
Service Source



iMac (20-inch Late 2006)

31 October 2006

iMac (20-inch Late 2006)

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Service Source



Take Apart

iMac (20-inch Late 2006)



General Information

Product View



Serial Number Location

On the bottom of your iMac stand, you'll find a label with the serial number printed on it:
Serial Number Location



What's New on the iMac (20-inch Late 2006)?

Logic board

- Intel Core 2 Duo Processor running at 2.16 or 2.33 GHz

AirPort Extreme and Bluetooth antennas

- Separate antennas: Two AirPort antennas, one Bluetooth antenna

Inverter Board

- New service part, 661-4112. It serves as the flat panel backlight controller.

Camera Board

- New service module, 661-4113, is smaller than previous camera boards.

Memory

- Supports up to 3 GB system memory
- Supports two standard PC2-5300 DDR2 SO-DIMM modules

Rear cover and Front bezel

- New part numbers (922-7769 and 922-7875) with slight revisions to each part

DC-DC Board

- There is no DC/DC board. The functionality previously accomplished on the DC/DC board has been integrated into the logic board

Tools Required

The following tools are required to service the computer. **Note** that a special access card (part 922-7172) is required to open the front bezel.

- ESD-safe workstation and mat
- Soft, clean towel or cloth (to protect the display and removed parts from scratches)
- Access card to open the rear cover (part 922-7172)
- Black stick (or other nonconductive nylon or plastic flat-blade tool)
- Phillips #1 screwdriver
- Phillips #2 screwdriver
- Torx T8 screwdriver (magnetized)
- Torx T6 screwdriver (magnetized)
- Torx T10 screwdriver (magnetized)
- Flat-blade screwdriver

Safety

Warning: When the iMac (20-inch Late 2006) is under power, be aware that the power supply contains high voltages that pose a potential hazard to your personal safety. Never work on or near the power supply with the unit powered on, and as a further precaution always make sure the unit is unplugged when working on it with the front bezel removed.

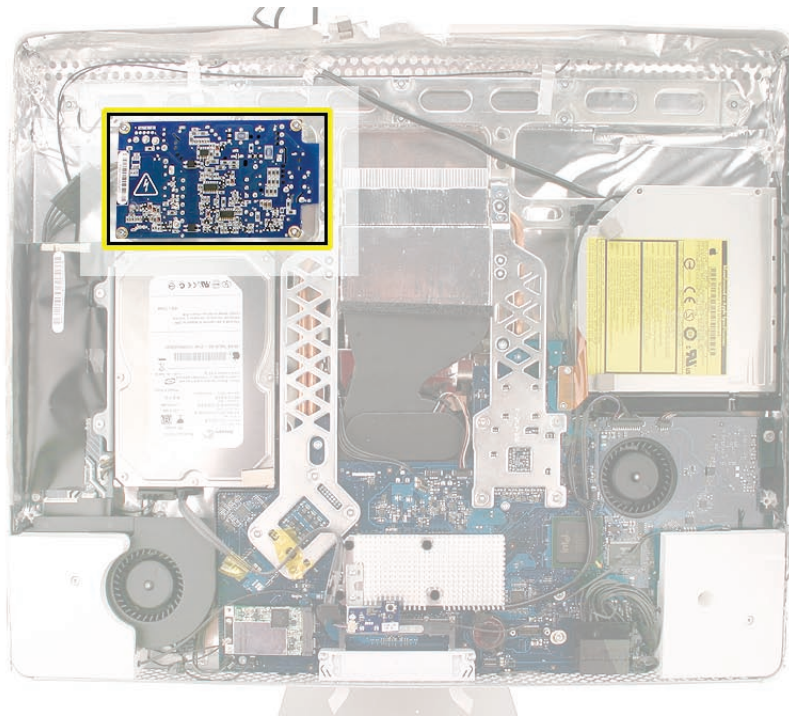


WARNING: HIGH VOLTAGE

Text or photographs marked by this symbol indicate that a potential hazard to your personal safety exists from a high voltage source.

The AC/DC power supply board is a high voltage source with the unit under power, and remains powered up whenever the system is plugged in, whether or not the system is turned on. Use extreme caution when troubleshooting the system with the front bezel removed.

- Disconnect power to the system before performing maintenance.
- Don't work alone. In the event of an electrical shock it is important to have another individual present who can provide assistance.
- Keep one hand in your pocket when working on any iMac (20-inch Late 2006) that is plugged in. This will help ensure that your body does not provide a path to ground in the event that you accidentally make contact with the line voltage.
- Don't wear jewelry, watches, necklaces, or other metallic articles that could present a risk if they accidentally make contact with the power supply circuitry.



Opening the Computer

Apple authorized, desktop certified technicians only should ever remove the front bezel on the iMac (20-inch Late 2006). When the front bezel is removed, be sure to always ground yourself and follow ESD-safe repair practices.

Removing the front bezel requires using a special access card (part 922-7172) to release latches located inside the upper corners of the front bezel. Slightly bending the upper quarter of the access tool card will help engage the latch more securely.

As you are inserting the card to disengage the latch you should squeeze the top of the bezel, that will help take pressure off of the latch and enable it to open easier. Note: If the bezel won't open, try cutting the card lengthwise into 3/4 inch or 1.5 cm strips. Insert the card on a 45° angle, aimed toward the outer corner, and try again.

Once the card has been released it is safe to open the bezel. See the Front Bezel Take Apart procedure for more information.

Access Tool Modification

If you wish to modify the access card tool, order kit 076-1213. The kit contains an access card and a piece of EMI gasket that can be cut and added to the top of the card. The additional thickness on the card will improve the chances of making contact with each bezel latch.

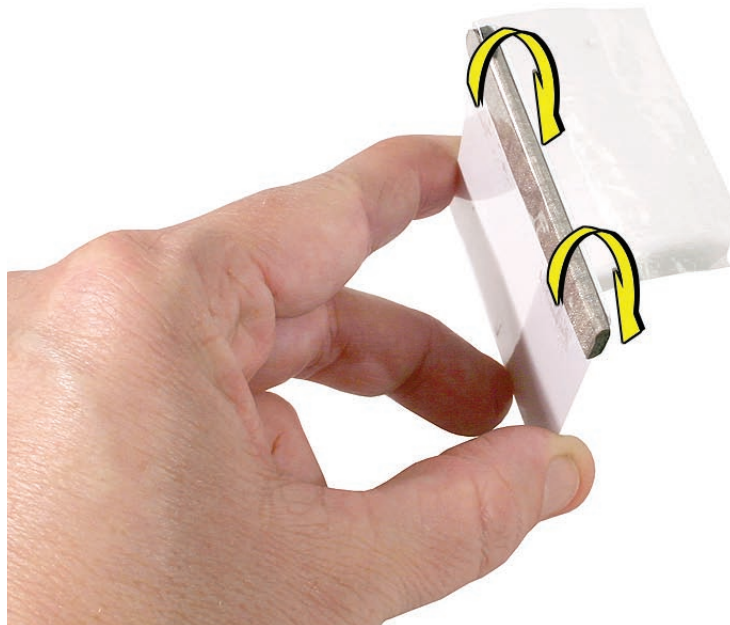
1. Remove the tape on the gasket to expose the sticky side of the gasket. Attach the sticky side of the EMI gasket to the top of the access card.



-
2. Cut the EMI gasket to the edge of the access card.



3. Using packing tape, or something equivalent, fold the tape over the EMI gasket to attach the gasket to the card.



-
4. Bend the card at a slight angle at the top to make sure the card makes contact with each latch.



5. Refer to [Removing the Front Bezel](#) for the complete procedure.

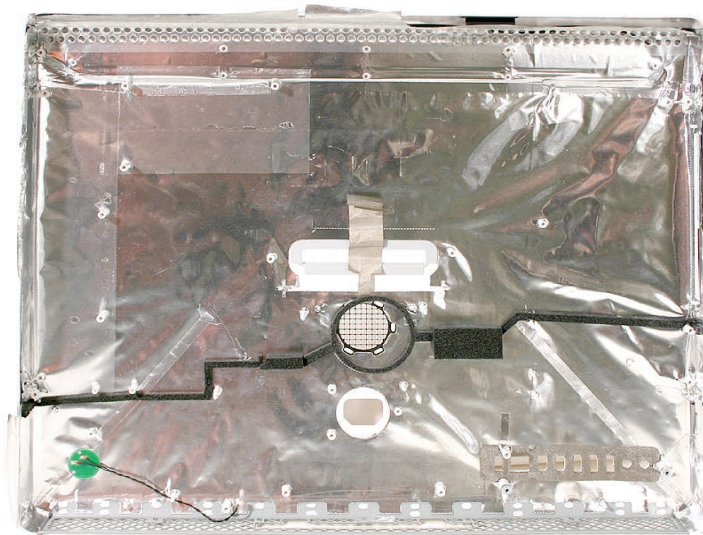
6.

EMI Shielding

The iMac enclosure is wrapped in EMI shielding that is easily torn and damaged. To maintain a properly shielded unit, you must repair all accidental tears and cracks to the shielding by covering them with EMI tape. Order EMI tape, part number 922-4786 (a long, thin strip) or 922-5026 (short, wide strips).



Cover nicks with EMI tape. Pay particular attention to the EMI shielding inside the rear housing, shown below. The EMI shield is easily damaged when replacing modules.



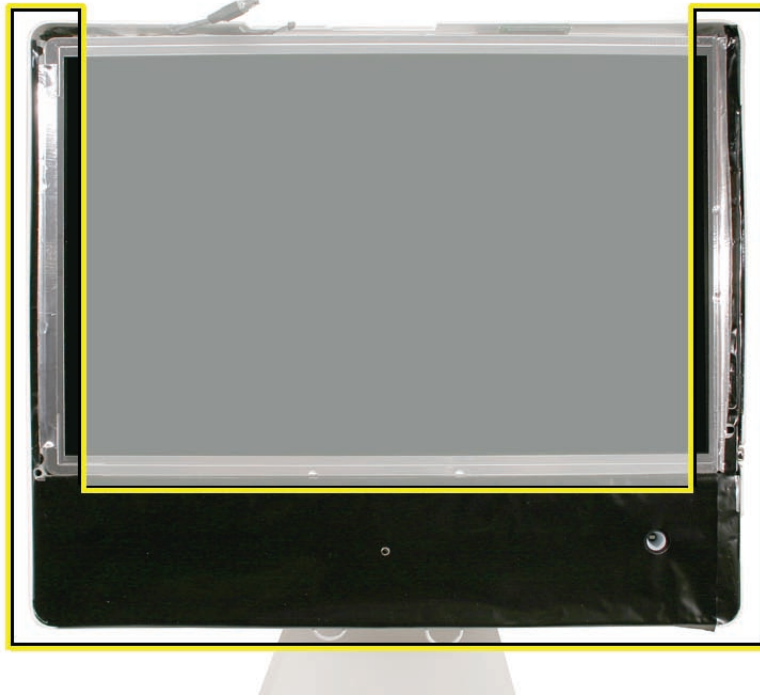
Lower EMI Shield

EMI tape covers the top and sides of the display panel, and the lower EMI shield covers the logic board along the bottom of the unit. The EMI tape and lower EMI shield are easily damaged when removed, and removal is necessary in order to access most components within the unit.

Should the EMI tape that seals the display, or the EMI shield covering the bottom of the enclosure (see photo below) accidentally tear, use the EMI tape (922-4786 or 922-5026) to repair and completely seal the unit.



When properly repaired, all edges shown below will be wrapped by EMI tape, and the tape securely adhered to all edges. Use a “black stick” to flatten the EMI tape tightly and rub out air pockets and wrinkles.





What's New

31 October 2006

- Troubleshooting has been updated with a new symptom, "[Fans running at full speed after computer turns on.](#)" **Note:** The customer may have entered a diagnostic mode that causes the fans to run at full speed. This symptom is very easy to resolve at the customer level.

29 September 2006

- The inverter procedure was updated; the DC cable connection to the inverter changed.
- Photos of the EMI tape (922-44786 and 922-5026), used to repair torn and damaged EMI shielding, have been added to the [EMI Shielding](#) section in the General Information chapter

6 September 2006

- Product Introduction: iMac (20-inch Late 2006)
 - Logic board: Intel Core 2 Duo processor running at 2.16 or 2.33 GHz
 - AirPort Extreme and Bluetooth antennas: Two AirPort antennas, one Bluetooth antenna
 - Inverter Board : New service part, 661-4112. It serves as the flat panel backlight controller.
 - Camera Board: New service module, 661-4113, is smaller than previous camera boards.
 - Memory: Accepts up to a 2 GB SO-DIMM in each of the two memory slots, but the iMac will only support 3 GB total memory
 - Rear cover and front bezel: New part numbers (922-7769 and 922-7875) with slight revisions to each part
 - DC-DC Board: There is no DC/DC board. The functionality previously accomplished on the DC/DC board has been integrated into the logic board



Access Door

Tools

- Phillips #2 screwdriver
- ESD-safe workstation and mat
- Soft , clean towel or cloth

Preliminary Steps

Before you begin, lay the computer down so the panel is face down and the bottom is facing you.

