Dell™ Dimension™ 4600 Series Service Manual

Notes, Notices, and Cautions

NOTE: A NOTE indicates important information that helps you make better use of your computer.

NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

Abbreviations and Acronyms

For a complete list of abbreviations and acronyms, see the *Tell Me How* help file.

If you purchased a Dell™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

Advanced Troubleshooting

Dell™ Dimension™ 4600 Series Service Manual

- Diagnostic Lights
- Beep Codes
- System Messages

Diagnostic Lights

To help you troubleshoot a problem, your computer is equipped with four lights on the back panel labeled "A," "B," "C," and "D." These lights can be yellow or green. When the computer starts normally, the lights flash. After the computer starts, the lights remain green. If the computer malfunctions, the color and sequence of the lights identify the problem.

⚠️ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide*.**

Light Pattern	Problem Description	Suggested Resolution
⚪⚪⚪⚪ A B C D	The computer is in a normal off condition or a possible pre-BIOS failure has occurred.	Verify that the computer is plugged into a working electrical outlet and that you have pressed the power button.
🟡🟡🟡🟡 A B C D	Memory modules are detected, but a memory failure has occurred.	l If you have one memory module installed, reinstall it and restart the computer. l If you have two or more memory modules installed, remove the modules, reinstall one module, and then restart the computer. If the computer starts normally, reinstall an additional module. Continue until you have identified a faulty module or reinstalled all modules without error. l If available, install properly working memory of the same type into your computer. l If the problem persists, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.
🟡⚫🟡🟡 A B C D	A possible expansion card failure has occurred.	1. Determine if a conflict exists by removing a card (not the video card) and then restarting the computer. 2. If the problem persists, reinstall the card that you removed, remove a different card, and then restart the computer. 3. Repeat this process for each card. If the computer starts normally, troubleshoot the last card removed from the computer for resource conflicts (see "Resolving Software and Hardware Incompatibilities" in your *Owner's Manual*). 4. If the problem persists, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.
🟡🟢🟢🟢 A B C D	A possible video card failure has occurred.	l If the computer has a video card, remove the card and reinstall it, and restart the computer. l If the problem still exists, install a video card that you know works and restart the computer. l If the problem persists or the computer has integrated video, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.
🟡🟢🟢🟡 A B C D	A possible floppy or hard drive failure has occurred.	Reseat all power and data cables and restart the computer.
🟡🟢🟢🟡 A B C D	A possible USB failure has occurred.	Reinstall all USB devices, check cable connections, and then restart the computer.
🟢🟡🟡🟡 A B C D	No memory modules are detected.	l Reinstall all memory modules and restart the computer. l To eliminate the possibility of a faulty memory connector, remove all memory modules, reinstall one memory module at a time (if the computer supports a single module), and then restart the computer. If the computer starts normally, move the memory module to a different connector and restart the computer. Continue until you have identified a faulty connector or reinstalled all modules without error.
	Memory modules are detected, but a memory	l Ensure that there are no special memory module/memory connector placement requirements. l Verify that the memory modules that you are installing are compatible with your computer.
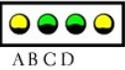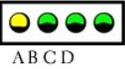
○●●● ABCD	configuration or compatibility error exists.	l If the problem persists, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.
●●○● ABCD	A possible expansion card failure has occurred.	1. Determine if a conflict exists by removing a card and then restarting the computer. 2. If the problem persists, reinstall the cards that you removed, remove a different card, and then restart the computer. 3. Repeat this process for each card. If the computer starts normally, troubleshoot the last card removed from the computer for resource conflicts (see "Resolving Software and Hardware Incompatibilities" in your *Owner's Manual*). 4. If the problem persists, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.
●●●○ ABCD	Other failure has occurred.	l Ensure that the cables are properly connected from the hard drive, CD drive, and DVD drive to the system board. l If there is an error message on your screen identifying a problem with a device (such as the floppy drive or hard drive), check the device to make sure it is functioning properly. l The operating system is attempting to boot from a device (such as the floppy drive or hard drive); check system setup to make sure the boot sequence is correct for the devices installed on your computer. l If the problem persists, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.
●●●● ABCD	The computer is in a normal operating condition after POST.	None.
○ = yellow ● = green ○ = off		

Beep Codes

Your computer might emit a series of beeps during start-up if the monitor cannot display errors or problems. This series of beeps, called a beep code, identifies a problem. One possible beep code (code 1-3-1) consists of one beep, a burst of three beeps, and then one beep. This beep code tells you that the computer encountered a memory problem.

Reseating the memory modules may fix the beep code errors in the following table. If the problem persists, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.

Code	Cause
1-3-1 through 2-4-4	Memory not being properly identified or used
4-3-1	Memory failure above address 0FFFFh

If you hear one of the following beep codes, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.

Code	Cause
1-1-2	Microprocessor register failure
1-1-3	NVRAM
1-1-4	ROM BIOS checksum failure
1-2-1	Programmable interval timer
1-2-2	DMA initialization failure
1-2-3	DMA page register read/write failure
3-1-1	Slave DMA register failure
3-1-2	Master DMA register failure
3-1-3	Master interrupt mask register failure
3-1-4	Slave interrupt mask register failure
3-2-2	Interrupt vector loading failure
3-2-4	Keyboard Controller Test failure
3-3-1	NVRAM power loss
3-3-2	NVRAM configuration
3-3-4	Video Memory Test failure

3-4-1	Screen initialization failure
3-4-2	Screen retrace failure
3-4-3	Search for video ROM failure
4-2-1	No time tick
4-2-2	Shutdown failure
4-2-3	Gate A20 failure
4-2-4	Unexpected interrupt in protected mode
4-3-3	Timer-chip counter 2 failure
4-3-4	Time-of-day clock stopped
4-4-1	Serial or parallel port test failure
4-4-4	Cache test failure

System Messages

NOTE: If the message you received is not listed in the table, see the documentation for either the operating system or the program that was running when the message appeared.

Message	Possible Cause	Corrective Action
8042 Gate-A20 error	The keyboard controller failed its test.	If you receive this message after you make changes in system setup, enter system setup and restore the original value(s).
Address Line Short!	An error in the address decoding circuitry in the memory has occurred.	Reseat the memory modules.
C: Drive Error C: Drive Failure	The hard drive is not working or is not configured correctly.	Ensure that the drive is installed correctly in the computer and defined correctly in system setup.
Cache Memory Bad, Do Not Enable Cache	The cache memory is not operating.	See "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.
CH-2 Timer Error	An error is occurring on the timer on the system board.	See "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.
CMOS Battery State Low CMOS Checksum Failure CMOS System Options Not Set CMOS Display Type Mismatch CMOS Memory Size Mismatch CMOS Time and Date Not Set	The system configuration information in system setup is incorrect or the battery charge may be low.	Enter system setup, verify the system configuration, and then restart the computer.
Diskette Boot Failure	Drive A or B is present but has failed the BIOS POST.	Ensure that the drive is installed correctly in the computer and defined correctly in system setup. Check the interface cable at both ends.
DMA Error DMA 1 Error DMA 2 Error	Error in the DMA controller on the system board.	The keyboard or system board may need to be replaced.
FDD Controller Failure HDD Controller Failure	The BIOS cannot communicate with the floppy drive or hard drive controller.	Ensure that the floppy drive or the hard drive is installed correctly in the computer and defined correctly in system setup. Check the interface cable at both ends.
INTR1 Error INTR2 Error	An interrupt channel on the system board failed to POST.	The keyboard or system board may need to be replaced.
Invalid Boot Diskette	The operating system cannot be located on drive A or drive C.	Enter system setup and confirm that drive A or drive C is properly identified.
Keyboard Error	The BIOS has detected a stuck key.	Ensure that nothing is resting on the keyboard; if a key appears to be stuck, carefully pry it up. If the problem persists, you may need to replace the keyboard.
KB/Interface Error	An error occurred with the keyboard connector.	Ensure that nothing is resting on the keyboard; if a key appears to be stuck, carefully pry it up. If the problem persists, you may need to replace the keyboard.
No ROM Basic	The operating system cannot be located on drive A or drive C.	Enter system setup and confirm that drive A or drive C is properly identified.

Before You Begin

Dell™ Dimension™ 4600 Series Service Manual

- Getting Started
- Recommended Tools
- Shutting Down Your Computer

Getting Started

This section provides procedures for removing and installing the components in your computer. Unless otherwise noted, each procedure assumes that the following conditions exist:

- l You have performed the steps in "Shutting Down Your Computer."

- l You have read the safety information in your *Owner's Manual*.

Recommended Tools

The procedures in this document may require the following tools:

- l Small flat-blade screwdriver

- l Phillips screwdriver

- l Flash BIOS update program floppy disk or CD

Shutting Down Your Computer

Use the following safety guidelines to help protect your computer from potential damage and to ensure your own personal safety.

⚠️ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide.***

🚫 **NOTICE:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

🚫 **NOTICE:** Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

🚫 **NOTICE:** When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

🚫 **NOTICE:** To avoid damaging the computer, perform the following steps before you begin working inside the computer.

1. Shut down the computer.

2. Ensure that the computer and any attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your computer, press and hold the power button for 4 seconds.

🚫 **NOTICE:** To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network wall jack.

3. Disconnect any telephone or telecommunication lines from the computer.

4. Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.

