



PowerBook G4 (DVI)

Updated 4 December 2003



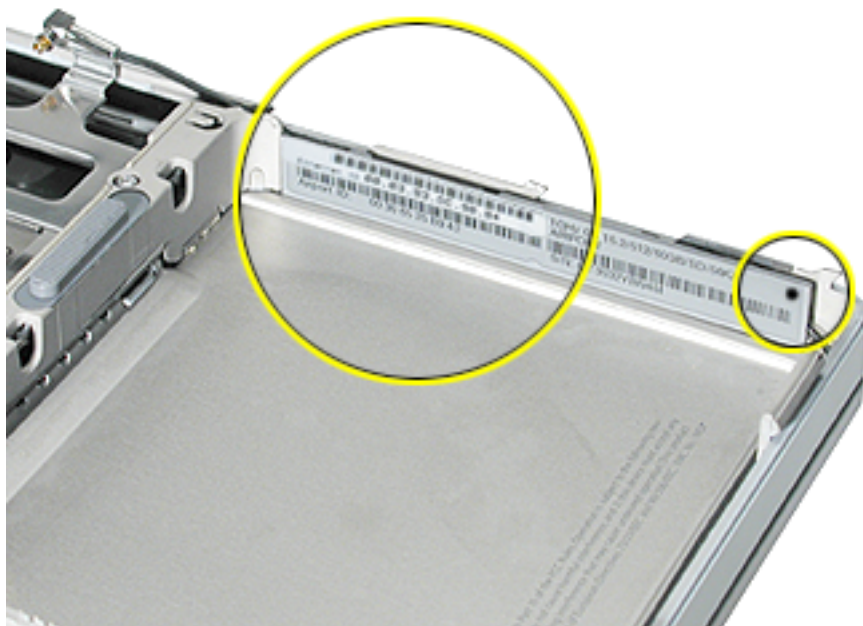
Upgrades
PowerBook G4 (DVI)

Check for PowerBook G4 (DVI) 867 MHz Upgrade

Check for Upgraded Computer

Before you begin service procedures, check whether the computer has been upgraded with a PowerBook G4 (DVI) 867 MHz Upgrade Kit. Look at the computer's ID label in the battery well to see if there is an Ethernet bar code label over the original Ethernet bar code, and a black dot in the upper right corner of the ID label.

In addition, the customer may also have a "Proof of Repair and Upgrade" sheet.



If so, the computer has been upgraded with a PowerBook G4 (DVI) 867 MHz Upgrade Kit.

The upgraded computer uses the following PowerBook G4 (1GHz/867MHz) parts:

- 867MHz logic board (661-1799)
- DC-in board (922-5460)
- Heat exchanger (922-5445)
- Primary fan (922-5459)
- Secondary fan (922-5564)

Use only these parts, and refer to the PowerBook G4 (1GHz/867MHz) service manual (Updated 8 August 2003, or later) when performing service involving these parts.

Note: This computer upgrade is NOT available to service providers.

Heat Exchanger Upgrade Installation Instructions

The following instructions explain how to install the appropriate parts of the Heat Exchanger Upgrade Kit (076-1071) in the PowerBook G4 (DVI) computer.

Important: Use this chapter in conjunction with the take apart chapters. Only the exceptions are shown in this chapter. Perform these “exception” procedures at the appropriate points, and ignore the take apart procedures that do not apply.

Important: This kit is NOT for PowerBook G4 (DVI) 867 MHz upgraded computers. Refer to the “Check for PowerBook G4 (DVI) 867 MHz Upgrade” chapter of this manual to check for this computer upgrade.

Important: Some parts and procedures are different depending upon the configuration (667 MHz and 800 MHz). Verify the configuration and follow the procedures below:

Note: The kit consists of parts for both the 667 MHz and 800 MHz configurations. Verify that the kit contains the following:

- New version heat exchanger with ribbed extension
- Heat exchanger hold down bracket
- New version secondary fan (for 800 MHz units, only)
- (1) thick and (1) thin washer (for 667 MHz units, only)

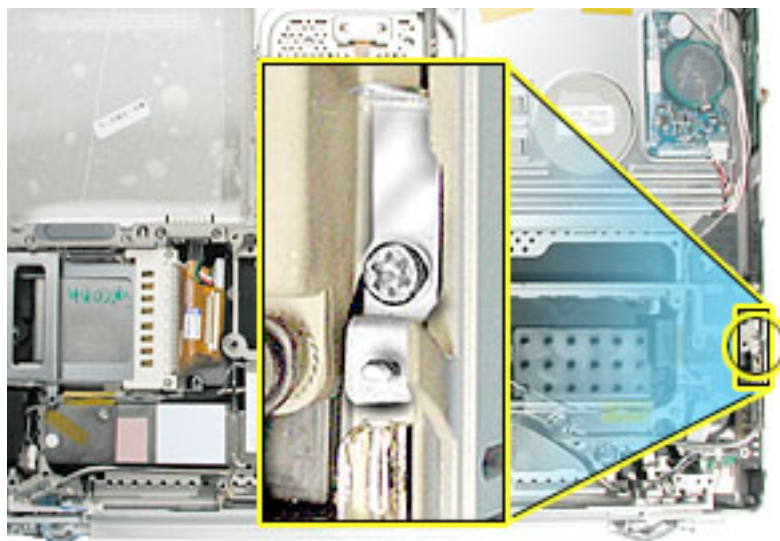
Note: Kapton® tape is needed for the 667 MHz configuration and is not included in the kit.

Procedure

For both configurations:

1. Remove the old heat exchanger and the secondary fan bracket (with fan, if present).
2. Install the new heat exchanger from the kit.
3. Install the heat exchanger hold-down bracket, as shown here. Use the screw that was removed from the rib frame at this location.

Replacement Note: Look from the side through the air vents of the top case to verify that the ribs on the heat exchanger do not block the vents.



Important: Before installing the logic board, verify that all thermal materials are installed on the new heat exchanger, and that all residual thermal material is removed from the logic board CPU chip, if any.

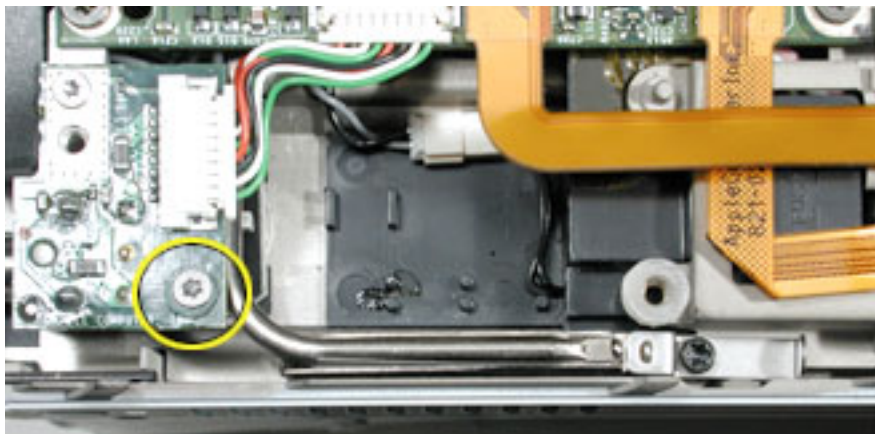
Important: If the heat exchanger has thermal material installed for the CPU chip, do not install thermal material onto the logic board chip.

For the 667 MHz configuration

This configuration does not use a secondary fan or bracket. A thin and thick washer will be installed.

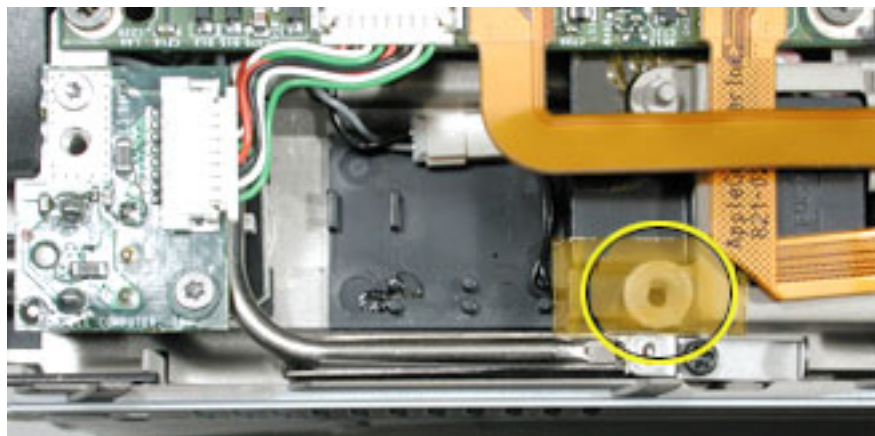
1. With the screw removed from the DC-in board, center the thin washer over the screw hole in the board, then replace the screw, as shown.

Replacement Note: Make sure the DC connector is straight and centered in the port opening. The unplugged adapter connector may be inserted onto the DC connector to ensure that the connector is centered and straight before securing the DC-in board.



2. Center the thick washer over the screw hole shown below (this is a bottom case screw hole) and place Kapton tape over the top to secure it in place.

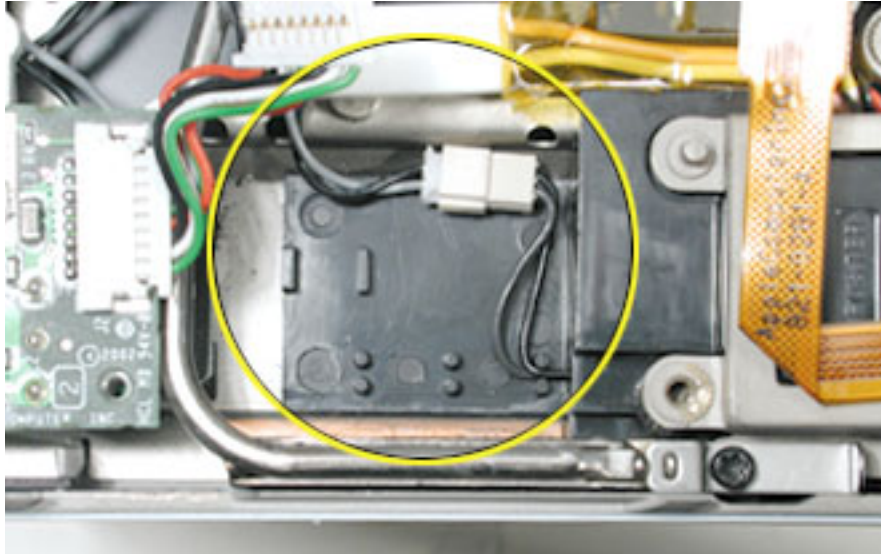
Important: Verify that the washer does not obstruct the screw hole.



For the 800 MHz configuration

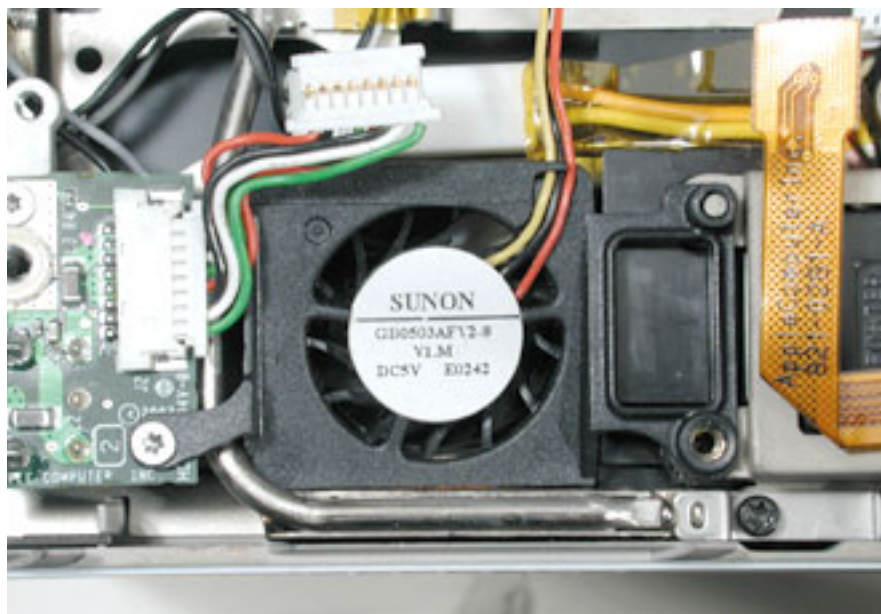
This configuration uses the new secondary fan included in the kit.

1. Reroute the speaker wire and connector, as shown.



2. Install the secondary fan, as shown.

Replacement Note: Make sure the DC connector is straight and centered in the port opening. The unplugged adapter connector may be inserted onto the DC connector to ensure that the connector is centered and straight before securing the fan to the DC-in board.





Take Apart
PowerBook G4 (DVI)

Keyboard Replacement Instructions

Follow the instructions in this sheet carefully. Failure to follow these instructions could damage your equipment and void its warranty.

Note: Written and video instructions covering customer-installable parts are available at <http://www.info.apple.com/installparts/>.

Warning: During this procedure, keep small parts away from children.

Tools Required

The only tool required for this procedure is a jeweler's flat-blade screwdriver (if keyboard is locked).

Removing the Installed Keyboard

Warning: Always shut down your computer before opening it to avoid damaging its internal components or causing injury. After you shut down the computer, the internal components can be very hot. Let the computer cool down before continuing.

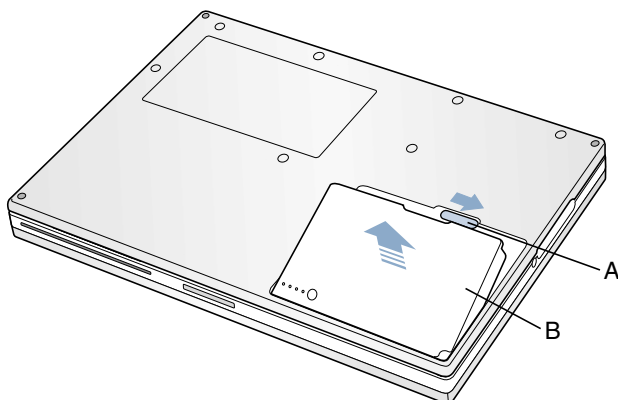
1. Place your computer on a clean, flat surface.
2. Shut down your computer and wait thirty minutes before continuing.
3. Disconnect the power cord and any other cables connected to the computer.

4. Close the computer and turn it over.
5. Slide the battery latch (**Figure 1A**) to the right to remove the battery (**Figure 1B**).

Removing the battery will prevent you from accidentally turning on the computer.

Warning: Removing the battery before shutting down your computer may result in data loss.

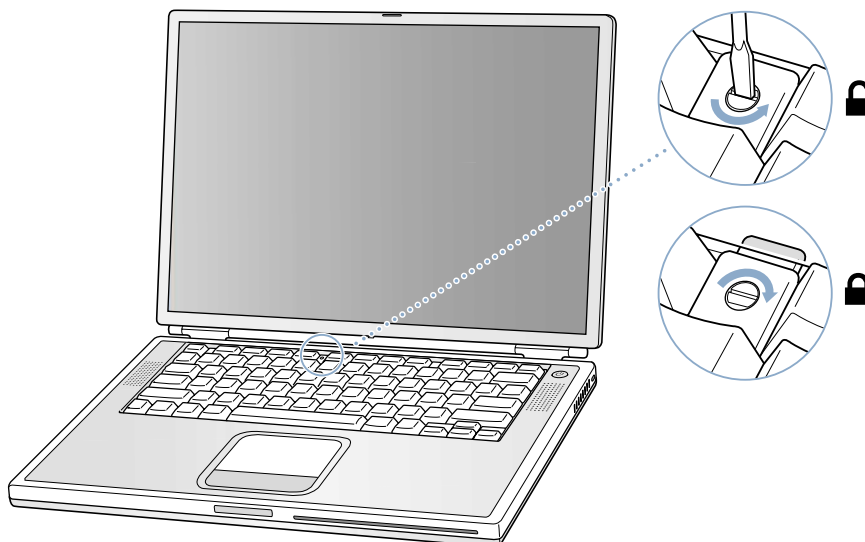
Figure 1



6. Turn over the computer.
7. Raise the display so you can access the keyboard.
8. Make sure the keyboard locking screw, located in the small plastic tab to the left of the Num Lock key (**Figure 2**), is not in the locked position. Your PowerBook comes with the keyboard unlocked, so unless you or someone else locked the keyboard, you can skip this step.

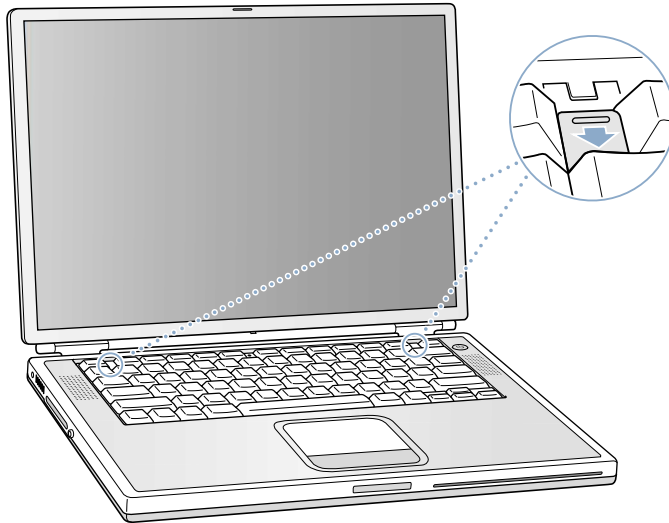
To unlock the keyboard, turn the screw 1/2 turn.

Figure 2



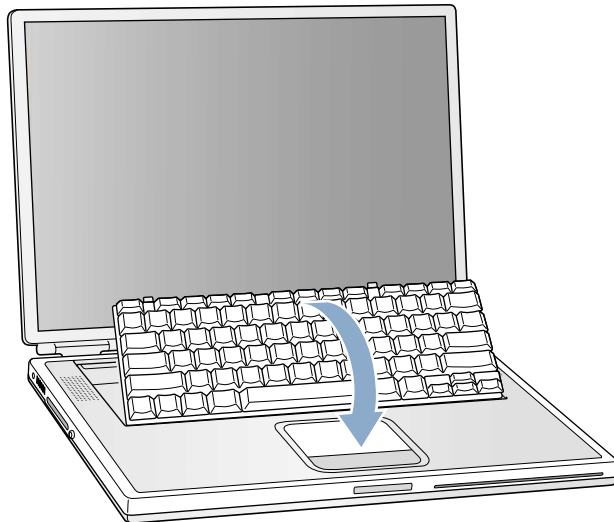
9. Release the keyboard by pulling down on the keyboard release tabs (located to the left of the F1 and F12 keys) (**Figure 3**), then lift the top portion of the keyboard up slightly, and toward the display.

Figure 3



10. Flip the keyboard over and lay it on the palm rests and trackpad. (**Figure 4**)

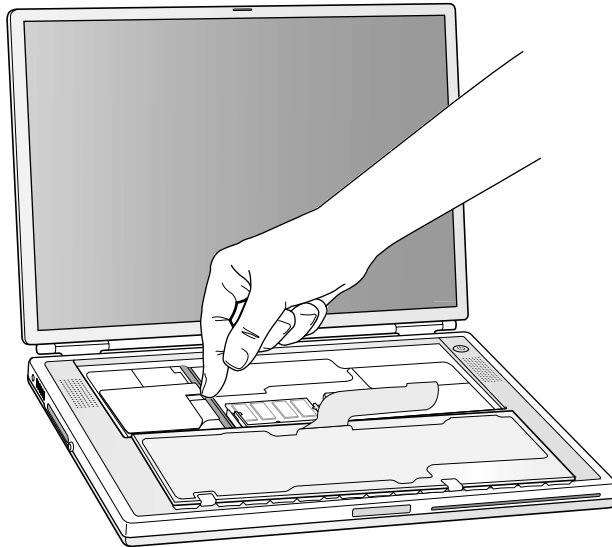
Figure 4



11. Touch the computer's inside framework (a dull gray conductive composite material) to discharge any static electricity, as shown **(Figure 5)**.

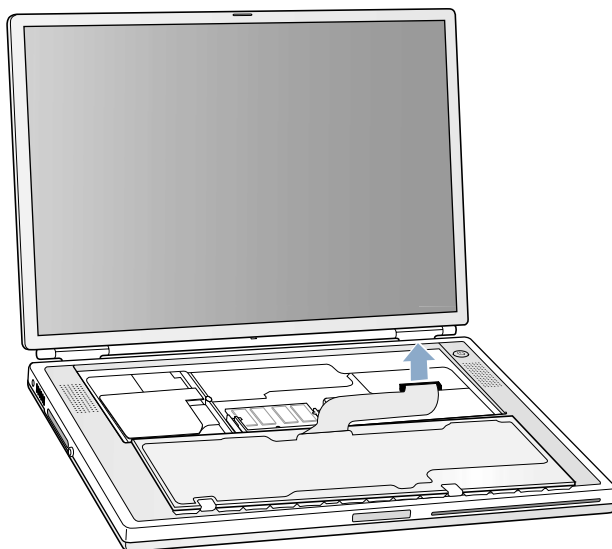
Important: To avoid electrostatic discharge damage, always ground yourself by touching the computer's framework before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed your installation and closed the computer.

Figure 5



12. Locate the keyboard cable connector. **(Figure 6)**

Figure 6

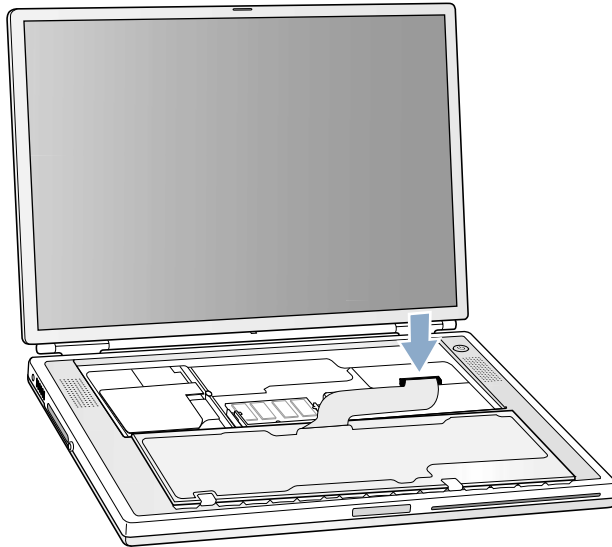


13. Pull up on the connector, from side to side if needed, to disconnect it from the computer.
14. Set the keyboard aside.

Installing the Replacement Keyboard

1. Lay the replacement keyboard in the correct orientation over the keyboard opening, then flip it toward you and lay it face down on the palm rests and trackpad to expose its connector cable. **(Figure 7)**

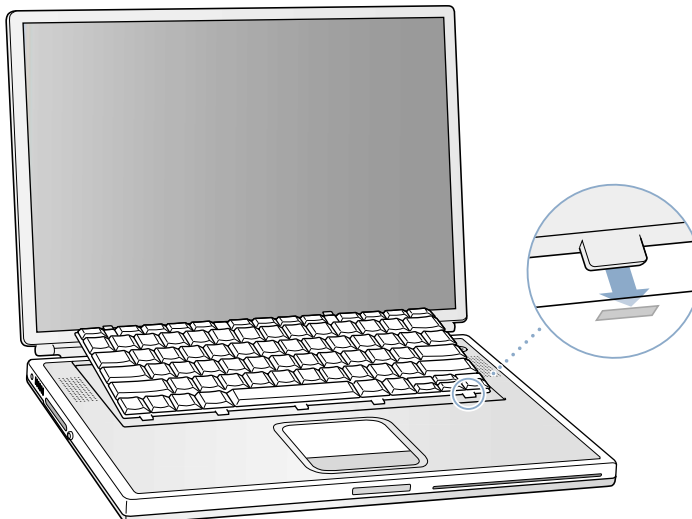
Figure 7



2. Firmly insert the keyboard cable connector into its connector on the computer.
3. Flip the keyboard back toward the keyboard opening in the case.
4. Hold the keyboard at an angle above the keyboard opening, and insert the tabs on the bottom edge of the keyboard into the slots below the edge of the opening. **(Figure 8)**

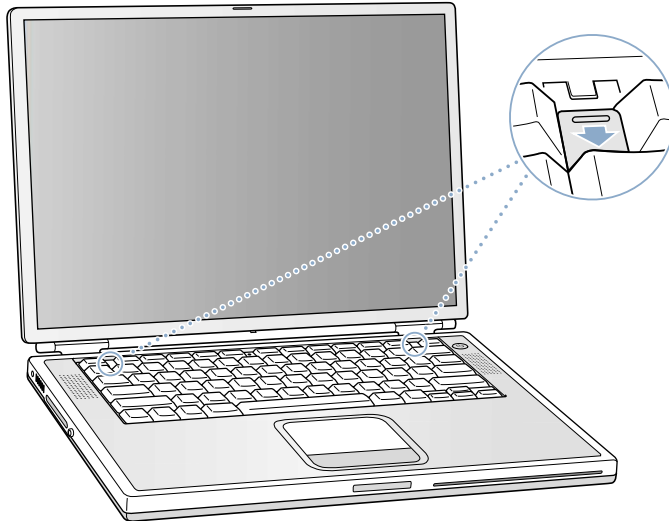
Important: Make sure that all the tabs are seated and that the keyboard rests flush against the edge of the opening.

Figure 8



5. Lay the keyboard flat into the keyboard opening.
6. Pull down on the keyboard release tabs and then press down on the top portion of the keyboard. **(Figure 9)**

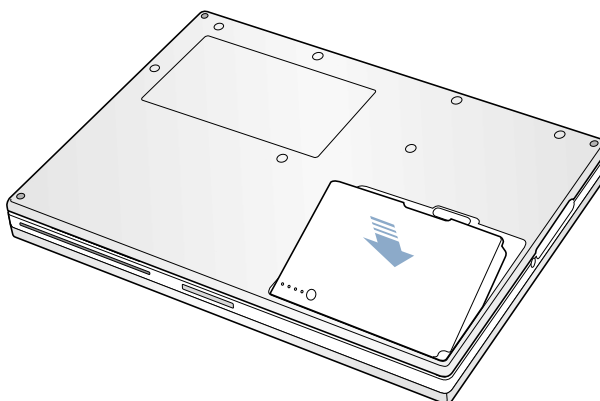
Figure 9



7. Release the tabs to secure the keyboard in place.
8. Close the display and turn the PowerBook over.
9. Replace the battery into the battery compartment. **(Figure 10)**

Important: Make sure that the battery locks securely into place and that the battery latch is slid all the way into the locked position.

Figure 10



10. Reconnect the power cord and any other cables that were connected, and restart your computer.

Warning: Never turn on your computer unless all of its internal and external parts are in place and it is closed. Operating the computer when it is open or missing parts can damage your computer or cause injury.

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Memory Card Replacement Instructions

Follow the instructions in this sheet carefully. Failure to follow these instructions could damage your equipment and void its warranty.

Note: Written and video instructions covering customer-installable parts are available at <http://www.info.apple.com/installparts/>.

Warning: During this procedure, keep small parts away from children.

Tools Required

The only tool required for this procedure is a jeweler's flat-blade screwdriver (if keyboard is locked).

Opening the Computer

Warning: Always shut down your computer before opening it to avoid damaging its internal components or causing injury. After you shut down the computer, the internal components can be very hot. Let the computer cool down before continuing.