Part Location



Removing the Access Door

1. Raise the stand and use a Phillips #2 screwdriver, to loosen the two captive access door screws.

Warning: The ambient light sensor is located to the left. Don't mistake the ambient light sensor for a screw. Sticking a screw driver or other sharp object in the ambient light sensor could damage the computer.

2. Remove the access door.



Replacing the Access Door

1. Position the access door on the rear housing over the memory compartment.
2. Lift the stand out of the way.
3. Use a Phillips #2 screwdriver to tighten the captive screws.



Front Bezel

Tools

This procedure requires the following tools:

- Torx T8 screwdriver
- Access card tool 922-7172

Preliminary Steps

Before you begin, remove the [access door](#).

Part Location



Removing the Front Bezel

1. Position unit on rear cover with the stand facing you.
2. Tilt up the front bezel and remove four screws along the bottom. The longer screw is the second screw from the right. It's to the left of the ambient light sensor.

Warning: The ambient light sensor is located in the second hole from the right. Don't mistake the ambient light sensor for a screw. Sticking a screwdriver or other sharp object in the ambient light sensor could damage the computer.



922-7011 (x3)

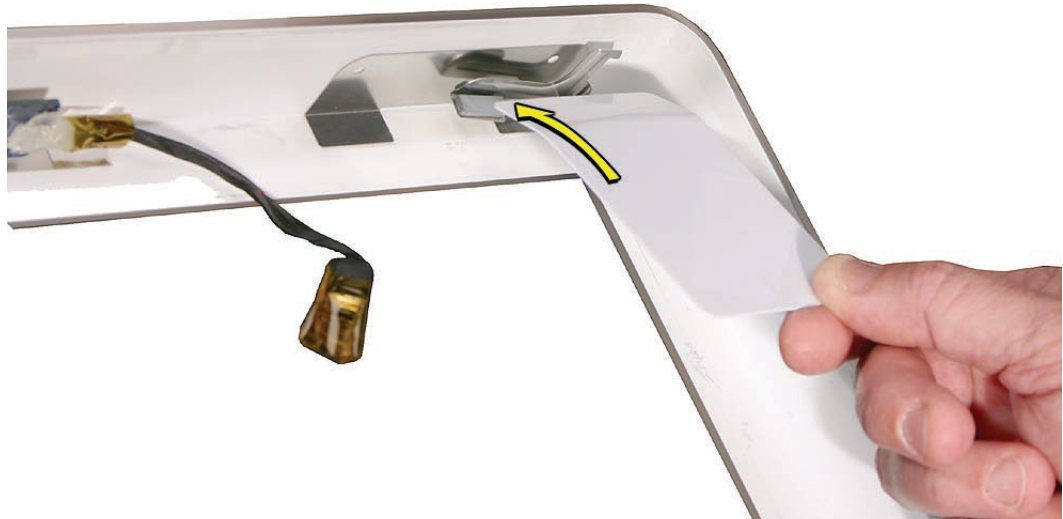
922-7749 (x1)



3. Locate the access card. Bending the upper quarter of the access tool card will help engage the latch. **Note:** Refer to [Access Tool Modification](#) in the General Information chapter if the bezel is difficult to open.



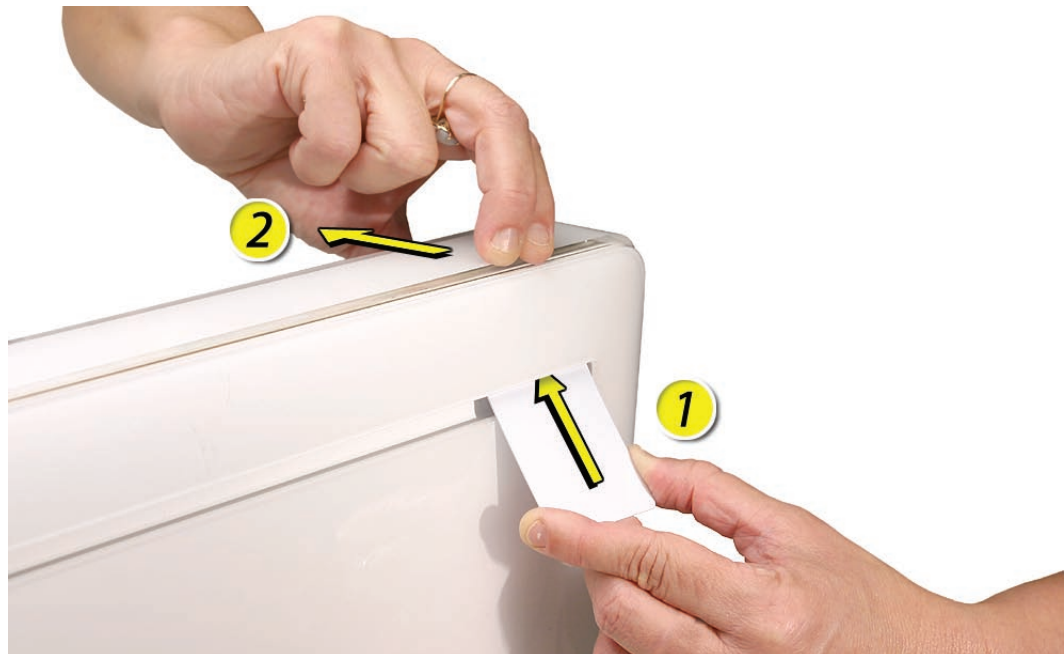
-
4. This picture shows how the access tool works. Pushing the tool up the vent on the rear cover releases the latches on the inside of the front bezel. Refer to the next step for the procedure.



5. Start on the left side (looking from the back of the unit). As you insert the card to disengage the latch, squeeze the top of the bezel, that will help take pressure off of the latch and enable it to open easier. As the bezel releases, pull the bezel away from the rear housing. Note: If the bezel won't open, try cutting the card lengthwise into 3/4 inch or 1.5 cm strips. Insert the card on a 45° angle, aimed toward the outer corner, and try again.



-
6. Repeat step 5 to release the locking latch in the right corner. Again, pull the bezel away as the card releases the latch.



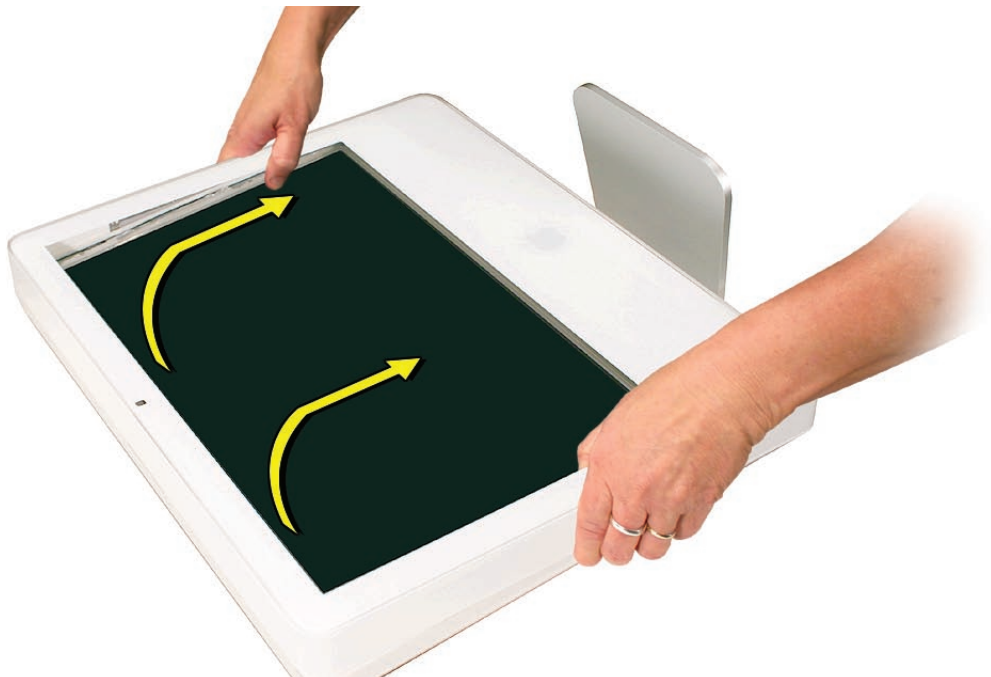
7. If the bezel won't release, pull the bottom of the bezel out a bit and insert the access card again.



-
8. Repeat step 7 for the left side.



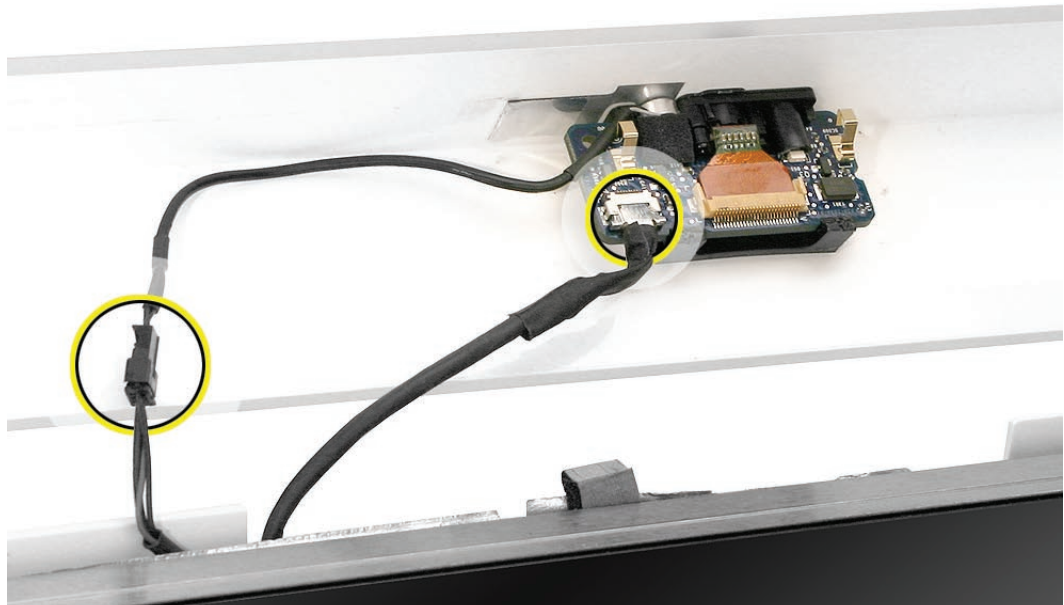
9. Once the access card has been removed, it is safe to open the bezel. Position the unit on an ESD mat, with the bottom facing toward you. Lift up the top of the bezel and pull it up and slightly toward you. **Caution:** Make sure the memory eject levers are not protruding from the access door when you lift the bezel up.



-
10. Swing the bezel up so you can disconnect two cables on the camera board at the top of the bezel.



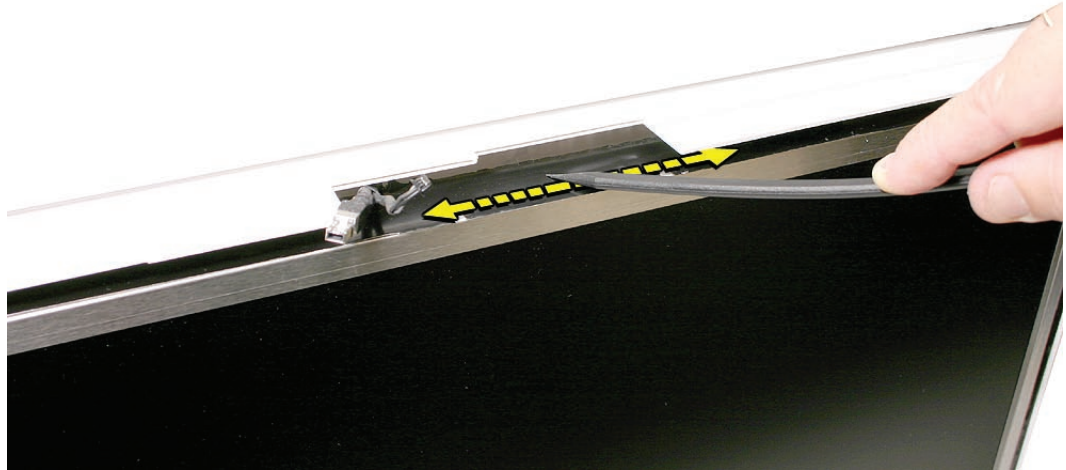
11. Remove the any kapton tape and disconnect the camera and microphone cables from the camera board.



