Size (Quantity)	Head and Color	Memo
1	M2 x 14L (2)	Pan head, silver	w/ brackets

Note: Be sure to use the correct screw when replacing.

Locations

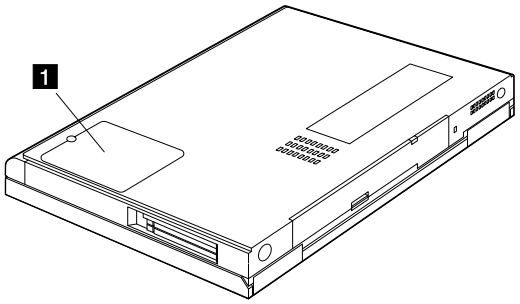
Front View

1 LCD
2 Indicator panel
3 Speakers
4 Power switch
5 CD-ROM eject button
6 CD-ROM drive (310D) or diskette drive (310)
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



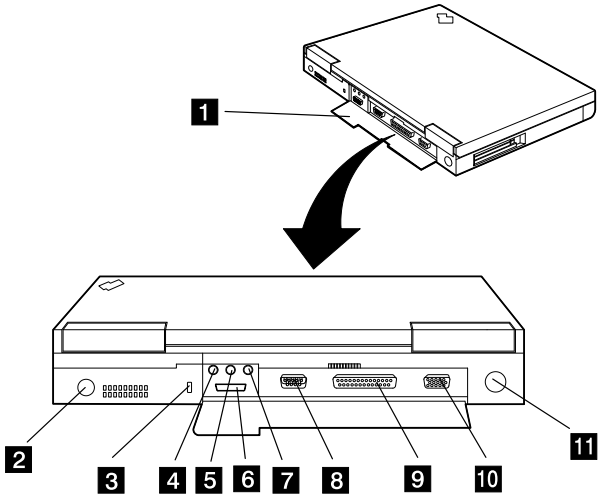
Bottom View

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

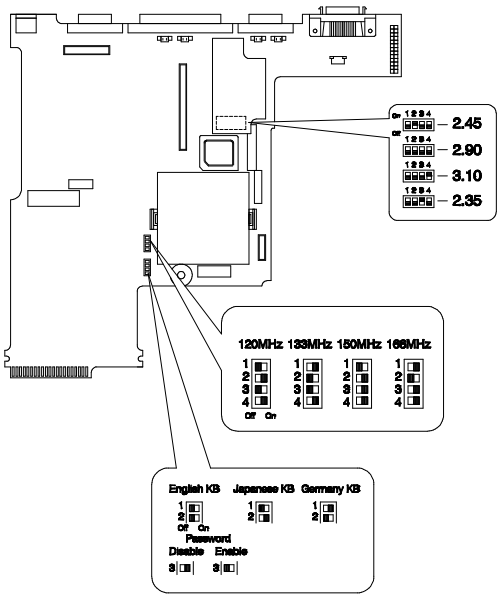
There are two switches on the system board.

- 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 for switch settings.



Note: Switch setting information continues on the following page.

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	120MHz	133MHz**	150MHz
Switch 1	Off	On	Off
Switch 2	On	Off	On
Switch 3	Off	Off	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

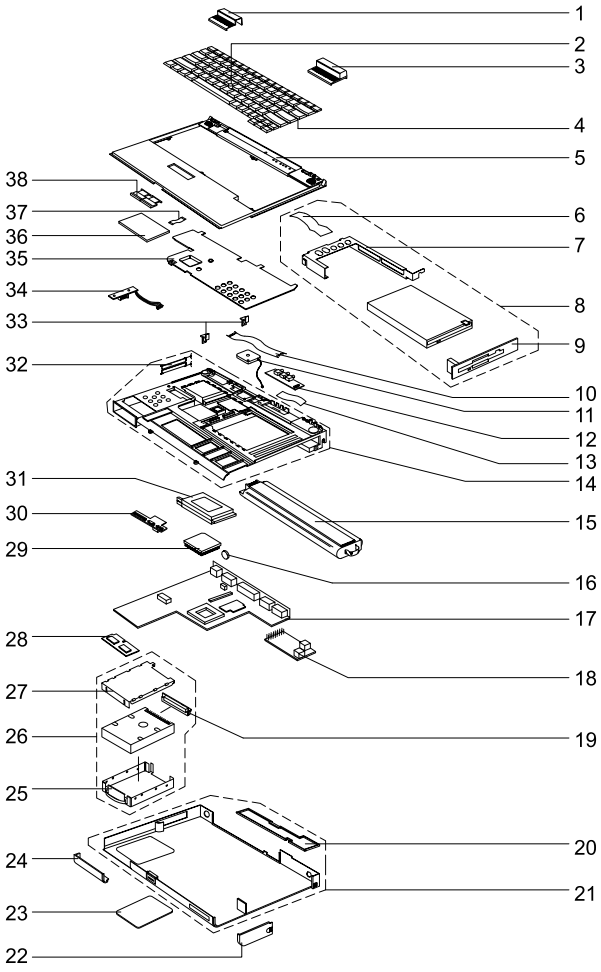
Password	ON	OFF
Switch 3	Bypass	Check

Reserved switch (SW2, Switch 4)

Reserved	ON	OFF
Switch 4	--	--

** Default setting
** Default setting

Parts Listing (310, 310D)