⚠️ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

5. Remove the computer cover.

🚫 **NOTICE:** Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

Back to Contents Page

Replacing the Computer Cover

Dell™ Dimension™ 4600 Series Service Manual

1. Ensure that all cables are connected, and fold cables out of the way.

2. Ensure that no tools or extra parts are left inside the computer.

3. Place the cover on the computer.

4. Slide the cover towards the front of the computer until it fits completely into place.

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

5. Connect your computer and devices to electrical outlets, and turn them on.

Removing the Computer Cover

Dell™ Dimension™ 4600 Series Service Manual

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your** *Owner's Manual* **or** *Product Information Guide.*

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

1. Follow the procedures in "Before You Begin."

2. Lay your computer on its side with the computer cover facing up.

3. If your computer cover has a cover latch, slide and hold the cover latch.

4. Grip the indents on the computer cover, and slide the computer cover toward the back of the computer

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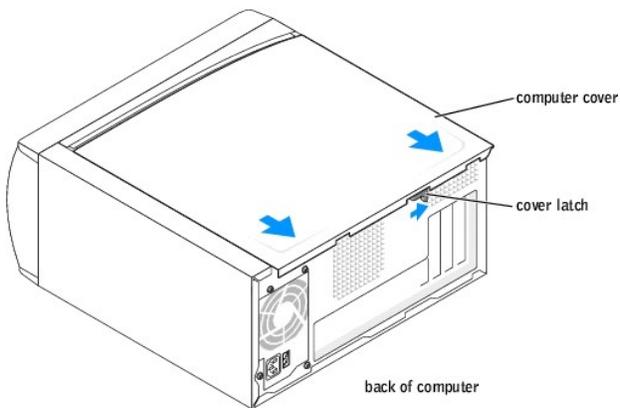
5. Place the computer cover on a level surface.

Removing and Installing Parts
Dell™ Dimension™ 4600 Series Service Manual

- PCI Cards
- AGP Card
- Memory
- Front Panel
- Drives

- Microprocessor
- Fan Assembly
- System Board
- Power Supply
- Battery

PCI Cards

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide*.**

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

1. Follow the procedures in "Before You Begin."

2. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.

3. Unscrew and remove the filler bracket for the card slot you want to use.
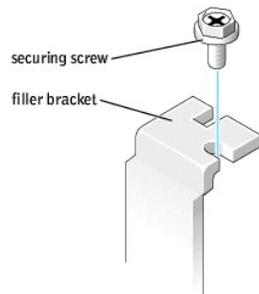
⚠ **CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.**

4. Align the cutout on the bottom of the card with the crossbar in the system board connector. Gently rock the card into the connector until it is fully seated.
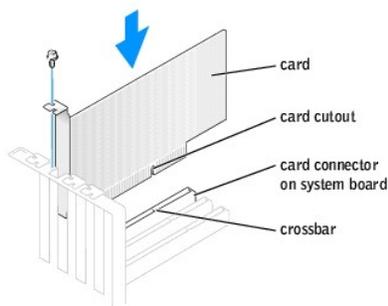
Ensure that the card is fully seated and that its bracket is within the card slot.

not fully seated card
fully seated card
bracket within slot
bracket caught outside of slot
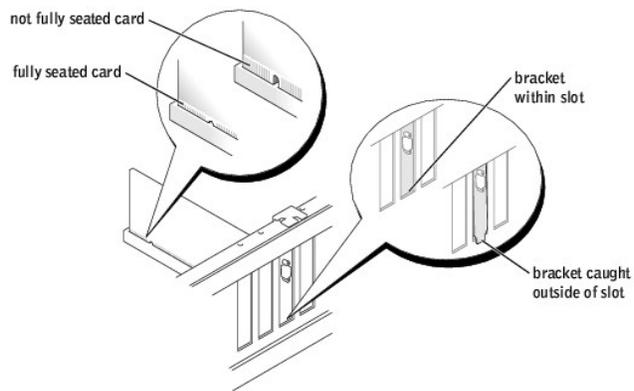
5. Secure the filler bracket onto the end of the card with the screw you removed in step 3.

6. Connect any cables that should be attached to the card.

See the documentation for the card for information about the card's cable connections.

⊖ **NOTICE:** Do not route card cables over or behind the cards. Cables routed over the cards can cause damage to the equipment.

7. Replace the computer cover.

⊖ **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

8. Connect your computer and devices to electrical outlets, and turn them on.

9. Install any drivers required for the card as described in the card documentation.

AGP Card

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide*.**

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

Your Dell™ computer provides a connector for an AGP card.

1. Follow the procedures in "Before You Begin."

2. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.

Removing an AGP Card

1. Press the card lever toward the PCI connector.

2. Pull the card up and out of the card clip.

notch
lever
tab
card clip
AGP connector
PCI connector
back of computer
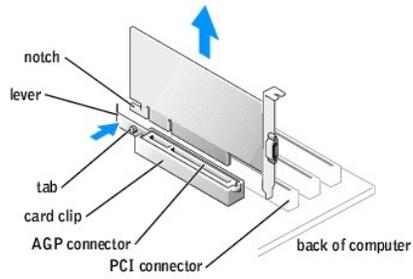
Installing an AGP Card

1. To add or replace the card, press the card lever toward the PCI connector and gently press the card into the AGP connector until it clicks into place.

AGP card
card clip
lever
card clip
slot connector
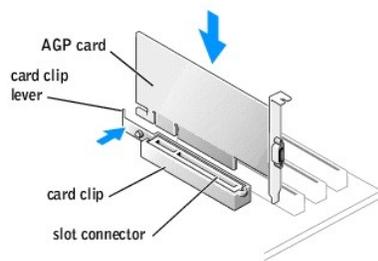
2. Release the card lever, ensuring that the tab fits into the notch on the front end of the card.

3. Secure the card with the securing screw.

securing screw
filler bracket
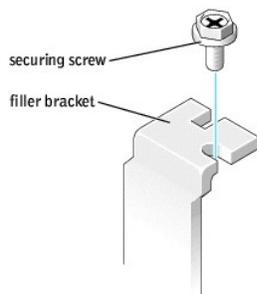
4. If your computer did not previously have an AGP card installed, move the monitor cable to the VGA connector on the new card.

5. Replace the computer cover.

⊘ **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

6. Connect your computer and devices to electrical outlets, and turn them on.

Memory

You can increase your computer memory by installing memory modules on the system board. For information on the type of memory supported by your computer, see "Memory."

✏ **NOTE:** DDR 333 memory operates at 320 MHz when used with an 800-MHz front-side bus.

DDR Memory Overview

DDR memory modules should be installed in *pairs of matched memory size.* This means that if you purchased your computer with 128 MB of memory installed and you want to add another 128 MB of memory, you should install it in the appropriate connector. If the DDR memory modules are not installed in matched pairs, the computer will continue to operate, but with a slight reduction in performance.

NOTE: Always install DDR memory modules in the order indicated on the system board.

The recommended memory configurations are:

l   Install a pair of matched memory modules in connectors DIMM1 and DIMM2.

   or

l   Install a pair of matched memory modules in connectors DIMM1 and DIMM2 and another matched pair in connectors DIMM3 and DIMM4.

l   Do not install ECC memory modules.

l   If you install mixed pairs PC2700 (DDR 333-MHz) and PC3200 (DDR 400-MHz) memory, the modules function at the slowest speed installed.

l   Be sure to install a single memory module in DIMM 1 or the connector closest to the processor before you install modules in the other connectors.

Memory Installation Guidelines

matched pair of memory modules
in connectors DIMM1 and DIMM2

matched pair of memory modules
in connectors DIMM3 and DIMM4
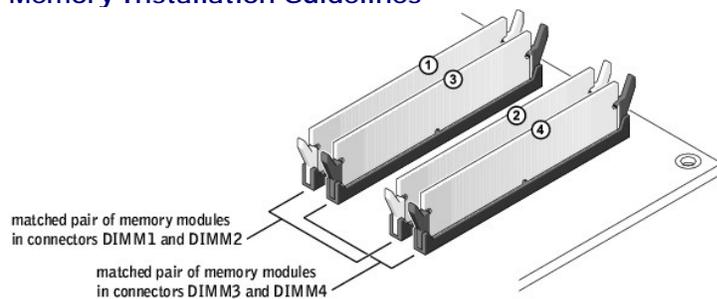
NOTICE: If you remove your original memory modules from the computer during a memory upgrade, keep them separate from any new modules that you may have, even if you purchased the new modules from Dell. You should install your original memory modules in pairs either in connectors DIMM1 and DIMM2 or connectors DIMM3 and DIMM4. If possible, *do not* pair an original memory module with a new memory module. Otherwise, your computer may not function at optimal performance.

NOTE: Memory purchased from Dell is covered under your computer warranty.

Installing Memory

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide.***

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

1.   Follow the procedures in "Before You Begin."

2.   Lay the computer on its side so that the system board is on the bottom of the inside of the computer.

NOTE: For easier access to the memory modules, remove the AGP card first.

3.   If necessary, remove a memory module:

   a.   Press out the securing clip at each end of the memory module connector.

   b.   Grasp the module and pull up.

If the module is difficult to remove, gently ease the module back and forth to remove it from the connector.