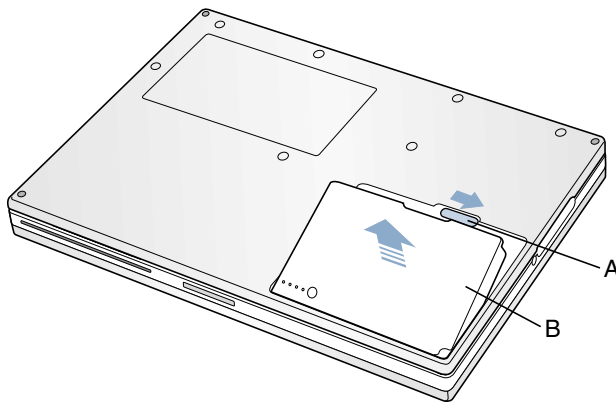
1. Place your computer on a clean, flat surface.
2. Shut down your computer and wait thirty minutes before continuing.
3. Disconnect the power cord and any other cables connected to the computer.

4. Close the computer and turn it over.
5. Slide the battery latch (**Figure 1A**) to the right to remove the battery (**Figure 1B**).

Removing the battery will prevent you from accidentally turning on the computer.

Warning: Removing the battery before shutting down your computer may result in data loss.

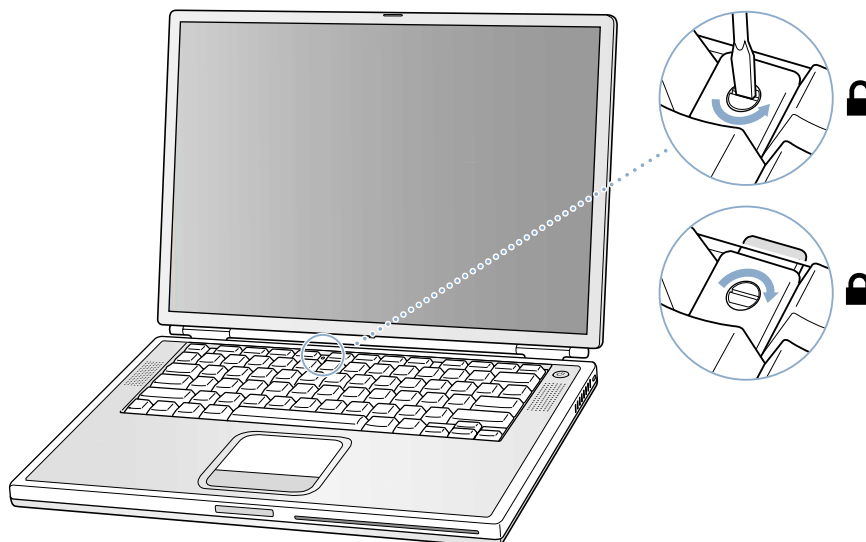
Figure 1



6. Turn over the computer.
7. Raise the display so you can access the keyboard.
8. Make sure the keyboard locking screw, located in the small plastic tab to the left of the Num Lock key (**Figure 2**), is not in the locked position. Your PowerBook comes with the keyboard unlocked, so unless you or someone else locked the keyboard, you can skip this step.

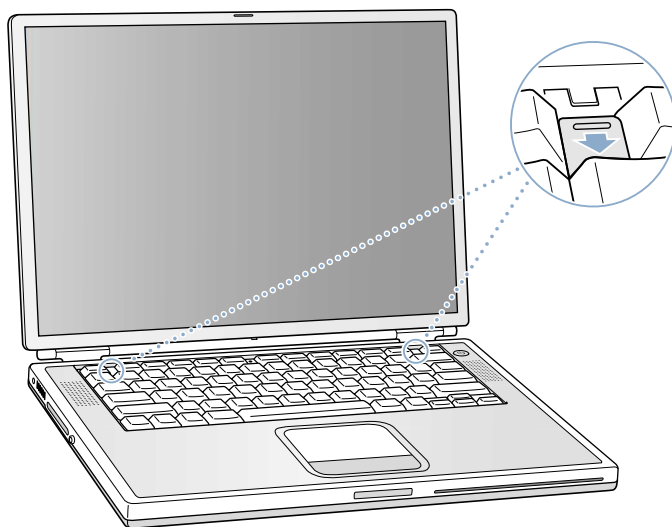
To unlock the keyboard, turn the screw 1/2 turn.

Figure 2



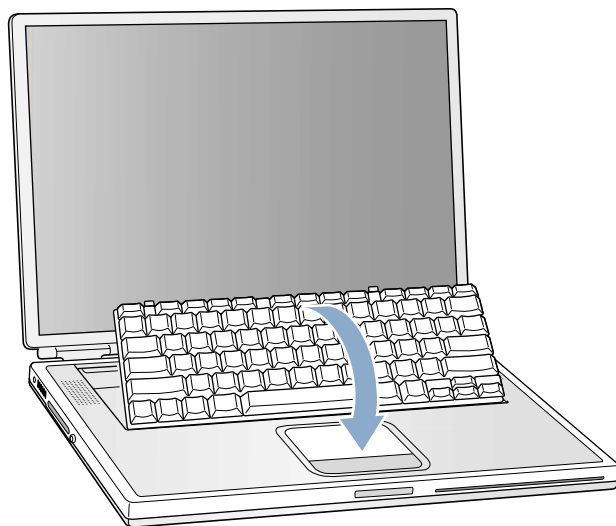
9. Release the keyboard by pulling down on the keyboard release tabs (located to the left of the F1 and F12 keys) (**Figure 3**), then lift the top portion of the keyboard up slightly, and toward the display.

Figure 3



10. Flip the keyboard over and lay it on the palm rests and trackpad. (**Figure 4**)

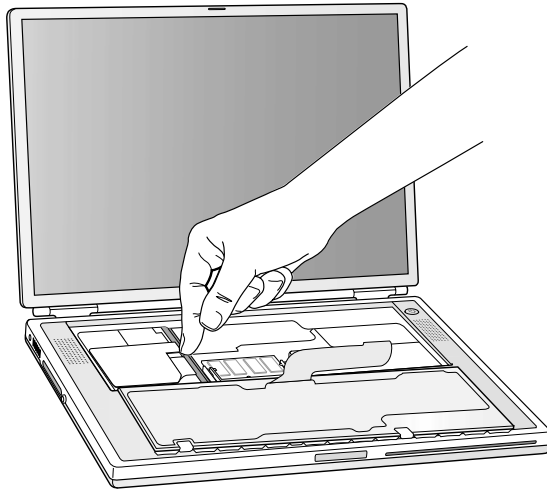
Figure 4



11. Touch the computer's inside framework (a dull gray conductive composite material) to discharge any static electricity, as shown (**Figure 5**).

Important: To avoid electrostatic discharge damage, always ground yourself by touching the computer's framework before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed your installation and closed the computer.

Figure 5

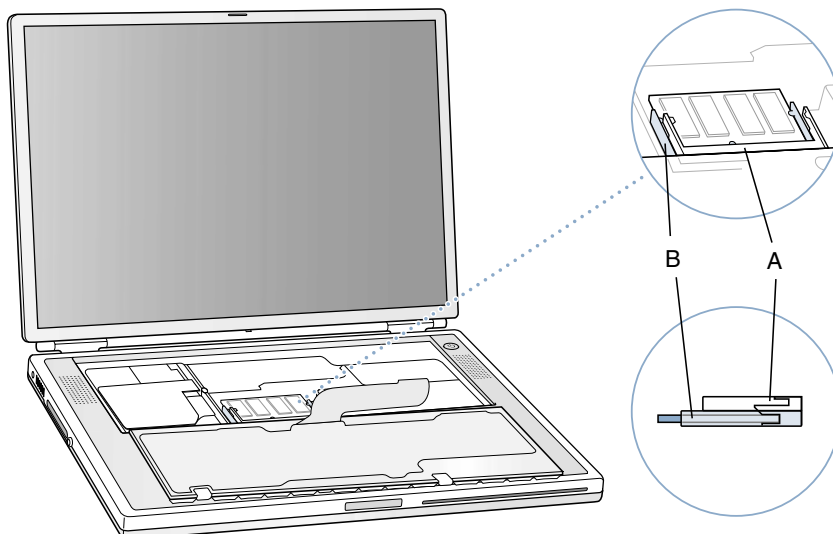


Removing the Installed Memory Card

1. To remove a memory card, locate the brackets that secure the card on both sides (**Figure 6**). Carefully spread the brackets apart until the card releases on each side. Pull the card up and out.

Note: If there is a memory card in the upper memory slot (**Figure 6A**), it must be removed before removing a card in the lower slot (**Figure 6B**).

Figure 6



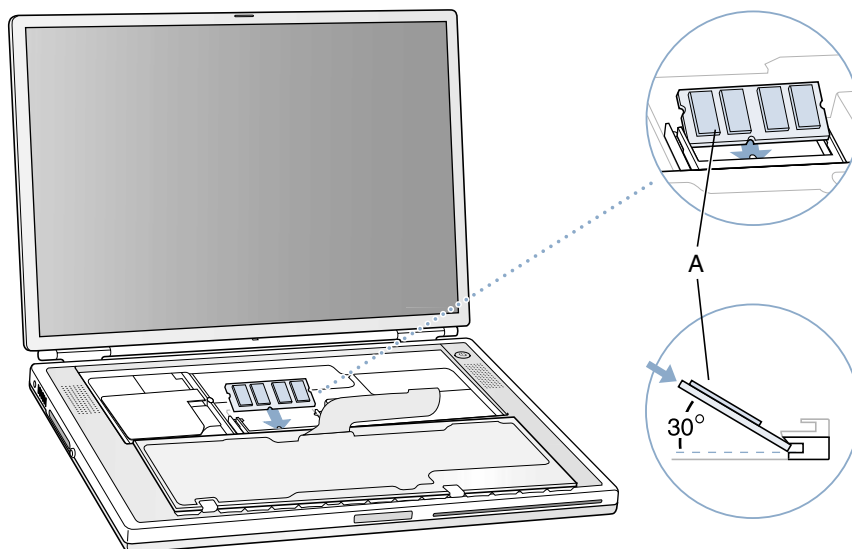
Installing the Replacement Memory Card

Warning: When handling a memory card, do not touch its gold connectors. Handle the card only by the edges.

1. To install the memory card, line up the notch in the card with the small tab in the memory slot. Hold the card at a 30-degree angle (**Figure 7A**), and then push the card into the slot until it is firmly seated.

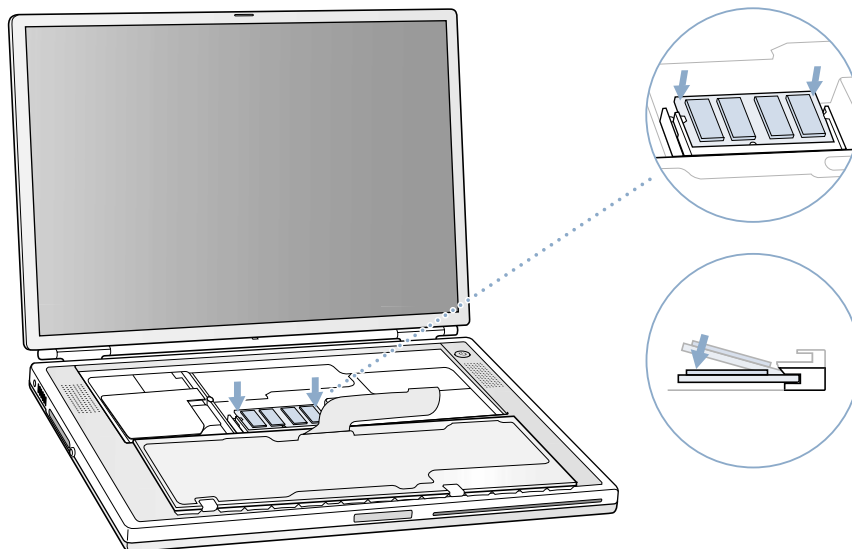
Note: You may feel some resistance. If you are having trouble inserting the card, try pushing one side at a time.

Figure 7



2. Gently push the card down until the two brackets on either side of the card lock into place (**Figure 8**).

Figure 8

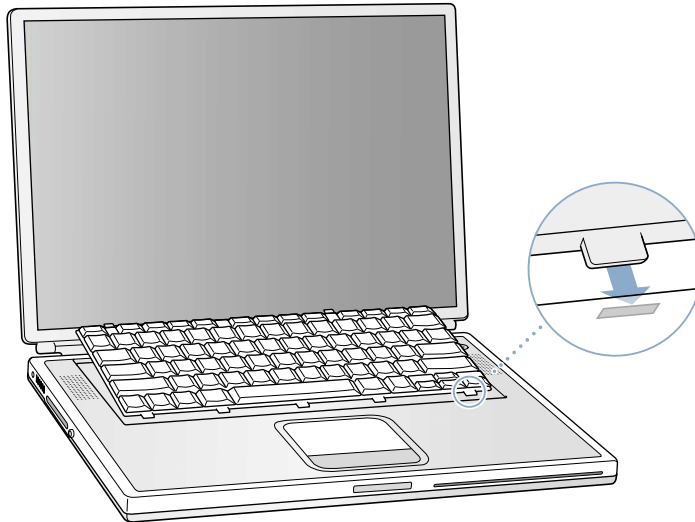


Closing the Computer

1. Flip the keyboard back toward the keyboard opening in the case.
2. Hold the keyboard at an angle above the keyboard opening, and insert the tabs on the bottom edge of the keyboard into the slots below the edge of the opening. **(Figure 9)**

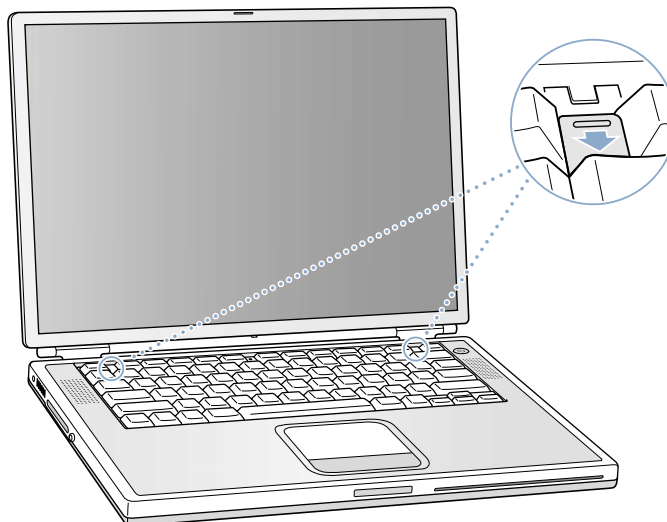
Important: Make sure that all the tabs are seated and that the keyboard rests flush against the edge of the opening.

Figure 9



3. Lay the keyboard flat into the keyboard opening.
4. Pull down on the keyboard release tabs and then press down on the top portion of the keyboard. **(Figure 10)**

Figure 10

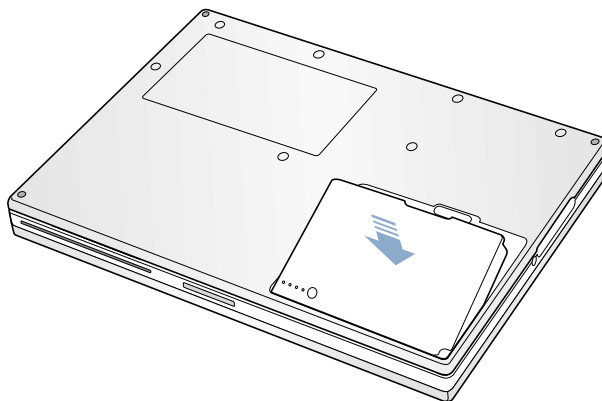


5. Release the tabs to secure the keyboard in place.

6. Close the display and turn the PowerBook over.
7. Replace the battery into the battery compartment. **(Figure 11)**

Important: Make sure that the battery locks securely into place and that the battery latch is slid all the way into the locked position.

Figure 11



8. Reconnect the power cord and any other cables that were connected, and restart your computer.

Warning: Never turn on your computer unless all of its internal and external parts are in place and it is closed. Operating the computer when it is open or missing parts can damage your computer or cause injury.

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Bottom Case Replacement Instructions

Follow the instructions in this sheet carefully. Failure to follow these instructions could damage your equipment and void its warranty.

Note: Written and video instructions covering customer-installable parts are available at <http://www.info.apple.com/installparts/>.

Warning: Sharp edges can exist inside your computer and on any parts being removed or installed. Use caution to avoid injury. Keep small parts away from children.

Tools Required

- Soft towel or cloth, larger than the PowerBook
- Torx T8 screwdriver (provided with bottom case)

Removing the Bottom Case

Warning: Always shut down your computer before opening it to avoid damaging its internal components or causing injury. After you shut down the computer, the internal components can be very hot. Let the computer cool down before continuing.

1. Place your computer on a clean, flat surface.
2. Shut down your computer and wait thirty minutes before continuing.
3. Disconnect the power cord and any other cables connected to the computer.

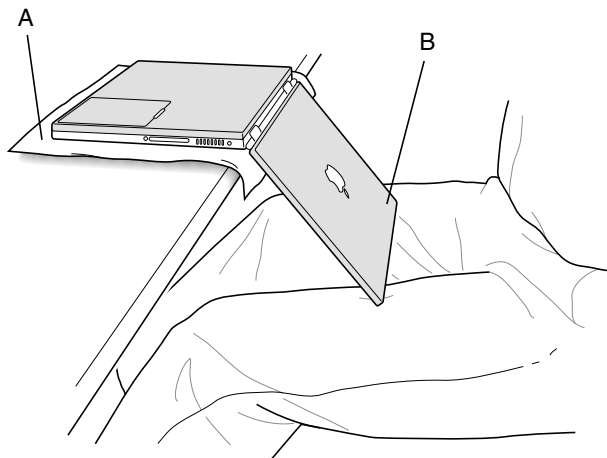
4. Place a towel or soft cloth on a table in front of you. **(Figure 1A)**

The towel or cloth will protect the keyboard and display area of the PowerBook when you flip it over to remove the battery and bottom case. Make sure it covers an area large enough for your PowerBook and that it hangs over the edge of the table.

5. With the display open at an angle greater than 90 degrees, carefully flip the PowerBook over and lay it flat, fully on the table. Make sure the display hangs over the edge of the table and rests lightly on your lap. **(Figure 1B)**

Important: Do not open the display farther than the angle shown.

Figure 1

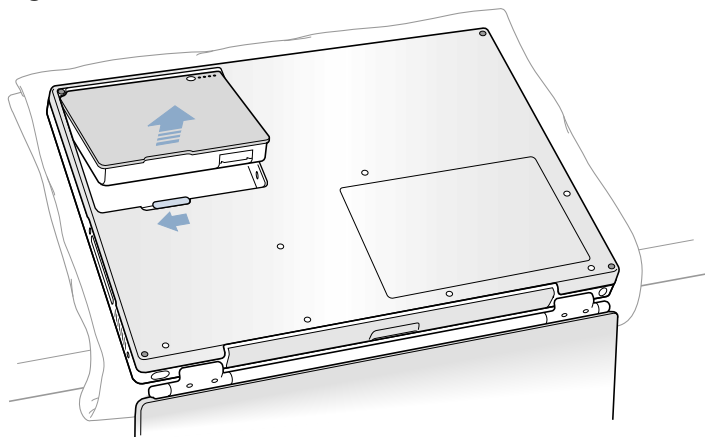


6. Remove the battery by sliding the battery latch to the left. Make sure to return the latch fully to the right. **(Figure 2)**

Removing the battery will prevent you from accidentally turning on the computer.

Warning: Removing the battery before shutting down your computer may result in data loss.

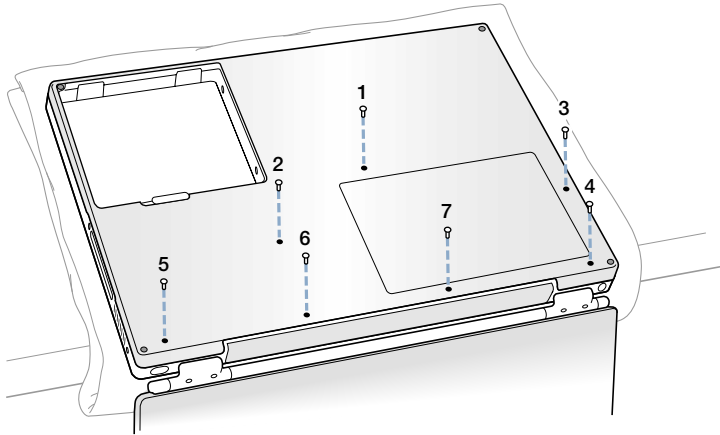
Figure 2



- Using the appropriate screwdriver, remove the eight bottom case screws in the order shown in the illustration. **(Figure 3)**

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during removal.

Figure 3

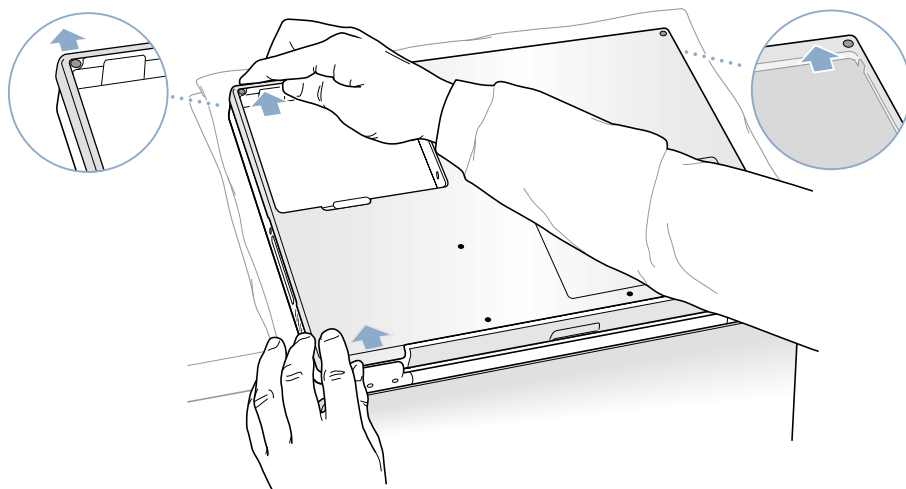


Note: The following three steps explain how to remove the bottom case by disengaging it at the left and right sides and then carefully pivoting it forward.

Important: During this procedure, do not push on the rubber feet of the bottom case.

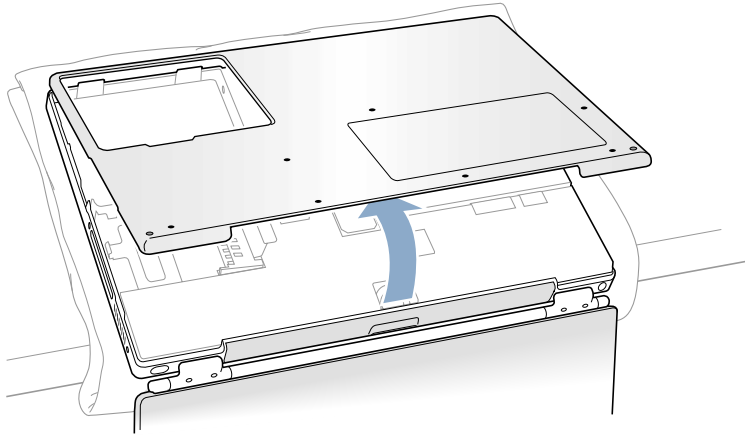
- Carefully slide the bottom case away from you. **(Figure 4)**

Figure 4



9. Pivot the bottom case up as shown in the illustration below. **(Figure 5)**

Figure 5



Installing the Replacement Bottom Case

1. To install the new bottom case, place it over the bottom of the computer in the same orientation as the original bottom case.
2. Align the notches on the right and left sides of the case (some of these can be viewed through the battery opening). Then press down and toward you slightly to secure the case.

Important: Make sure that the seams between the bottom case and the frame are closed. Verify that the case lies flat and fits properly around the battery latch and that the alignment tab that protrudes on the underside of the bottom case, shown in the illustration **(Figure 6A)**, is seated properly.

Note: To help with alignment, apply pressure to the bottom case at the back of the battery compartment opening, near the latch, and on the front and back outside edges of the case.

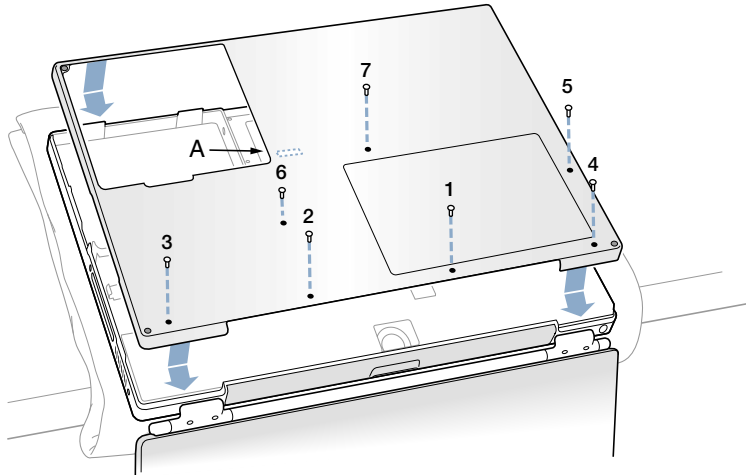
3. Check that the eight screw holes on the case align with the holes on the computer.

4. Replace the eight screws in the order shown in the illustration (**Figure 6**). Do not overtighten the screws or damage could result.

Note: The screws must go in straight and easily; if they do not, readjust the bottom case for proper alignment.

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during tightening.

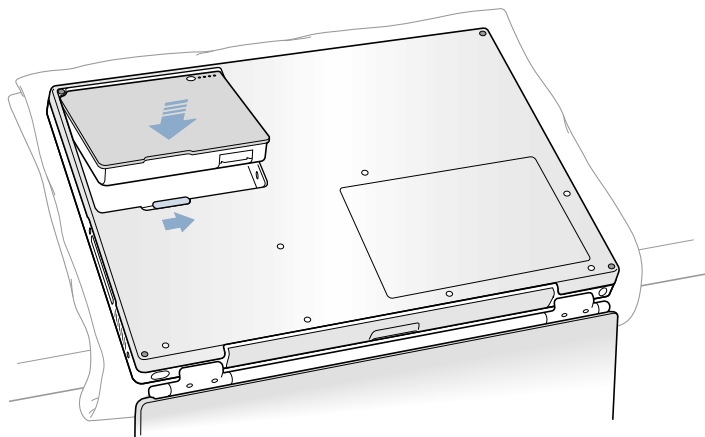
Figure 6



5. Replace the battery. (**Figure 7**)

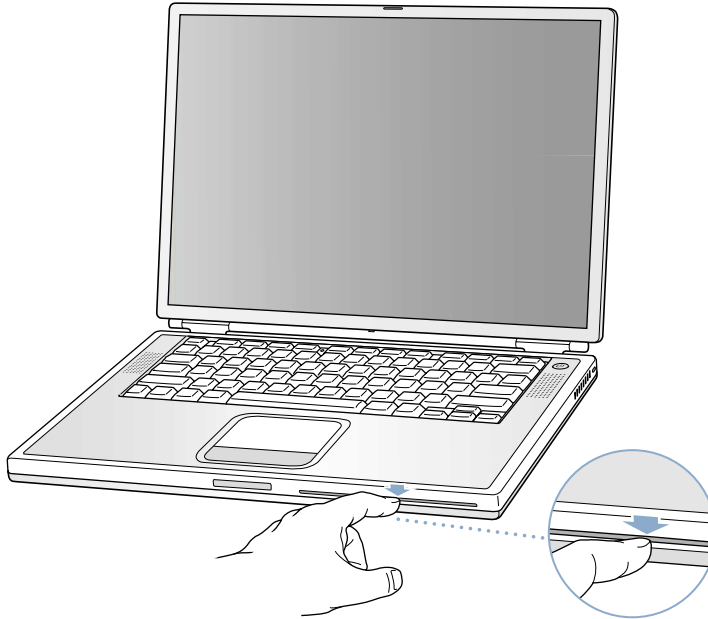
Important: Make sure that the battery locks securely into place and that the battery latch is slid all the way into the locked position.