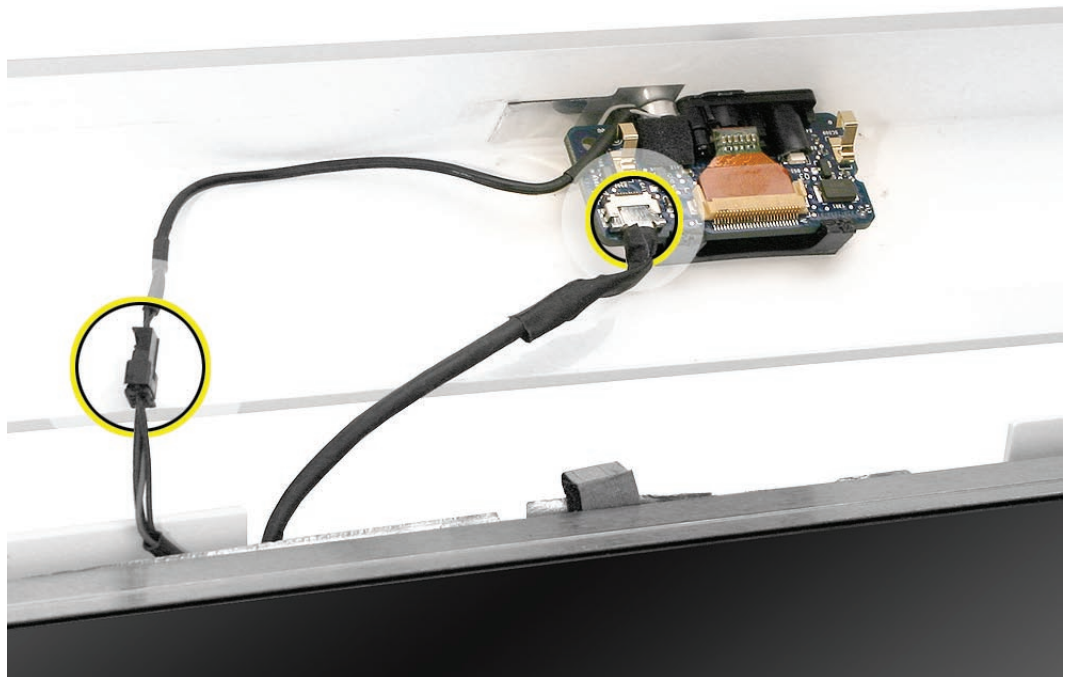
12. Lift the front bezel off the computer. If replacing a damaged front bezel, also remove the camera board. **Note** the microphone is part of the front bezel assembly.

Replacing the Front Bezel

1. Make sure the black EMI shielding along the top of the LCD panel is not in the way of the locking mechanisms when you lower the front bezel onto the computer. Use a black stick to press (re-stick) the EMI shielding along the top of the panel.



2. Connect the camera and microphone cables (on the camera board) to the cables sticking out of the top of the computer.



-
3. Tuck the cables neatly into the channel on the rear housing.



4. Press the memory ejector levers into the closed position.
5. Continue to lower the front bezel down and press the top corners of the front bezel to connect the latches. **Note:** Check that the latches are connected by lifting the front bezel at each corner.
6. Replace the four bezel mounting screws along the bottom of the computer.
7. Replace the access door; tighten the two captive screws.



Camera Board

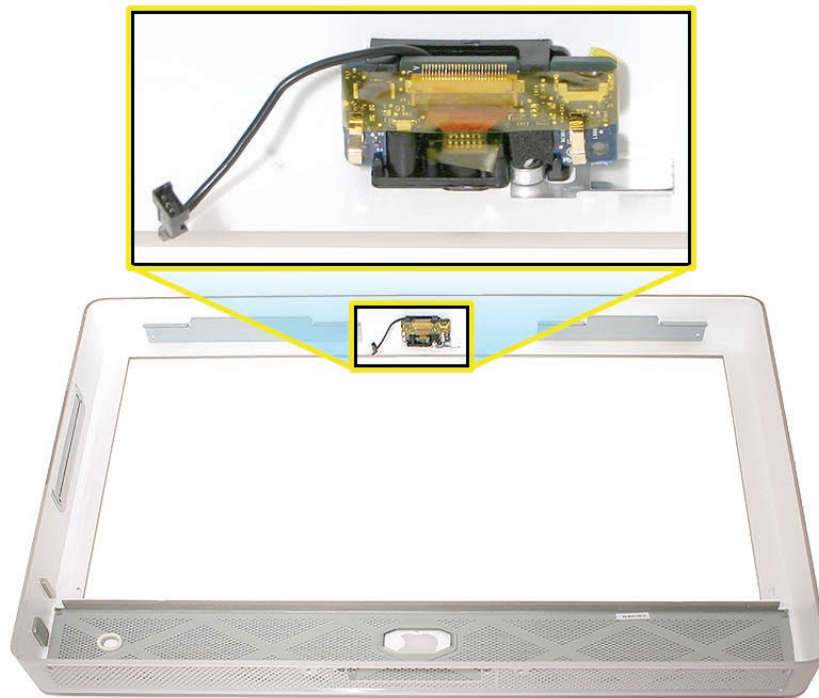
Tools

- Black stick
- ESD mat, soft , clean towel or cloth

Preliminary Steps

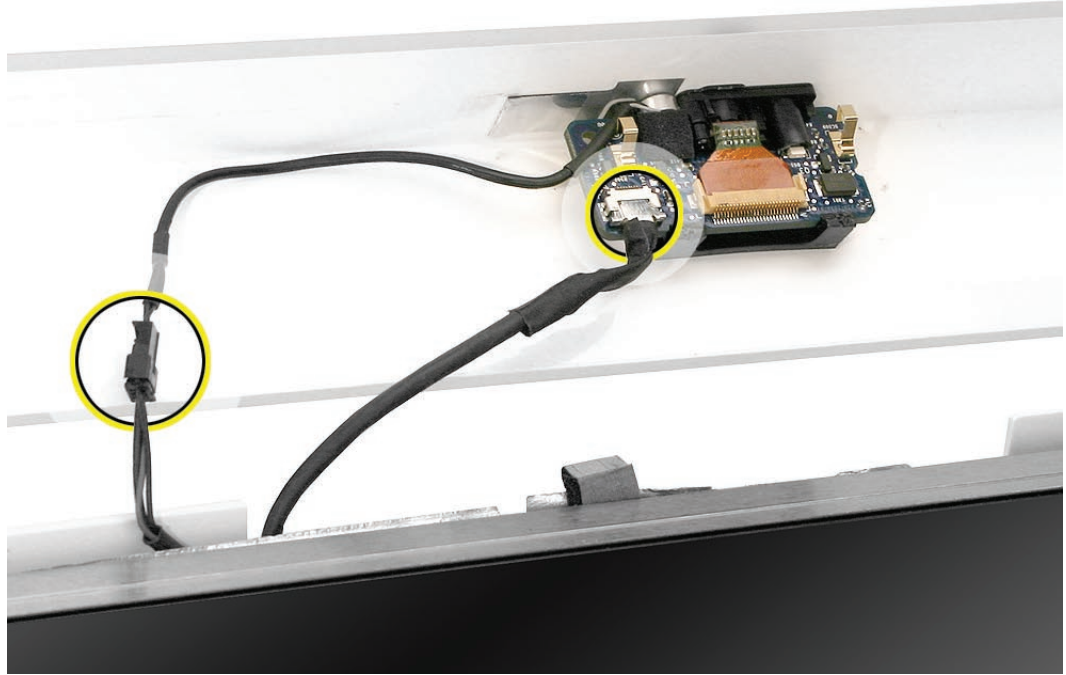
Before you begin, remove the [access door](#) and [front bezel](#).

Part Location

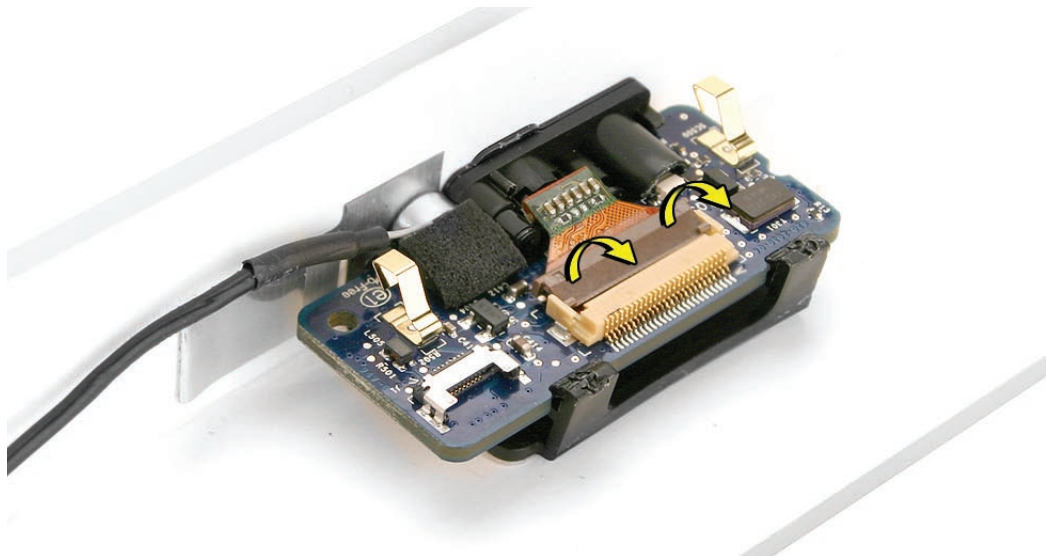


Removing the Camera Board

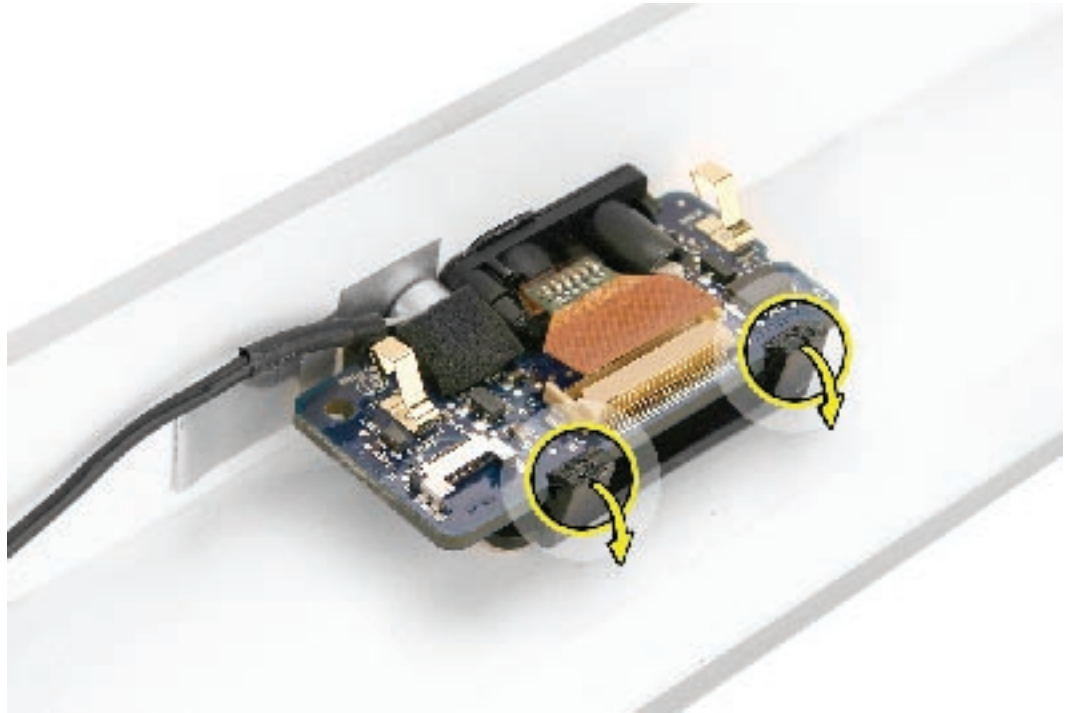
1. The camera board and cables are visible as you lift the front bezel off the computer.
2. Remove any kapton tape on the cables. Disconnect the camera and microphone cables.



3. Remove any kapton tape covering the camera board. With your fingernail or a black stick, gently lift/flip up the flex cable locking hinge to release the flexible camera cable.