4. To insert a module, press out the securing clip at each end of the memory module connector.
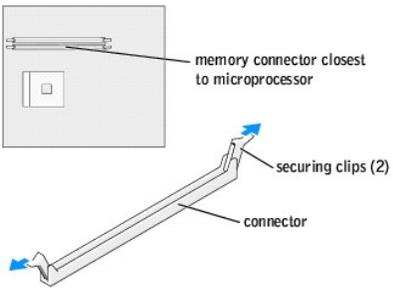
5. Align the notch on the bottom of the module with the crossbar in the connector.
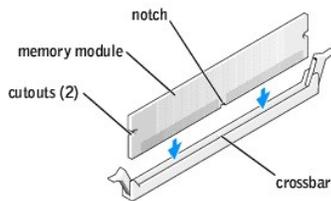
⊖ **NOTICE:** To avoid breaking the memory module, do not press near the middle of the module.

6. Insert the module straight down into the connector, ensuring that it fits into the vertical guides at each end of the connector. Press firmly on the ends of the module until it snaps into place.

If you insert the module correctly, the securing clips snap into the cutouts at each end of the module.
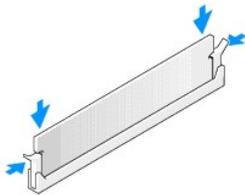
7. Replace the computer cover.

⊖ **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

8. Connect your computer and devices to electrical outlets, and then turn them on.

9. Click the **Start** button, right-click **My Computer**, and then click **Properties**.

10. Click the **General** tab.

11. To verify that the memory is installed correctly, check the amount of memory (RAM) listed.

Front Panel

Removing the Front Panel

⚠️ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide.***

⚠️ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

1. Follow the procedures in "Before You Begin."

2. Release and remove the front panel:

    a. Push the release lever to release the top tab.

    b. Reach inside the computer and push the bottom tab towards you to release it (the middle tab releases automatically).

    c. Rotate the front panel to separate it from the side hinges.
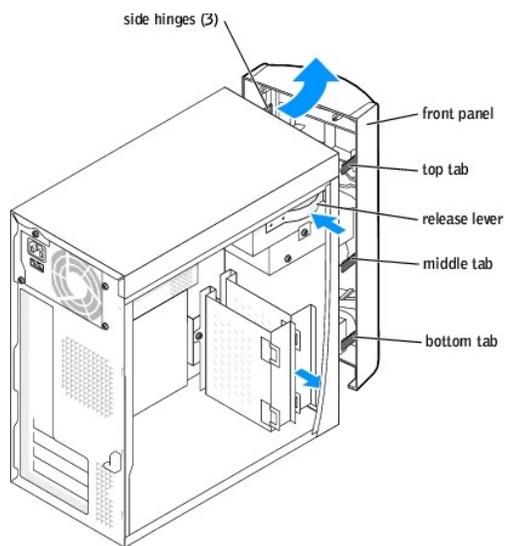
Replacing the Front Panel

To replace the front panel, attach the side hinges and then rotate the front panel until it snaps onto the front of the computer.

side hinges (3)
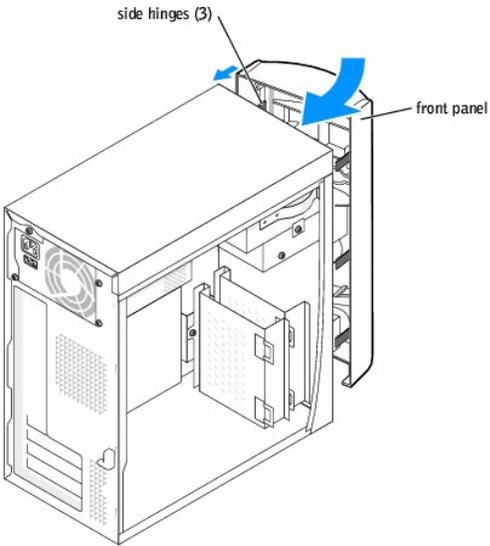
front panel

Removing the Front-Panel Insert

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide*.**

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

1. Follow the procedures in "Before You Begin."

2. Remove the front panel.

3. Pull the two front-panel tabs towards you, and then push out the front-panel insert.

insert

tabs
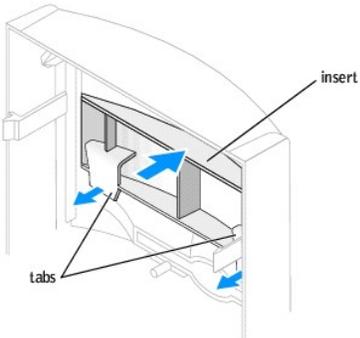
Drives

✍ **NOTE:** See "Boot Sequence" for instructions on booting to a different device, such as a floppy drive.

Replacing a Hard Drive

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide*.**

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

⊖ **NOTICE:** To avoid damage to the drive, do not set it on a hard surface. Instead, set the drive on a soft surface, such as a foam pad, that will sufficiently cushion it.

1. Follow the procedures in "Before You Begin."

2. Remove the hard drive:

   a. Disconnect the power and hard-drive cables from the drive.

   b. Remove the two bracket-securing screws, and then remove the drive bracket from the computer.

   c. Remove the three hard drive-securing screws, and then remove the hard drive from the bracket.
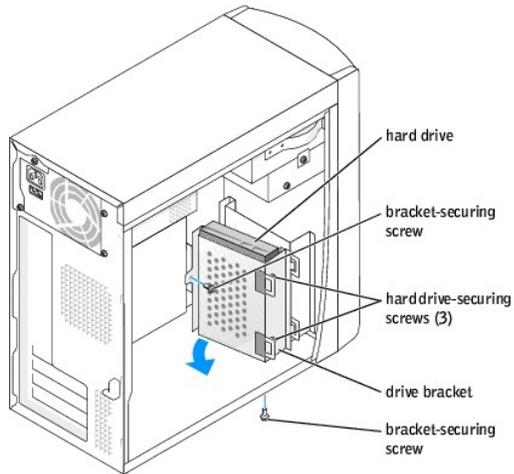
⊖ **NOTICE:** Ground yourself by touching an unpainted metal surface on the back of the computer.

⊖ **NOTICE:** When you unpack the drive, do not set it on a hard surface, which may damage the drive. Instead, set the drive on a soft surface, such as a foam pad, that will sufficiently cushion it.

3. Unpack the replacement hard drive.

4. Check the jumper setting on the back of the replacement drive.

   Ensure that the jumper setting on the new device is set for "cable select" (see the documentation that came with the drive for information).

5. Install the hard drive:

   a. Place the hard drive in the bracket so that all three screw-hole tabs insert into the three screw holes on the hard drive.

   b. Secure the drive to the bracket with the screws that you removed in step 2.

   c. Install the bracket into the computer with the two bracket-securing screws that you removed in step 2.

hard drive
bracket tabs (2)
drive slots (2)
bracket-securing screw
drive bracket
bracket-securing screw
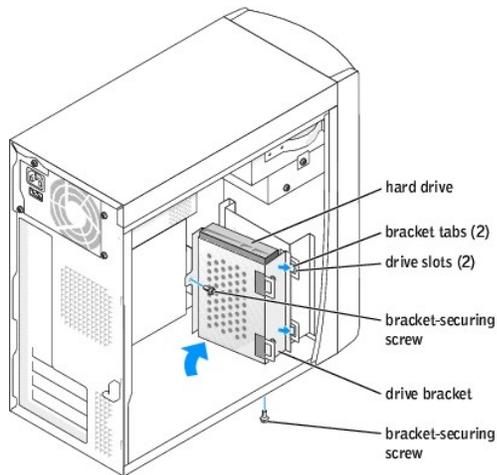
🛇 **NOTICE:** Match the colored strip on the cable with pin 1 on the drive (pin 1 is marked as "1").

6. Connect the power and data cables to the back of the replacement drive.

7. Replace the computer cover.

🛇 **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

8. Connect your computer and devices to electrical outlets, and turn them on.

9. See the documentation that came with the drive for instructions on installing any software required for drive operation.

Adding or Replacing a Second Hard Drive

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide.***

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

🛇 **NOTICE:** To avoid damage to the drive, do not set it on a hard surface. Instead, set the drive on a soft surface, such as a foam pad, that will sufficiently cushion it.

1. Follow the procedures in "Before You Begin."

2. Remove the existing hard drive.

3. Remove the additional hard drive bracket from the computer:

   a. Remove the bracket-securing screws for the additional drive.

   b. Remove the bracket for the additional drive from the computer.

4. If you are replacing the additional hard drive, remove the drive from the bracket:

   a. Remove the hard drive-securing screws.

   b. Remove the hard drive from the bracket.
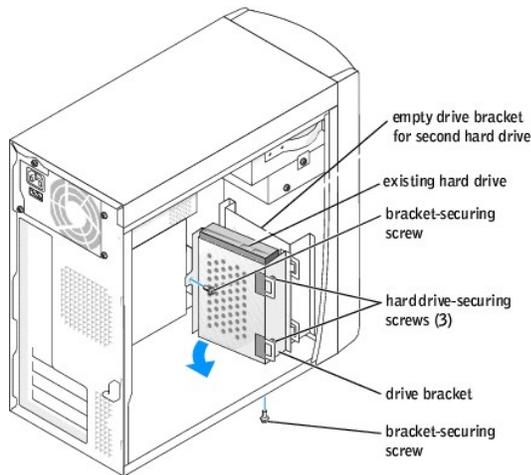
empty drive bracket
for second hard drive

existing hard drive

bracket-securing
screw

hard drive-securing
screws (3)

drive bracket

bracket-securing
screw

🔴 **NOTICE:** Ground yourself by touching an unpainted metal surface on the back of the computer.