Figure 7



6. Turn the computer over so that the optical drive slot faces you. Verify that the bottom case is flush with the front edge of the slot. If the case is slightly bowed and there is a gap near the center of the slot, carefully pull the bottom edge of the slot until it clicks into place and becomes flush with the bottom case. **(Figure 8)**

Figure 8



7. Reconnect the power cord and any other cables that were connected, and restart your computer.

Warning: Never turn on your computer unless all of its internal and external parts are in place and it is closed. Operating the computer when it is open or missing parts can damage your computer or cause injury.

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AirPort Card Replacement Instructions

Follow the instructions in this sheet carefully. Failure to follow these instructions could damage your equipment and void its warranty.

Note: Written and video instructions covering customer-installable parts are available at <http://www.info.apple.com/installparts/>.

Warning: Sharp edges can exist inside your computer and on any parts being removed or installed. Use caution to avoid injury. Keep small parts away from children.

Tools Required

- Soft towel or cloth, larger than the PowerBook
- Torx T8 screwdriver

Opening the Computer

Warning: Always shut down your computer before opening it to avoid damaging its internal components or causing injury. After you shut down the computer, the internal components can be very hot. Let the computer cool down before continuing.

To access the AirPort Card, you must first remove the battery and bottom case.

1. Place your computer on a clean, flat surface.
2. Shut down your computer and wait thirty minutes before continuing.
3. Disconnect the power cord and any other cables connected to the computer.

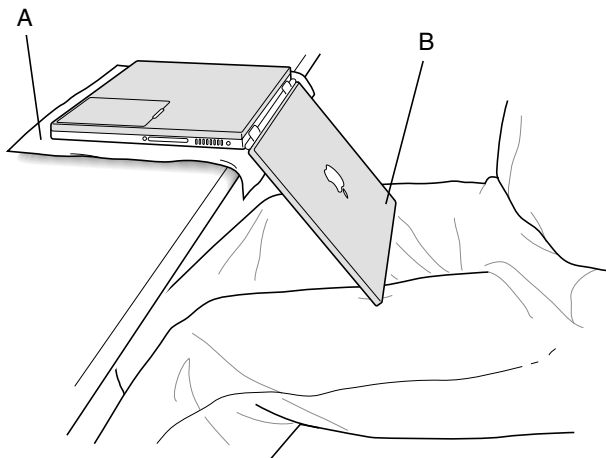
4. Place a towel or soft cloth on a table in front of you. **(Figure 1A)**

The towel or cloth will protect the keyboard and display area of the PowerBook when you flip it over to remove the battery and bottom case. Make sure it covers an area large enough for your PowerBook and that it hangs over the edge of the table.

5. With the display open at an angle greater than 90 degrees, carefully flip the PowerBook over and lay it flat, fully on the table. Make sure the display hangs over the edge of the table and rests lightly on your lap. **(Figure 1B)**

Important: Do not open the display farther than the angle shown.

Figure 1

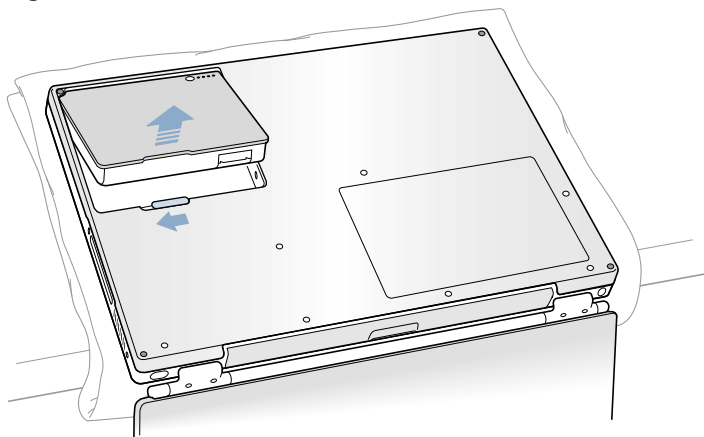


6. Remove the battery by sliding the battery latch to the left. Make sure to return the latch fully to the right. **(Figure 2)**

Removing the battery will prevent you from accidentally turning on the computer.

Warning: Removing the battery before shutting down your computer may result in data loss.

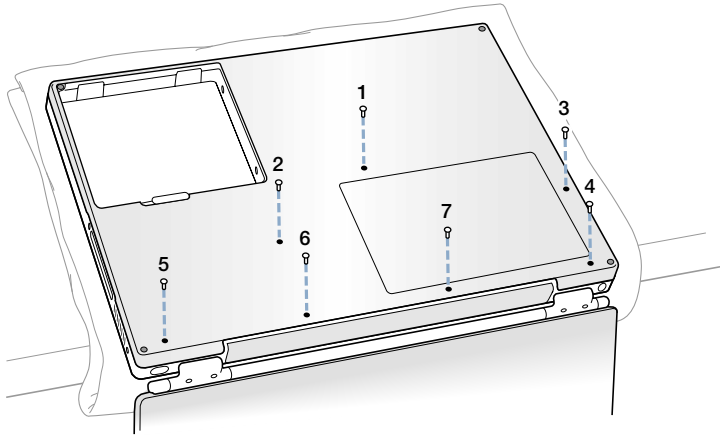
Figure 2



- Using a Torx T8 screwdriver, remove the eight bottom case screws in the order shown in the illustration. **(Figure 3)**

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during removal.

Figure 3

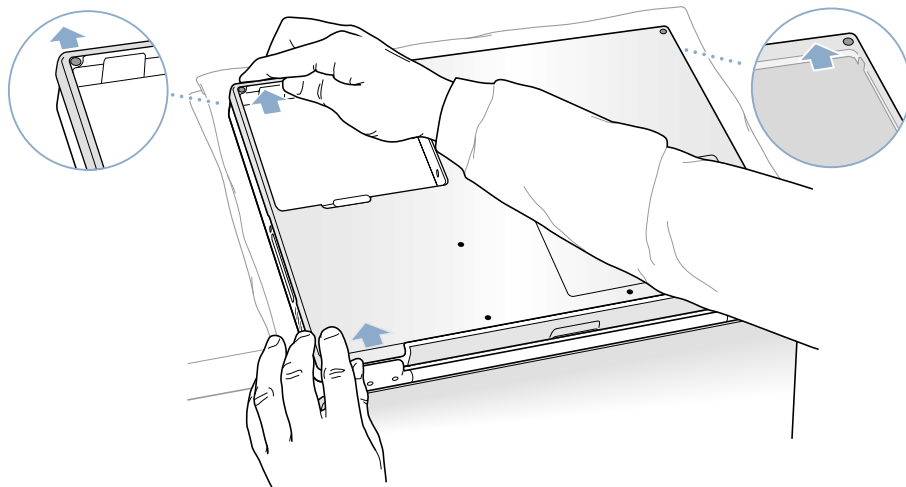


Note: The following three steps explain how to remove the bottom case by disengaging it at the left and right sides and then carefully pivoting it forward.

Important: During this procedure, do not push on the rubber feet of the bottom case.

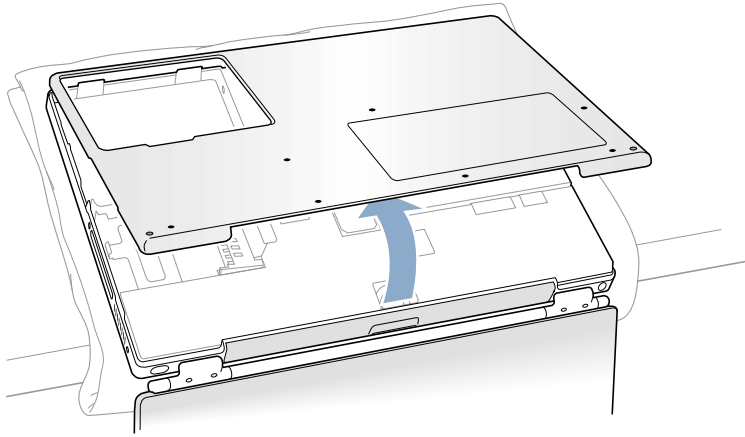
- Carefully slide the bottom case away from you. **(Figure 4)**

Figure 4



- Pivot the bottom case up as shown in the illustration below. **(Figure 5)**

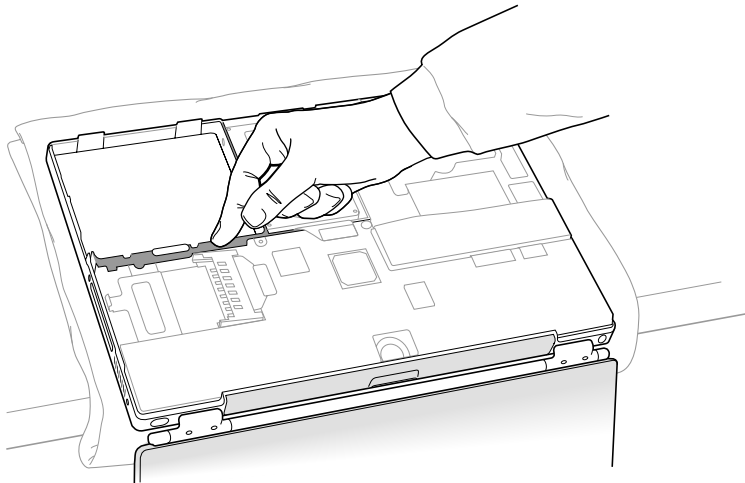
Figure 5



- Touch the computer's inside framework (a dull gray conductive composite material) to discharge any static electricity, as shown. **(Figure 6)**

Important: To avoid electrostatic discharge damage, always ground yourself by touching the computer's framework before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed your installation and closed the computer.

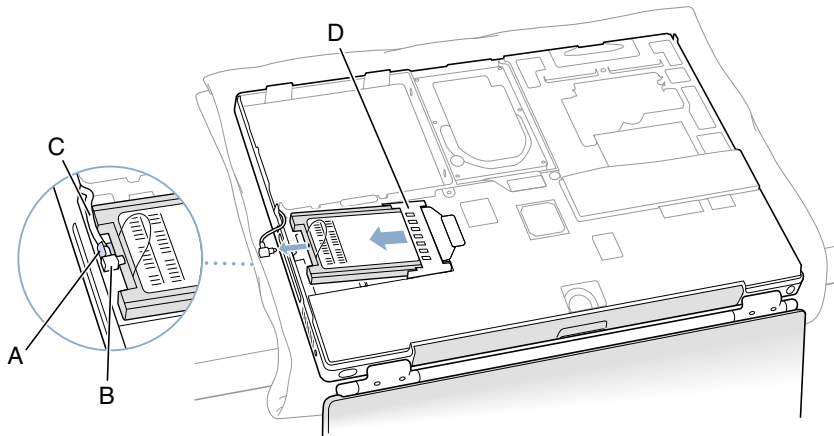
Figure 6



Removing the Installed AirPort Card

1. Pull back on the antenna clip (**Figure 7A**) to release the antenna cable connector (**Figure 7B**) and allow the card to rise up slightly.
2. Pull the card from the AirPort connector (**Figure 7D**).
3. Hold the AirPort Card with one hand and grasp the antenna cable connector with the other. While being careful not to strain the antenna cable (**Figure 7C**), firmly pull the connector straight out of the AirPort Card.

Figure 7



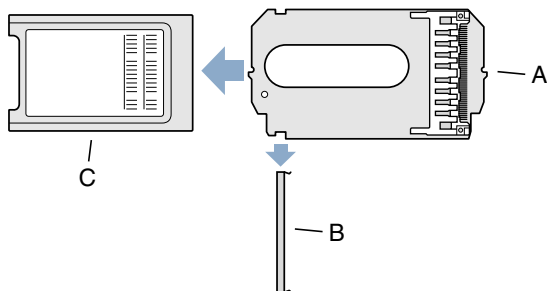
Important: If the AirPort Card is not being replaced right away, replace the antenna cable connector into its holder (**Figure 9B**) and pull the loop of the antenna cable up slightly and away from the edge of the computer case. This prevents the cable from interfering with the PC card slot, below, or getting pinched during reassembly.

Also, if the insertion end of the AirPort Card connector is rotated up, push it down into the level position. This allows the bottom case to install properly.

Installing the Replacement AirPort Card

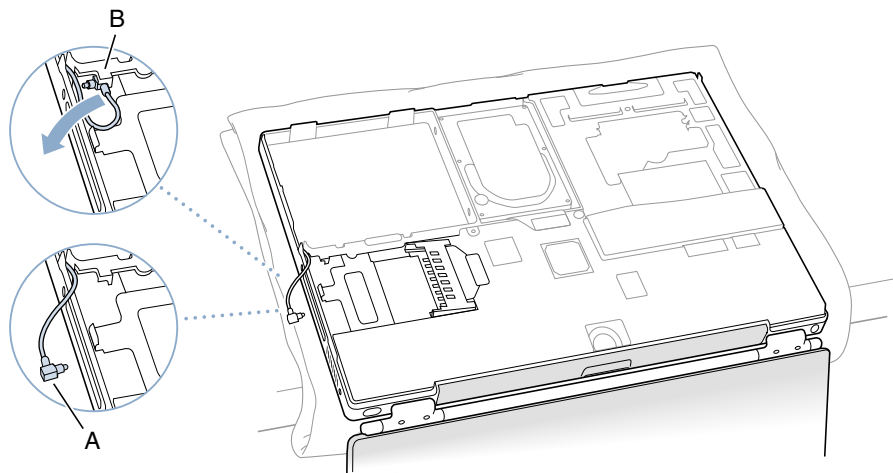
1. If the AirPort Card to be installed came with the AirPort adapter (**Figure 8A**), remove the metal clip (**Figure 8B**) and pull the AirPort Card (**Figure 8C**) from the adapter. (The adapter and metal clip are not used with your PowerBook.)

Figure 8



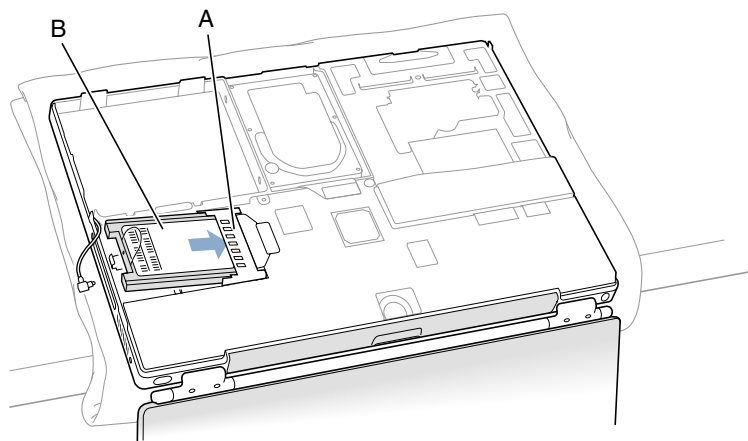
2. If necessary, pull the AirPort antenna cable connector (**Figure 9A**) from its holder (**Figure 9B**).

Figure 9



3. Pull up the insertion end of the AirPort Card connector (**Figure 10A**) to raise it up slightly, if it is not already up.
4. Position the AirPort Card (**Figure 10B**) with the AirPort ID numbers and bar code facing up and slide the card into the connector. Make sure to slide the card all the way in until the card is securely attached to the connector.

Figure 10



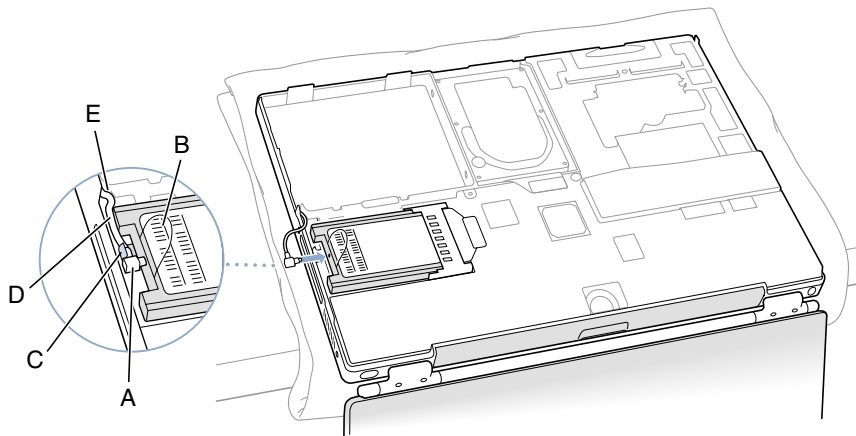
5. Plug the antenna cable connector (**Figure 11A**) into the port, which is located just below the plastic tab (**Figure 11B**), on the end of the AirPort Card. Make sure the connector is straight before inserting it into the card.
6. Push the AirPort Card down into its space until the antenna cable connector is secured by the small antenna clip (**Figure 11C**).

Important: Route the antenna cable (**Figure 11D**) between the edge of the computer and the AirPort Card. Verify that the cable is away from the edge of the computer so that it will not be pinched during reassembly and that it does not sag down into the PC card slot area (below the AirPort Card). Take up any extra cable by tucking it in where shown (**Figure 11E**).

7. Fold the plastic tab (**Figure 11B**) on the AirPort Card over the top of the card.

Note: The plastic tab must be folded over the card during the installation of the bottom case; otherwise you will not be able to securely attach the bottom case to the computer.

Figure 11



Closing the Computer

1. To replace the bottom case, place it over the bottom of the computer in the same orientation as the original bottom case.
2. Align the notches on the right and left sides of the case (some of these can be viewed through the battery opening). Then press down and toward you slightly to secure the case.

Important: Make sure that the seams between the bottom case and the frame are closed. Verify that the case lies flat and fits properly around the battery latch and that the alignment tab that protrudes on the underside of the bottom case, shown in the illustration (**Figure 12A**), is seated properly.

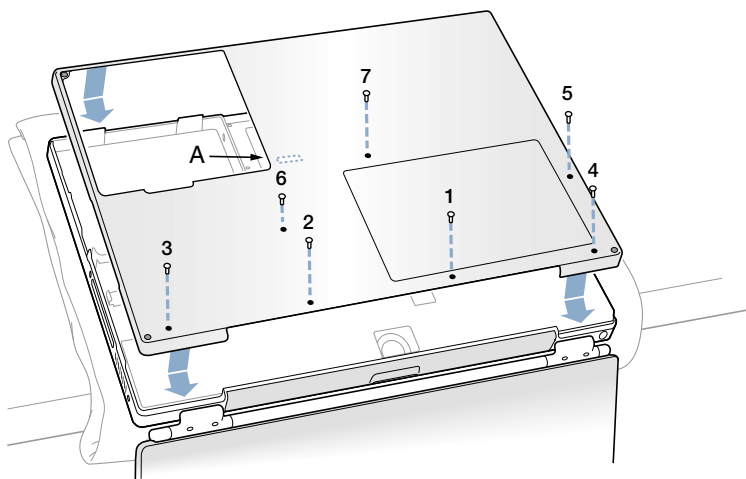
Note: To help with alignment, apply pressure to the bottom case at the back of the battery compartment opening, near the latch, and on the front and back outside edges of the case.

3. Check that the eight screw holes on the case align with the holes on the computer.
4. Replace the eight screws in the order shown in the illustration (**Figure 12**). Do not overtighten the screws or damage could result.

Note: The screws must go in straight and easily; if they do not, readjust the bottom case for proper alignment.

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during tightening.

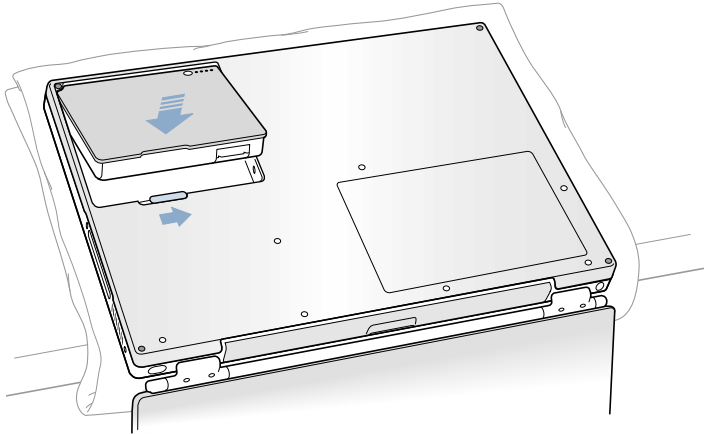
Figure 12



5. Replace the battery. **(Figure 13)**

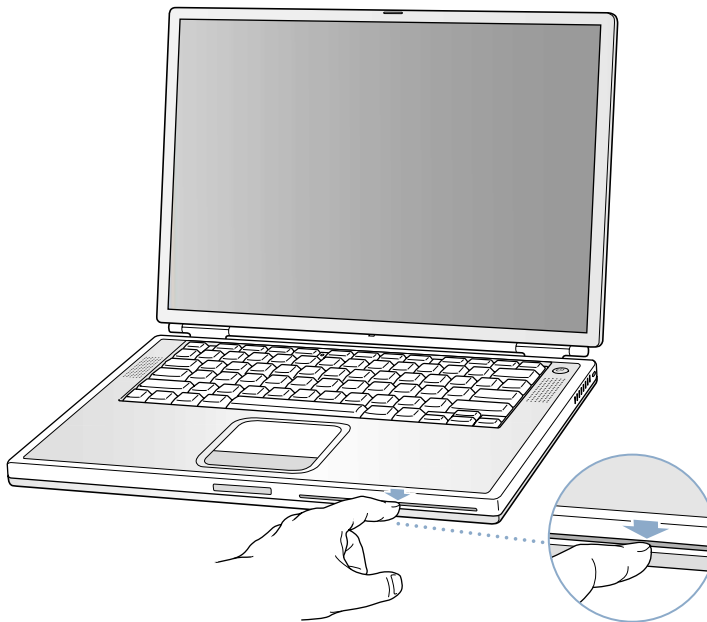
Important: Make sure that the battery locks securely into place and that the battery latch is slid all the way into the locked position.

Figure 13



6. Turn the computer over so that the optical drive slot faces you. Verify that the bottom case is flush with the front edge of the slot. If the case is slightly bowed and there is a gap near the center of the slot, carefully pull the bottom edge of the slot until it clicks into place and becomes flush with the bottom case. **(Figure 14)**

Figure 14



-
7. Reconnect the power cord and any other cables that were connected, and restart your computer.

Warning: Never turn on your computer unless all of its internal and external parts are in place and it is closed. Operating the computer when it is open or missing parts can damage your computer or cause injury.

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Hard Drive Replacement Instructions

Follow the instructions in this sheet carefully. Failure to follow these instructions could damage your equipment and void its warranty.

Note: Written and video instructions covering customer-installable parts are available at <http://www.info.apple.com/installparts/>.

Warning: Sharp edges can exist inside your computer and on any parts being removed or installed. Use caution to avoid injury. Keep small parts away from children.

Tools Required

- Soft towel or cloth, larger than the PowerBook
- Torx T8 screwdriver (provided with hard drive)

Backing Up Your Data

Warning: Before replacing your hard drive, make sure you back up all data on the drive.

Opening the Computer

Warning: Always shut down your computer before opening it to avoid damaging its internal components or causing injury. After you shut down the computer, the internal components can be very hot. Let the computer cool down before continuing.

To access the hard drive, you must first remove the battery and bottom case.

1. Place your computer on a clean, flat surface.
2. Shut down your computer and wait thirty minutes before continuing.
3. Disconnect the power cord and any other cables connected to the computer.

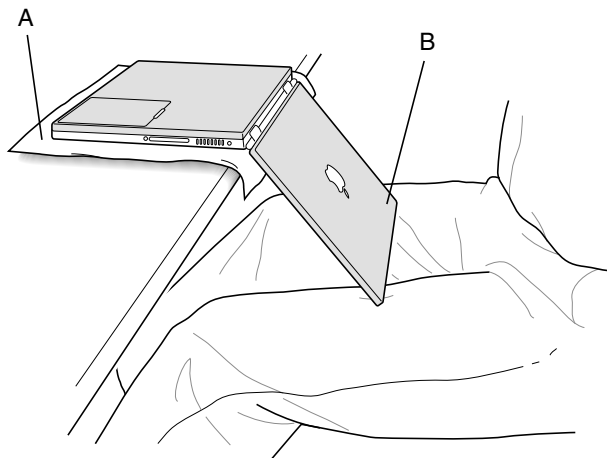
4. Place a towel or soft cloth on a table in front of you. **(Figure 1A)**

The towel or cloth will protect the keyboard and display area of the PowerBook when you flip it over to remove the battery and bottom case. Make sure it covers an area large enough for your PowerBook and that it hangs over the edge of the table.

5. With the display open at an angle greater than 90 degrees, carefully flip the PowerBook over and lay it flat, fully on the table. Make sure the display hangs over the edge of the table and rests lightly on your lap. **(Figure 1B)**

Important: Do not open the display farther than the angle shown.

Figure 1

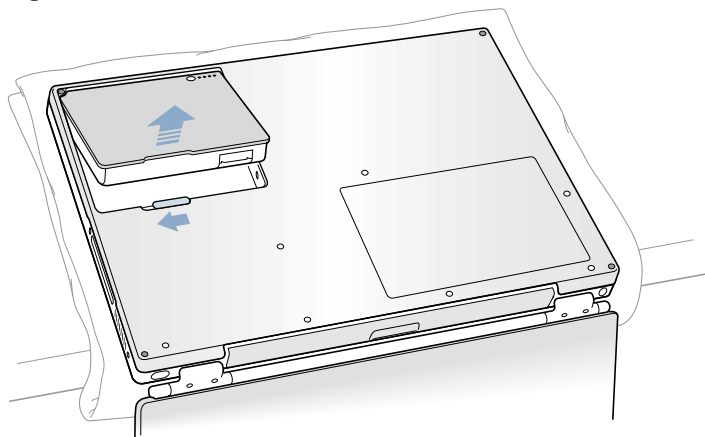


6. Remove the battery by sliding the battery latch to the left. Make sure to return the latch fully to the right. **(Figure 2)**

Removing the battery will prevent you from accidentally turning on the computer.

Warning: Removing the battery before shutting down your computer may result in data loss.

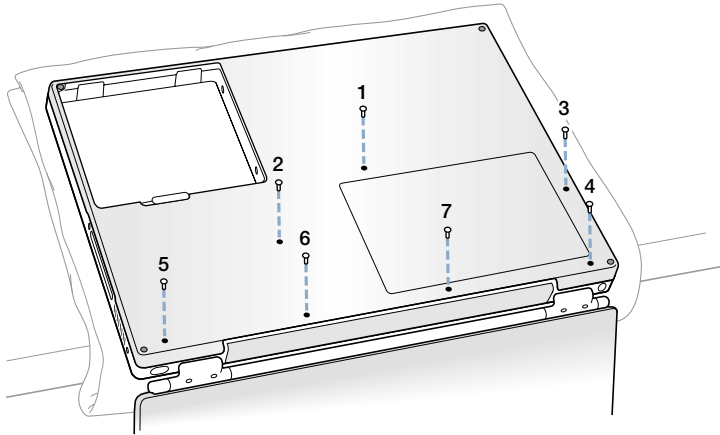
Figure 2



- Using a Torx T8 screwdriver, remove the eight bottom case screws in the order shown in the illustration. **(Figure 3)**

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during removal.