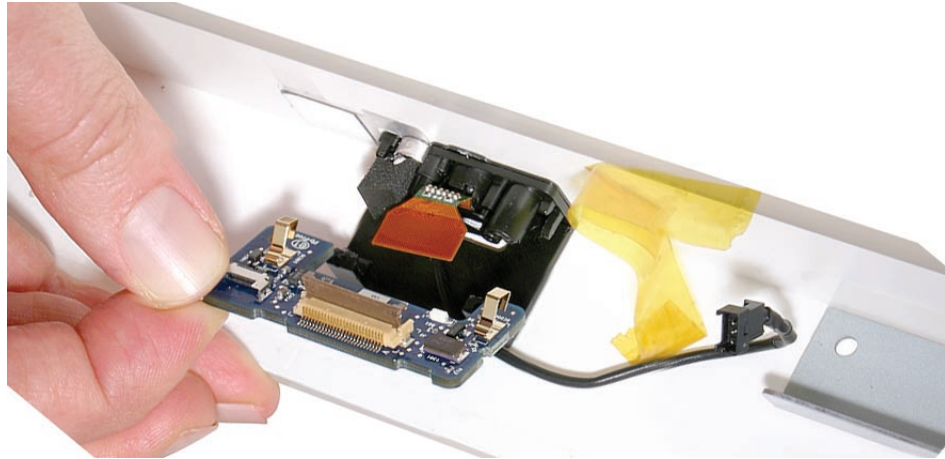
-
4. With your fingers or black stick, flex the two black tabs forward to release the camera board from the camera bracket.



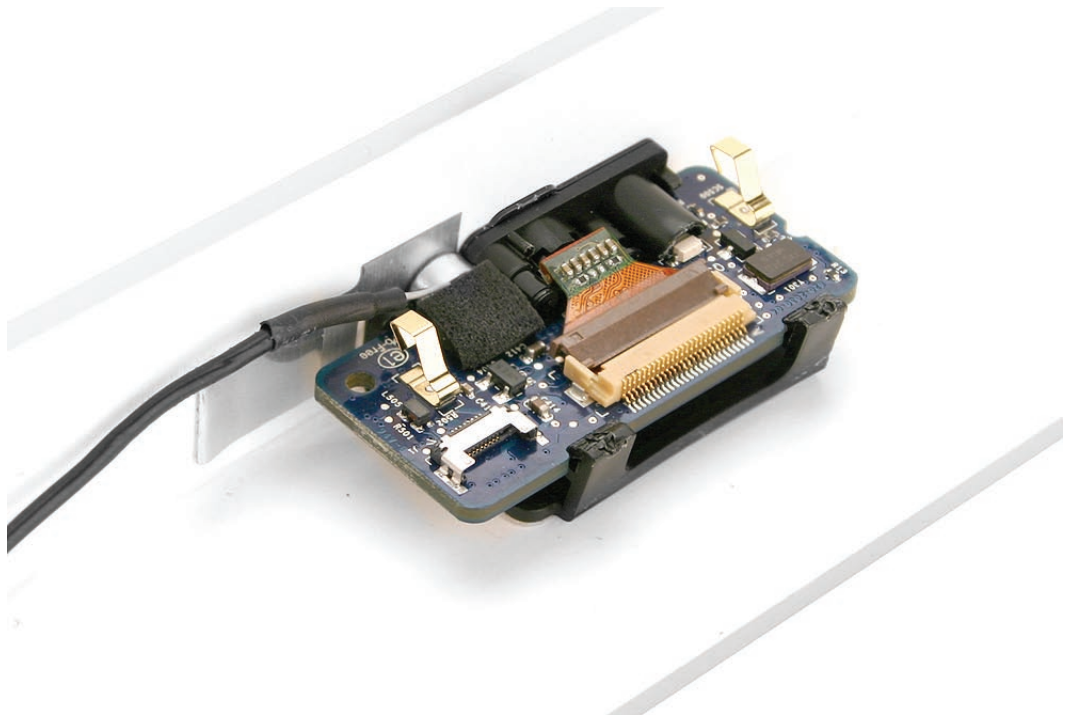
5. Remove the camera board from the front bezel. **Note:** The flex cable, camera lens, and black mounting bracket are part of the front bezel.

Replacing the Camera Board

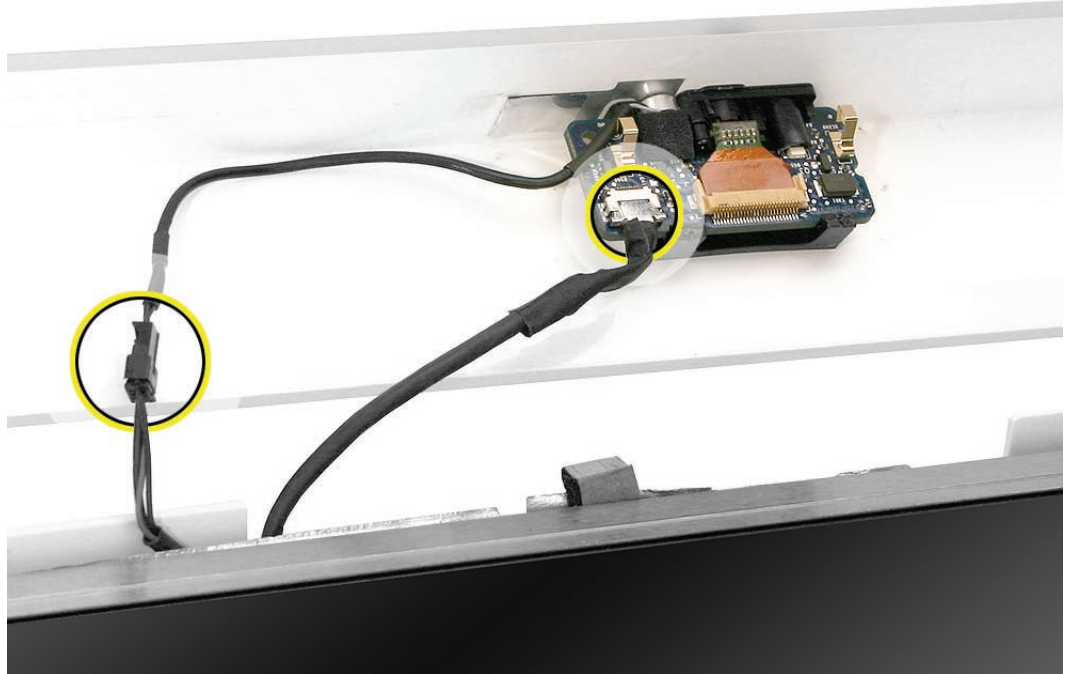
1. Position the camera board in the plastic bracket. Make sure the flex cable is not pinched as you install the board.



2. Snap the board into the mounting bracket and lock the flex cable into the connector with the locking hinge.



3. Reapply the tape across the length of the camera board.
4. Connect the two cables to the camera board.



5. Tuck the camera board cables neatly into the channel on the rear housing.



-
6. Holding the memory ejector levers closed, lower the front bezel down.
 7. Replace the bezel screws along the bottom of the computer.
 8. Replace the access door; tighten the two captive screws.



Lower EMI Shield

Tools

- Black stick (or other nonconductive nylon or plastic flat-blade tool).

Preliminary Steps

Before you begin, remove the following:

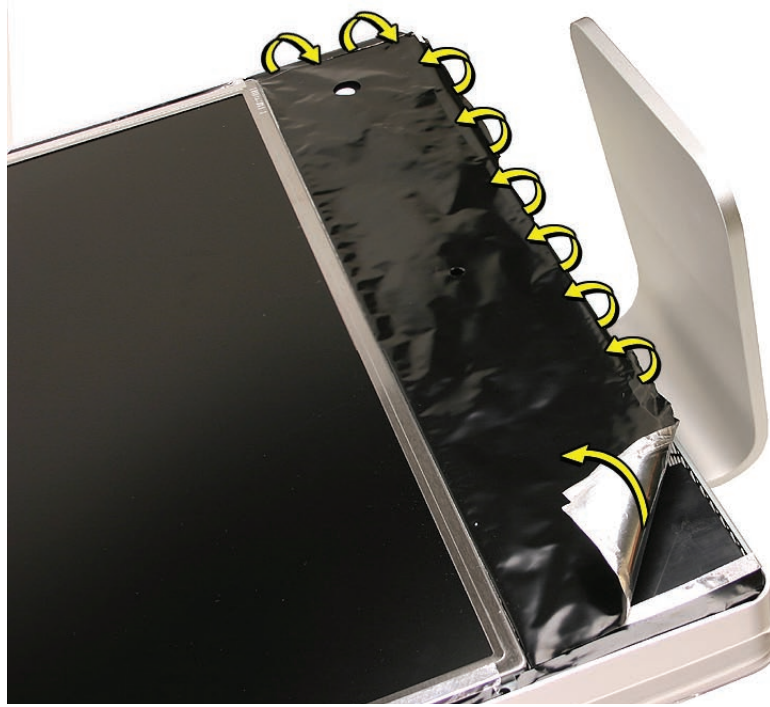
- [Access door](#)
- [Front bezel](#)

Part Location



Removing the Lower EMI Shield

1. Carefully peel the lower EMI shield off the bottom edge of the rear housing. Use a black stick to help peel back the shield.



2. Gently lift the EMI shield to rest of the way to expose the other modules.



Replacing the Lower EMI Shield

1. Position the lower EMI shield over the bottom of the unit so that the holes (for the IR board and the LED) in the shield are properly aligned.
2. Press the sticky, edge of the EMI shield onto the bottom side of the display panel. The crease in the EMI shield should align with the edge of the panel.
3. Fold down the EMI shield and press it firmly over the bottom edge of the rear housing. Use a black stick to rub out any air bubbles and ensure that the EMI shield adheres firmly and without wrinkles along all edges.



4. Make sure the memory eject levers are in the closed position before you replace the front bezel.
5. Replace the access door.



IR Board

Tools

- Torx T6 screwdriver.

Preliminary Steps

Before you begin, remove the following:

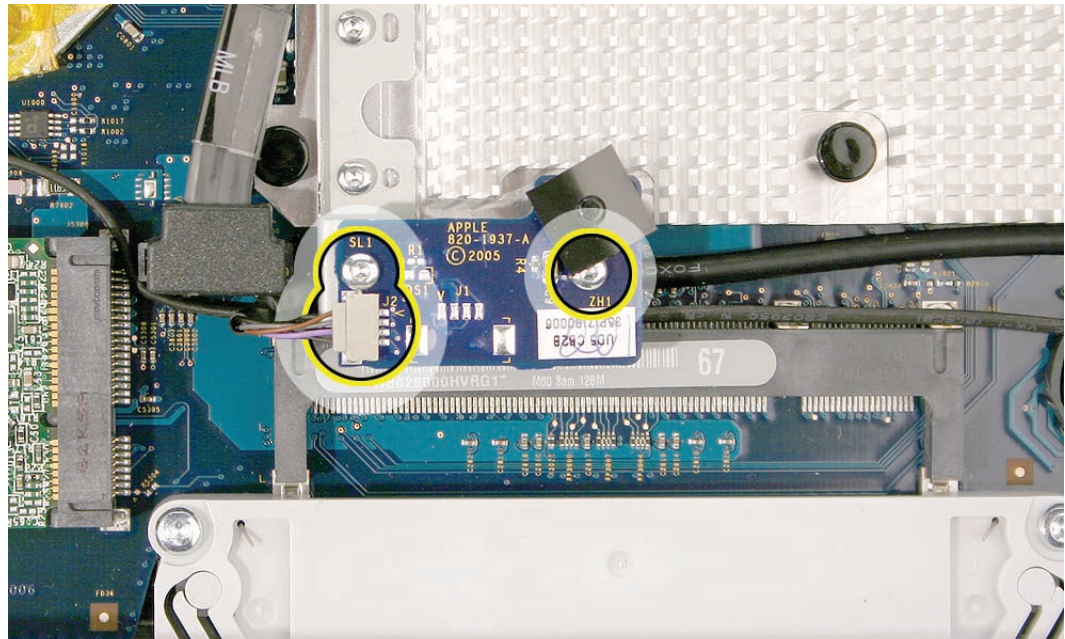
- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)