🔴 **NOTICE:** When you unpack the drive, do not set it on a hard surface, which may damage the drive. Instead, set the drive on a soft surface, such as a foam pad, that will sufficiently cushion it.

5. Unpack the additional hard drive.

6. Check the jumper setting on the back of the second drive.

    Ensure that the jumper setting on the new device is set for "cable select" (see the documentation that came with the drive for information).

7. Install the additional hard drive:

    a. Insert hard-drive securing screws.

    b. Place the two bracket tabs into the drive slots inside the computer's front panel.

    c. Swing the bracket forward so that it is flush with the computer's front panel.

    d. Replace the bracket-securing screws.

---

second hard drive

bracket tabs (2)

drive slots (2)

bracket-securing
screw

drive bracket

bracket-securing
screw

---
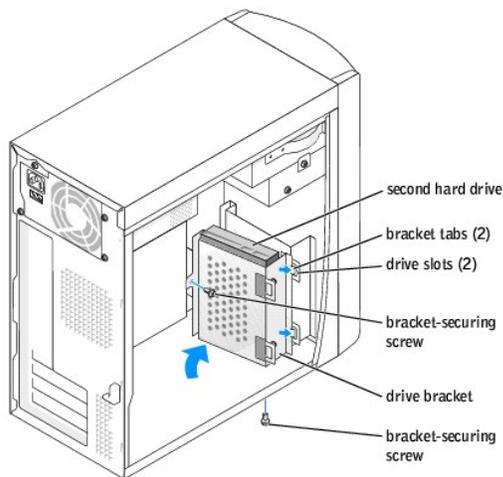
8. Reinstall the existing hard drive into the computer.

🔴 **NOTICE:** Match the colored strip on the cable with pin 1 on the drive (pin 1 is marked as "1").

9. Connect the power and data cables to the back of the drives.

10. Replace the computer cover.

⊘ **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

11. Connect your computer and devices to electrical outlets, and turn them on.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

Adding a Floppy Drive

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your** *Owner's Manual* **or** *Product Information Guide.*

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

1. Follow the procedures in "Before You Begin."

2. Release and remove the front panel.

3. Press in the two insert tabs, and then push out the front-panel insert.
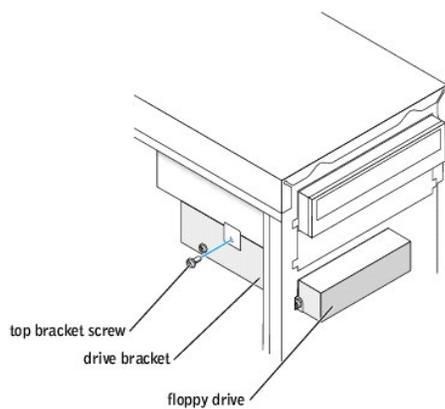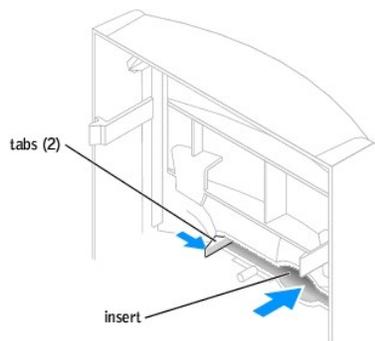
4. Connect the floppy-drive power cable to the back of the drive.

⊘ **NOTICE:** Match the colored strip on the cable with pin 1 on the drive (pin 1 is marked as "1").

5. Connect the data cable to the back of the drive and to the floppy drive connector on the system board.

6. Position the top of the floppy drive bracket so that it is completely flush with the bottom of the upper drive bay, and then slide the floppy drive bracket

forward into position.

NOTE: The top of the floppy drive bracket has two slots that fit into two clips on the bottom of the upper drive bay. When the floppy drive bracket is properly mounted, it remains in place without support.

7. Secure the floppy drive bracket with the top bracket screw that came with your drive.

8. Reattach the front panel to the side hinges, and then rotate it until it snaps onto the front of the computer.
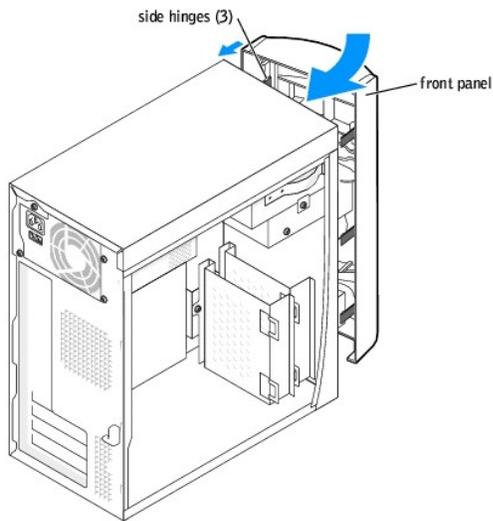
9. Check all cable connections, and fold cables out of the way to provide airflow for the fan and cooling vents.

10. Replace the computer cover.

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

11. Connect your computer and devices to electrical outlets, and turn them on.

12. After you turn on your computer, press <F2> when you are prompted to enter setup mode.

13. Highlight **Drive Configuration** and press <Enter>.

14. Use the left- and right- arrows to change Diskette Drive A from **Not Installed** to **3.5 inch, 1.44MB**.

15. Press <Enter>.

16. Highlight Integrated Devices (LegacySelect Options) and press <Enter>.

17. Make sure that the Diskette Interface entry is set to Auto. If necessary, use the left- and right- arrows to set it to Auto.

18. Press <Enter>.

19. Press <Esc>.

20. Press <Enter> to save changes and exit.

The computer restarts.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

Adding a Second CD or DVD Drive

CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide.*

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

1. Follow the procedures in "Before You Begin."

NOTE: Drives sold by Dell come with their own operating software and documentation. After you install a drive, see the documentation that came with the drive for instructions on installing and using the drive software.

2. Release and remove the front panel.

3. Pull the two front-panel tabs towards you, and then push out the front-panel insert.
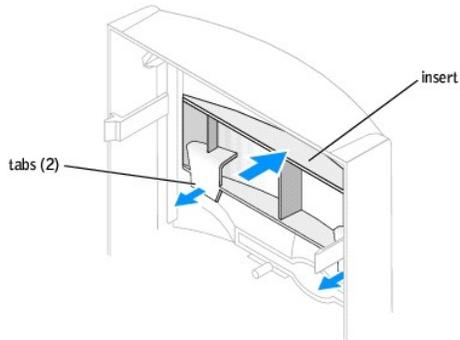
4. Ensure that the jumper setting on the new drive is set for "cable select" (see the documentation that came with the drive for information).

5. Remove two extra alignment screws, shown in the following figure, from the front of the computer and insert them into the drive.
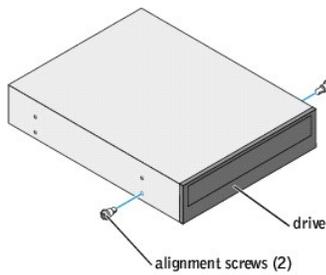
NOTE: Some computers come with only two extra alignment screws; others come with four. You only need two alignment screws for this procedure.

6. Gently slide the drive into place.
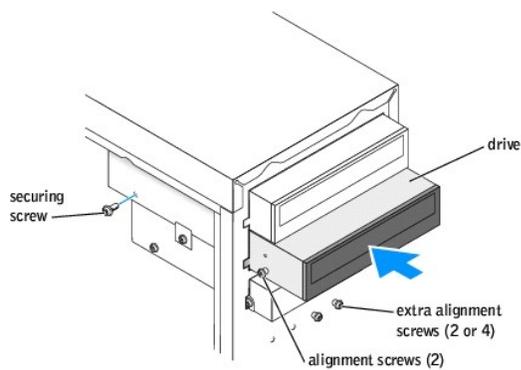
7. Once the drive is in place, apply pressure to ensure that the drive is fully seated.

8. Use the securing screw that came with the drive to attach the drive to the computer.

NOTICE: Match the colored strip on the cable with pin 1 on the drive (pin 1 is marked as "1").

9. Connect the power cable to the system board.

10. Locate the data cable from the CD or DVD drive in the upper drive bay and connect its middle data connector to the new drive.

11. Check all cable connections, and then fold the cables out of the way to provide airflow for the fan and cooling vents.

12. Reattach the front panel to the side hinges, and then rotate it until it snaps onto the front of the computer.
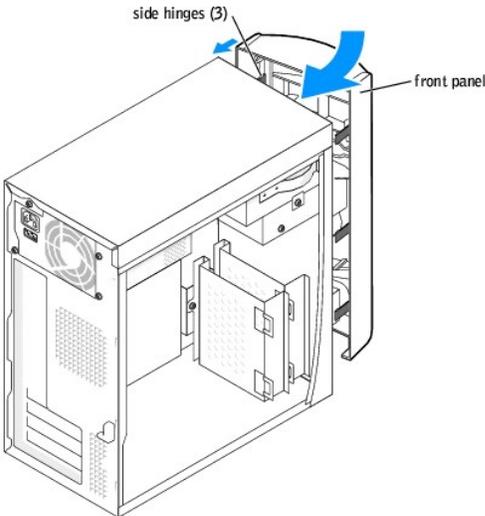
13. Replace the computer cover.