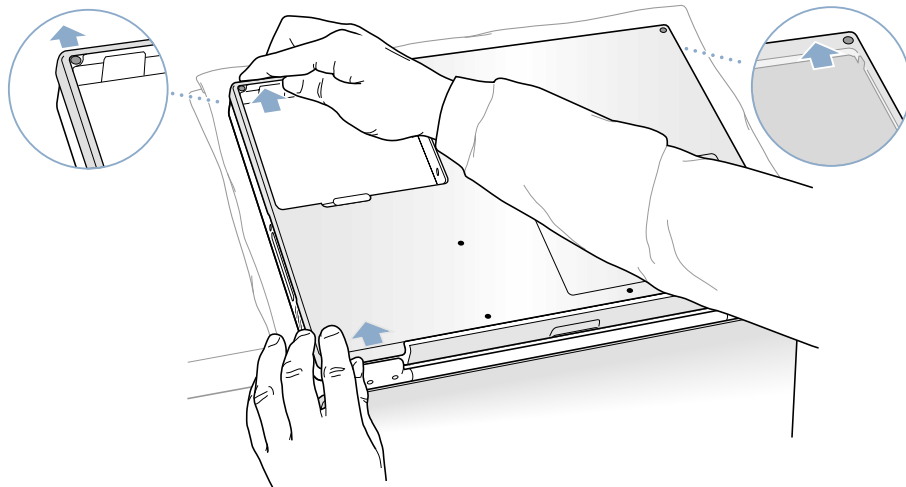
Figure 3



Important: During this procedure, do not push on the rubber feet of the bottom case.

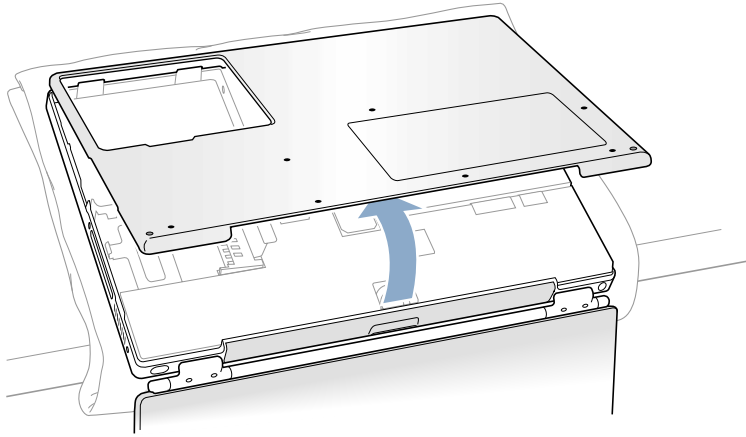
- Carefully slide the bottom case away from you. **(Figure 4)**

Figure 4



- Pivot the bottom case up as shown in the illustration below. **(Figure 5)**

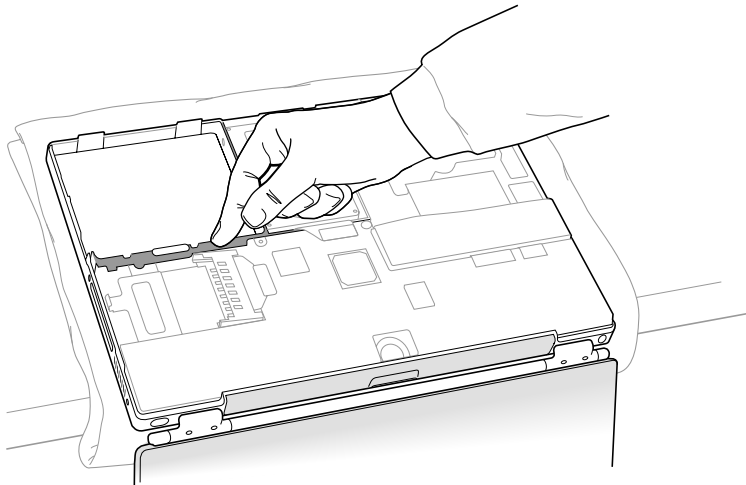
Figure 5



- Touch the computer's inside framework (a dull gray conductive composite material) to discharge any static electricity, as shown. **(Figure 6)**

Important: To avoid electrostatic discharge damage, always ground yourself by touching the computer's framework before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed your installation and closed the computer.

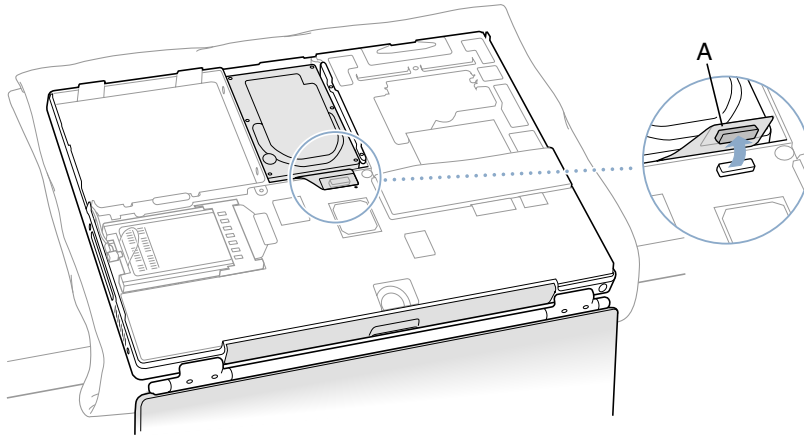
Figure 6



Removing the Installed Hard Drive

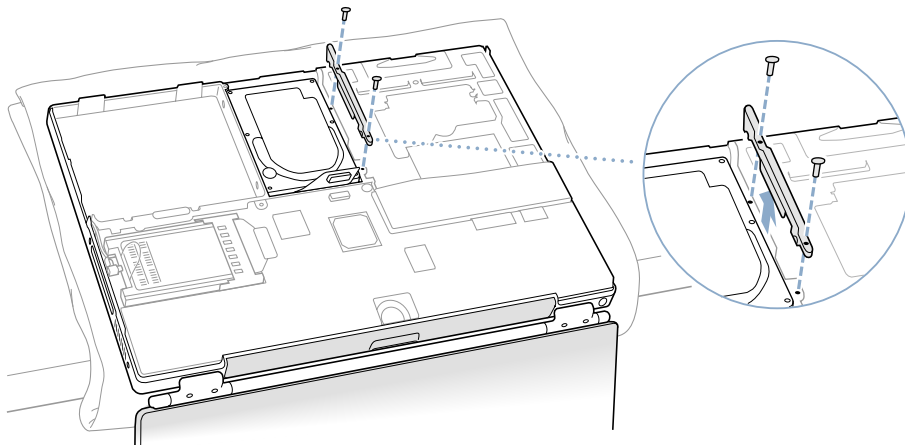
1. With your fingers, carefully pry up the hard drive cable connector (**Figure 7A**) at its sides to disconnect it from the logic board. You may need to pry one side, then the other, in a rocking motion.

Figure 7



2. With a Torx T8 screwdriver, remove the two screws that secure the hard drive mounting bracket, and remove the bracket. (**Figure 8**)

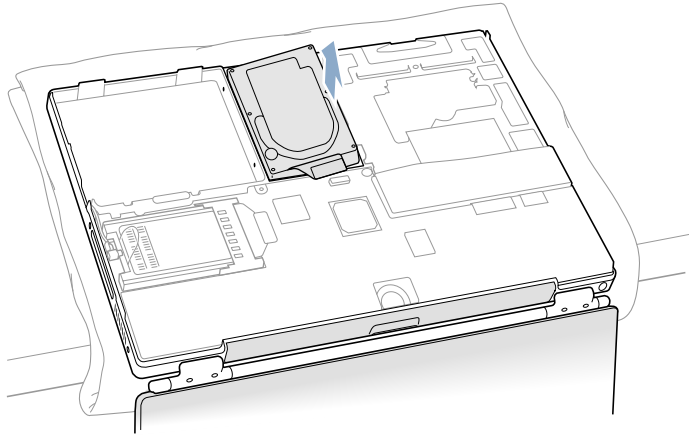
Figure 8



3. Pull up on the right side of the hard drive to remove. **(Figure 9)**

Important: Do not pull on the connector cable or use the cable as a handle.

Figure 9



Note: There are four rubber stoppers on the hard drive that fit over screws (two on each side). Remove any that may have fallen off or that remain in the holes in the mounting bracket inside the computer.

4. Carefully remove the Mylar sheath and cable from the hard drive to transfer to the replacement drive.

Important: The connector pins on the hard drive are fragile and bend easily. Use care to keep the pins straight when removing or installing.

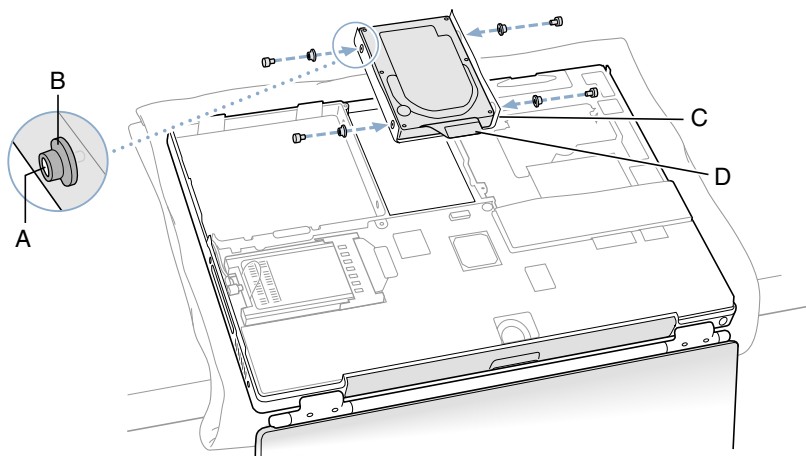
Installing the Replacement Hard Drive

Warning: To avoid potential injury, avoid touching or brushing against the thin strip of metal that extends up from the hard drive mounting bracket (Figure 10A).

Important: Avoid touching the optical drive as you perform this procedure.

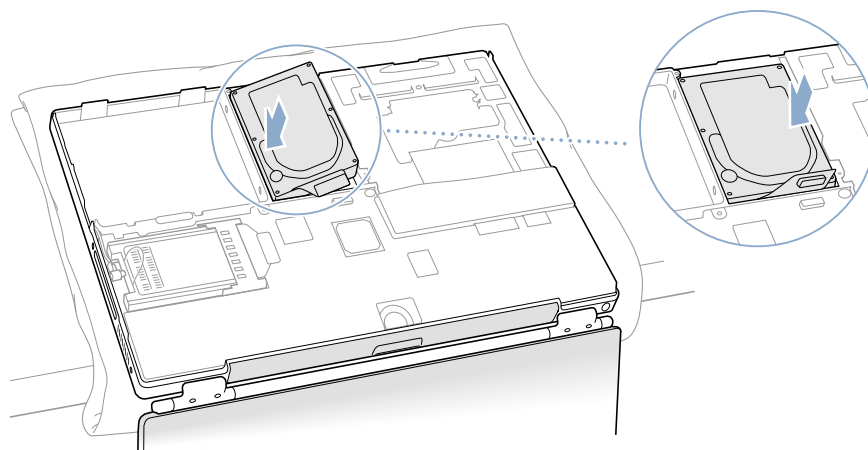
1. Make sure that the screws (Figure 10A) and rubber stoppers (Figure 10B) are in place on the sides of the replacement drive.
2. Install the Mylar sheath (Figure 10C) so that it covers the bottom and left and right sides of the drive. The sheath is directional—install it so that it does not extend beyond the front of the hard drive.
3. Carefully install the hard drive cable (Figure 10D). The cable connector is keyed to fit only one way.

Figure 10



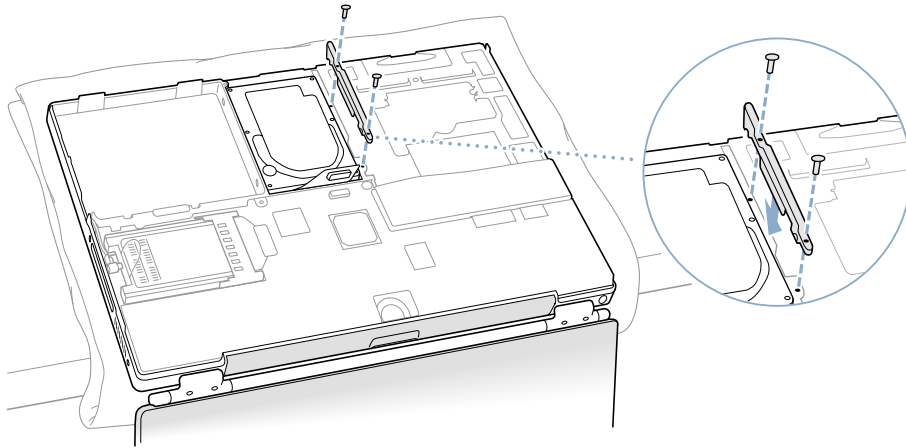
4. Insert the left side of the drive first, then the right. Use a screwdriver through the frame holes on the left side to help align the stoppers, if necessary. (Figure 11)

Figure 11



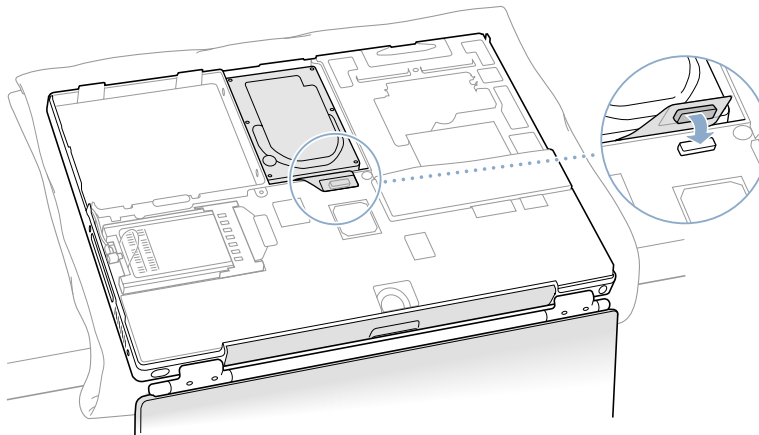
-
5. With a Torx T8 screwdriver, replace the two screws that secure the hard disk to the mounting bracket. **(Figure 12)**

Figure 12



6. Connect the hard drive cable connector **(Figure 13)** to the logic board.

Figure 13



Closing the Computer

1. Attach the bottom case to the computer and replace the seven screws in the order shown in the illustration below (**Figure 14**).

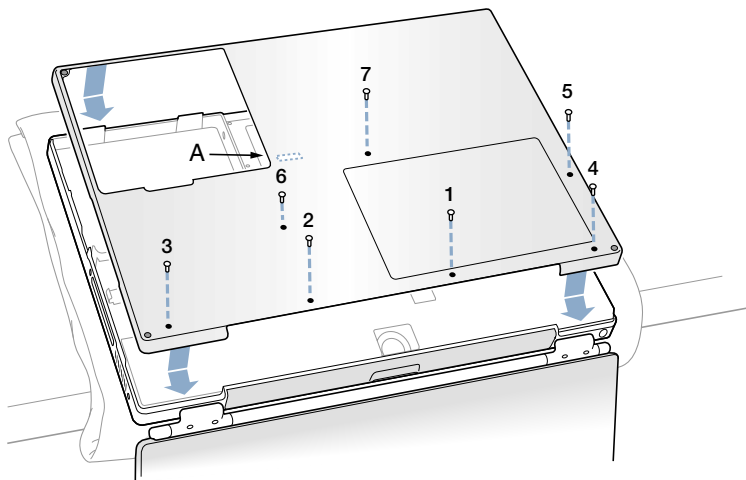
Line up the notches on the right and left sides of the case, then press down slightly to secure the case. Check the alignment of the seven screw holes to make sure the bottom case is properly positioned.

Important: Make sure that the seams between the bottom case and the frame are closed. Check the outside edges and around the battery bay. Verify that the alignment tab on the underside of the bottom case, shown in the illustration below (**Figure 14A**), has seated, and the case lies flat.

Note: The screws must go in straight and easily; if they do not, readjust the bottom case for proper alignment. Do not overtighten the screws or damage could result.

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during tightening.

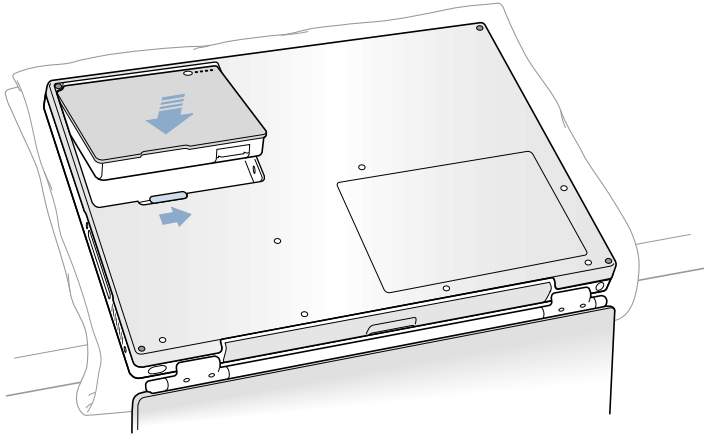
Figure 14



2. Replace the battery. **(Figure 15)**

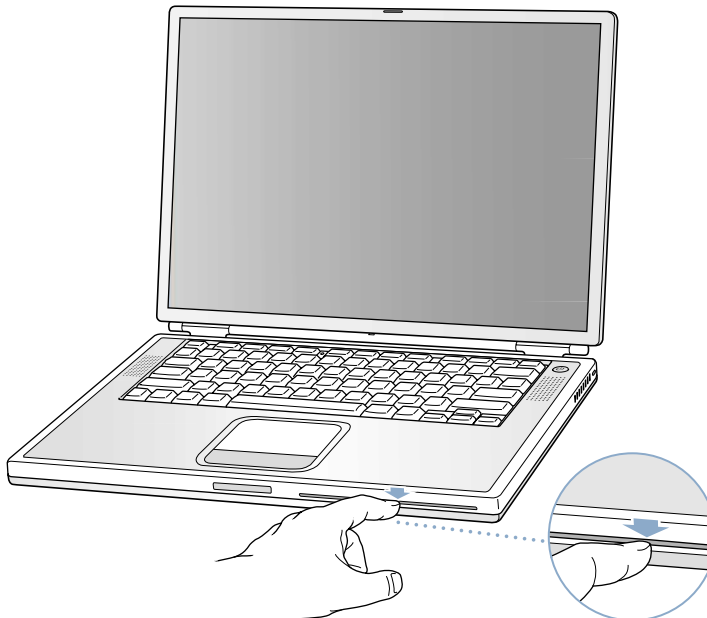
Important: Make sure that the battery locks securely into place and that the battery latch is slid all the way into the locked position.

Figure 15



3. Turn the computer over. Look at the optical drive slot to make sure that the case is properly secured. If a gap exists below the slot, gently pull the bottom of the optical drive slot toward you until it clicks into place and the gap is removed. **(Figure 16)**

Figure 16



-
4. Reconnect the power cord and any other cables that were connected, and restart your computer.

Warning: Never turn on your computer unless all of its internal and external parts are in place and it is closed. Operating the computer when it is open or missing parts can damage your computer or cause injury.

5. Restore the data from your backup to the new drive.
6. Check the operation of the optical drive. If the hard drive is installed incorrectly, the optical drive mechanism might not spin correctly and will result in mechanical noise when playing a disc.

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Modem Filter Board Replacement Instructions

The following instructions explain how to replace the modem EMI filter board in the PowerBook G4 (DVI) computer.

Tools

- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool
- Torx T8 screwdriver

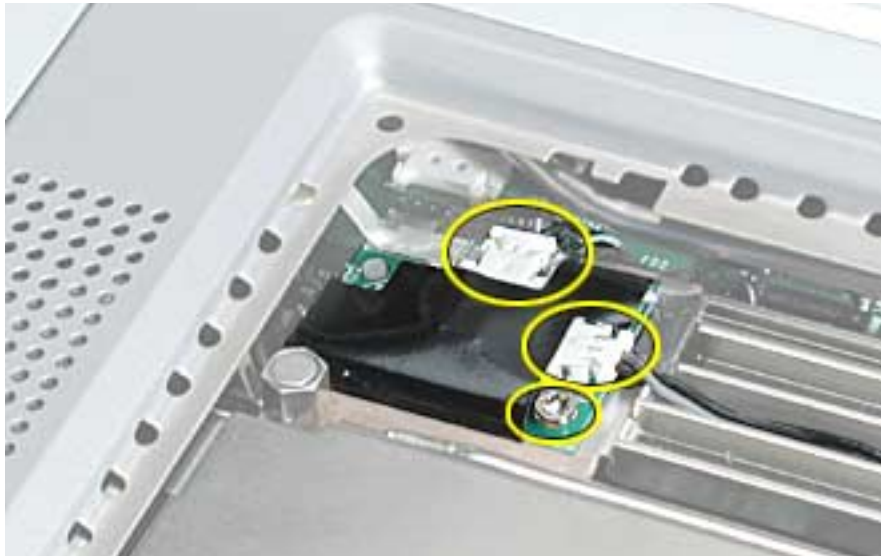
Preliminary Steps

Before you begin, remove the following:

- Battery
- Keyboard

Procedure

1. Disconnect the RJ-11 and the modem wire connectors from the modem filter board.
2. Remove the Torx T8 screw.



3. Guide the modem filter board out of the case.

DC-In Board Replacement Instructions

The following instructions explain how to replace the DC-in board in the PowerBook G4 (DVI) computer.

Important: Check the “Heat Exchanger Upgrade” and the “Check for PowerBook G4 (DVI) 867 MHz Upgrade” chapters of this manual for possible configuration changes.

Tools

- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool
- Torx T6 screwdriver

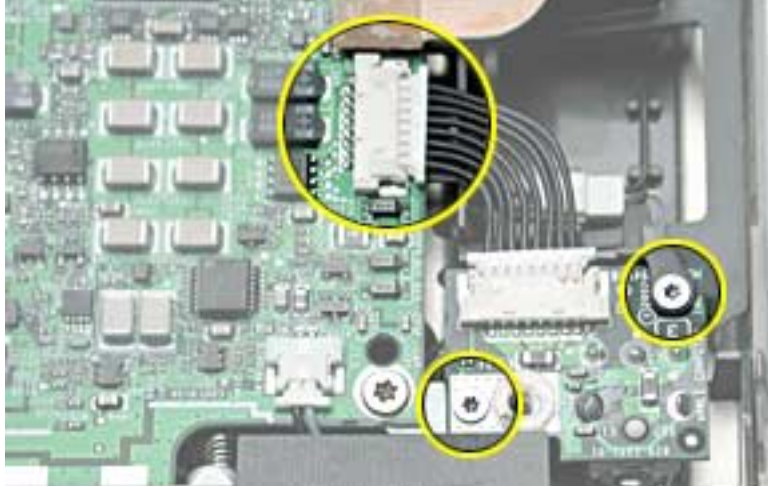
Preliminary Steps

Before you begin, remove the following:

- Battery
- Bottom case

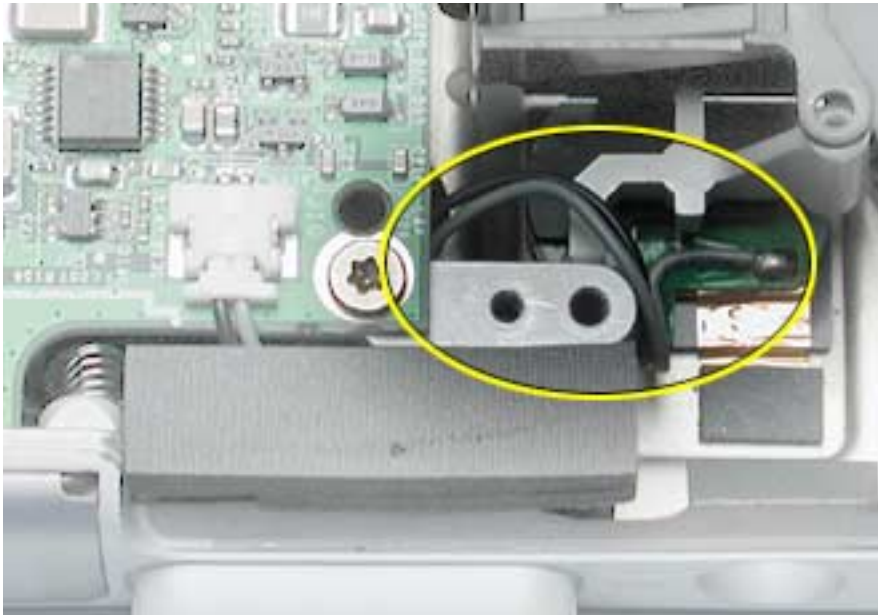
Procedure

1. Disconnect the DC-in board cable connector from the logic board.
2. Remove the two Torx T6 screws.



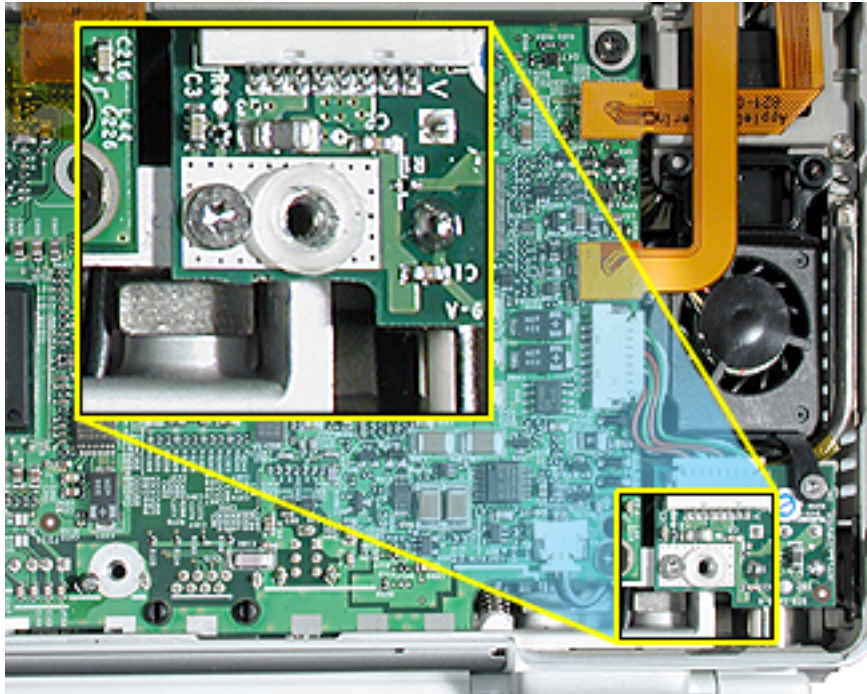
3. Guide the DC-in board out of the case.

Replacement Note: If you performed a procedure that also removed the logic board, ensure that the power button cable routes as shown.



Replacement Notes:

- Install or transfer the 1 mm plastic spacer washer to the replacement DC-In board.



- When replacing the DC-in board, ensure that the secondary fan or bracket is seated properly over the pin on the rib frame, and with its securing-tab resting on top of the DC-In board. If one screw was longer, replace it through the fan's securing-tab.
- Make sure that the DC connector is straight and centered in the port opening. With the power adapter unplugged, the adapter connector may be inserted onto the DC connector to ensure that the connector is centered and straight before securing the DC-in board.

- If a secondary fan is installed, bend the DC-In board cable wires around the edge of the fan, as shown, so they do not interfere with the fan or air flow.



Inverter Board Replacement Instructions

The following instructions explain how to replace the inverter board in the PowerBook G4 (DVI) computer.