Part Location

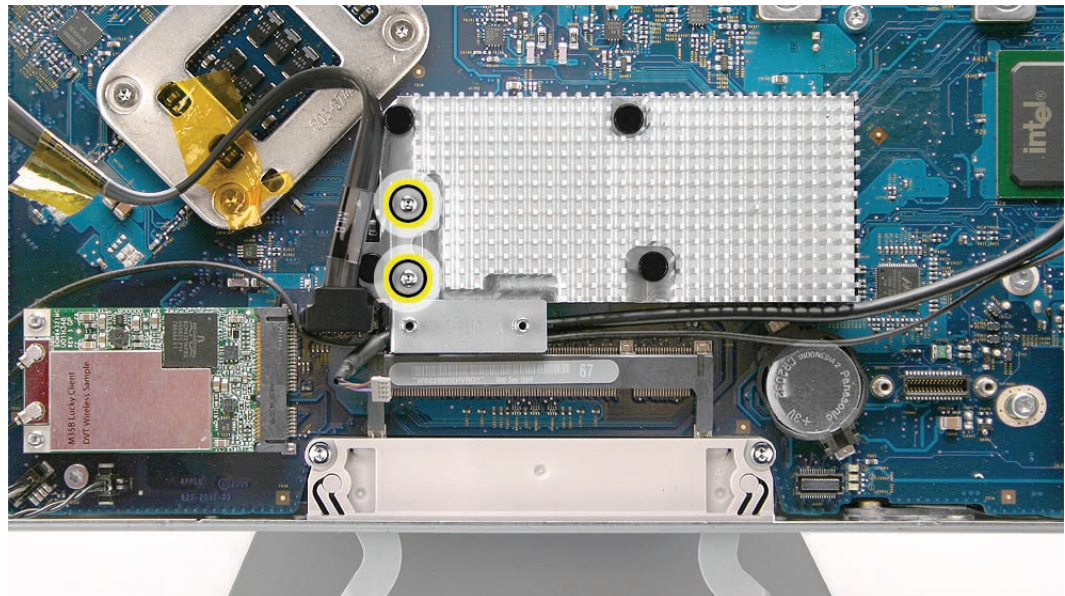
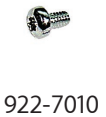


Removing the IR Board

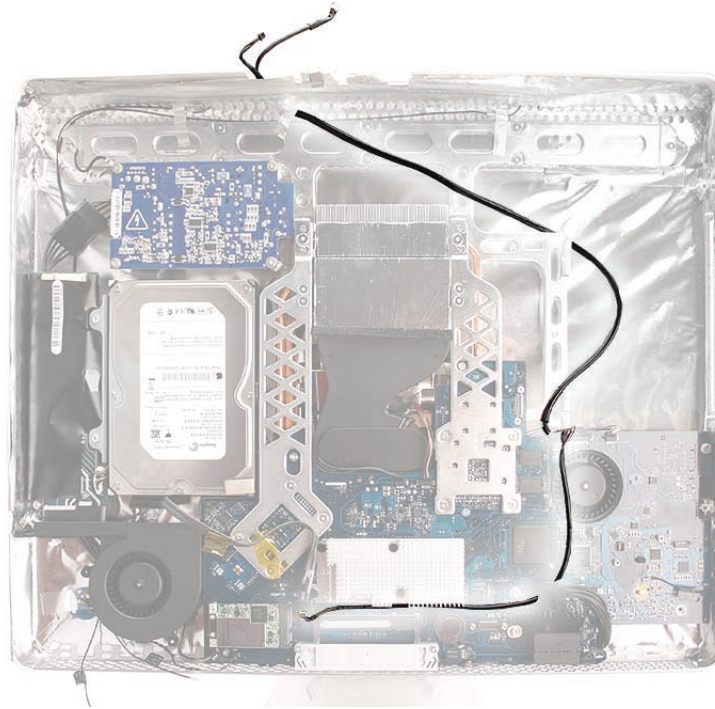
1. Disconnect the IR cable and remove the two T6 screws on the IR board. Lift the IR board from its mounting bracket.



2. If necessary, use a Torx T6 screwdriver to remove the IR board mounting bracket.

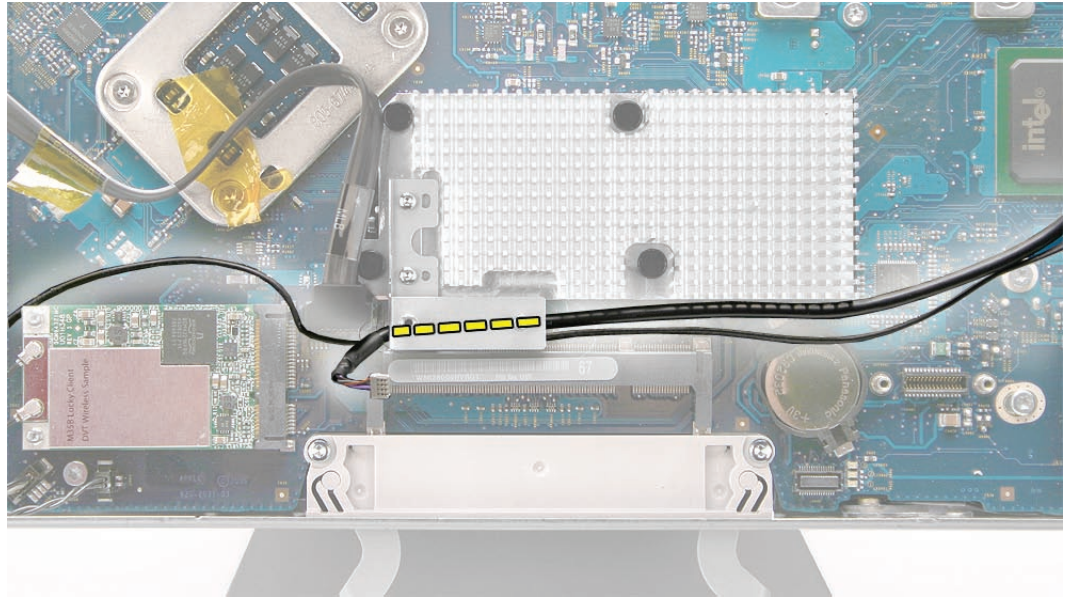


-
3. **Note:** If you are replacing the IR /camera cable, you must remove the optical drive and disconnect the cable from the logic board.

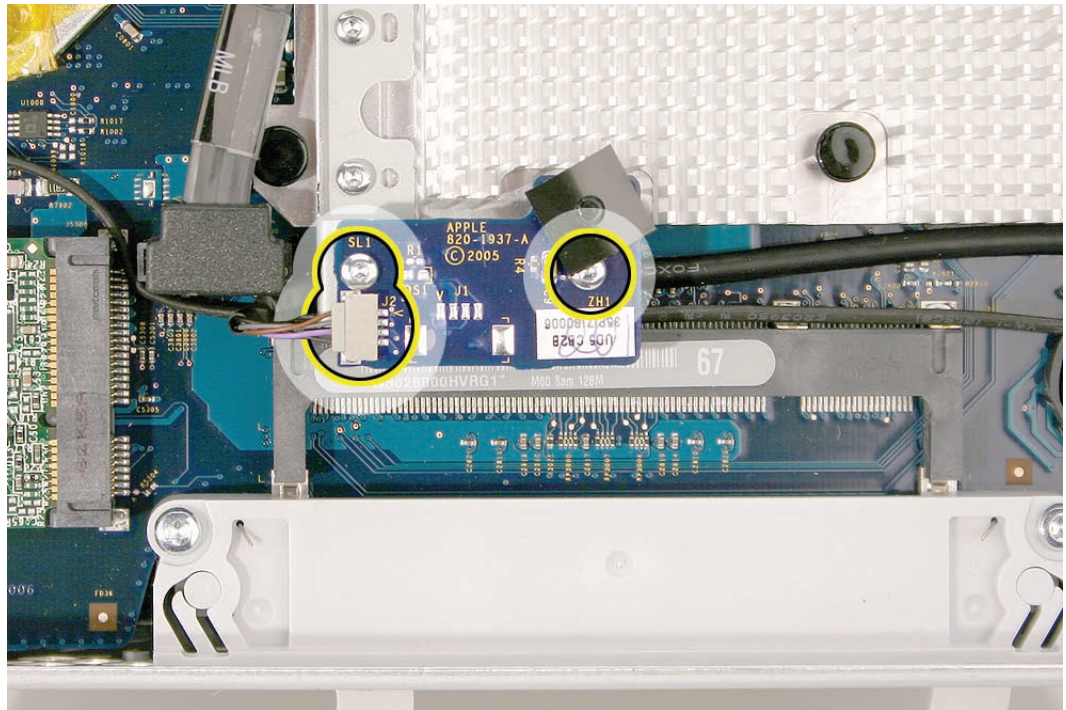


Replacing the IR Board

1. If removed, route the IR/camera cable under the IR bracket.



2. Install the IR board on the mounting bracket. Replace the T6 screws and connect the IR cable to the IR board.



-
3. Replace the lower EMI shield.
 4. Position the memory eject levers into the closed position.
 5. Replace the front bezel.
 6. Replace the access door.



Battery

Tools

The only tool required for this procedure is a black stick.

Preliminary Steps

Before you begin, follow steps for removing the following:

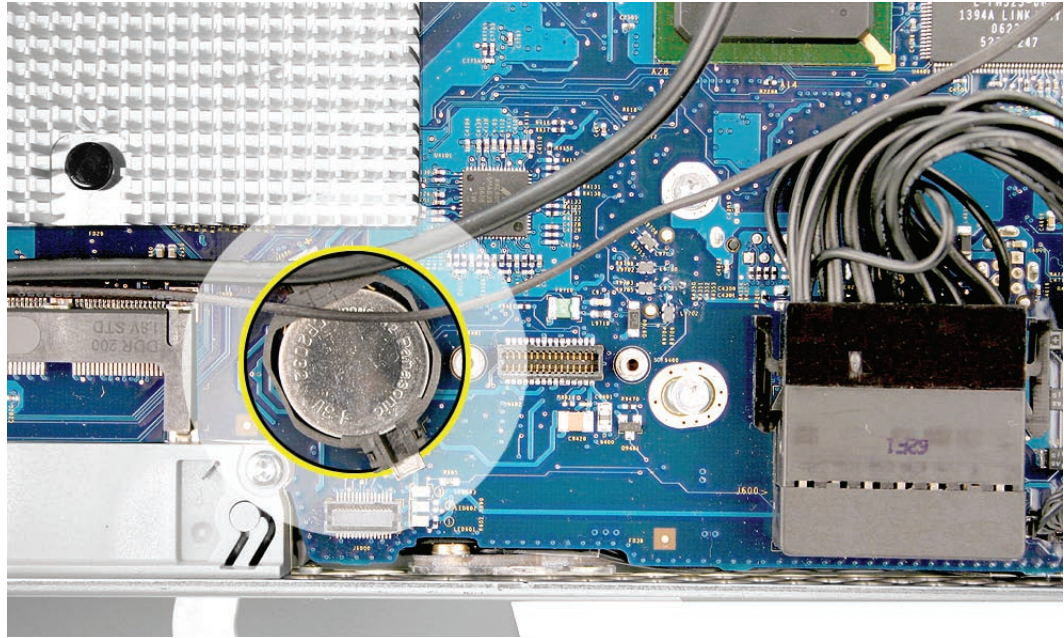
- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)

Part Location



Removing the Battery

1. With a black stick, pry the battery from the battery slot.



Replacing the Battery

1. Slide the battery (with voltage information face up) into the battery holder.
2. Replace the lower EMI shield.
3. Replace the front bezel.
4. Replace the access door.



LCD Display Panel

Tools

- Torx T6 screwdriver.
- Torx T10 screwdriver
- Black stick (or other nonconductive nylon or plastic flat-blade tool)

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)

Part Location

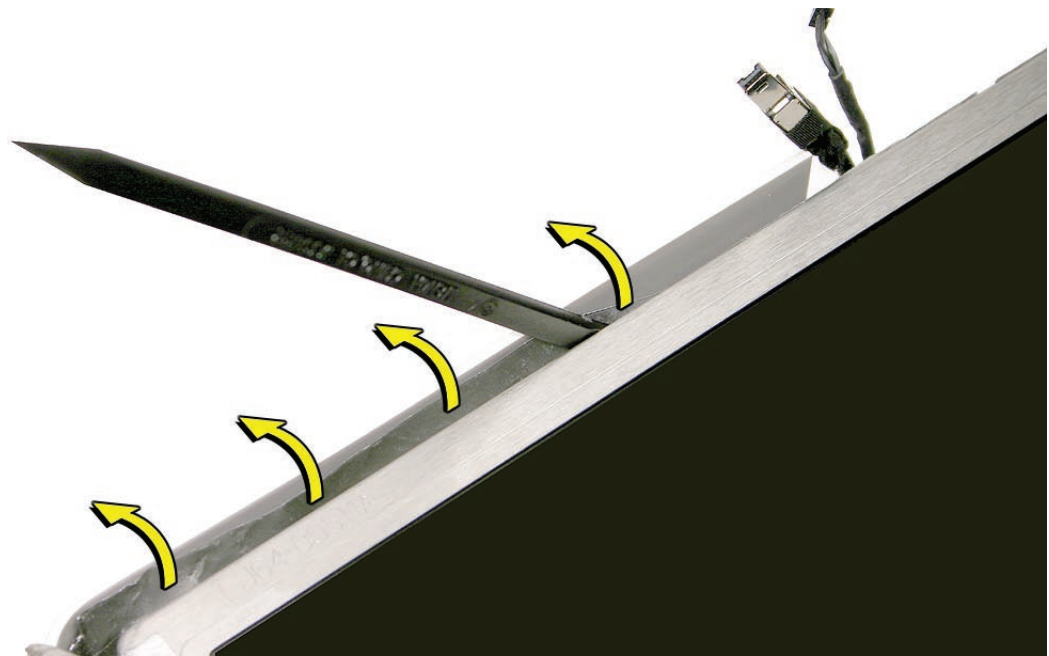


Removing the Display Panel

1. Using the access tool, a black stick, or your fingers, peel the black EMI tape off the right and left sides of the panel.