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

14. Connect your computer and devices to electrical outlets, and then turn them on.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

Microprocessor

Removing the Microprocessor

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide*.**

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

1. Follow the procedures in "Before You Begin."

2. Disconnect the cooling fan power cable from the fan connector (J1F1) on the system board.

3. Disconnect the power cable from the microprocessor power connector (J5B1) on the system board.

4. Lift the air shroud to disengage the anchors and then rotate the shroud up.
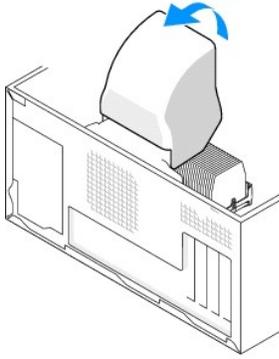
⚠ **CAUTION: The heat sink can get very hot during normal operation. Be sure that the heat sink has had sufficient time to cool before you touch it.**

5. Remove the microprocessor heat sink:

   a. Twist the heat sink from side to side to break the seal.

   a. Remove the retention module clip by pressing in on the tab and lifting the retention module clip up.

   b. Pull the release tab out until the heat sink is released.

   c. Lift the heat sink away from the microprocessor.
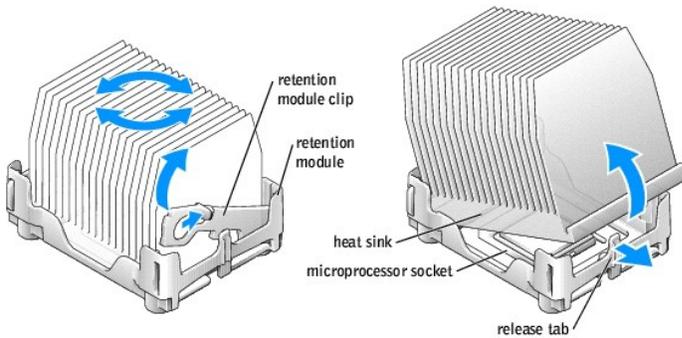
🔘 **NOTICE:** Lay the heat sink down with the thermal grease facing upward.

🔘 **NOTICE:** If you are installing a microprocessor upgrade kit from Dell, discard the original heat sink. If you are *not* installing a microprocessor upgrade kit from Dell, reuse the original heat sink when you install your new microprocessor.

🔘 **NOTICE:** Be careful not to bend any of the pins when you remove the microprocessor from the socket. Bending the pins can permanently damage the microprocessor.

6. Remove the microprocessor from the socket.

   Leave the release lever extended in the release position so that the socket is ready for the new microprocessor.
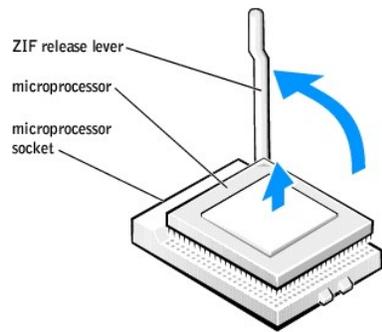
Installing the Microprocessor

⬤ **NOTICE:** Ground yourself by touching an unpainted metal surface on the back of the computer.

⬤ **NOTICE:** Be careful not to bend any of the pins when you unpack the microprocessor. Bending the pins can permanently damage the microprocessor. If any of the pins on the microprocessor appears to be bent, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.

1. Unpack the new microprocessor.

⬤ **NOTICE:** You must position the microprocessor correctly in the socket to avoid permanent damage to the microprocessor and the computer when you turn on the computer.

2. If the release lever on the socket is not fully extended, move it to that position.

3. Align the pin-1 corners of the microprocessor and socket.
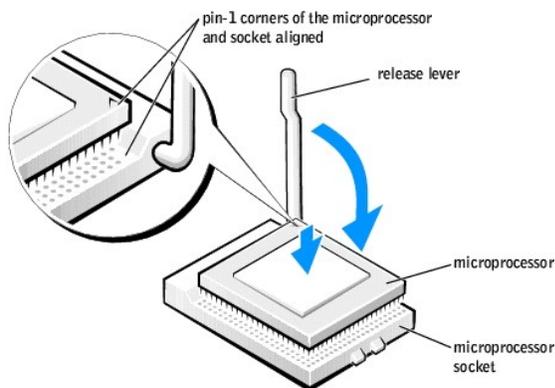
⬤ **NOTICE:** When you place the microprocessor in the socket, ensure that all of the pins fit into the corresponding holes on the socket.

4. Set the microprocessor lightly in the socket and ensure that all pins are headed into the correct holes. Do not use force, which could bend the pins if the microprocessor is misaligned. When the microprocessor is positioned correctly, press it with minimal pressure to seat it.

5. When the microprocessor is fully seated in the socket, pivot the release lever back toward the socket until it snaps into place to secure the microprocessor.

⬤ **NOTICE:** If you are *not* installing a microprocessor upgrade kit from Dell, reuse the original heat sink assembly when you replace the microprocessor.

If you installed a microprocessor replacement kit from Dell, return the original heat sink assembly and microprocessor to Dell in the same package in which your replacement kit was sent.

6. Install the heat sink:

   a. Insert the notched end of the heat sink onto the end of the retention module which is next to the power supply.

    b. Lower the heat sink until it fits securely in the module.

    c. When the heat sink is secured, pivot the retention module clip down until the tab snaps into place to secure the heat sink.
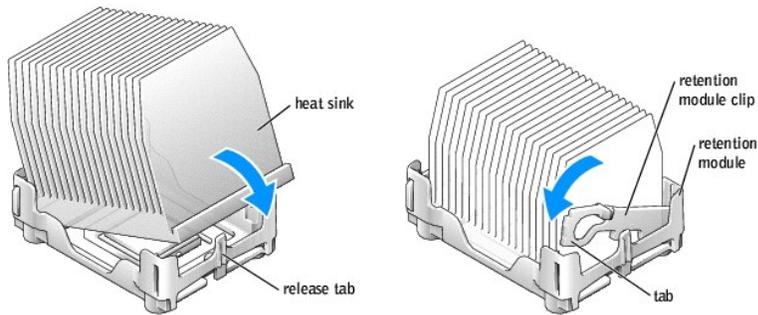
7. Lower the airflow shroud over the heat sink.

8. Reconnect the cooling fan power cable to the fan connector (J1F1) on the system board.

9. Reconnect the power cable to the microprocessor power connector (J5B1) on the system board.

10. Replace the computer cover.

⬤ **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

11. Connect your computer and devices to electrical outlets, and turn them on.

Fan Assembly

Removing the Fan Assembly

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide*.**

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

1. Follow the procedures in "Before You Begin."

2. Disconnect the AC power cable from the AC power connector on the back of the power supply.

3. Unplug the DC power cables from the drives and system board.

4. Disconnect the fan power cable from its connector on the system board.

5. Pull the fan release lever away from the back of the computer and slide the fan toward the release lever.
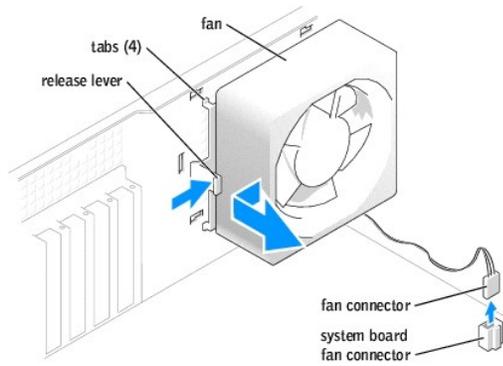
6. Remove the fan assembly from the computer.

Replacing the Fan Assembly

1. Align the fan assembly tabs with the holes in the back of the computer.

2. Slide the fan assembly away from the fan release lever until it clicks in place.

3. Reconnect the DC power cables to the drives and system board.

4. Replace the computer cover.

5. Connect the AC power cable to the AC power connector on the back of the power supply.

⊖ **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

6. Connect your computer and devices to electrical outlets, and turn them on.

System Board

Removing the System Board

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide.***

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

1. Follow the procedures in "Before You Begin."

2. Remove the floppy drive. To remove the floppy drive, see "Adding a Floppy Drive."

3. Remove any cards that are installed.

4. Disconnect all cables from the system board.

5. Lift up the heat-sink shroud.

⚠ **CAUTION: The microprocessor heat sink can get hot. To avoid burns, ensure that the heat sink has had sufficient time to cool before you touch it.**

6. Remove the microprocessor heat sink.

7. Remove the fan assembly.

8. Remove the 12 screws that secure the system board to the computer frame.

Four of the 12 screws that secure the system board to the computer frame also secure the heat-sink base to the system board.

system board-
securing screws (8)

system board-
securing screws on
heat-sink base (4)
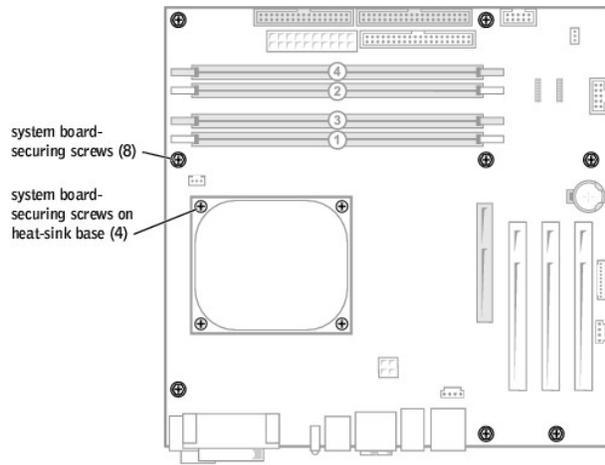
9. Lift the system board out from the computer.