Tools

- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool
- Torx T6 screwdriver

Preliminary Steps

Before you begin, remove the following:

- Battery
- Bottom case

Procedure

Important: With the bottom case removed, be careful if turning over the computer. Some components could become loose and fall out.

1. Disconnect the inverter board flex cable from both the inverter board and logic board.



2. Disconnect the bulb wire cable from the inverter board.
3. Remove the two T6 screws that secure the inverter board and remove the board.

Replacement Note: When reinstalling the replacement optical drive, ensure that the bulb wire cable is safely within the case edge so that it will not get pinched by the bottom case.



-
4. Install the replacement inverter board onto the optical drive.
 5. Reassemble and test the computer.

Important: Make sure the bottom case is installed correctly. If the slot-load area is slightly bowed, carefully pull the bottom edge of the slot until it clicks into place and becomes flush with the bottom case.



Important: Check the operation of the optical drive. If the drive is installed incorrectly, the optical drive mechanism might not spin correctly and will result in mechanical noise when playing a disc.

Modem Replacement Instructions

The following instructions explain how to replace the modem in the PowerBook G4 (DVI) computer.

Tools

- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool
- Torx T6 screwdriver
- Torx T8 screwdriver

Preliminary Steps

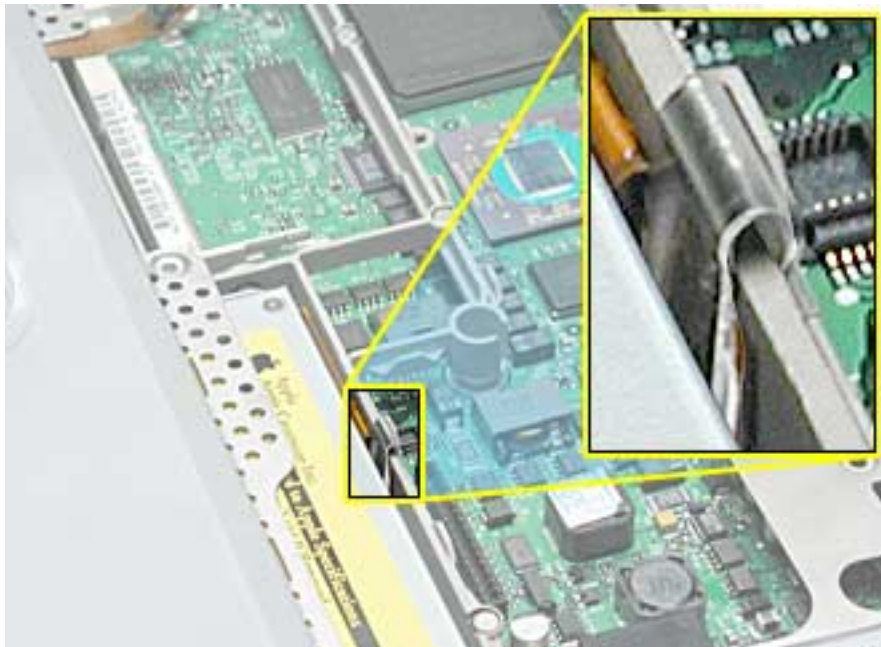
Before you begin, remove the following:

- Battery
- Keyboard
- Bottom case (remove in step 2)

Procedure

1. With the display open and the keyboard removed, locate and remove the EMI clip that secures the optical drive's flex cable to the rib frame. Side until reassembling the computer.

Replacement Note: When reassembling the computer, ensure that the EMI clip captures the tab on the flex cable and holds it against the rib frame.



2. Remove the bottom case.

Important: With the bottom case removed, be careful if turning over the computer. Some components could become loose and fall out.

3. Remove the two T8 screws that secure the hard drive mounting bracket and remove the bracket.



4. Disconnect the inverter board flex cable from the inverter board and logic board.
5. Disconnect the optical drive and modem flex cables from the logic board.



6. Remove the two T6 screws that secure the modem.
7. Lift up the end of the modem slightly and disconnect the 2-pin cable connector.



8. Use a thin tool to lift the optical drive slightly, then deroute the modem flex cable.



9. If the modem flex cable is not damaged, remove it and transfer it to the replacement modem.
10. Install the replacement modem. Avoid putting pressure on or stressing the modem board during installation.
11. To replace the optical drive, carefully guide the rubber stoppers on the outer side of the drive past the edge of the computer case.

Warning: To prevent damage to the optical drive, handle the drive only by the corners. Do not press on the body of the drive.

Important: When the rubber stoppers are inserted, push down on all four corners of the drive to verify that the drive is level and secure.

12. Reassemble and test the computer.

Replacement Note: When reinstalling the optical drive, ensure that the bulb wire cable is safely within the case edge so that it will not get pinched by the bottom case.



Important: Make sure the bottom case is installed correctly. If the slot-load area is slightly bowed, carefully pull the bottom edge of the slot until it clicks into place and becomes flush with the bottom case.



Important: Check the operation of the optical drive. If the drive is installed incorrectly, the optical drive mechanism might not spin correctly and will result in mechanical noise when playing a disc.

Combination DVD-ROM/CD-RW Optical Drive Replacement Instructions

The following instructions explain how to replace the combination DVD-ROM/CD-RW optical drive in the PowerBook G4 (DVI) computer.

Tools

- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool
- Torx T6 screwdriver
- Torx T8 screwdriver

Preliminary Steps

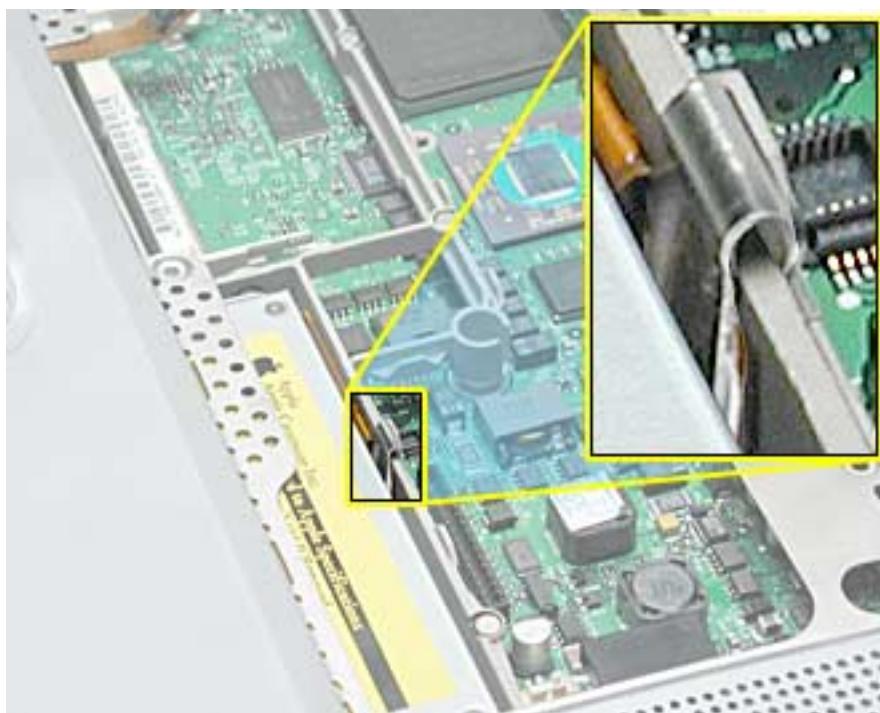
Before you begin, remove the following:

- Battery
- Keyboard
- Bottom case (remove in step 2)

Procedure

1. With the display open and the keyboard removed, locate and remove the EMI clip that secures the optical drive's flex cable to the rib frame. Set it aside for installation of the replacement drive.

Replacement Note: When installing the replacement drive, ensure that the EMI clip captures the tab on the flex cable and holds it against the rib frame.



2. Remove the bottom case.

Important: With the bottom case removed, be careful if turning over the computer. Some components could become loose and fall out.

3. Remove the two T8 screws that secure the hard drive mounting bracket and remove the bracket.

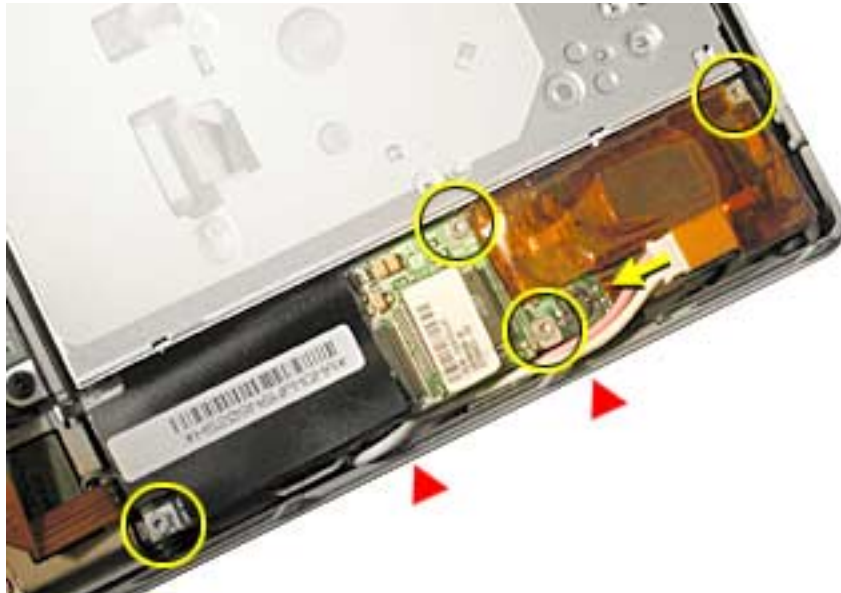


4. Disconnect the inverter board flex cable from the inverter board and logic board.
5. Disconnect the optical drive and modem flex cables from the logic board.



6. Disconnect the bulb wire cable from the inverter board.
7. Remove the four T6 screws that secure the modem and the inverter board and remove the inverter board.

Replacement Note: When reinstalling the replacement optical drive, ensure that the bulb wire cable is safely within the case edge so that it will not get pinched by the bottom case.



8. Lift up the end of the modem slightly and disconnect the 2-pin cable connector.



9. Use a thin tool to lift the optical drive slightly, then deroute the modem flex cable.



10. **Warning:** To prevent damage to the optical drive, handle the drive only by the corners. Do not press on the body of the drive.

To remove the optical drive, pull the drive to the right, away from the hard drive, to release the long rubber stopper from the rib frame.

11. **Important:** If you notice that the felt strip for the slot-load area is torn or damaged, replace the felt strip with a new one before replacing the optical drive. Follow the instructions below to replace the felt strip:

Locate the felt strip that came with the replacement drive. Before you remove the old felt strip, note the alignment of the felt strip over the slot-load area in the inner top case.



Peel off the felt strip from the inner top case. If there is any residual adhesive on the top case, rub it away.



Apply the new felt strip to the slot-load area. Make sure the new felt strip lies flat. Use a black stick to run the length of the slot to make sure that the felt strip does not block any of the slot.



12. Install the modem and inverter board onto the replacement optical drive. Again, handle the optical drive only by the corners. Do not press on the body of the drive.
13. To install the replacement optical drive, first insert the longer stopper on the inner side of the drive into the opening on the rib frame. Ensure that the other inner stopper rests securely in its space on the frame. Then while holding the inner side of the drive in place, carefully guide the rubber stoppers on the outer side of the drive past the edge of the computer case.



Important: When the rubber stoppers are inserted, push down on all four corners of the drive to verify that the drive is level and secure.

14. Reassemble and test the computer.

Important: Make sure the bottom case is installed correctly. If the slot-load area is slightly bowed, carefully pull the bottom edge of the slot until it clicks into place and becomes flush with the bottom case.



Important: Check the operation of the optical drive. If the drive is installed incorrectly, the optical drive mechanism might not spin correctly and will result in mechanical noise when playing a disc.

Backup Battery Replacement Instructions

The following instructions explain how to replace the backup battery in the PowerBook G4 (DVI) computer.

Tools

- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool

Preliminary Steps

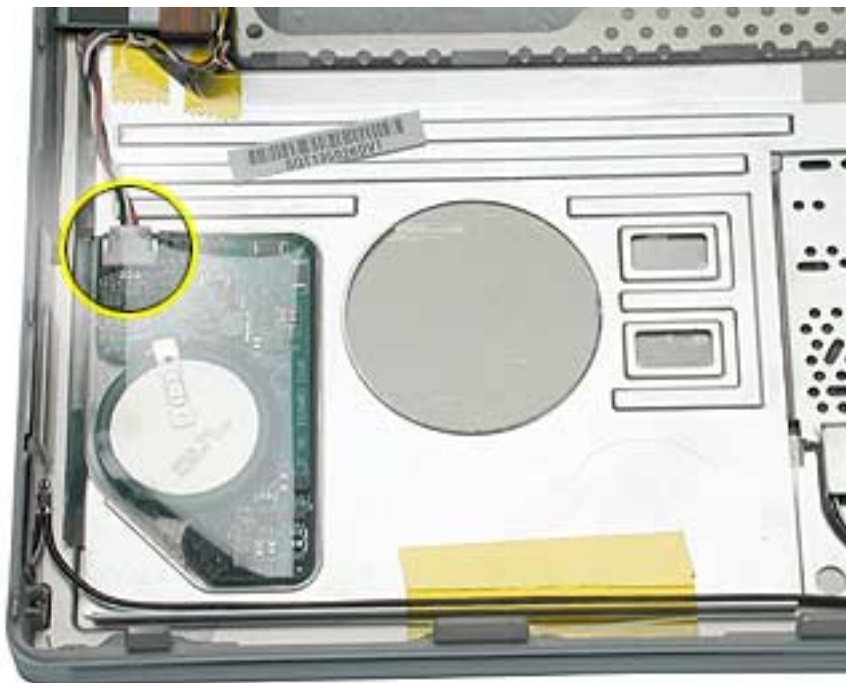
Before you begin, remove the following:

- Battery
- Optical drive

Procedure

1. Disconnect the backup battery cable from the backup battery.

Note: If the cable connector gets caught on the ridged area of the top case, use a black stick to raise up the backup battery and then disconnect the cable.



2. **Note:** The backup battery is compressed between two thin plastic sheets. The battery is held in place with adhesive on the lower plastic sheet.

Slide a black stick under and along the edge of the backup battery. Pry up the backup battery so that the entire battery—including the lower plastic sheet—is removed from the inner top case.

Warning: The ridged area of the top case is sharp.



3. If there is any adhesive left on the surface of the inner top case, use a black stick to rub it away. Do not use solvents.

Note: When installing the replacement backup battery, make sure the inner top case is clean and free of debris.

4. Peel off the cover sheet from the bottom surface of the replacement backup battery to expose the adhesive.
5. When positioning the replacement backup battery on the inner top case, make sure the battery fits within the ridged battery area of the inner top case.



6. Install the replacement backup battery, and reassemble and test the computer.

Logic Board

Replacement Instructions

The following instructions explain how to replace the logic board in the PowerBook G4 (DVI) computer.

Important: Check the “Heat Exchanger Upgrade” and the “Check for PowerBook G4 (DVI) 867 MHz Upgrade” chapters of this manual for possible configuration changes.

Tools

- Torx T8 screwdriver
- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool
- Razor blade
- Needle nose pliers (optional)

Note: To organize the screws you remove from the computer, use a tray with divided compartments (such as a plastic ice cube tray).

Preliminary Steps

Before you begin, remove the following:

- Battery
- Keyboard

Remove the following in step 4:

- Bottom case
- AirPort Card (if installed)

Procedure

1. With the display open and the keyboard removed, remove the T8 screw near the heat pipe.



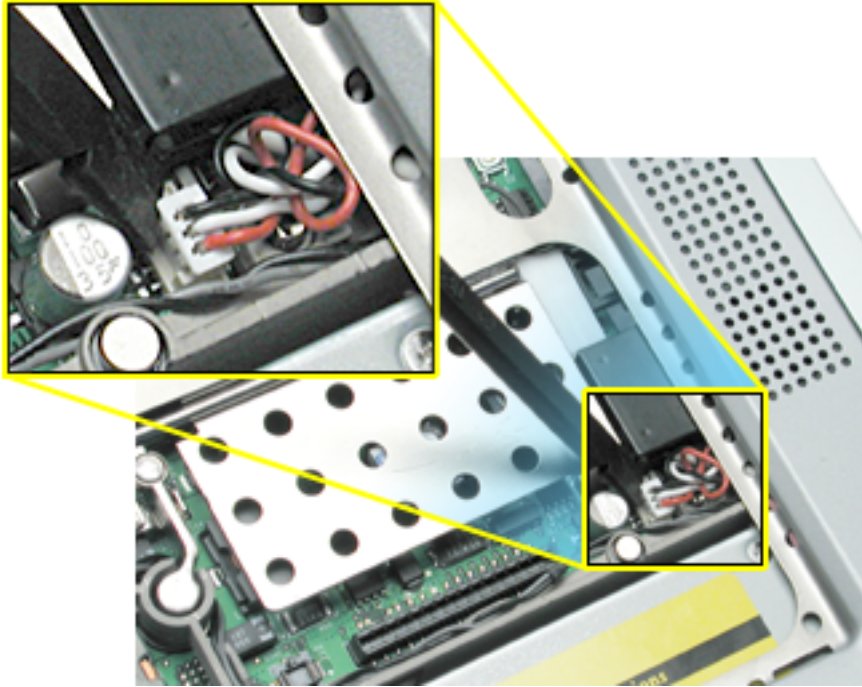
2. Disconnect the PC card flex cable connector and the keyed battery connector.

Important: If the battery connector has not been disconnected before, the keyed connector may be tight. If necessary, use a black stick or needle nose pliers to loosen one side of the connector and then the other side. Then insert the black stick under the cables to pry up and disconnect the connector.



Replacement Note: When reassembling the computer, tuck down the battery cables so they do not get in the way when the keyboard is installed.

3. Disconnect the 3-pin backup battery connector from the logic board.

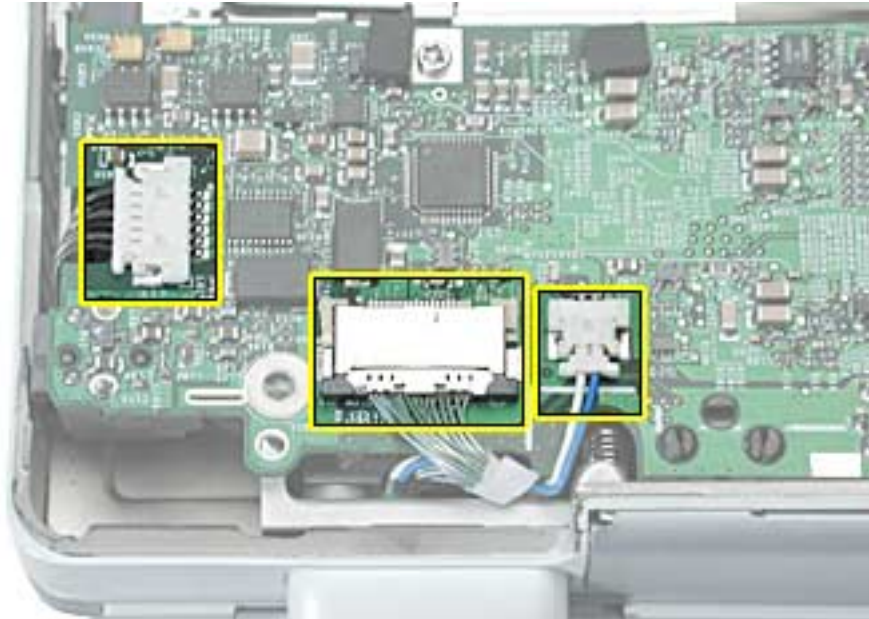


4. Remove the bottom case.

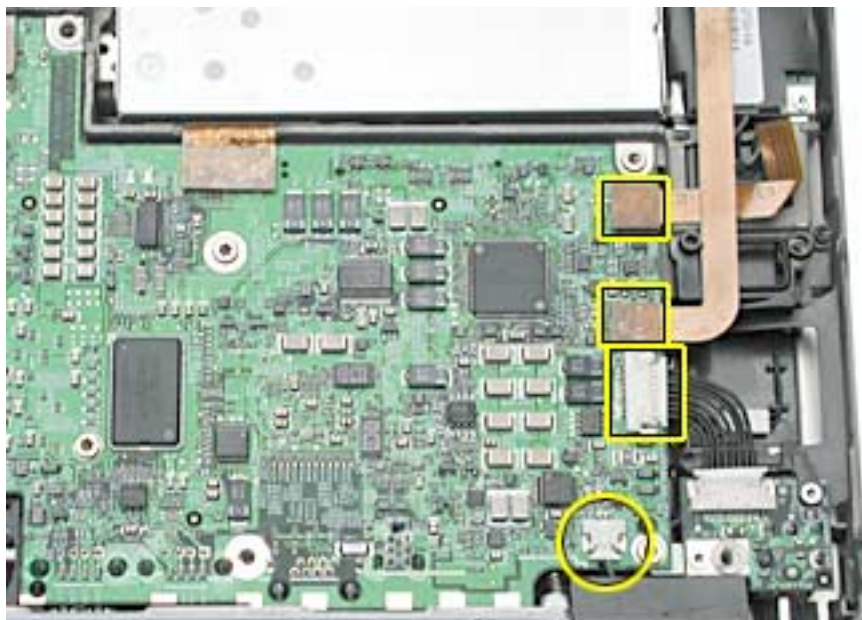
Important: With the bottom case removed, be careful when turning over the computer. Some components could become loose and fall out.

- 5. Warning: The thin cables connected to the LVDS (low voltage data signal) connector are extremely delicate. Do not pull or pinch the LVDS cables. Be especially careful when working near cables that attach to the display. If any of these cables are damaged, the entire display module must be replaced.**

At the left side of the logic board, disconnect the 2-pin sleep LED cable connector, the LVDS connector, and the 6-pin audio connector.



- 6. At the right side of the logic board, disconnect the 2-pin power button cable connector, the DC-in board cable connector, and the inverter board and modem flex cable connectors.**



7. Disconnect the trackpad, hard drive and optical drive flex cable connectors.

Note: If tape is covering the trackpad connector, reserve the tape for installation of the replacement logic board.



8. Remove the T8 screw on the edge of the logic board near the battery well.

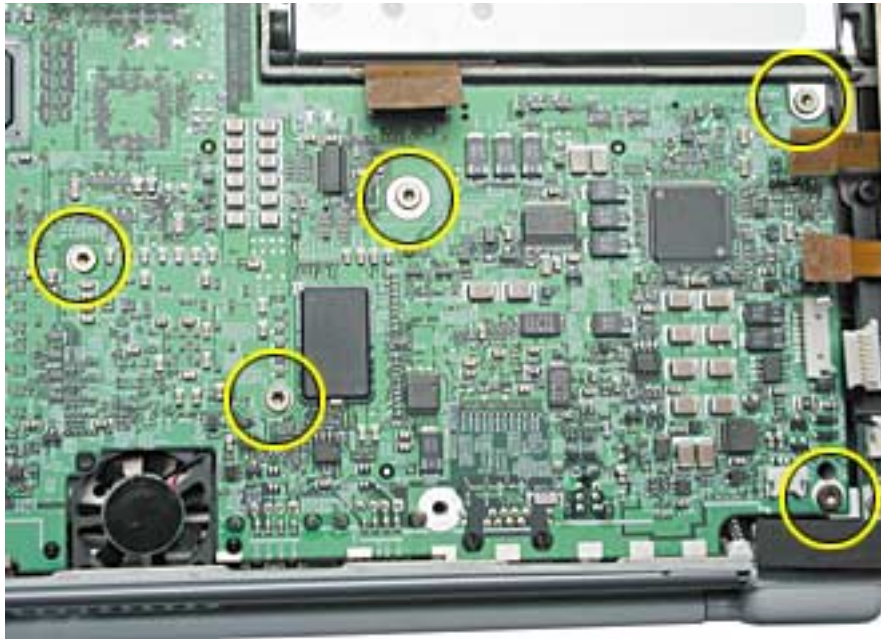
Important: Install this screw first when installing the replacement logic board. This screw helps the logic board align properly to the rib frame.

9. Remove the T8 screw securing the PC card cage.



10. Remove the five identical (bronze colored) T8 screws.

Note: When reassembling the computer, do not overtighten the screws.



11. Grasp the logic board near the AirPort Card carrier and gently lift the board up and out, as shown below, being careful where it catches on ports, back panel mesh liner, and disconnected cables.

If necessary, open the panel door and press on the ports to free the logic board from the back panel.

Important: If a secondary fan is installed, lift the board just enough to access and disconnect the fan's connector on the logic board before removing the board.

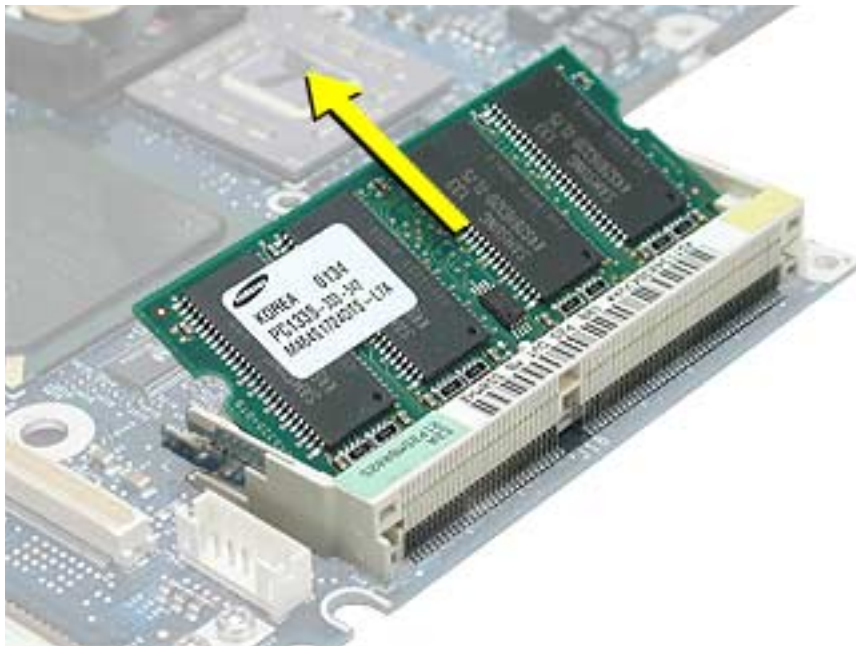


Replacement Note: When reassembling the computer, make sure the replacement logic board ports align completely with the openings in the back panel.

Replacement Note: When positioning the replacement logic board into the computer, check that cables and connectors do not get caught under the board. Tilt the logic board toward the back panel, and place the following cables into the notches in the board:

- Power switch cable (reapply tape over the cable, if applicable)
- Sleep LED cable
- LVDS cable
- Audio cable

12. Remove existing memory cards from the logic board for installation on the replacement logic board. Carefully spread the end brackets to allow the card to raise up, then pull out.