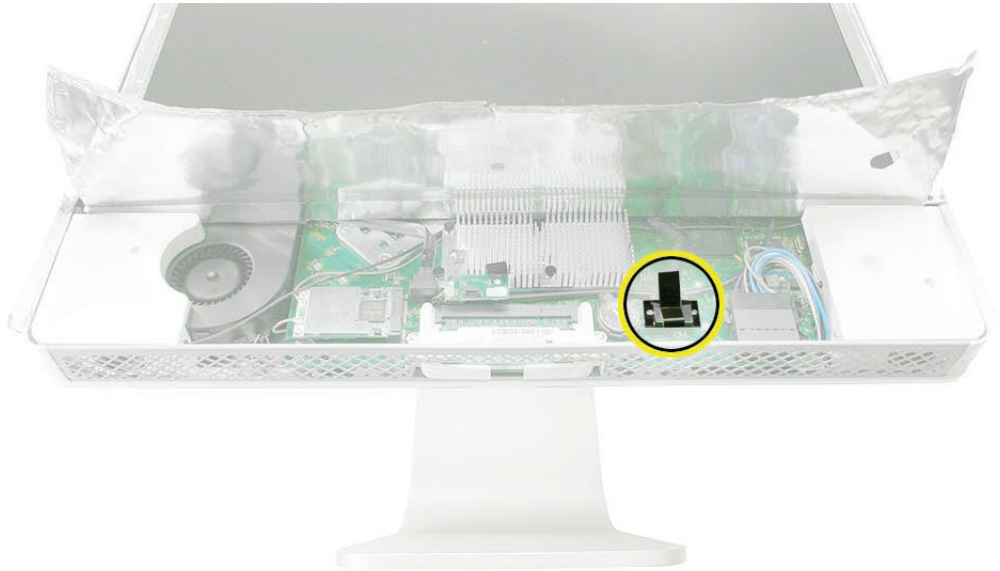
2. Using the access tool or black stick, peel back the black EMI tape stuck along the entire length of the top panel.



- Using a Torx T6 screwdriver, remove the two LVDS connector screws. Pull the black tab on the connector to disconnect the LVDS cable from the logic board.



922-7010



- Using a Torx T10 screwdriver, remove the four panel mounting screws.



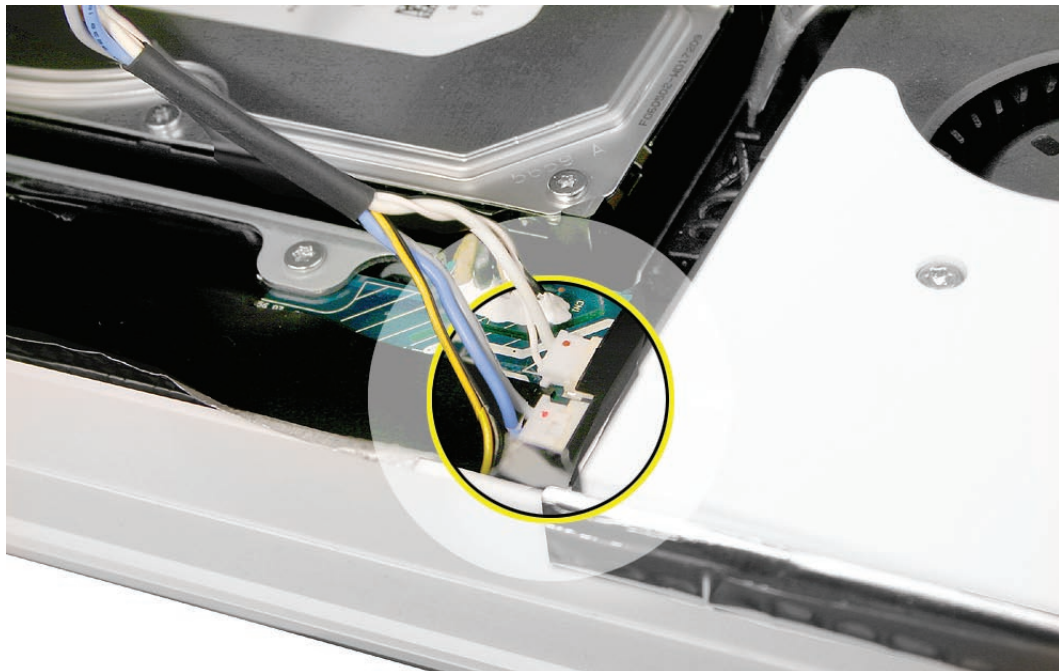
922-7023



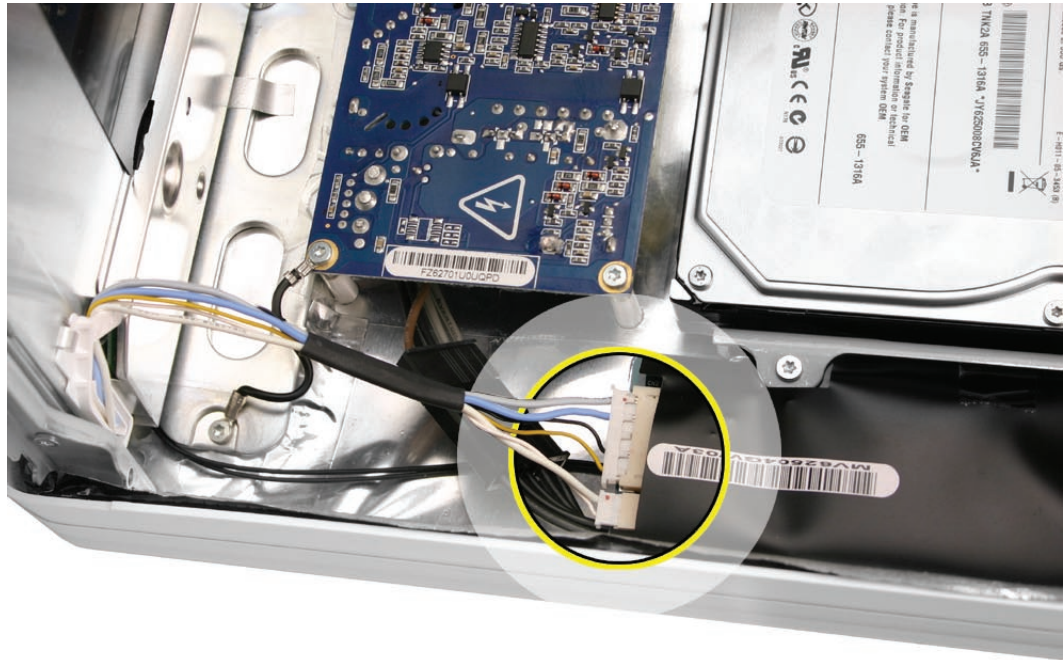
5. Lift the panel up just enough to see the inverter cables on the left side.



6. Disconnect the two panel-to-inverter cables above the left speaker. **Replacement Note:** The cable connectors are marked with dots to indicate “right-side-up.”



7. Raise the panel up the rest of the way. Disconnect the two inverter-to-display cables at the top of the inverter. **Replacement Note:** The cable connectors are marked with dots to indicate “right-side up.”



8. Carefully separate the display from the sticky EMI shielding along the top of the display.



-
9. **Note:** If replacing the display panel, remove the lower EMI shield, the display panel mounting brackets (on each side), and the LVDS cable from the back of the display panel before returning the module to Apple.



Replacing the Display Panel

1. Replace the LVDS cable on the rear of the display panel.
2. If removed, replace the metal panel mounting brackets to each side of the display.
3. Connect the four inverter-to-display cable connectors. Remember the connectors are keyed; dot-side-up.
4. Replace the display panel with four mounting screws.
5. Connect the LVDS cable connector to the logic board and secure it with two screws.
6. Fold the EMI tape firmly over the left, top, and right edges of the display panel. Use your fingers or the black stick to adhere the tape firmly and rub out wrinkles. **Note:** If the tape was ripped or damaged, replace the damaged EMI tape with new EMI tape
7. Replace the lower EMI shield. Press the EMI shield along the bottom and sides of the computer frame.



8. Replace the front bezel.
9. Replace the access door.



Memory

Tools

- Phillips #2 screwdriver
- ESD mat, soft , clean towel or cloth

Preliminary Steps

Before you begin, remove the [access door](#).

Part Location

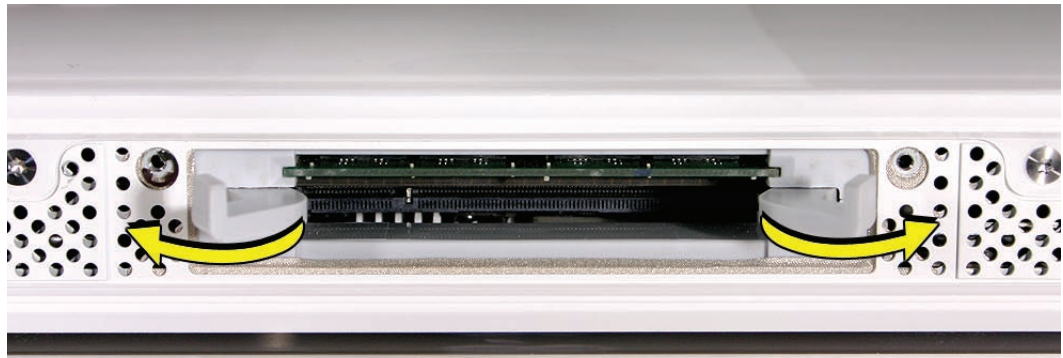


Removing the Memory

1. After removing the access door, touch the metal frame around the memory compartment to discharge any static electricity from your body.

Important: Always discharge static before you touch any parts such as the memory board. To avoid generating static electricity, do not walk around the room until you have finished replacing the memory.

2. Pull the two levers in the memory compartment toward you. If a memory module is installed in the slot, pulling the levers will dislodge it. **Note:** The levers are used to remove memory not to install memory. Always install memory my hand.



a

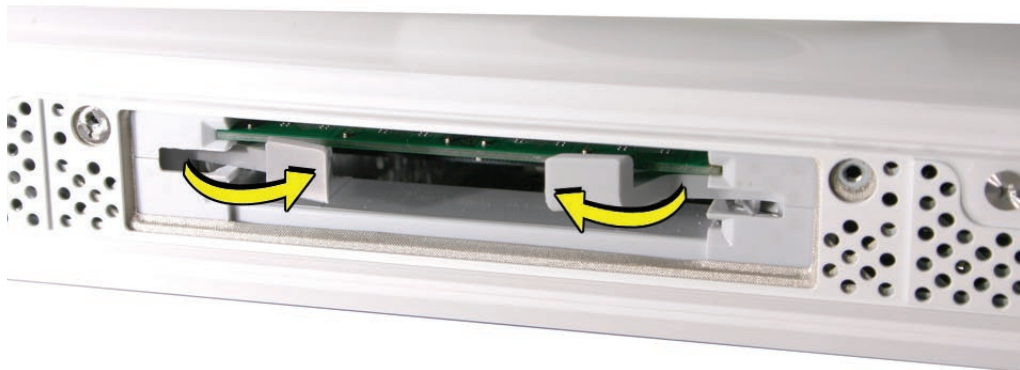
3. Set the memory module aside.

Replacing the Memory

1. Make sure the DIMM levers are all the way open.
2. With the computer face down, orient the DIMM with the notch on the left.



3. With your fingers, press the DIMM fully into the slot until you hear a click. After inserting the memory, fold the DIMM levers closed. There will be a slight resistance and you will hear a click when they fold into the closed position.



4. Replace the access door on the memory compartment.
5. Use a Phillips #2 screwdriver to tighten the captive screws on the access door.