10. Place the system board that you just removed next to the replacement system board.

Visually compare the replacement system board to the existing system board to ensure that you have the correct part.

Installing the System Board

1. Transfer components from the existing system board to the replacement system board:

    a. Remove the memory modules and install them on the replacement board.

⚠ CAUTION: The microprocessor package can get hot. To avoid burns, ensure that the package has had sufficient time to cool before you touch it.

    b. Remove the microprocessor package from the existing system board and transfer it to the replacement system board.

2. Configure the settings of the replacement system board.

    Set the jumpers on the replacement system board so that they are identical to the ones on the existing board.

3. Place the system board inside the computer frame, place the heat-sink base on the system board, and then replace the screws that you removed in step 8 of the preceding procedure.

4. Reinstall the fan assembly.

5. Reinstall the microprocessor heat sink, and then lower the heat-sink shroud.

6. Reattach the cables to the system board.

7. Reinstall any cards.

8. Replace the floppy drive.

9. Replace the computer cover.

⊘ NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

10. Connect your computer and devices to electrical outlets, and turn them on.

Power Supply

Removing the Power Supply

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide*.**

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

1. Follow the procedures in "Before You Begin."

2. Remove the fan assembly.

3. Disconnect the AC power cable from the AC power connector on the back of the power supply.

4. Unplug the DC power cables from the drives and system board.

5. Remove the four screws that secure the power supply to the back of the computer.
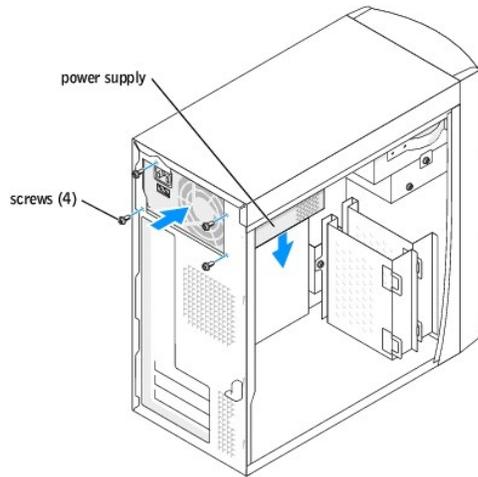
6. Remove the power supply from the computer.

Replacing the Power Supply

1. Slide the power supply into place.

2. Replace the four screws that secure the power supply to the back of the computer.

3. Reinstall the fan assembly.

4. Reconnect the DC power cables to the drives and system board.

5. Replace the computer cover.

6. Connect the AC power cable to the AC power connector on the back of the power supply.

⊘ **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.

Battery

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide*.**

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.**

Battery Overview

A coin-cell battery maintains computer configuration, date, and time information. The battery can last several years.

If you have to repeatedly reset time and date information after turning on the computer, replace the battery.

⚠ **CAUTION: A new battery can explode if it is incorrectly installed. Replace the 3-V CR2032 battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.**

Replacing the Battery

1. Record all the screens in system setup so that you can restore the correct settings when you perform step 8.

2. Follow the procedures in "Before You Begin."

3. Locate the battery socket on the system board.

🚫 **NOTICE:** If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the socket before you attempt to pry out the battery. Otherwise, you may damage the system board by prying off the socket or by breaking circuit traces on the system board.
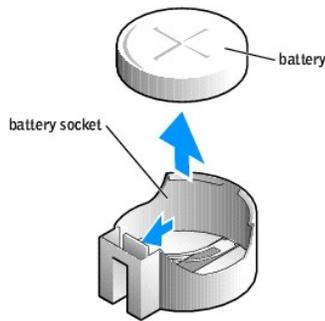
4. Remove the battery by carefully prying it out of its socket with your fingers or with a blunt, nonconducting object such as a plastic screwdriver.

5. Insert the new battery into the socket with the side labeled "+" facing up, and snap the battery into place.

6. Replace the computer cover.

🚫 **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.

8. Enter system setup and restore the settings you recorded in step 1.

9. Properly dispose of the old battery. See the safety instructions in your *Owner's Manual* or *Product Information Guide.*

Back to Contents Page

Technical Specifications

Dell™ Dimension™ 4600 Series Service Manual

Microprocessor	
Microprocessor type	Intel® Pentium® 4 that runs at 2.26, 2.4, 2.533, 2.66, 2.8, or 3.06 GHz internally and 533 MHz externally, or 2.4, 2.6, 2.8, 3.0, 3.2, or 3.4 GHz internally and 800 MHz externally
Level 1 (L1) cache	8 KB first-level
Level 2 (L2) cache	512-KB or 1-MB pipelined-burst, eight-way set associative, write-back SRAM

System Information	
System chip set	Intel 865PE or 865G
DMA channels	eight
Interrupt levels	24 APIC mode
System BIOS chip	4 Mb (512 KB)
System clock	533- or 800-MHz data rate

Expansion Bus	
Bus types	PCI
Bus speed	PCI: 33 MHz
PCI connectors	three
PCI connector size	120 pins
PCI connector data width (maximum)	32 bits
AGP	AGP 1X, 4X, 8X

Memory	
Architecture	Dual Channel DDR SDRAM
Memory connectors	Four
Memory capacities	128-, 256-, 512-MB or 1-GB
Minimum memory	128-MB DDR SDRAM **NOTE:** Between 32 and 64 MB of system memory may be allocated to support graphics, depending on system memory size and other factors.
Maximum memory	4 GB
Memory type	PC2700 (333-MHz) or PC3200 (400-MHz) DDR SDRAM (non-ECC)

Drives	
Externally accessible	two 5.25-inch bays one 3.5-inch bay
Internally accessible	Two bays for 1-inch–high IDE hard drives

Ports and Connectors	
Externally accessible:	
Serial	9-pin connector; 16550C-compatible
Parallel	25-hole connector (bidirectional)
Video	15-hole connector
Keyboard	6-pin mini-DIN connector
Mouse	6-pin mini-DIN connector
USB	two front-panel and six back-panel USB 2.0–compliant connectors
Network	RJ-45 connector
Audio	Five back miniature connectors for line-in, line-out, microphone, surround and center/Low-Frequency Effects (LFE) channel
Headphone	one front miniature connector for line-out
Internally accessible:	
Primary IDE channel	40-pin connector on PCI local bus
Secondary IDE channel	40-pin connector on PCI local bus
Floppy drive	34-pin connector
Serial ATA	two 7-pin connectors

Video	
Integrated	Intel Extreme Graphics controller
AGP video card	AGP 8X
Audio	
Audio controller	ADI 1980

Network	
Network controller	Integrated Intel PRO 10/100 Ethernet

Controls and Lights	
Power control	push button
Front-panel power light	green light — Blinking green indicates sleep state; solid green indicates power-on state. amber light — Blinking amber indicates a problem with an installed device; solid amber indicates an internal power problem
Hard-drive access light	green
Diagnostic code lights	four bicolor (amber and green) located on back panel

Power	
DC power supply:	
Wattage	250 W
Heat dissipation	853 BTU (fully-loaded computer without monitor)
Voltage (See the safety instructions in your *Owner's Manual* or *Product Information Guide* for important voltage setting information.)	100 to 120 V at 60 Hz; 200 to 240 V at 50 Hz
Backup battery	3-V CR2032 coin cell

Physical	
Height x Width x Depth	36.8 x 18.4 x 42.6 cm (14.5 x 7.25 x 16.75 inches)
Weight	10.4 kg (23 lb)

Environmental	
Temperature:	
Operating	10º to 35ºC (50º to 95ºF) **NOTE:** At 35ºC (95ºF), the maximum operating altitude is 914 m (3000 ft).
Storage	–40º to 65ºC (–40º to 149ºF)
Relative humidity	20% to 80% (noncondensing)
Maximum vibration:	
Operating	0.25 G at 3 to 200 Hz
Storage	2.20 Grms at 10 to 500 Hz
Maximum shock:	
Nonoperating (half-sine pulse)	105 G, 2 ms
Nonoperating (faired-square wave)	32 G with a velocity change of 596.9 cm/sec (235 inches/sec)
Altitude:	
Operating	–15.2 to 3048 m (–50 to 10,000 ft) **NOTE:** At 35ºC (95ºF), the maximum operating altitude is 914 m (3000 ft).
Storage	–15.2 to 10,670 m (–50 to 35,000 ft)

System Setup
Dell™ Dimension™ 4600 Series Service Manual

- Overview
- Entering System Setup
- Clearing Forgotten Passwords

Overview

Use system setup as follows:

- To change the system configuration information after you add, change, or remove any hardware in your computer
- To set or change a user-selectable option such as the user password
- To read the current amount of memory or set the type of hard drive installed

Before you use system setup, you must know the kind of floppy drive(s) and hard drive(s) installed in your computer. It is recommended that you write down the system setup screen information for future reference.