13. Install new, or transfer the following from the old logic board to the replacement logic board:

- AirPort card carrier
- RJ-11 port



- U-shaped EMI clip between the FireWire and Ethernet ports



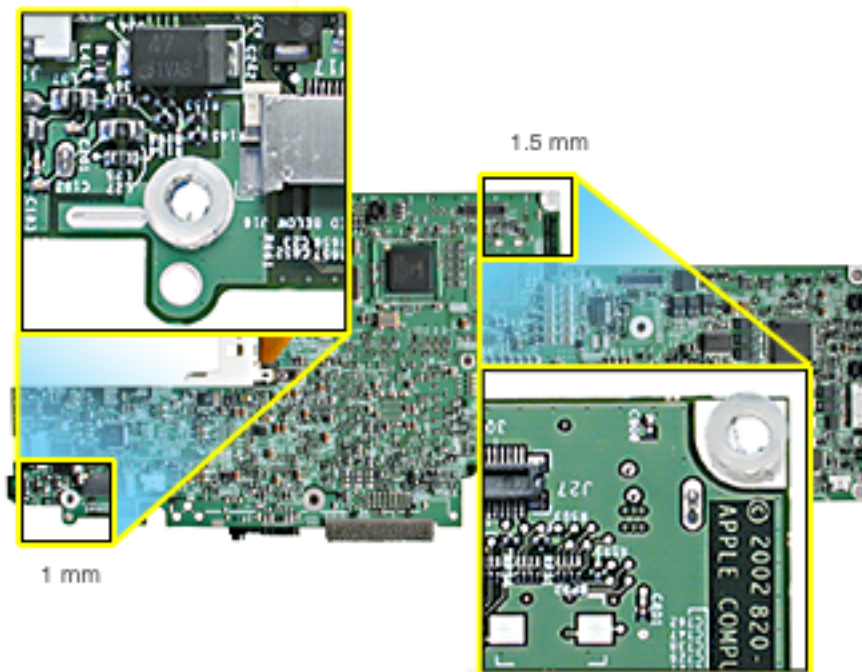
- Rectangular plastic standoff around the agere chip

Important: If transferring from the old board, use a razor knife to remove. Be very careful not to damage board components.

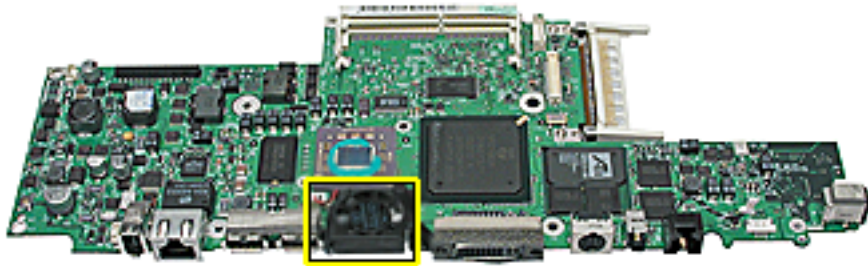
Warning: Verify that the standoff installs flat and does not get caught or raised up on the perimeter edge of the chip.



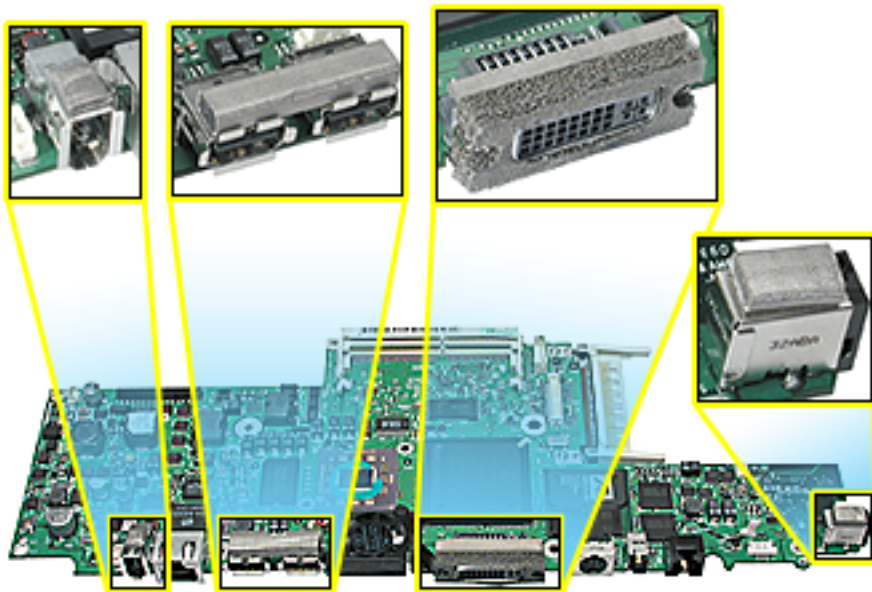
- Plastic 1 mm and 1.5 mm washers around the screw holes, shown. Center and press into place.



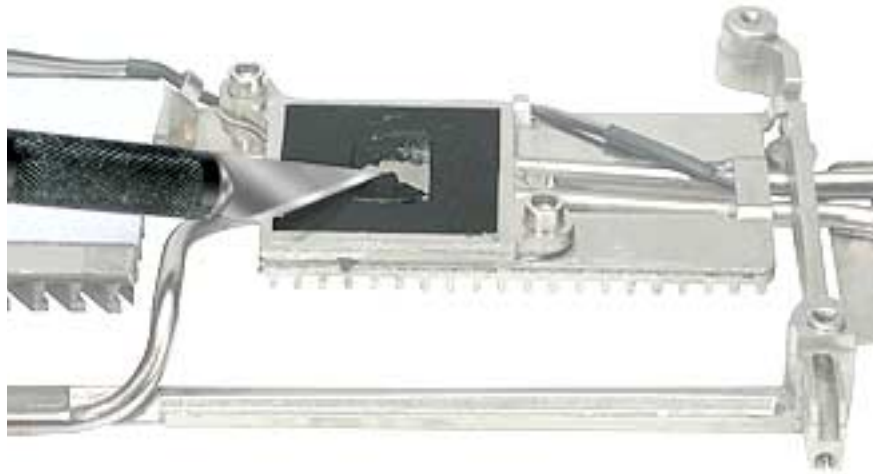
14. Install the following onto the replacement logic board:
- Primary fan



- EMI gaskets to the USB ports, FireWire port, DVI-I port, and headphone port, (use an I/O EMI gasket kit)



15. Check that the heat exchanger has three rectangular thermal interface pads in place. If the pads are missing or damaged, replace the heat exchanger.
16. Use a razor blade or black stick to gently scrape away any residual thermal transfer material on the heat exchanger on the surface that mates with the microprocessor.



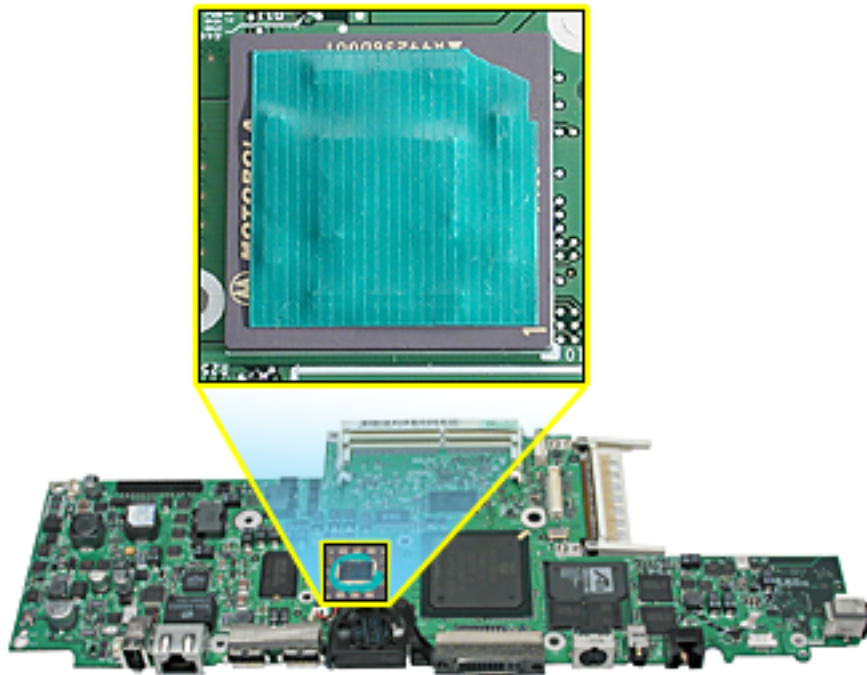
-
17. **Important:** If you have removed the logic board to access another part, and you will be placing the original logic board back in the computer, use a black stick to gently scrape away any residual thermal transfer material from the microprocessor chip on the logic board.

Warning: When scraping away the thermal transfer material from the microprocessor chip, be careful not to nick the microprocessor chip.

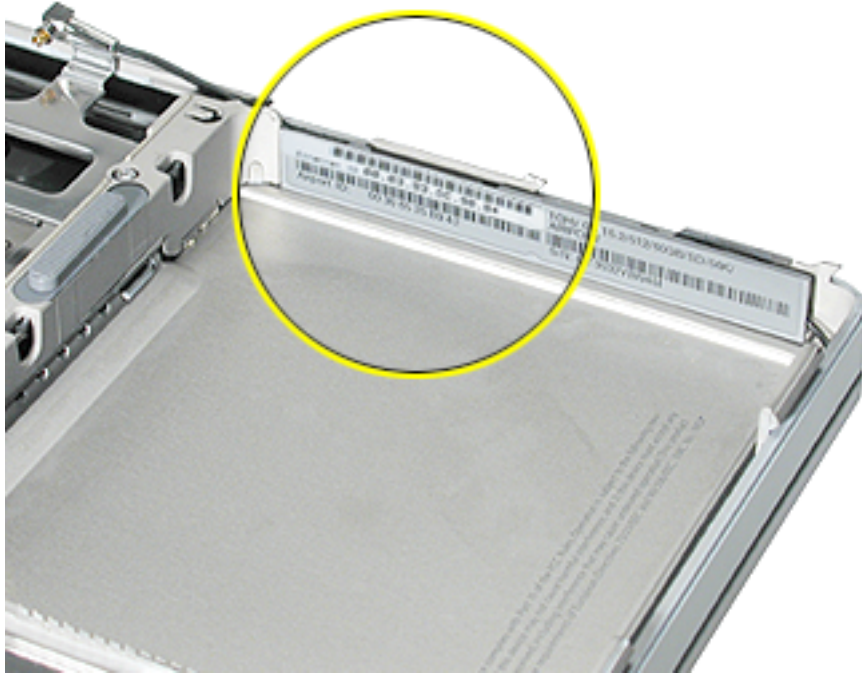
18. On the replacement logic board, center new thermal transfer material over the epoxy cap on the microprocessor chip. Press it into place.

Note: The thermal material pads break easily. Use care when removing the pad from its packaging and when handling, to avoid damage.

Important: Do not install thermal material on the logic board chip if replacing the heat exchanger and thermal material is already installed on the chip mating surface.



19. If included with the logic board, remove the new Ethernet ID label (possibly on the static bag or on the board's memory card bracket), peel off the adhesive protector and attach the label, right side up, over the Ethernet ID and bar code on the ID plate inside the battery well.



20. Install the replacement logic board, and reassemble and test the computer.

Replacement Note: When replacing the logic board, the RJ-11 cable and backup battery wire connectors must be routed, as shown below, so that they do not interfere with the logic board replacement and can later be accessed through the keyboard opening.

Ensure that optical drive's flex cable has not been pulled out of the EMI clip, and that the clip still secures the tab on the flex cable to the rib frame.





21. Use appropriate diagnostics to test all ports, components and functions of the computer.

Primary Fan Replacement Instructions

The following instructions explain how to replace the primary fan in the PowerBook G4 (DVI) computer.

Important: Check the “Check for PowerBook G4 (DVI) 867 MHz Upgrade” chapter of this manual for possible configuration changes.

Tools

- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool
- Razor blade
- Needle nose pliers

Preliminary Steps

Before you begin, remove the following:

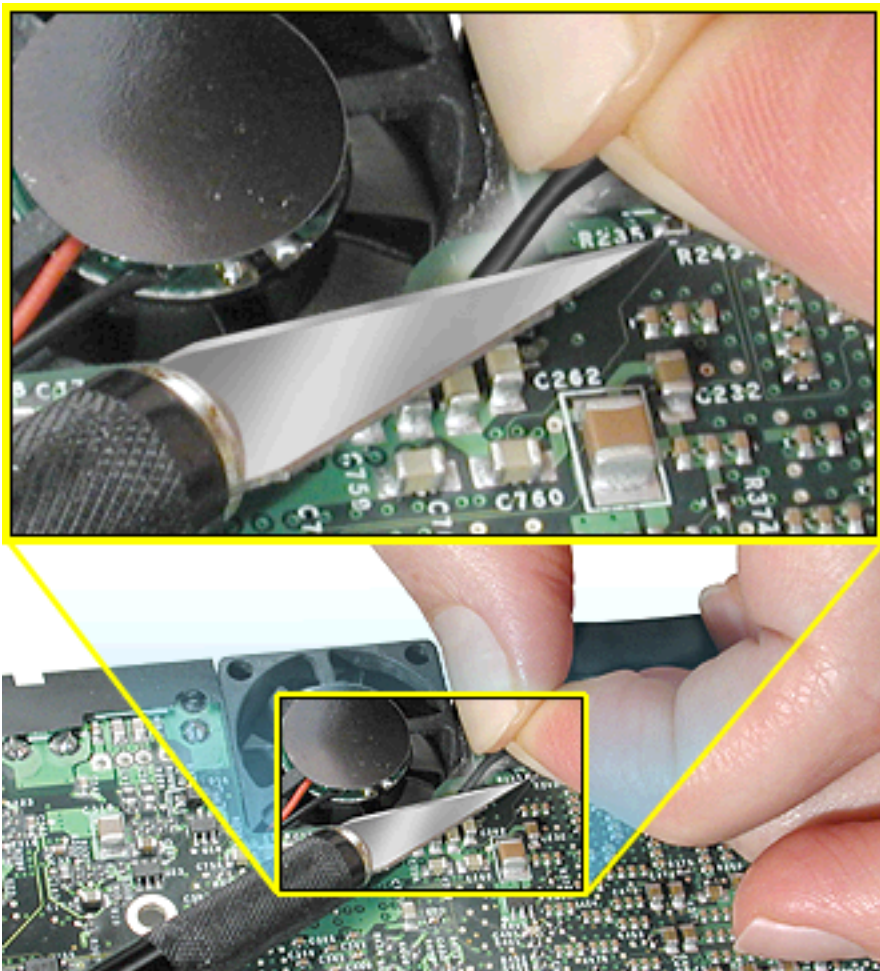
- Battery
- Logic Board

Procedure

1. With the logic board removed from the computer, disconnect the fan connector from the logic board.

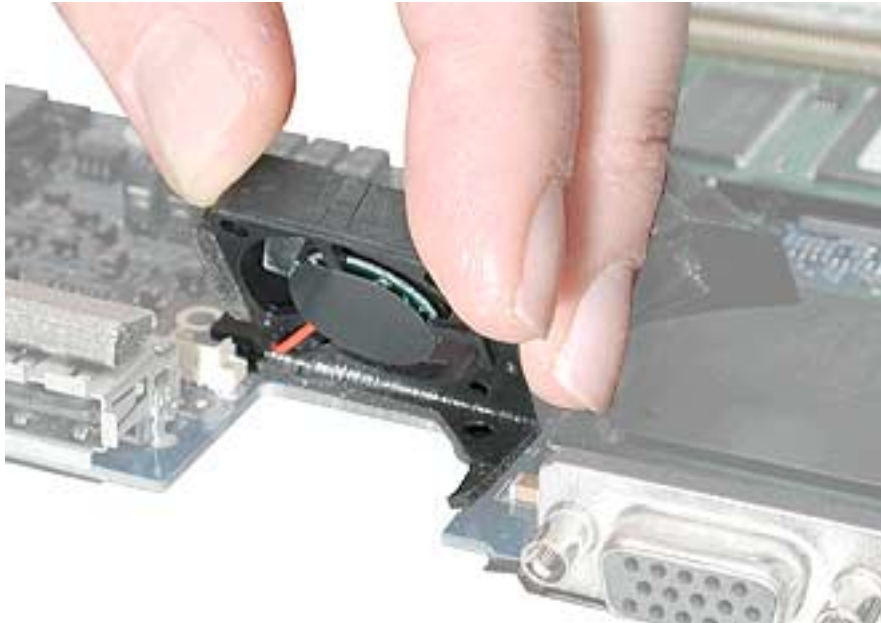


2. Turn over the logic board, and locate the cone-shaped pin at the right corner of the fan. Pull the rubber pin tight. Use a razor blade to cut through the rubber pin.



3. Turn over the logic board, and tilt up the fan to remove it completely from the logic board.

Note: The fan is secured to the logic board by a spongy, rubber adhesive lining on three sides of the bottom of the fan. If there is any adhesive stuck to the surface of the logic board, remove it by rubbing it away. Do not use solvents.



4. When installing the replacement fan, first use a black stick to push the cone-shaped rubber pin into the hole on the logic board. (If necessary, use needle nose pliers to pull the rubber pin through to the other side of the logic board.) Then, peel away the protective cover from the adhesive that lines the three sides of the fan. Align the fan over the logic board opening and press the fan into place.

Important: Do not press on the center hub of the fan. Press only on the outside edges of the fan housing.

Note: If the cone-shaped rubber pin is too long, use a razor blade to cut the extra length.

5. With the replacement fan installed securely, and the fan connector connected to the logic board, reassemble and test the computer.

Secondary Fan (or bracket) Replacement Instructions

The following instructions explain how to replace the secondary fan (800 MHz logic board) or bracket (667 MHz logic board) in the PowerBook G4 (DVI) computer.

Important: Check the “Heat Exchanger Upgrade” and the “Check for PowerBook G4 (DVI) 867 MHz Upgrade” chapters of this manual for possible configuration changes.

Tools

- Black stick (or other nonconductive nylon or plastic tool)
- Torx T6 screwdriver

Preliminary Steps

Before you begin, remove the following:

- Battery
- Logic Board (if a secondary fan is installed, disconnect its connector from the logic board while removing the logic board)

Procedure

1. Remove the T6 screw from the fan bracket.
2. If a secondary fan is installed, disconnect its connector from the logic board while removing the logic board. Lift out the fan bracket or fan assembly.



Replacement Note: Ensure that the fan bracket captures and secures the bulb wire connector, as shown.

PC Card Cage Replacement Instructions

The following instructions explain how to replace the PC card cage in the PowerBook G4 (DVI) computer.

Tools

- Torx T8 screwdriver
- 4 mm Hex socket or wrench
- 5 mm Hex socket or wrench

Preliminary Steps

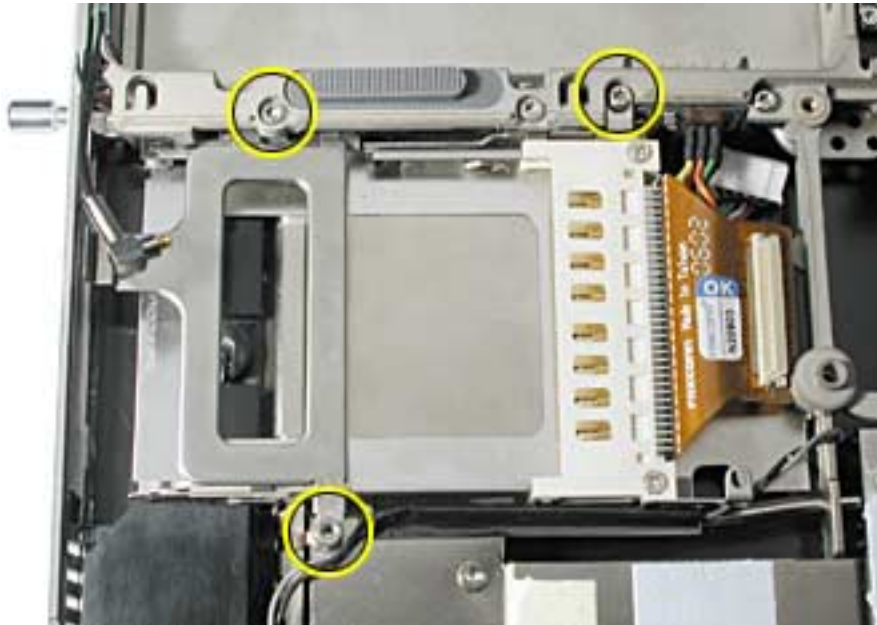
Before you begin, remove the following:

- Battery
- Keyboard
- Logic board

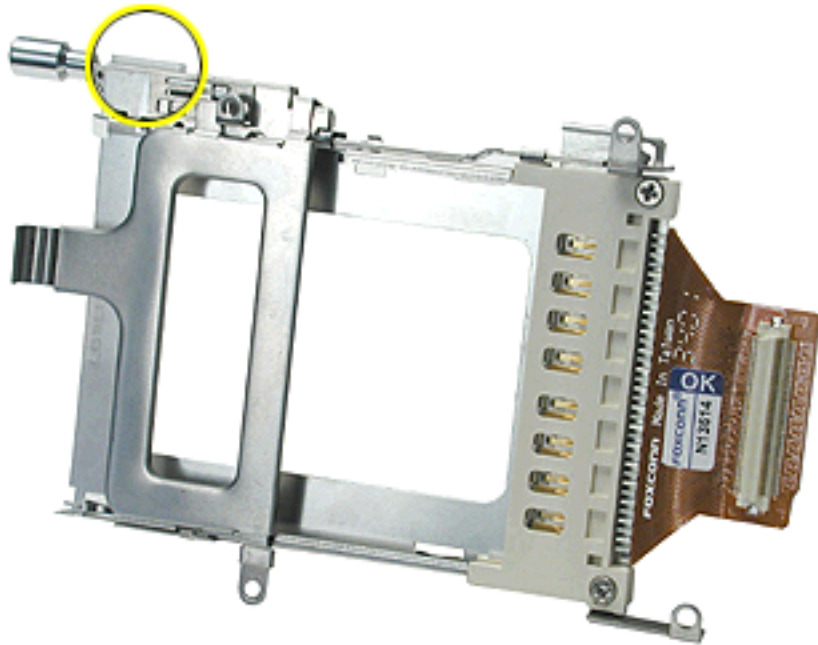
Procedure

1. Remove the two screws that attach the PC card cage to the rib frame. (The longer screw is next to the battery connector.)
2. To remove the 4 mm hex nut that secures the PC card cage to the heat exchanger, you may want to use a finger to support the 5 mm (magnetic) hex screw underneath the nut to prevent the screw from falling out of the screw hole.

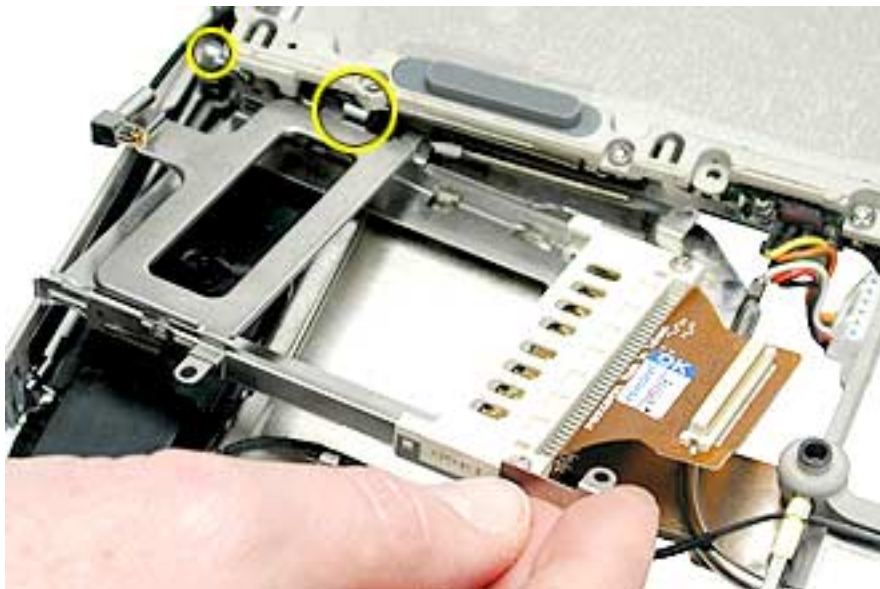
Loosen and remove the hex nut. Remove the PC card cage, being careful where it can catch on the PC card eject button. Then, reattach the hex nut temporarily to the hex screw.



3. Check that the replacement PC card cage includes a clear plastic shim on the outer frame near the PC card eject button. If the shim is not there, transfer the shim from the old PC card cage to the replacement PC card cage.



4. When installing the replacement PC card cage, ensure that the metal flange that is closest to the PC card eject button goes underneath the rib frame and metal liner at the battery latch.



5. Install the replacement PC card cage, and reassemble and test the computer.

Rib Frame and Heat Exchanger Replacement Instructions

The following instructions explain how to replace the rib frame and the heat exchanger in the PowerBook G4 (DVI) computer.

Important: Check the “Heat Exchanger Upgrade” and the “Check for PowerBook G4 (DVI) 867 MHz Upgrade” chapters of this manual for possible configuration changes.

Warning: Make sure you carefully follow these instructions, especially when working near cables that attach to the display module. If any of the cables are damaged, the entire display module must be replaced.

Tools

- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool
- Torx T8 screwdriver
- Torx T6 screwdriver

Preliminary Steps

Before you begin, remove the following:

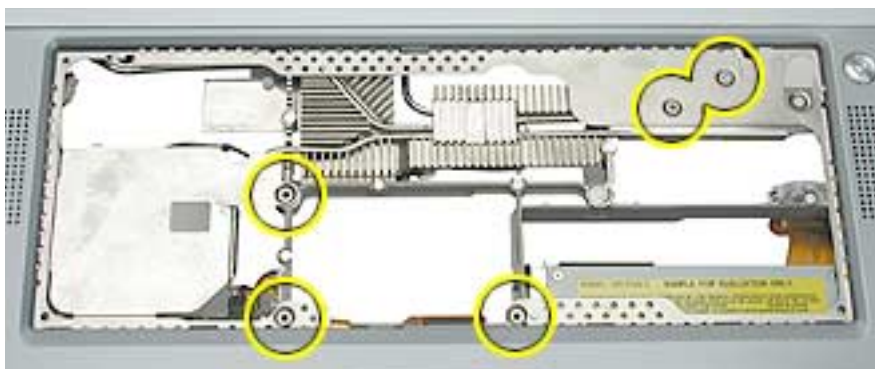
- Battery
- Keyboard

Remove the following in step 2:

- Bottom case
- Hard drive
- Optical drive
- Logic board
- PC card cage
- Secondary fan

Procedure

1. With the display open and the keyboard removed, remove the five identical T8 screws from the top case.



2. Remove the items listed in Preliminary Steps, to be removed in step 2.

Important: With the bottom case removed, be careful when turning over the computer. Some components could become loose and fall out.

3. Open the I/O door, and remove the four identical T6 screws.



4. Lift out the two back panel mounts from the notches in the rib frame.



5. Close the computer to an approximate 45-degree angle, and stand it on a soft cloth with the clutch covers facing up.
6. Remove the four identical T8 screws from the clutch covers (two screws on each clutch cover).



7. Use a black stick to pry off the two clutch covers.

Note: Opening the display slightly may help to remove the covers.



8. Open the computer so that the display rests in your lap and is protected by a soft cloth.
9. **Warning: Be especially careful when working near cables that attach to the display. If any of these cables are damaged, the entire display module must be replaced.**

Warning: At the left clutch, the wrapped cable connected to the LVDS (low voltage data signal) connector is extremely delicate. Do not pull or pinch the LVDS cable. Do not allow the screwdriver to touch the LVDS cable.