Speakers

Tools

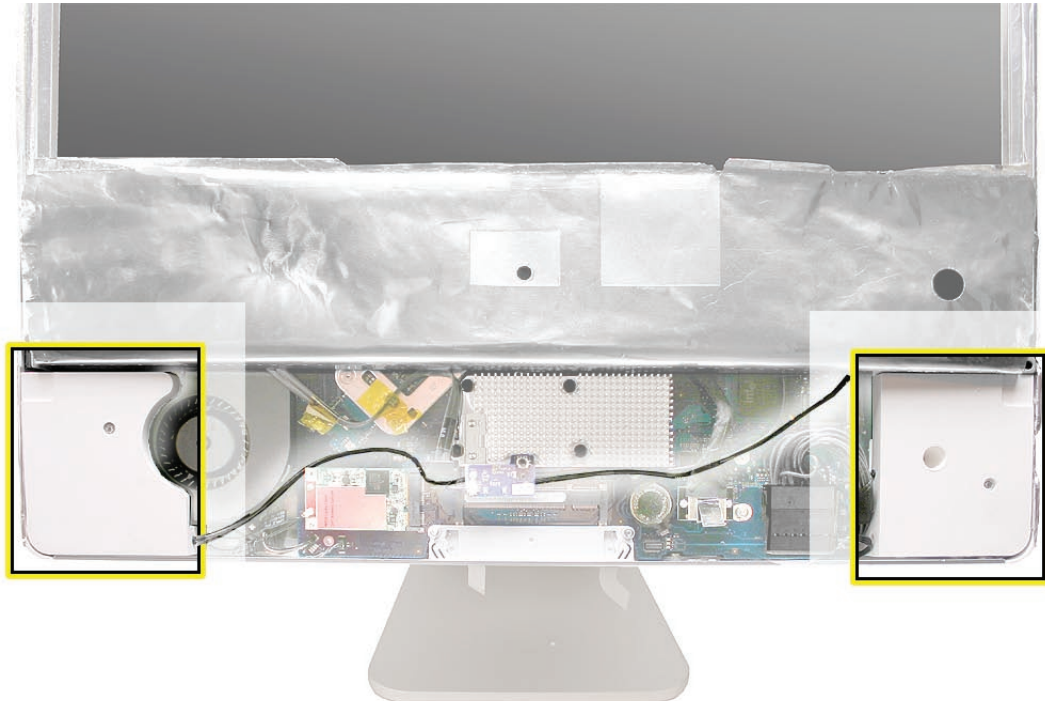
- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [IR board](#)

Part Location



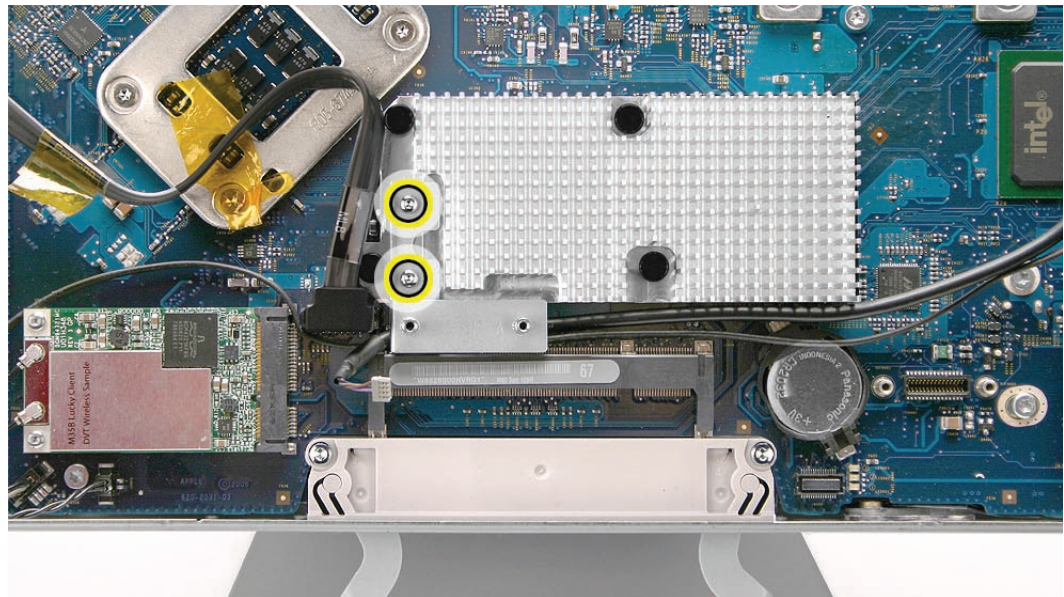
Removing the Speakers

1. Using a T10 torx screwdriver, remove the screws from the left and right speakers.

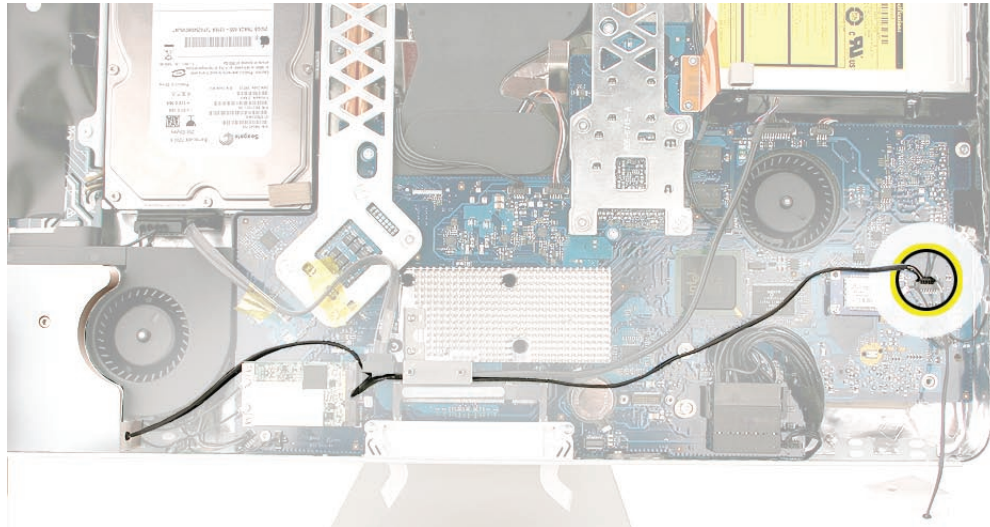
Replacement Note: The longer of the two speaker mounting screws is used to secure the left speaker; the shorter screw secures the right speaker.



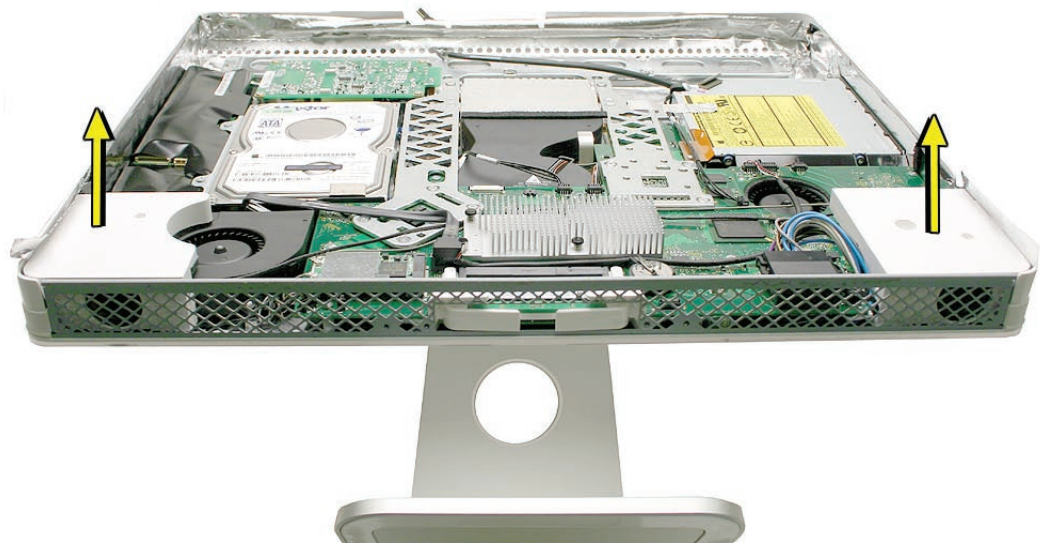
2. Remove the two T6 screws on the IR mounting bracket so the speaker cable insulation is not sliced on the metal bracket.



3. If necessary, disconnect the hard drive cable (to the left of the IR bracket) from the logic board to allow easier removal of the speaker cable.
4. Note the speaker cable routing. The speaker wire runs below the heatsink and above the memory slot. Disconnect the speaker cable from the right side of the logic board.

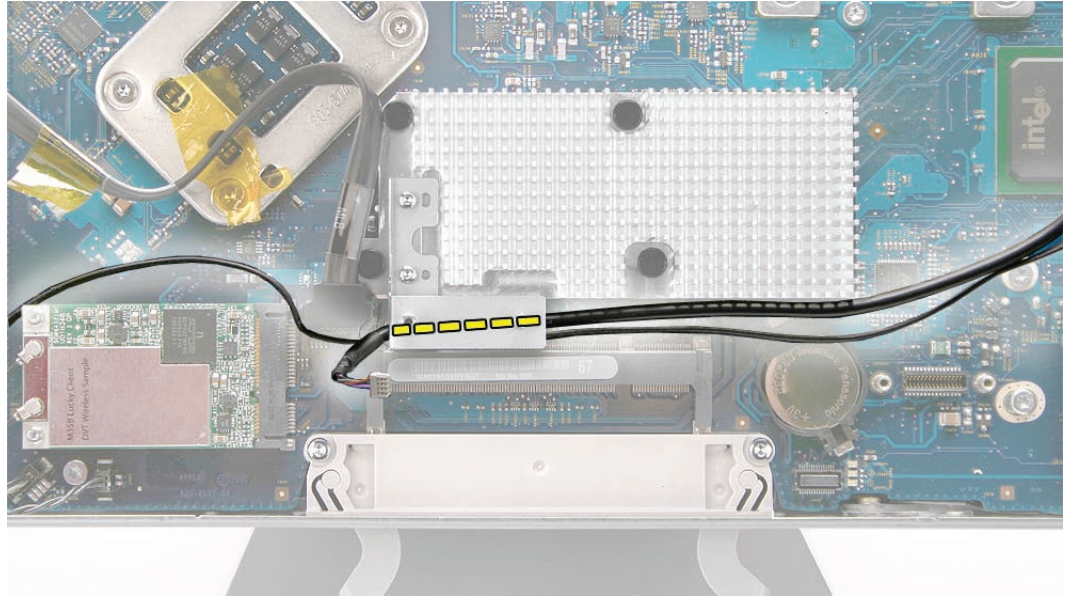


5. Lift the speakers up and out of the computer. See the next photo for disconnecting the speaker.



Replacing the Speakers

1. Connect the speaker cable to the logic board.
2. Install the speakers and route the speaker below the heatsink and above the memory slot.
3. Replace the IR mounting bracket making sure the speaker cable runs under the bracket.



4. Replace the IR board.
5. Secure the right speaker with the smaller of the two mounting screws.
6. Secure the left speaker with the longer of the two mounting screws.
7. Replace the display panel.
8. Replace the lower EMI shield.
9. Replace the front bezel.
10. Replace the access door.



AirPort Extreme Card

Tools

- Torx T6 screwdriver

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)

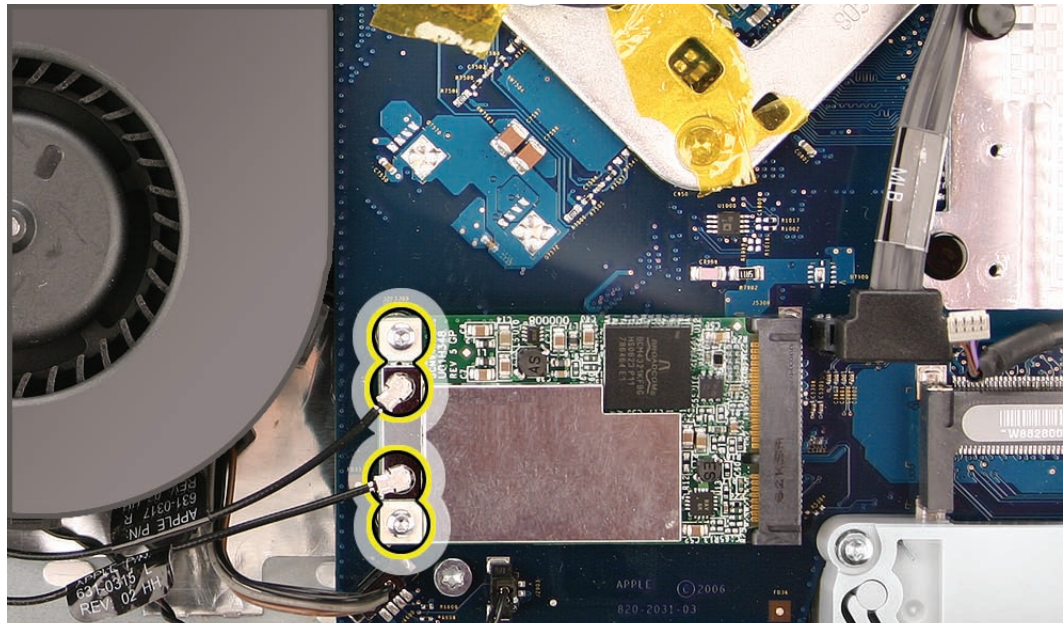
Part Location



Removing the AirPort Extreme Card

1. Disconnect the two AirPort antennas and remove the two T6 screws.

922-7010



2. The board pops up when the screws are removed. Pull the AirPort Extreme card out of the slot in the direction of the arrow.