NOTICE: Unless you are an expert computer user, do not change the settings for this program. Certain changes can make your computer work incorrectly.

Entering System Setup

Viewing Settings

1. Turn on (or restart) your computer.

2. When the blue DELL™ logo appears, press <F2> immediately.

If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop. Then shut down your computer and try again.

System Setup Screens

System setup screens display the current configuration information for your computer. Information on the screen is divided into five areas:

- Title — The box at the top of all screens that lists the computer name.
- Computer data — Two boxes below the title box that display your computer processor, L2 cache, Service Tag, and the version number of the BIOS.
- Options — A scrollable box listing options that define the configuration of your computer, including installed hardware, power conservation, and security features.

Fields to the right of the option titles contain settings or values. When <Enter> appears to the right of an option title, press <Enter> to access a pop-up menu of additional options.

- Help — A feature that gives you information on the option that is selected (highlighted) when you press <F1>.
- Key functions — A line of boxes across the bottom of all screens that lists keys and their functions within system setup.

Keys	Action
<Tab> or down arrow	Moves to the next field.
<Shift>, <Tab> or up arrow	Moves to the previous field.
back arrow or forward arrow	Cycles through the options in a field. In many fields, you can also type the appropriate value.

<Page Down> or <Page Up>	Scrolls through help information.
<Enter>	Enters the selected field's pop-up options menu.
spacebar, <+> or <->	In the selected field's pop-up options menu, cycles through the options in a field.
<Alt> <x>	Exits system setup without restarting the computer and returns the computer to the boot routine.
<Alt> <b>	Exits system setup and restarts the computer, implementing any changes you have made.
<Alt> <d>	Resets the selected option to the default setting.
<Alt> <f>	Restores all system settings to the default configuration.

System Setup Options

📝 **NOTE:** Depending on your computer and installed devices, the items listed in this section may or may not appear.

Drive Configuration	
Diskette Drive A	Identifies the floppy drive attached to the DSKT connector on the system board. With the standard cabling configuration, **Diskette Drive A** (the boot floppy drive) is the 3.5-inch floppy drive installed in the top externally accessible drive bay. The two options are **3.5 Inch, 1.44 MB** and **Not Installed.** Tape drives are not reflected in the **Diskette Drive A** option. For example, if a single floppy drive and a tape drive are attached to the floppy drive interface cable, set **Diskette Drive A** to **3.5 Inch, 1.44 MB**.
SATA Primary Drive	Identifies the serial ATA hard drive attached to the SATA1 connector on the system board.
SATA Secondary Drive	Identifies the serial ATA hard drive attached to the SATA2 connector on the system board (not available on the small form-factor computer).
Primary Drive 0	Identifies the IDE hard drive attached to the IDE1 connector on the system board.
Primary Drive 1	Identifies the IDE device attached to the IDE2 connector on the system board.
Secondary Drive 0	Identifies the device that is cabled with the drive on the IDE1 data cable.
Secondary Drive 1	Identifies the device that is cabled with the device on the IDE2 data cable.
IDE Drive UDMA	Sets the mode for all installed hard drives. **NOTE:** You must have an IDE device connected to the primary IDE interface if you have an IDE device connected to the secondary IDE interface.
If you have a problem, see "Hard Drive Problems" in your *Owner's Manual*.	

Hard-Disk Drive Sequence	
If you insert a boot device and restart, this option appears in the system setup menu.	
System BIOS boot device	
USB Device	To boot from a USB memory device, select the USB device and move it so it becomes the first device in the list.

Boot Sequence	
Normal	(This option is available only for the current boot process.) The computer attempts to boot from the sequence of devices specified in system setup.
Diskette Drive	The computer attempts to boot from the floppy drive. If the floppy disk in the drive is not bootable, or if no floppy disk is in the drive, the computer generates an error message.
Hard Drive	The computer attempts to boot from the primary hard drive. If no operating system is on the drive, the computer generates an error message.
CD Drive	The computer attempts to boot from the CD drive. If no CD is in the drive, or if no operating system is on the CD, the computer generates an error message.
PXE	(This option is available only for the future boot process.) As the computer boots, it prompts the user to press <Ctrl><Alt><b>. Pressing this key combination causes a menu to display that allows you to select a method for booting from a network server. If a boot routine is not available from the network server, the computer attempts to boot from the next device in the boot sequence list.
USB Flash Device	Insert the memory device into a USB port and restart the computer. When F12 = Boot Menu appears in the upper-right corner of the screen, press <F12>. The BIOS detects the device and adds the USB flash option to the boot menu. **NOTE:** To boot to a USB device, the device must be bootable. To ensure that your device is bootable, check the device documentation.

Memory Information	
Indicates amount of installed memory, computer memory speed, amount of video memory, size of the display cache, and channel mode (dual or single).	
Installed System Memory	Displays the amount of installed system memory.
System Memory Speed	Displays the speed of your system memory.

System Memory Channel Mode	Displays the mode of your system memory.
AGP Aperture	Displays the amount of aperture memory. The default setting is **128 MB**.

CPU Information	
CPU Speed	The processor speed at which the computer boots. Press the left- or right-arrow key to toggle the **CPU Speed** option between the resident processor's rated speed (the default speed) and a lower-compatibility speed. A change to this option takes effect immediately and no restart is necessary. To toggle between the rated processor speed and the compatibility speed while the computer is running in real mode, press <Ctrl><Alt><\>. (For keyboards that do not use American English, press <Ctrl><Alt><#>.)
Bus Speed	The speed of the processor's system bus.
Processor ID	The manufacturer's identification code(s) for the installed processor.
Clock Speed	The core speed at which the processor(s) can operate.
Cache Size	The size of the processor's L2 cache.
Hyper-Threading	The setting that allows you to enables or disable Hyper-Threading technology for operating systems that support Hyper-Threading. The default setting is **Disabled**.
NOTE: If your computer has a processor capable of supporting Hyper-Threading, the Hyper-Threading option is the first selection in the list.	

Integrated Devices (Legacy Select Options)	
Configures the following devices integrated with the system board:	
Sound	The settings are **On** (default) or **Off**.
Network Interface Controller	The settings are **On** (default), **Off**, or **On w/ PXE**.
Mouse Port	The settings are **On** or **Off**.
USB Emulation	The settings are **On** (default) and **Off**.
USB Controller	The settings are **On** (default) or **Off**.
PCI Slots	The settings are **Enabled** (default) and **Disabled**.
Serial Port 1 and Serial Port 2	The settings are **Off** and **Auto** (default). (Serial Port 2 appears as an option if you have a serial port card installed.) **Auto** automatically configures a connector to a particular designation (**COM1** or **COM3** for **Serial Port 1**; **COM2** or **COM4** for **Serial Port 2**). If you set a serial connector to **Auto** and then add a card that is also set to **Auto**, the computer automatically remaps the integrated port to the next available connector designation that shares the same IRQ setting as follows: l **COM1** (I/O address 3F8h), which shares IRQ4 with **COM3**, is remapped to **COM3** (I/O address 3E8h). l **COM2** (I/O address 2F8h), which shares IRQ3 with **COM4**, is remapped to **COM4** (I/O address 2E8h). **NOTE:** When two COM connectors share an IRQ setting, you can use either connector as necessary, but you may not be able to use both connectors at the same time.
Parallel Port	The settings are **Mode**, **I/O Address**, and **DMA Channel**: l **Mode** settings are **PS/2** (default), **EPP**, **ECP**, **AT**, or **Off**. Set the **Mode** option according to the type of device connected to the parallel connector. To determine the correct mode to use, see the documentation that came with the device. l **I/O Address** settings are **378h** (default), **278h**, or **3BCh**. The settings are not available when **Mode** is set to **Off**. **NOTE:** You cannot set the parallel connector to **3BCh** if **Mode** is set to **EPP**. l **DMA Channel** appears only when **Mode** is set to **ECP**. Settings are **DMA 1**, **DMA 3**, or **Off**.
IDE Drive Interface	The settings are **Off** and **Auto** (default). **Auto** turns off the IDE interface (when necessary) to accommodate a controller card installed in an expansion slot.
Diskette Interface	The settings are **Auto** (default), **Read Only**, and **Off.** l **Auto** turns off the integrated floppy drive controller when necessary to accommodate a controller card installed in an expansion slot. l **Read Only** prevents the computer's integrated floppy drive controller from writing to floppy drives and also activates the **Auto** setting.
PC Speaker	The settings are **On** (default) and **Off**.
Primary Video Controller	The settings are **Auto** (default) and **Onboard**. l **Auto** (default) — If only an AGP card is installed, the computer uses the AGP card; if only a PCI card is installed, the computer uses the PCI card; if *both* AGP and PCI cards are installed, the computer uses both cards. l **Onboard** — The computer uses the AGP card.
Onboard Video Buffer	The settings are **1 MB** (default) and **8 MB**.

Power Management	

Suspend Mode	The options are **S1** or **S3**.
AC Power Recovery	Determines what happens when AC power is restored to the computer. l **Off** (default) — The computer remains off when AC power is restored. l **On** — The computer starts when AC power is restored. l **Last** — The computer returns to the AC power state existing at the time that AC power was lost.
Low Power Mode	The settings are **Enabled** and **Disabled**.
See "Power Problems" in your *Owner's Manual* for more information.	