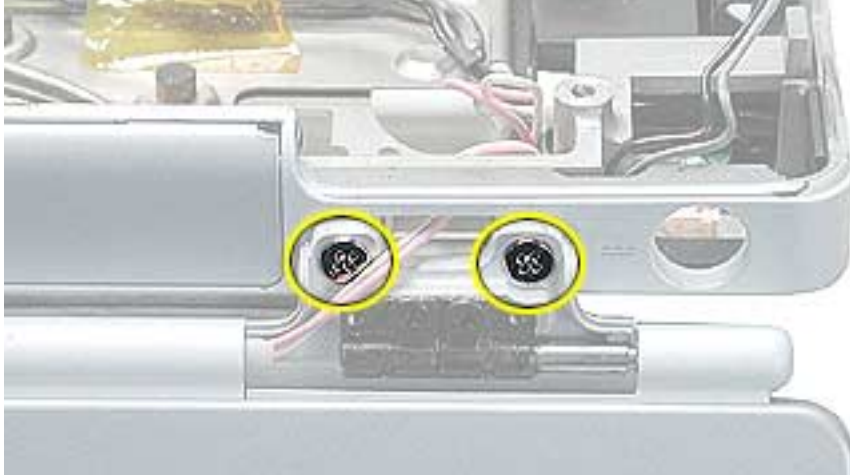
Locate the two large silver-colored screws. Gently move aside the LVDS cable so you can access the screws.

Remove the two silver-colored T8 screws from the left clutch. Notice that the screw closest to the LVDS cable has a sloped screw head. (Do not remove the smaller screws.)

Important: When installing the replacement display, make sure the screw closest to the LVDS cable is the screw with the sloped head.

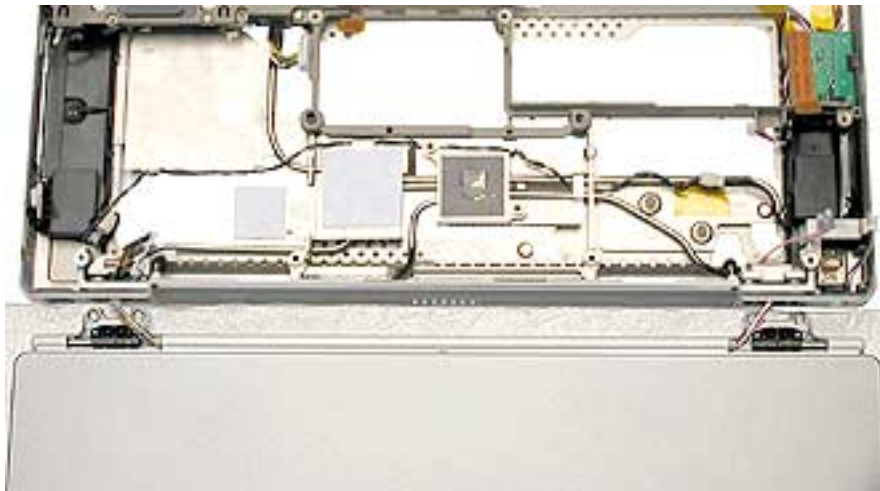


10. At the right clutch, note the routing of the inverter cable. Without straining the inverter cable, gently move it aside so you can access the two large silver-colored screws.
11. Support the display as you remove the two identical, large, silver-colored T8 screws from the right clutch. (Do not remove the smaller screws.)

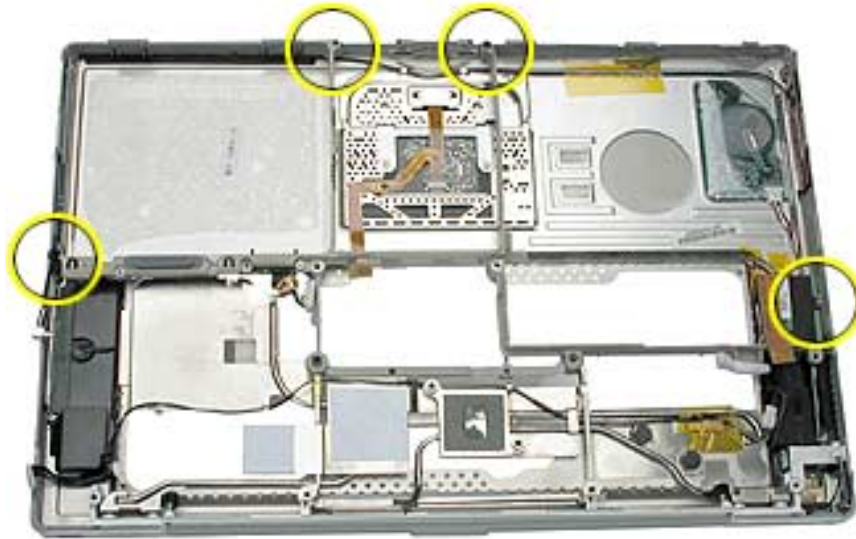


12. **Important:** With the display hinge disconnected, support the display as you place it face-down on a soft cloth in front of the computer chassis.

Warning: Do not separate the display cables from the computer chassis. Do not strain the cables.



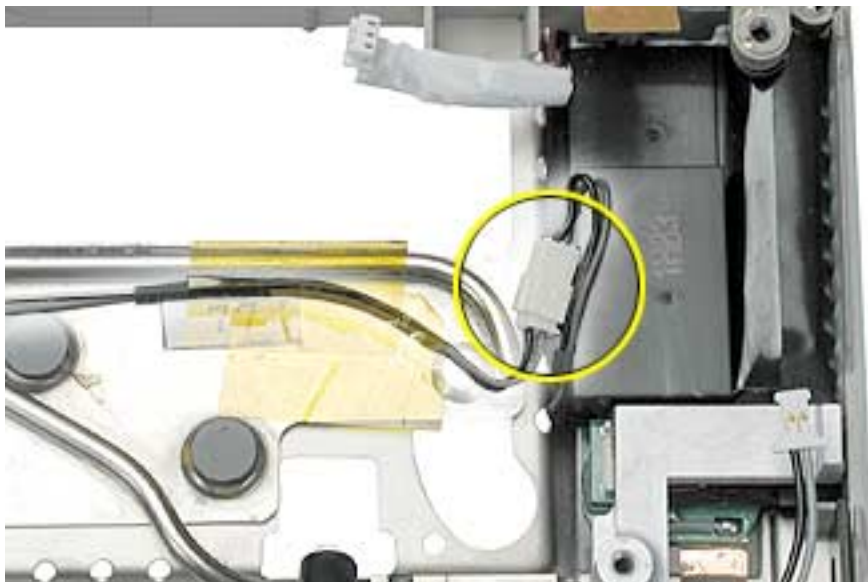
13. Remove the four identical black T8 screws from the rib frame. (You might need to move aside the AirPort antenna cable to reach one of the screws.)



14. Lift the rib frame off of the heat exchanger. If the heat exchanger sticks to the rib frame, press gently on the heat exchanger near the two connection points shown.



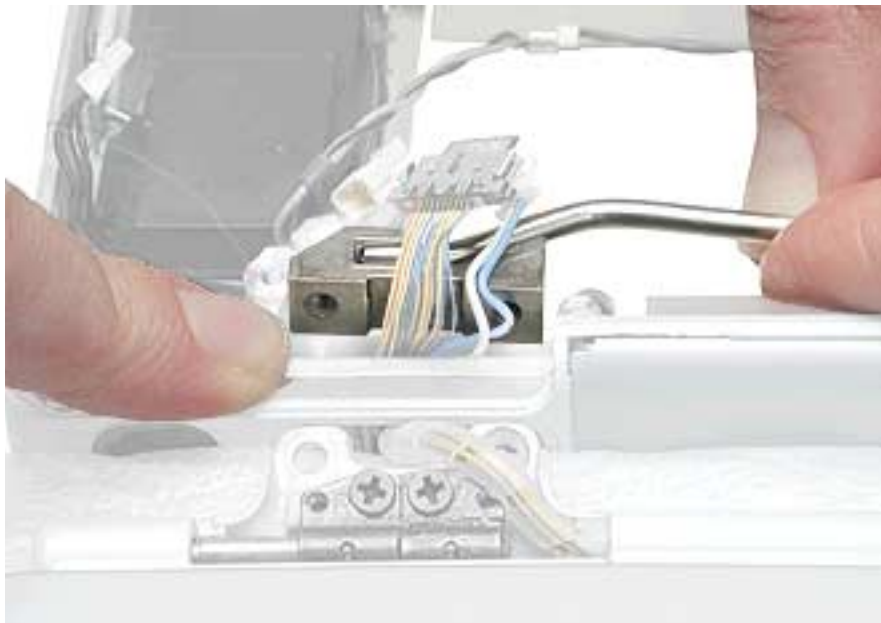
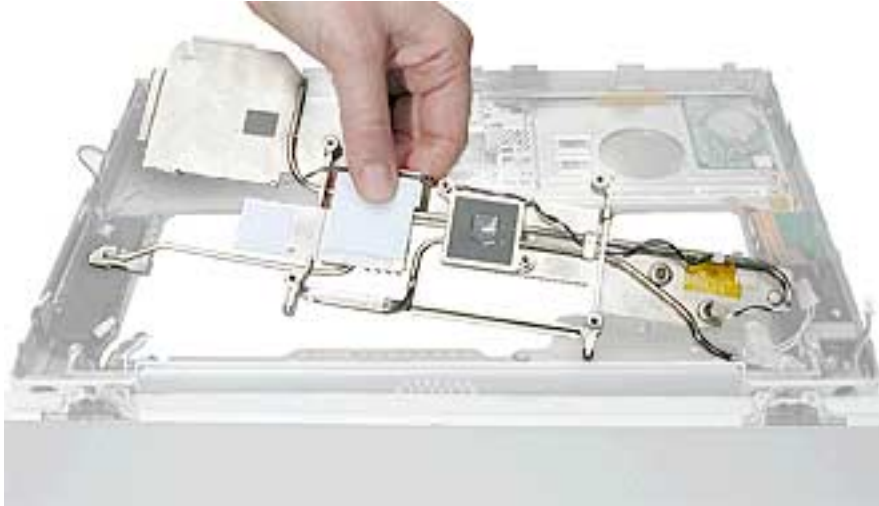
15. Disconnect the audio cable at each end of the heat exchanger.



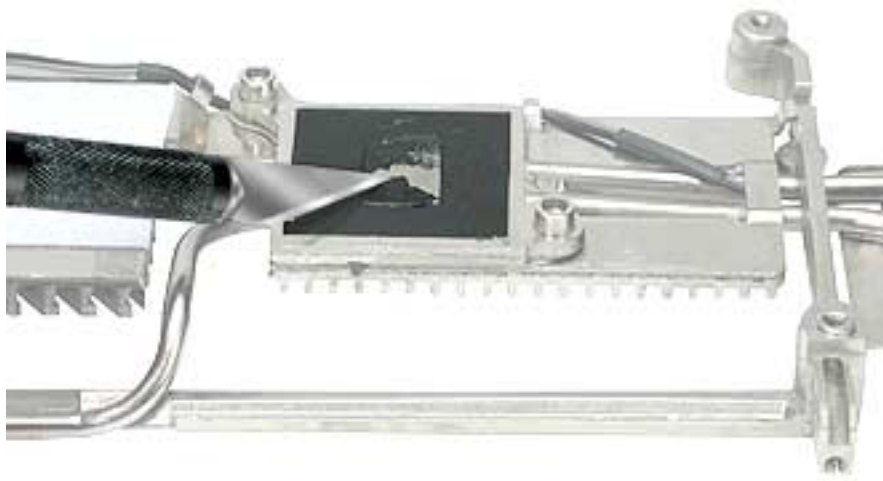
-
16. Pivot the heat exchanger out of the top case assembly. Be careful where it might catch at the LVDS cable.

Warning: At the left clutch, the wrapped cable connected to the LVDS connector is extremely delicate. Do not pull or pinch the LVDS cable.

Warning: Do not bend the heat pipe.

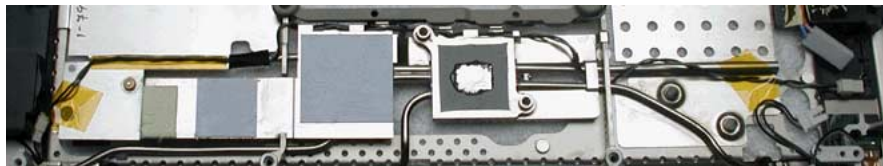


17. If replacing the rib frame but reusing the heat exchanger, scrape off the thermal transfer material residue from the area shown. Apply new thermal transfer material to the logic board chip.



Replacement Notes: If replacing the heat exchanger, transfer the hex nut and screw to the replacement heat exchanger.

When replacing the heat exchanger, check that the audio cable is routed as shown.



If replacing the rib frame, transfer the battery connector to the replacement rib frame, if needed.

Ensure that a modem filter board cable is attached to the replacement rib frame; if not, transfer the cable. The cable should route as shown below.



Check that the EMI clip for the optical drive's flex cable has been removed for transfer to the replacement rib frame.

18. Install the replacement rib frame and/or heat exchanger, and reassemble and test the computer.

Bulb Wire Cable Replacement Instructions

The following instructions explain how to replace the bulb wire cable in the PowerBook G4 (DVI) computer.

Important: Check the “Heat Exchanger Upgrade” and the “Check for PowerBook G4 (DVI) 867 MHz Upgrade” chapters of this manual for possible configuration changes.

Tools

- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool
- Torx T8 screwdriver

Preliminary Steps

Before you begin, remove the following:

- Battery
- Optical drive
- Logic board
- Secondary fan bracket

Procedure

Important: With the bottom case removed, be careful if turning over the computer. Some components could become loose and fall out.

Note: Remove any kapton tape as needed and replace during reassembly.

1. Remove the black T8 screw holding the right side of the rib frame and disconnect the bulb wire cable connector.
2. Pull up slightly on the rib frame then deroute the bulb wire cable.

Replacement Note: Route the replacement cable as shown. Use a black stick to tuck the cable in over the backup battery cable between the speaker and top case.



Replacement Note: After reconnecting the bulb wire, ensure that the bulb wire cable is safely tucked within the case edge so that it will not get pinched by the bottom case.



3. Reassemble and test the computer.

Important: Make sure the bottom case is installed correctly. If the slot-load area is slightly bowed, carefully pull the bottom edge of the slot until it clicks into place and becomes flush with the bottom case.



Important: Check the operation of the optical drive. If the drive is installed incorrectly, the optical drive mechanism might not spin correctly and will result in mechanical noise when playing a disc.

I/O Door Replacement Instructions

The following instructions explain how to replace the I/O door in the PowerBook G4 (DVI) computer.

Tools

- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool
- Needle nose pliers

Preliminary Steps

Before you begin, remove the following:

- Battery
- Logic board

Procedure

1. Using needle nose pliers, pull off the rubber plugs at each end of the door. Remove the springs, and set aside the plugs and springs.

Important: Be very careful not to damage or bend the heat exchanger pipes.



2. Pull the door away from the top case.



3. Remove the L-shaped pin from each end of the I/O door.

Note: The L-shaped pin has a knob at one end. The knobbed end holds the rubber plug onto the L-shaped pin.



4. Install the replacement I/O door. Make sure each L-shaped pin threads through the top case, inner clutch mount, spring, and plug.

Note: You might need to use a black stick to compress the spring while installing the plug on each L-shaped pin.

5. Reassemble and test the computer.

Display Module Replacement Instructions

The following instructions explain how to replace the display module on the PowerBook G4 (DVI) computer.

Warning: Make sure you carefully follow these instructions, especially when working near cables that attach to the replacement display module. If any of the cables are damaged, the entire display module must be replaced.

Tools

- Soft cloth
- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool

Preliminary Steps

Before you begin, remove the following:

- Battery
- DC-In Board
- Rib frame and heat exchanger

Procedure

1. With the rib frame and heat exchanger removed, make sure
 - The display is supported on a soft cloth in front of the top case
 - The display cables are not strained

Warning: Be especially careful when working near cables that attach to the display. If any of these cables are damaged, the entire display module must be replaced.

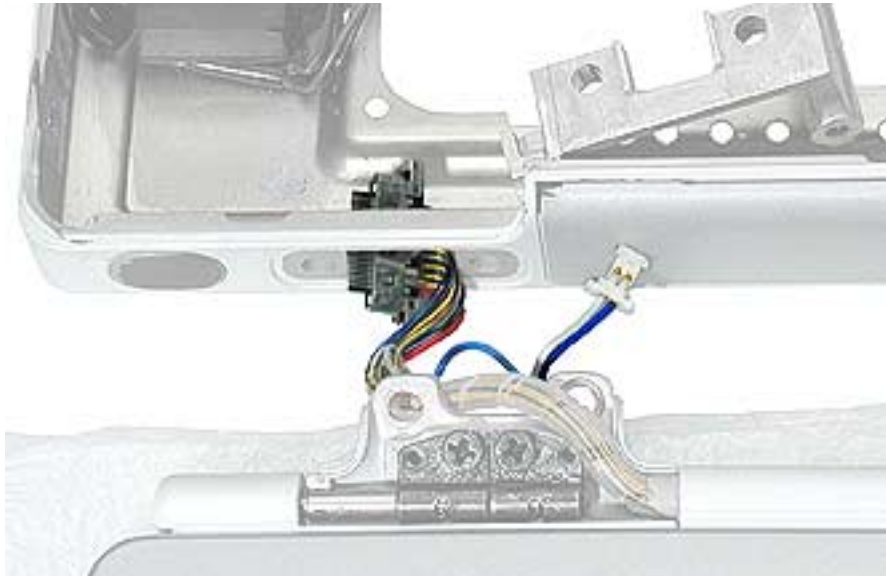
The LVDS cable and connector are extremely delicate. Do not pull or pinch the LVDS cable or connector. If necessary, use a black stick or other nonconductive tool to guide the cables out of the top case.

2. Raise the inner clutch mount so it is pivoted away from the LVDS cable and sleep LED cable.



3. Thread the 2-pin LED sleep cable through the opening in the top case.

Carefully guide the LVDS cable through the opening by looping the cable and turning the LVDS connector sideways, as shown, to fit through the opening.



4. At the right clutch, raise the inner clutch mount and disconnect the inverter cable. Carefully slide the inverter cable out through the opening in the top case.



5. The display module includes all three cables.



6. **Important:** When the replacement display module is installed, and before the clutch covers are installed, test that the display is seated properly. With the computer upright and closed, press the computer latch. The display module should pop up slightly if the module is properly seated.



7. Install the replacement display module, and reassemble and test the computer.

Top Case Replacement Instructions

The following instructions explain how to replace the top case in the PowerBook G4 (DVI) computer.

Tools

- Black stick (nylon probe tool 922-5065) or other ESD-safe, non-marring tool
- Razor blade (optional)

Preliminary Steps

Before you begin, remove the following:

- Battery
- Backup battery
- Display module
- I/O door

Procedure

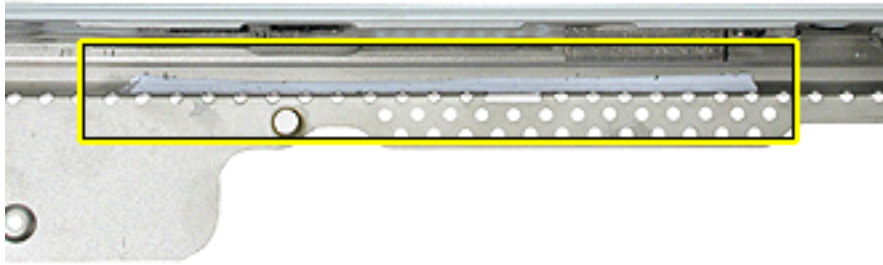
1. With the preliminary steps completed, compare the original top case to the replacement top case.
2. Before installing the replacement top case, make sure it includes the following:
 - Speaker set and cables
 - Power button and board (heatstaked to top case)
 - AirPort antenna cable
 - Trackpad assembly with board and cable



3. **Important:** Make sure you transfer the original serial number label from the old top case to the serial number panel on the replacement top case. You can use a black stick or razor blade to carefully peel up a corner of the label. Then peel off the label completely and apply it to the serial number panel. Make sure that the label lies completely flat so it does not interfere with the battery compartment.



4. Confirm that the thermal strip and mesh liners are installed at the back panel.

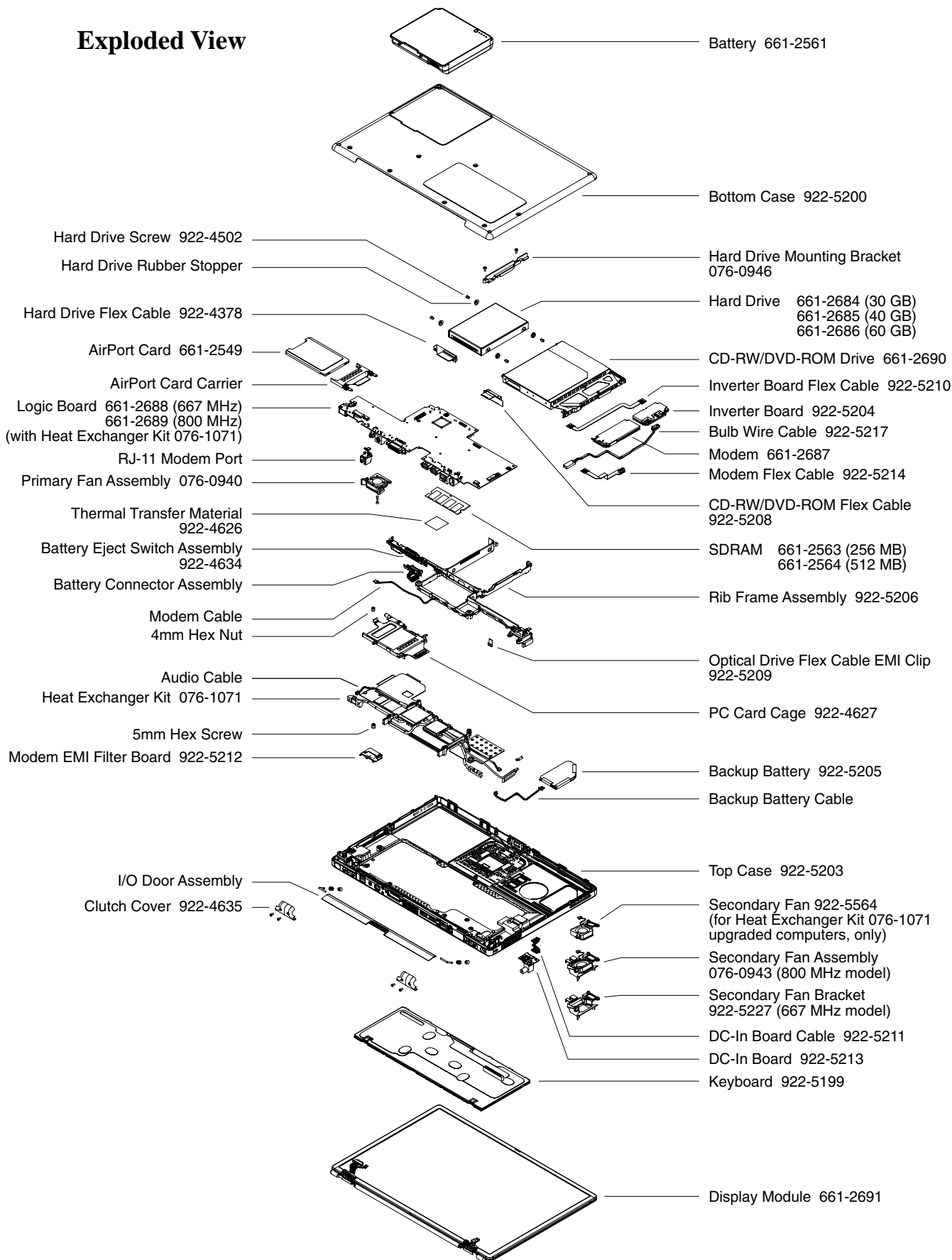


5. **Important:** Make sure you transfer the backup battery cable from the original top case to the replacement top case. The backup battery cable is tucked below the bulb wire cable along and between the speaker and top case, as shown.

































6. Install the replacement top case, and reassemble and test the computer.

Exploded View



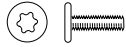
Screw Reference Sheet

This sheet shows the screws used in the PowerBook G4 (DVI) computer and indicates the replacement procedure where first removed. To see where the screws are located in the computer, refer to the "PowerBook G4 (DVI) Screw Locator."