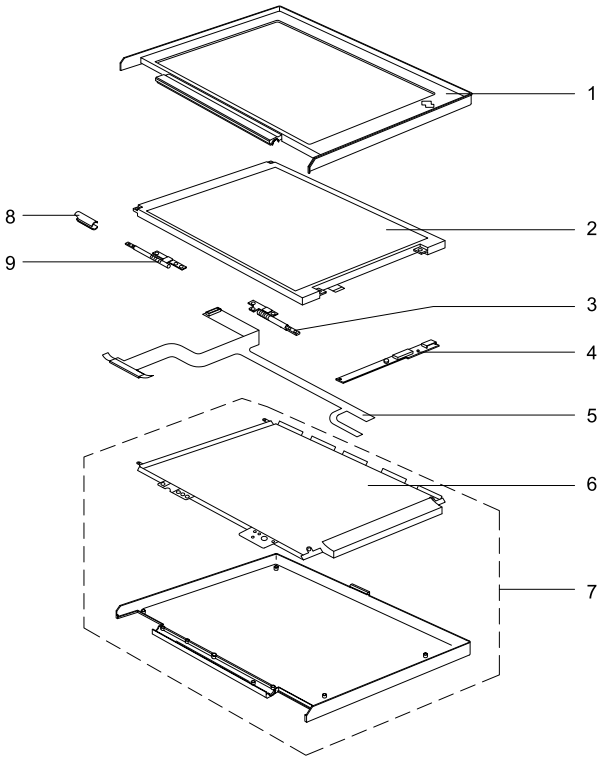


ThinkPad 310 model shown above.

No.	Description	FRU No.	Q'ty
1	Hinge cover (L)	12J0533	1
2	TrackPoint rubber cap	11J8620	2
3	Hinge cover (R)	12J0534	1
4	Keyboard (Japan) (with TrackPoint rubber cap)	11J8608	
	Keyboard (Germany) (with TrackPoint rubber cap)	11J8609	
	Keyboard (Slovakia) (with TrackPoint rubber cap)	12J0504	
	Keyboard (Portugal) (with TrackPoint rubber cap)	11J8622	
	Keyboard (Netherlands) (with TrackPoint rubber cap)	11J8612	
	Keyboard (Hungary) (with TrackPoint rubber cap)	12J0506	
	Keyboard (France) (with TrackPoint rubber cap)	11J8610	
	Keyboard (Italy) (with TrackPoint rubber cap)	11J8611	
	Keyboard (Czech) (with TrackPoint rubber cap)	12J0507	
	Keyboard (Russia) (with TrackPoint rubber cap)	12J0503	
	Keyboard (Spain) (with TrackPoint rubber cap)	11J8614	
	Keyboard (U.K.) (with TrackPoint rubber cap)	11J8607	
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
13	Audio connector board FPC cable	11J8585	
14	Chassis (with speaker, LCD cover switch, PCMCIA door and Mylar)	11J8566	1

No.	Description	FRU No.	Q'ty
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	1.08GB hard disk drive module (with upper and lower cover plates, connector board, Mylar and information label)	11J8624	1
	2.10 GB 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		
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		

LCD Unit Parts Listing (310/310D)



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		
7	11.3" DSTN LCD cover (with logo and LCD diaper)	11J8573	1
	11.3" TFT LCD cover (with logo and LCD diaper)	11J8574	1
8	See Miscellaneous/ Miscellaneous pack 2		
9	LCD hinge (L)	12J0527	1

Miscellaneous and Other Parts

Miscellaneous

Item	Description	FRU No.	Q'ty
Miscellaneous parts pack 1	Foot (long) Foot LCD screw cap	12J0515	2 2 6
Miscellaneous parts pack 2	PCMCIA door spring(U) PCMCIA door spring(L) PCMCIA door (U) PCMCIA door (L) LCD hinge cable cover Diskette Drive/CD-ROM latch	12J0516	5 5 2 2 2 2
Miscellaneous parts pack 3	TrackPoint button(L) TrackPoint button(R)	12J0517	1 1
Mylar pack	11.3" DSTN LCD diaper 11.3" TFT LCD diaper Hard disk drive module Mylar(outside) Fan tape	12J0514	1 1 10 10
Screw pack	M2 x 3L, Pan head, silver M2 x 4L, Flat head, black M2 x 4L, Pan head, silver M2 x 4L, Pan head, black, w/ nylock M2 x 6L, Flat head, black M2 x 6L, Pan head, silver M2 x 14L, Pan head, silver M2.5 x 6L, Pan head, black, w/ nylock M2.5 x 8L, Pan head, silver, w/ nylock M2.5 x 18L, Pan head, silver M3 x 6L, Bind head, silver Screw bracket	11J8580	5 5 5 5 5 5 5 10 5 5 5 10

Others

Description	FRU No.	Q'ty
AC adapter 45W (2 PIN) (with information label)	12J0536	1
AC adapter 45W (3 PIN) (with information label)	12J0537	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 (with information label)	11J8628	1

Tools and Diskettes

Description	FRU No.	Q'ty
Wrap plug (parallel/serial)	72X8546	1
PC test card	35G4703	1
ThinkPad 310/310D diagnostics diskette	12J1009	1
ThinkPad 310/310D maintenance utility diskette	12J1010	1

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