System Security
Display system security options when you press <Enter>.

Keyboard NumLock	
The settings are **On** and **Off** (these settings do not apply to 84-key keyboards).	
On (default)	Activates the rightmost bank of keys so that they provide the mathematical and numeric functions shown at the top of each key.
Off	Activates the rightmost bank of keys so that they provide the cursor-control functions shown by the label on the bottom of each key.

Report Keyboard Errors
Displays keyboard errors when set to **Report**. The default setting is **Report**.

Auto Power On
Sets time and days of week to automatically turn on the computer. Choices are every day or every Monday through Friday.
Time is kept in a 24-hour format (*hours:minutes*). Change the start-up time by pressing the right- or left-arrow key to increase or decrease the numbers, or type numbers in both the date and time fields.
The default setting is **Disabled**.
This feature does not work if you turn off your computer using a power strip or surge protector.

Fastboot	
On (default)	Your computer starts more quickly, skipping certain configurations and tests.
Off	Your computer does not skip certain configurations and tests during the boot process.

OS Install mode
Turns the OS Install mode on and off. The default setting is **Off**.

IDE Hard Drive Acoustics Mode	
The acoustics mode field may contain the following options:	
Quiet	The hard drive operates in its quietest setting.
Performance	The hard drive operates at its maximum speed. **NOTE:** Switching to performance mode may cause the drive to be noisier, but its performance is not affected.
Bypass (default)	Your computer does not test or change the current acoustics mode setting.
Suggested	The hard drive operates at the level suggested by the hard drive manufacturer. **NOTE:** Changing the acoustics setting does not alter your hard drive image.

System Event Log
Displays the system event log when you press <Enter>.

Asset Tag
Displays the customer-programmable asset tag number for the computer if an asset tag number is assigned.

Boot Sequence

This feature allows you to change the boot sequence for devices.

Option Settings

- l **Normal —** (Available only for the current boot process) The computer attempts to boot from the sequence of devices specified in system setup.

- l **Diskette Drive —** The computer attempts to boot from the floppy drive. If the floppy disk in the drive is not bootable, or if no floppy disk is in the drive, the computer generates an error message.

- l **Hard Drive —** The computer attempts to boot from the primary hard drive. If no operating system is on the drive, the computer generates an error message.

- l **CD Drive —** The computer attempts to boot from the CD drive. If no CD is in the drive, or if the CD has no operating system, the computer generates an error message.

- l **PXE —** (Available only for the future boot process) As the computer boots, it prompts the user to press <Ctrl><Alt><b>. Pressing this key combination causes a menu to display that allows you to select a method for booting from a network server. If a boot routine is not available from the network server, the system attempts to boot from the next device in the boot sequence list.

- l **USB Flash Device —** Insert the memory device into a USB port and restart the computer. When F12 = Boot Menu appears in the upper-right corner of the screen, press <F12>. The BIOS detects the device and adds the USB flash option to the boot menu.

NOTE: To boot to a USB device, the device must be bootable. To make sure your device is bootable, check the device documentation.

Changing Boot Sequence for the Current Boot

You can use this feature, for example, to restart your computer from a USB device, such as a floppy drive, memory key, or CD-RW drive.

1. Turn on (or restart) your computer.

2. When F2 = Setup, F12 = Boot Menu appears in the upper-right corner of the screen, press <F12>.

   If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then shut down your computer and try again.

   The **Boot Device Menu** appears, listing all available boot devices. Each device has a number next to it.

3. At the bottom of the menu, enter the number of the device that is to be used for the current boot only.

Changing Boot Sequence for Future Boots

1. Enter system setup.

2. Use the arrow keys to highlight the **Boot Sequence** menu option and press <Enter> to access the pop-up menu.

NOTE: Write down your current boot sequence in case you want to restore it.

3. Press the up- and down-arrow keys to move through the list of devices.

4. Press the spacebar to enable or disable a device (enabled devices have a checkmark).

5. Press plus (+) or minus (–) to move a selected device up or down the list.

Clearing Forgotten Passwords

⚠ **CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in your O*wner's Manual* or *Product Information Guide.***

1. Follow the procedures in "Before You Begin."

2. Locate the 3-pin password jumper (CLR PSSWRD) on the system board, and attach the jumper plug to pins 2 and 3 to clear the password.

NOTE: When you receive your computer, the jumper plug is attached to pins 1 and 2.

3. Replace the computer cover.

4. Connect your computer and monitor to electrical outlets, and turn them on.

5. After the Microsoft® Windows® desktop appears on your computer, shut down the computer.

6. Turn off the monitor and disconnect it from the electrical outlet.

7. Disconnect the computer power cable from the electrical outlet, and press the power button to ground the system board.

8. Remove the computer cover.

9. Locate the 3-pin password jumper (CLR PASSWRD) on the system board and attach the jumper to pins 1 and 2 to reenable the password feature.

10. Replace the computer cover.

⊙ **NOTICE:** To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

11. Connect your computer and devices to electrical outlets, and turn them on.

Technical Overview

Dell™ Dimension™ 4600 Series Service Manual

- Inside View of Your Computer
- System Board Components
- Power Supply DC Connector Pin Assignments

Inside View of Your Computer

⚠ **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions in your *Owner's Manual* or *Product Information Guide.*

⚠ **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the computer cover.

System Board Components

floppy drive connector (J4J1)
hard drive connector (J6J2)
CD drive connector (J6J1)
control panel connector (J7J2)
password jumper (CLR PSSWRD)
main power connector (J3J1)
memory module connectors (DDR2, DDR4)
memory module connectors (DDR1, DDR3)
fan connector (J1F1)
microprocessor connector (J2E1)
microprocessor power connector (J5B1)
serial ATA connectors (2) (J8G2 and J8G1)
front-panel I/O connector (J9G1)
AGP connector (J6C1)
battery socket (XBT9E1)
front panel audio connector (J9C2)
CD audio connector (J9C1)
PCI card slots (3) (PCI1, PCI2, PCI3)
TAD connector (J6B1)
back of computer

Power Supply DC Connector Pin Assignments

P1
P7
P6
P4
P2
P5
P3
P8
P9

The 250-W power supply can operate from an AC power source of 115 VAC at 60 Hz or 230 VAC at 50 Hz. The power supply provides the DC operating voltages and currents listed in the following table.

Output Voltage	Minimum Current (A)	Maximum Current (A)1

+12 VDC	0.0	14.0[3]
+5 VDC	1.0	22.0[3]
+3.3 VDC	0.1/0.0[2]	18.0[3]
−12 VDC	0.0	1.0
+5 VFP	0.0	2.0

When the current load is outside of the ranges listed, but within each specified output current range, the +5-V, +12-V, and +3.3-V outputs are allowed to regulate at +/−10% of nominal DC voltages.

[1]Maximum continuous total DC output cannot exceed 200 W. Maximum continuous combined load on +5-VDC and +3.3-VDC outputs cannot exceed 135 W.

[2]In system applications where +3.3 VDC is not used, these values may be 0 A without affecting the regulation on the other outputs.

[3]The required full load combinations are adjusted so that the total output power is less than or equal to 250 W.

DC Power Connector P1
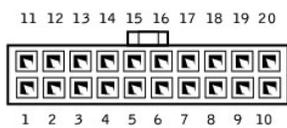
Pin Number	Signal name	18-AWG Wire
1	+3.3 VDC	Orange
2	+3.3 VDC	Orange
3	COM	Black
4	+5 VDC	Red
5	COM	Black
6	+5 VDC	Red
7	COM	Black
8	POK*	Gray
9	+5 VFP	Purple
10	+12 VDC	Yellow
11	+3.3 VDC	Orange
12	−12 VDC*	Blue
13	COM	Black
14	PS ON*	Green
15	COM	Black
16	COM	Black
17	COM	Black
18	-	No connect
19	+5 VDC	Red
20	+5 VDC	Red
*Use 22-AWG wire instead of 18-AWG wire.		

DC Power Connector P2

Pin Number	Signal Name	18-AWG Wire
1	COM	Black
2	COM	Black

3	+12 VDC	Yellow
4	+12 VDC	Yellow

DC Power Connectors P3, P5, P6, P8 and P9
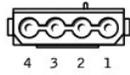
Pin Number	Signal Name	18-AWG Wire
1	+12 VDC	Yellow
2	COM	Black
3	COM	Black
4	+5 VDC	Red

DC Power Connector P4
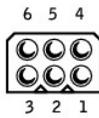
Pin Number	Signal Name	22-AWG Wire
1	-	No connect
2	COM	Black
3	COM	Black
4	+3.3 VDC	Orange
5	+5VDC	Red
6	+12VDC	Yellow

DC Power Connector P7
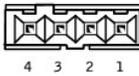
Pin Number	Signal Name	22-AWG Wire
1	+5 VDC	Red
2	COM	Black
3	COM	Black
4	+12 VDC	Yellow

Dell™ Dimension™ 4600 Series Service Manual

⬚ **NOTE:** A NOTE indicates important information that helps you make better use of your computer.

⬚ **NOTICE:** A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

⚠ **CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.**

For a complete list of abbreviations and acronyms, see the *Tell Me How* help file.

If you purchased a Dell™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.