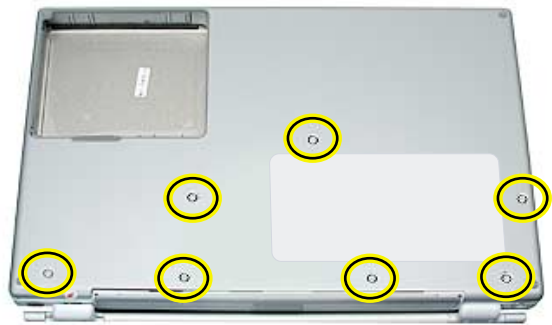
		Torx T6, 4.15 mm long:	Secondary Fan (DC-In Board) (1) DC-In Board (2) Inverter Board (2) Modem (2)
		Torx T8, 4.4 mm long:	Rib Frame and Heat Exchanger (5)
		Torx T8, 4.5 mm long:	Modem Filter Board(1) Logic Board (1) AirPort Card Carrier (3)
		Torx T8 (black), 4.9 mm long:	Hard Drive (4)
		Torx T8, 5 mm long:	Logic Board (1)
		Torx T8, 5.2 mm long:	Logic Board (1) PC Card Cage (1) Rib Frame and Heat Exchanger (4)
		Torx T8 (bronze), 6.4 mm long:	Logic Board (5)
		Torx T8, 6.5 mm long:	PC Card Cage (1)
		Torx T8, 8 mm long:	Bottom Case (7)
		Torx T8, 9.3 mm long:	Hard Drive/Optical Drive Hold Down Bracket (2)
		Torx T8 (black), 9.5 mm long:	Rib Frame and Heat Exchanger (4)
		Torx T8, 16 mm long:	Rib Frame and Heat Exchanger (1)
		Torx T8, 16.75 mm long:	Rib Frame and Heat Exchanger (3)
		4 mm Hex Nut:	PC Card Cage (1)
		5 mm Hex Screw, magnetic:	PC Card Cage (1)

Screw Locator

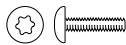
Bottom Case



Seven identical Torx T8,
8 mm long



Hard Drive and Optical Drive Hold Down Bracket



Two identical Torx T8,
9.3 mm long



Hard Drive



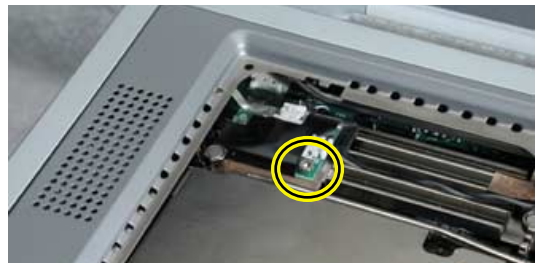
Four identical (black) Torx T8,
4.9 mm long



Modem Filter Board



One Torx T8, 4.5 mm long



Secondary Fan



One Torx T6, 4.15 mm long



DC-In Board



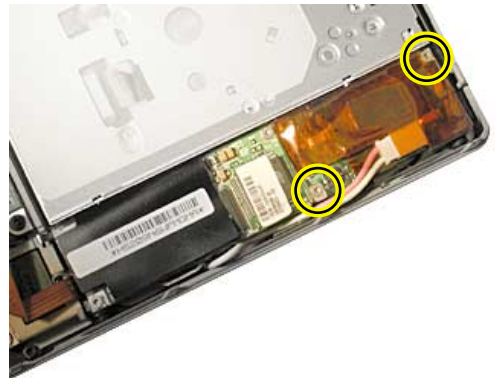
Two Torx T6, 4.15 mm long



Inverter Board



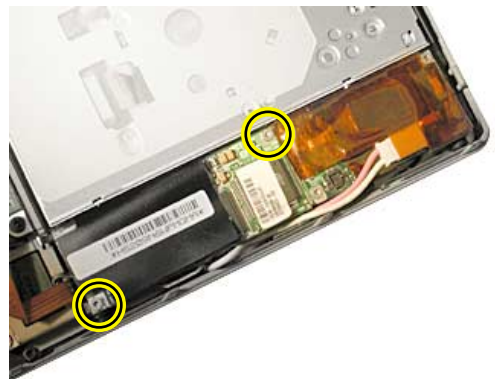
Two Torx T6, 4.15 mm long



Modem



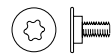
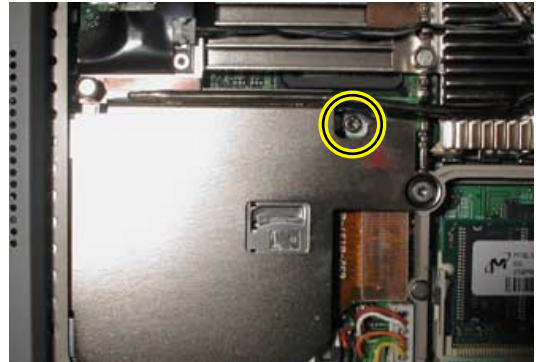
Two Torx T6, 4.15 mm long



Logic Board



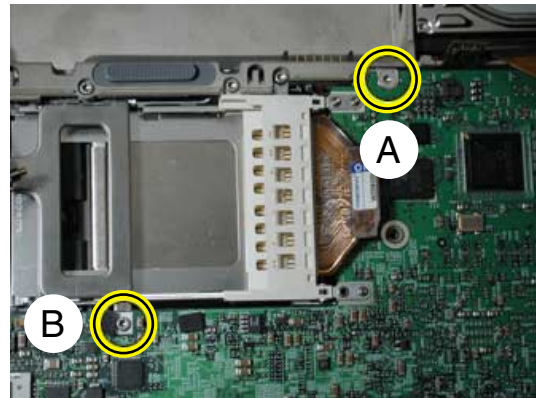
One Torx T8, 4.5 mm long



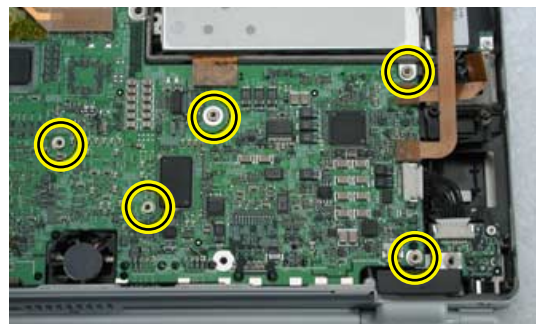
(A) - One Torx T8, 5 mm long



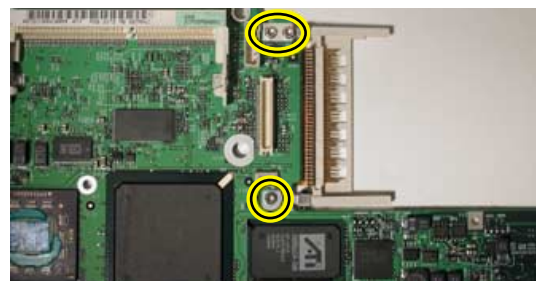
(B) - One Torx T8, 5.2 mm long



Five identical Torx T8,
6.4 mm long (bronze)



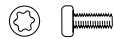
Three Torx T8, 4.5 mm long



PC Card Cage



(A) - One Torx T8, 5.2 mm long



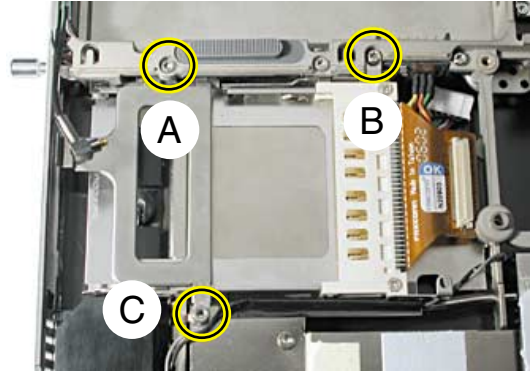
(B) - One Torx T8, 6.5 mm long



(C) - One 4 mm Hex Nut



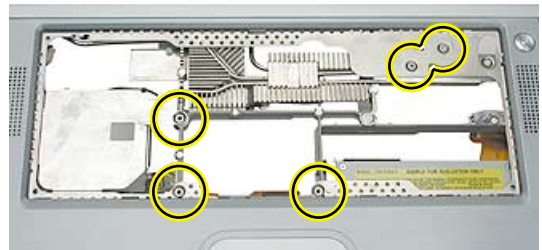
One 5 mm Hex Screw, magnetic, (accessed from keyboard opening)



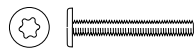
Rib Frame and Heat Exchanger



Five identical Torx T8,
4.4 mm long



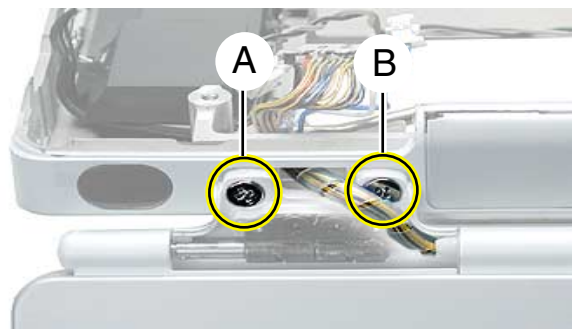
Four identical Torx T8,
5.2 mm long



(A) - One Torx T8,
16.75 mm long



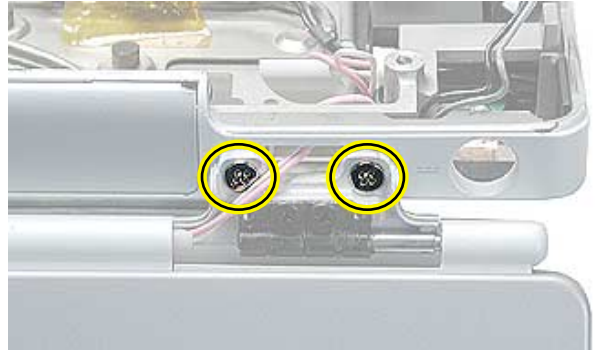
(B) - One Torx T8,
16 mm long



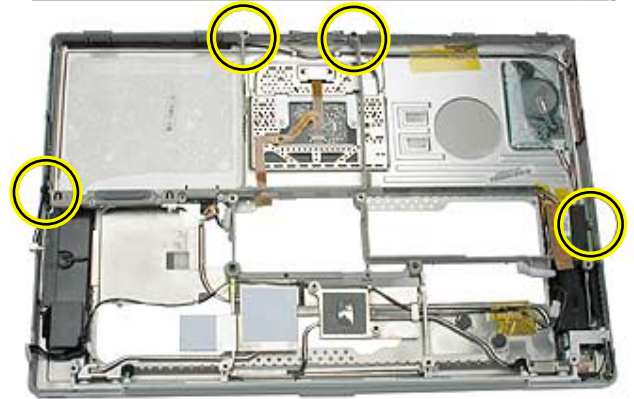
Rib Frame and Heat Exchanger (continued)



Two identical Torx T8,
16.75 mm long



Four identical (Black)
Torx T8, 9.5 mm long





Troubleshooting
PowerBook G4 (DVI)



Symptom Charts

How to Use the Symptom Charts

The Symptom Charts included in this chapter will help you diagnose specific symptoms related to the product.

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

Related articles can be found in the Knowledge Base at:
<http://kbase.info.apple.com/>

Startup

The computer will not power on (no fan movement, hard drive spin up and display is not lit)

1. Remove any connected peripherals.
2. Check that the battery has enough charge to start the computer by pressing the button next to the LEDs on the battery. At least one LED must light solid (not flashing).
3. Connect known-good PowerBook (DVI) power adapter (922-5164) and power cord, if using, to known-good power outlet; DC plug should light up. Make sure DC plug is firmly inserted.

Important: The PowerBook (DVI) power adapter must be used with the PowerBook (DVI) computers. To identify these adapters, check that the last three characters in the serial number (located under the plug connection on the adapter) is one of the following: MKC, MKD, MDK, MKE, MKF, MKG, MKH, MKJ, MKK.

4. Try powering up without the battery installed.
5. Press Caps Lock key to see if light on key comes on. If it does, hold power button down for six seconds to shut down the computer and restart.

6. With a non-metallic tool, reset the power manager by pressing the reset button (located under the keyboard in the recess just left of the power button). Wait five seconds before continuing. Press the power button to start the computer.

Warning: Resetting the power manager will permanently remove a RAM disk, if present, and all of its contents. You will also need to reset the date and time (using the Date & Time control panel)



7. Verify power button cable is connected properly to logic board, if power button is not functioning correctly or damaged, replace the top case.
8. Disconnect keyboard completely. Inspect connectors. Restart with keyboard disconnected.
9. Remove any additional RAM.
10. Remove AirPort Card.
11. Verify DC-in board cable is securely connected.
12. Try known-good DC-in board.
13. Replace logic board.

Memory error message appears on the screen

1. Reseat the DIMMs.
2. Verify proper memory is being used. The PowerBook (DVI) uses 1.25-inch (or shorter) PC-133 compliant, SO-DIMM memory cards.
3. Run Apple Hardware Test. If the test finds bad memory, replace the DIMMs one at a time and test until all bad DIMMs are replaced with known-good modules. If the failure is intermittent, run Apple Hardware Test in loop mode (Control-L) for an extended time to test the memory.

Flashing question mark appears on the screen

1. Start up from the system restore CD and check to see if the hard drive shows up on the desktop. If it does, go to step 2. If it does not, go to step 4.
2. Mac OS X: Run Disk Utility. Mac OS 9: Run Disk First Aid. Update the driver and restart the computer.
3. Reinstall system software using the system restore CD that came with the computer.
4. Reseat the hard drive flex cable.
5. Replace the hard drive.

Computer begins to power up, the fan and hard drive are spinning, hitting caps lock key and LED turns on, but there is no startup chime or video

1. With a non-metallic tool, reset the power manager by pressing the reset button (located under the keyboard in the recess just left of the power button). Wait five seconds before continuing. Press the power button to start the computer.

Warning: Resetting the power manager will permanently remove a RAM disk, if present, and all of its contents. You will also need to reset the date and time (using the Date & Time control panel).



2. Replace the logic board.

System shuts down intermittently

1. Disconnect all external peripherals.
2. Make sure the battery is fully inserted and is charged.
3. Check battery connection to main logic board.
4. Make sure system is not over heating, the air vents are clear and unit is not on soft surface.

-
5. Check that the fan cable is connected and the fan is operational.
 6. Check that the heat exchanger is properly attached to the processor.

Important: If the heat exchanger is separated from the logic board, new thermal transfer material for the processor must be reinstalled.

7. Remove the battery and connect known-good PowerBook (DVI) power adapter (922-5164) and power cord, if using, to known-good power outlet; DC plug should light up. Make sure DC plug is firmly inserted.

Important: The PowerBook (DVI) power adapter must be used with the PowerBook (DVI) computers. To identify these adapters, check that the last three characters in the serial number (located under the plug connection on the adapter) is one of the following: MKC, MKD, MDK, MKE, MKF, MKG, MKH, MKJ, MKK.

8. Verify DC-in board cable is securely connected.
9. Try known-good DC-in board.
10. Replace the logic board.

System shuts down almost immediately after startup

1. Disconnect all external peripherals.
2. Make sure the battery is fully inserted and is charged.
3. Check battery connection to main logic board.
4. Replace the logic board.

System crashes or hangs intermittently

1. If the system crashes or hangs in a specific application, replace the application. Mac OS X: Verify the application is compatible with OS X.
2. Clear parameter RAM. Hold down Command-Option-P-R during startup until you hear a second startup chime.
3. Perform a clean install of system software with the system restore CD that came with the computer.
4. Mac OS 9: Start up with extensions off to determine if there are system extension or control panel problems.
5. Mac OS X: Relaunch Finder.
6. Mac OS X: Run Disk Utility. Mac OS 9: Run Disk First Aid.
7. Run Apple Hardware Test in loop mode (Control-L) for an extended time to test the memory. If the test finds bad memory, replace the DIMMs one at a time and test until all bad DIMMs are replaced with known-good modules.
8. Replace the logic board.

At startup, a dialog box comes up stating: “kernel panic” in Mac OS X or “Built-in memory test has detected an error” in Mac OS 9

1. If there are two RAM cards installed in the expansion slots, remove top card and restart.
 - If symptom repeats, replace bottom card with known-good RAM card.
 - If symptom does not repeat, replace top RAM card with known-good RAM card and restart.

Error Beeps

The computer automatically performs a power-on self test when it is turned on after being fully shut down (not a restart). This section describes what to do if beeps are heard during the startup.

Note: The PowerBook G4 has two memory expansion slots and accepts 1.25-inch (or shorter) PC-133 compliant, SO-DIMM memory cards; there is no RAM on the logic board itself. Refer to Memory Card Replacement instructions for removal and installation.

Computer beeps once at startup

1. One beep means that no RAM is detected.

Note: There is no RAM on the logic board itself, so the computer will beep if no memory is installed in at least one of the RAM slots.

2. Put the original RAM that came with the computer back in, or put in known-good and compatible RAM and restart.
 - If symptom does not repeat, replace RAM card(s).
 - If symptom repeats, replace logic board.

Computer beeps twice at startup

1. Two beeps means that EDO memory is installed in the RAM expansion slot. The PowerBook does not accept EDO memory.
2. Replace RAM card(s) with known-good and compatible RAM and restart.
 - If symptom repeats, replace logic board.

Computer beeps three times at startup

1. Three beeps means that no RAM banks passed memory testing.
2. If a RAM card is installed in the upper expansion slot (if not, skip to next step), remove it and restart.
 - If symptom does not repeat, replace RAM card.
 - If symptom repeats, replace RAM in lower RAM slot with known-good and compatible RAM card and restart. If symptom repeats, replace logic board.

-
3. If a RAM card is not installed in the upper expansion slot, replace RAM in lower RAM slot with known-good and compatible RAM card and restart.
 - If symptom repeats, replace logic board.

Computer beeps four times at startup

1. Four beeps indicates a bad checksum for the remainder of the boot ROM. The ROM (which is located on the logic board) is bad.
2. Replace RAM card(s) with known-good and compatible RAM and restart.
 - If symptom repeats, replace logic board.

Related articles:

58442: Power On Self-Test Beep Definition - Part 2

95132: PowerBook G4: Installing or Replacing Memory

AirPort Card

AirPort Card not recognized

1. In Mac OS X, use Software Update in System Preferences, or in Mac OS 9 use the Software Update control panel, or see the Apple Software Updates web page to make sure the latest version of AirPort software is installed.
2. Restart the computer. Mac OS 9: Restart using Mac OS All extensions setting.
3. Mac OS X: Open AirPort in System Preferences and make sure AirPort is on and Base Station is selected. Mac OS 9: Open Airport in Apple Menu and make sure AirPort is on and Base Station is selected.
4. Reseat AirPort Card and make sure AirPort antenna cable is fully connected.
5. Remove and reinstall the AirPort software.
6. Replace with known-good AirPort Card.
7. Replace logic board.

Battery

Battery will not eject

1. Flip over the unit and release the battery latch by sliding the latch towards the PC Card button.
2. If the battery still will not eject, while holding the latch towards the PC Card button, use a small plastic flat-blade tool to pry the battery around the battery latch.
3. Verify proper latch operation, by exercising the latch. If it does not move smoothly or evenly, replace the latch.
4. If the latch does exercise correctly, verify that the customer is not installing the battery with excessive force.

The battery won't charge

1. Remove any externally connected peripherals.
2. Try known-good power outlet.
3. Try known-good PowerBook (DVI) power adapter (922-5164) and power cord.
4. **Note:** Verify that power adapter connector glows amber or green. If the power adapter light is green, turn over the computer and press the battery button. The battery lights should glow green and stay on if the power adapter is operating correctly.
5. Try known-good battery.
6. Turn off the computer. With a non-metallic tool, reset the power manager by pressing the reset button (located under the keyboard in the recess just left of the power button). Wait five seconds before continuing. Press the power button to start the computer.

Warning: Resetting the power manager will permanently remove a RAM disk, if present, and all of its contents. You will also need to reset the date and time (using the Date & Time control panel).



7. Replace DC-in board.
8. Replace logic board.

Hard Drive

Internal hard drive will not initialize

1. Boot from PowerBook G4 Software Install CD and see if the hard drive mounts on the desktop.
2. If in Mac OS X, boot from the Mac OS X software install CD. Under the File menu, select Disk Utilities and initialize the disk or run Disk First Aid.
3. If in Mac OS 9, launch Drive Setup and update hard drive driver.
4. Launch Drive Setup and update hard drive driver.
5. If no hard drive is found in Drive Setup, verify the hard drive cable connections.
6. Replace hard drive cable.
7. Replace hard drive.

Important: If the computer is under warranty and data recovery is required, refer to Article 31077: Hard Drive Data Recovery & Warranty Implications, for important information.

Keyboard

No response from any key on keyboard

1. Remove any connected peripherals.
2. Turn off the computer. Disconnect the keyboard connector and inspect connectors.
3. Boot from a Mac OS system CD to verify that it is not a software problem.
4. Replace keyboard.
5. Replace logic board.

The keyboard lock is damaged or won't lock

1. Verify that keyboard is installed properly so the lock lines up with the notch in the top case.
2. Replace keyboard.

Modem

No modem dial tone

1. Check that the correct modem is selected. In Mac OS X, check Network Setup. In Mac OS 9, check the Modem control panel.
2. Verify known-good analog (not digital) telephone line.
3. Verify known-good RJ11 telephone cable.

-
4. Verify RJ11 cable is not plugged into Ethernet port.
 5. Inspect RJ11 connector and modem port for pin damage.
 6. Verify RJ11 telephone cable is firmly installed in the modem port.
 7. If using Apple Remote Access, select Ignore Dial Tone in the Modem control panel. If the modem connects with this settings selected, try another phone line. If using a terminal or communications program, enter atx1 to disable tone detection. To reset the modem back to the factory settings, enter atz.
 8. Check RJ-11 wires to modem filter board.
 9. Verify modem wire's 2-pin connectors are plugged into modem and modem filter board correctly.
 10. Check modem wire. If damaged, replace rib frame and modem cable assembly.
 11. Replace modem filter board.
 12. Replace modem.

Modem does not respond (gets dial tone)

1. Check software.
2. Replace modem.

Optical Drive

The optical drive does not accept CD or DVD disc (mechanical failure)

1. Verify disc is not warped and is a 12 cm circular disc.
2. Verify disc is pushed almost all the way into the slot.
3. Check the optical drive flex cable.
4. Replace optical drive.

The disc icon does not show up on desktop, or a dialog box appears to initialize disc, when inserting a read-only disc

1. Verify the correct type of disc is being used.
2. Use Software Update control panel to update firmware.
3. Try cleaning the disc. If it is dirty or scratched, it may not mount.
4. Try a different disc.
5. Select "Mac OS All" in the Extensions Manager control panel and restart.
6. Replace optical drive cable.
7. Replace optical drive.

PC Card

PC Card will not insert into the PC Card slot

1. Make sure the PC Card eject button is in, before attempting to insert a PC Card.



2. Make sure the PC Card is right side up (cards are keyed and cannot be inserted upside down).
3. Verify the PC Card is not warped or damaged in any way; if so replace the card.
4. Try a different PC Card.
5. Carefully raise the PC Card slot cover and check for a foreign object inside the slot.
6. Check to see if the AirPort Card antenna wire is protruding up into the PC Card slot opening from below. If so, open the computer to gain access to the AirPort Card location and reposition the antenna cable so that it does not sag down into the PC Card slot area (see AirPort Card Installation Instructions).
7. If the slot cover is preventing the card from being inserted, replace the top case.
8. Replace PC Card Cage.

Ports

The FireWire or USB port is not recognizing devices

1. Completely shut down, then press the power button to start the computer.
2. Use Software Update in Mac OS X system preferences (or the Software Update control panel in Mac OS 9) to verify that the latest software is installed.
3. Use Apple System Profiler to verify that the computer is recognizing the bus.
4. For USB, test ports with an Apple keyboard or mouse.
5. For FireWire, test by connecting another computer in FireWire Target Disk Mode. Refer to article 58583: How to Use FireWire Target Disk Mode.
6. Verify that drivers are installed properly for third party, if needed.
7. If in Mac OS 9, boot with Mac OS All extension set.
8. Try a different cable.
9. If self powered make sure that the power supply is connected and device's LED indicates that it is getting power.
10. Replace logic board.

A USB device not recognized by computer

Note: If you are trying to use a serial device with a USB/Serial adapter, check with the manufacturer of the adapter for compatibility.

1. Completely shut down, then press the power button to start the computer.
2. Try known-good Apple USB keyboard or mouse to verify the port is working properly.
3. Verify current driver for the device is installed.
4. If a camera, turn on camera after initiating download with camera application.
5. Try the other USB port.
6. Try different USB device on same port.
7. Eliminate chain by plugging in only one peripheral.
8. If in Mac OS 9, select "Mac OS All" in the Extensions Manager control panel and restart.
9. If in Mac OS 9, troubleshoot extensions and perform a clean installation of system software.
10. Replace logic board.

Sound

No sound heard and the Speakers section of the Sound control panel indicates that an external device is plugged in (to the headphone jack or USB ports)

1. If there is nothing plugged into the headphone jack or USB ports, the picture in the Speakers section of the Sound control panel should be of the internal speakers, as shown here.



2. If not, and if nothing is plugged in, try plugging in headphones or external speakers. Restart the computer. Remove the device.

-
3. Reset PRAM (Press the power button, then hold down the Option-Command-P-R keys until you hear the startup chime at least one additional time after the initial startup chime).

Warning: Resetting the PRAM will permanently remove a RAM disk, if present, and all of its contents. You will also need to reset the date and time (using the Date & Time control panel).

4. Replace logic board.

No sound from speaker(s)

1. Use the Software Update control panel to verify that the latest audio update has been installed.
2. Press the F3 key (with the fn key pressed and not pressed) to verify that mute mode is not enabled.
3. Press the F4 or F5 key (with the fn key pressed and not pressed) to check the volume setting.
4. Verify no external speakers or headphones are plugged in.
5. Check the speakers tab on the Sound control panel to confirm that the software is correctly seeing that there are no external speakers or headphones connected.
6. Shutdown computer and restart.
7. Reset PRAM (Press the power button, then hold down the Option-Command-P-R keys until you hear the startup chime at least one additional time after the initial startup chime).

Warning: Resetting the PRAM will permanently remove a RAM disk, if present, and all of its contents. You will also need to reset the date and time (using the Date & Time control panel).

8. Verify that the speaker cable is connected properly to logic board.
9. Check speaker cable. Verify left and right cable connections.
10. Check with headphones or external speaker, if audio is heard, replace heat exchanger with speaker wire assembly.
11. Replace top case.
12. Replace logic board

Distorted sound from speakers

1. Verify sound is correct with external speakers/headphones. If sound is correct, check speaker wire and connections.
2. In Mac OS X check balance.
3. Compare same sound with two different units to make sure that sound is actually distorted.

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4. Check speaker wire. If damaged, replace heat exchanger with speaker wire assembly.
 5. Replace top case.
 6. Replace logic board.

Video

No display, or dim display, but computer appears to operate correctly

1. Remove any connected peripherals.
2. Make sure F1 key is not stuck down.
3. Press the F2 key (with the fn key pressed and not pressed) to increase the screen brightness settings.
4. Reboot the computer—hold down the Control and Command keys and press the Power button to restart the computer. Or, press and hold the Power button for 5 to 10 seconds to shut down the computer, then press the Power button to restart.
5. Make sure using the PowerBook (DVI) power adapter (922-5164)
6. Verify inverter flex cable and LVDS cable connections are seated properly and that the cables are not damaged (refer to inverter board and display module replacement instructions).
7. Replace inverter board.
8. Replace display assembly.
9. Replace logic board.

Computer appears to work, but no video on external device connected to the TV out port (S-video out port)

1. The device must be connected to the S-video port while the PowerBook is sleeping or off for the device to be recognized.
2. If running Mac OS X, verify that this issue is also in Mac OS 9.
3. Verify monitor that is used in testing is known-good and is supported by this computer.
4. Try different cable(s).
5. Replace logic board.

No video on an external VGA device connected to the external monitor (DVI-I) port

1. In the Resolution control strip, see if the device is being recognized. If so select resolution.
2. If running Mac OS X, verify that this issue is also in Mac OS 9.

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3. Verify monitor that is used in testing is known-good and is supported by this computer.
 4. Try another DVI-to-VGA adapter cable.
 5. Restart the computer and test again.
 6. Replace logic board.

Misc. Symptoms

Latch not working

Note: When the display is being closed, a hook in the top of the display housing should be magnetically pulled down to the latch. When the latch button is pushed, the hook should release and retract into the display housing.

1. Verify hook operation by exercising the latch mechanism.
2. If the hook does not operate properly, replace the display assembly.
3. If the latch or latch button does not operate properly, replace the top case assembly.

The Date and Time settings reset all the time

Note: Resetting the power manager or PRAM resets the date and time.

1. Do a backup battery test:
 - Set the date and time.
 - Perform a Shut Down from the Apple menu or Special menu.
 - Remove the main battery and disconnect the power adapter for 10 minutes.
 - Connect the power adapter, insert the battery, and power on the computer.
 - If the date and time were lost the backup battery may be dead or discharged.
 - Remove the main battery from the unit and leave the PowerBook plugged in for at least 5 hours.

Note: If a discharged main battery is installed in the computer, recharging the backup battery may take up to 48 hours to completely charge. It is okay to use it while it is charging.

- If the date and time still reset, replace the backup battery.
2. If not the backup battery, replace logic board.

Note: For main and backup battery part numbers, refer to article 11751: Macintosh Family: Batteries and Part Numbers.

AirPort Card installed and received a -3278 error

1. Use Software Update control panel or see the Apple Software Updates web page to make sure the latest version of AirPort software is installed.
2. Boot using Mac OS All extensions setting.

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3. Reseat AirPort Card.
 4. Remove and reinstall the AirPort software.
 5. Replace with known-good AirPort Card.
 6. Replace logic board.

The microphone is not working

1. Check the Sound control panel and verify that the selection for input is the built-in microphone.
2. Check the signal level and level meter and adjust the gain.
3. Remove Sound Preferences from the Preferences folder and restart.
4. Reset PRAM (Press the power button, then hold down the Option-Command-P-R keys until you hear the startup chime at least one additional time after the initial startup chime).

Warning: Resetting the PRAM will permanently remove a RAM disk, if present, and all of its contents. You will also need to reset the date and time (using the Date & Time control panel).

5. If no sound as well as microphone is not working, verify cable connections.
6. Replace top case.

During startup boot sequence and before reaching Finder, the following dialog box appears: “The built-in memory test has detected an error”

1. If a RAM card is installed in the upper expansion slot (if not, skip to next step), remove it and restart. Refer to Memory Card Replacement instructions.
 - If symptom does not repeat, replace RAM card.
 - If symptom repeats, replace RAM in lower RAM slot with known-good SDRAM SO-DIMM RAM card and restart.
 - If symptom repeats, replace logic board.
2. If a RAM card is not installed in the upper expansion slot, replace RAM in lower RAM slot with known-good SDRAM SO-DIMM RAM card and restart. Refer to Customer-Installable-Parts Memory Replacement instructions.
 - If symptom repeats, replace logic board.