Replacing the AirPort Extreme Card

1. Align the AirPort Extreme card with the slot on the logic board. Insert the board into the slot.
2. Replace the two T6 AirPort Extreme card screws.
3. Connect the antenna cables to the AirPort Extreme card.
4. Replace the lower EMI shield.
5. Replace the front bezel.
6. Replace the access door.



Bluetooth Card

Tools

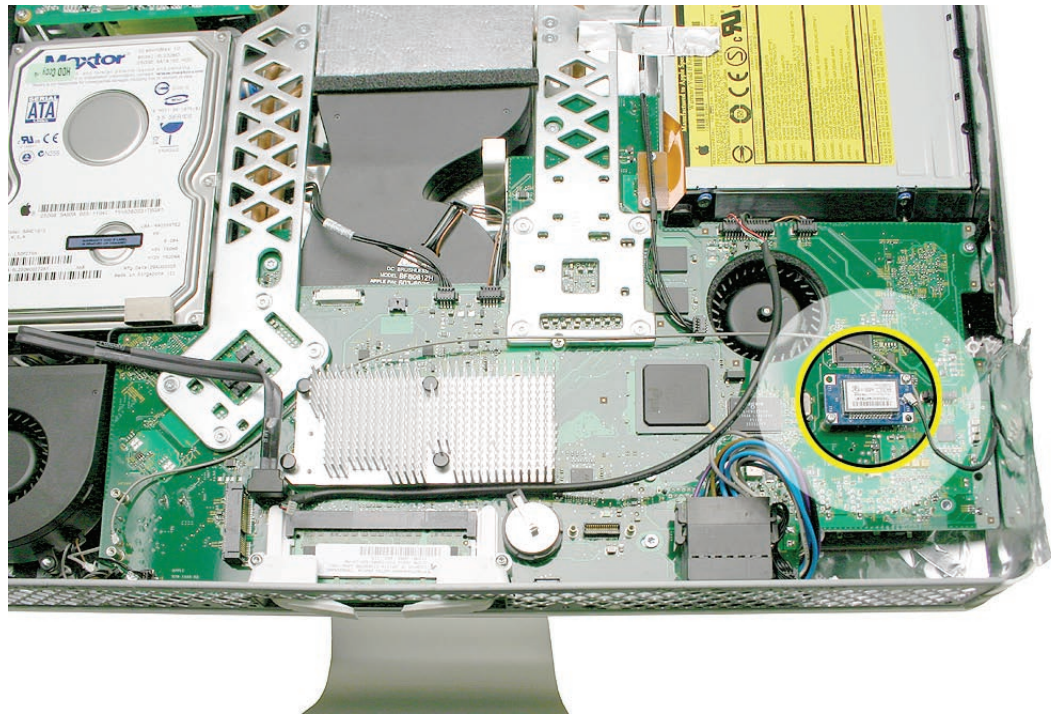
- Torx T6 screwdriver

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Speakers](#)

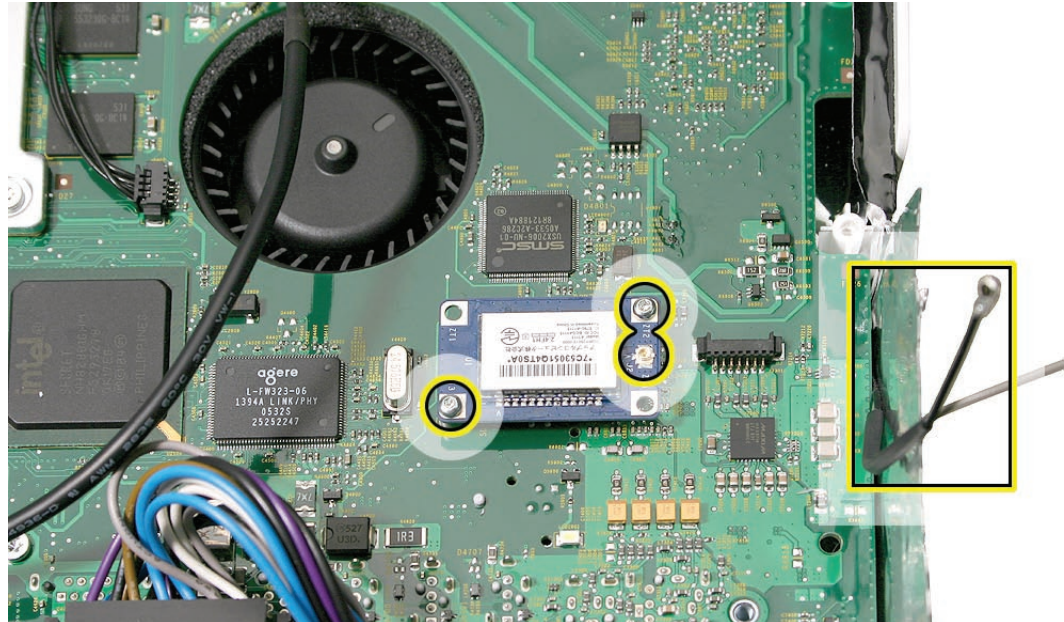
Part Location



Removing the Bluetooth Board

1. Using a T6 torx screwdriver, remove the two screws on the Bluetooth board and disconnect the antenna from the card.

922-7010



2. Lift the card off the logic board.

Replacing the Bluetooth Board

1. Press the Bluetooth board onto the logic board connector.
2. Connect the Bluetooth antenna to the Bluetooth board. **Note:** Make sure the card and antenna are securely connected before installing the speakers.
3. Replace the two T6 Bluetooth board screws.
4. Replace the speakers and speaker screws.
5. Replace the lower EMI shield.
6. Replace the front bezel.
7. Replace the access door.



Optical Drive

Tools

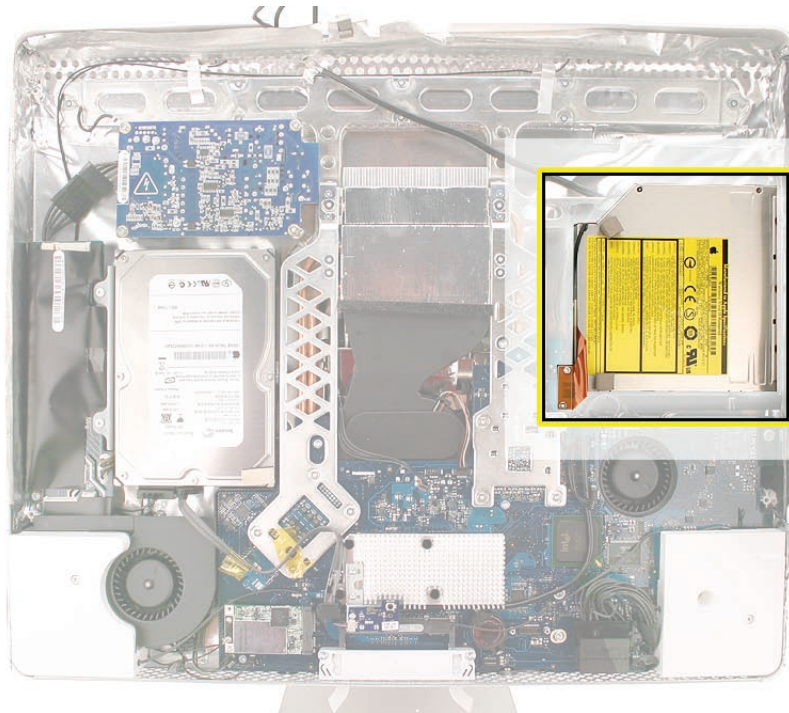
- Torx T10 screwdriver
- Torx T6 screwdriver
- Flat-blade screwdriver

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)

Part Location



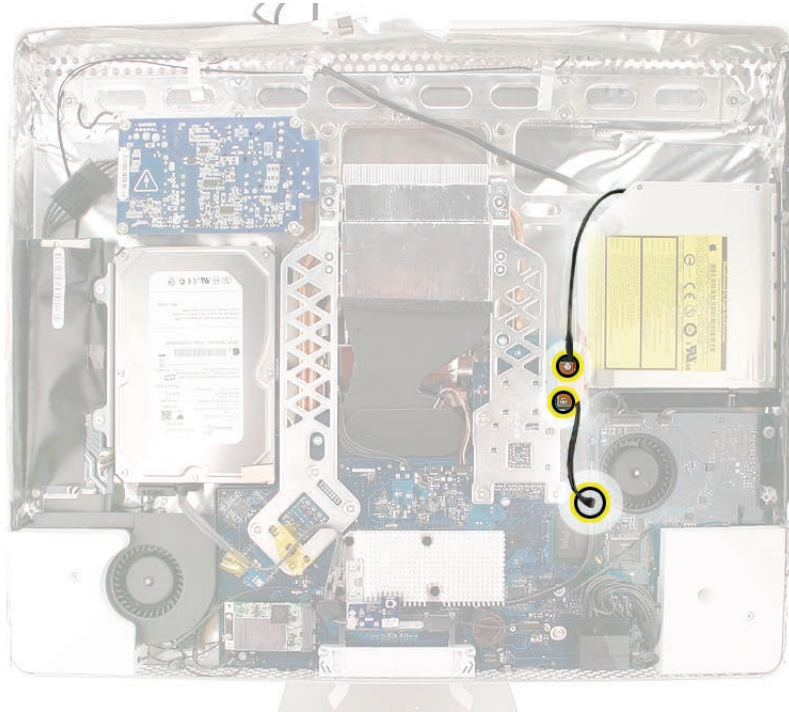
Removing the Optical Drive

1. Remove the two T6 wafer head screws from the optical drive flex cable. Disconnect the flexible cable and the optical drive sensor cable from the logic board.

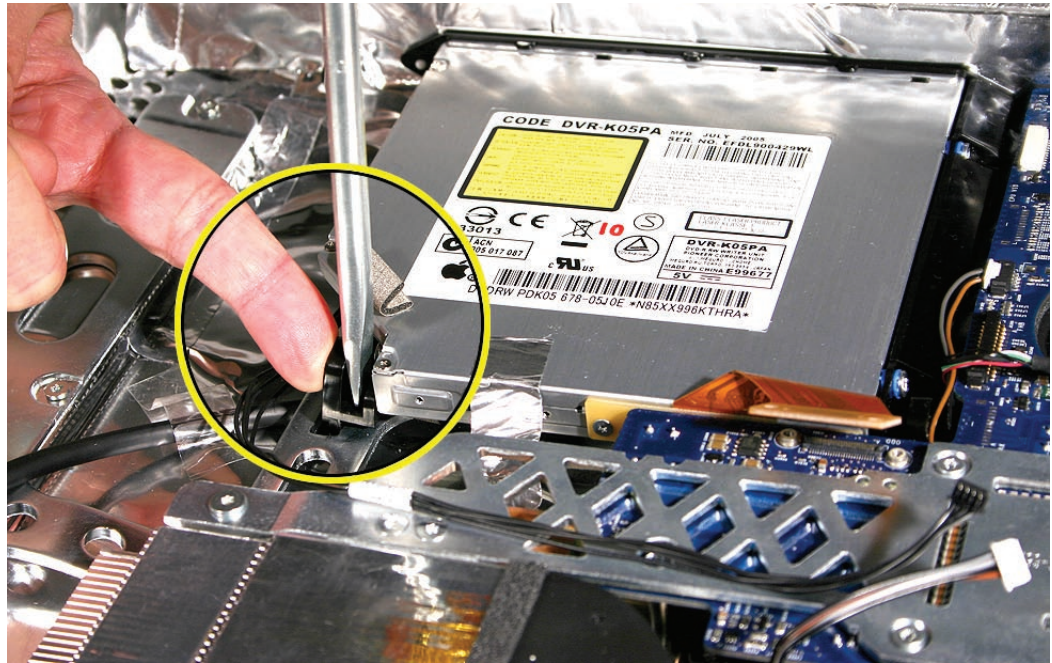
Caution: Never press down on or grasp the body of the optical drive. Pressing or squeezing the body of the optical drive could damage the mechanism.



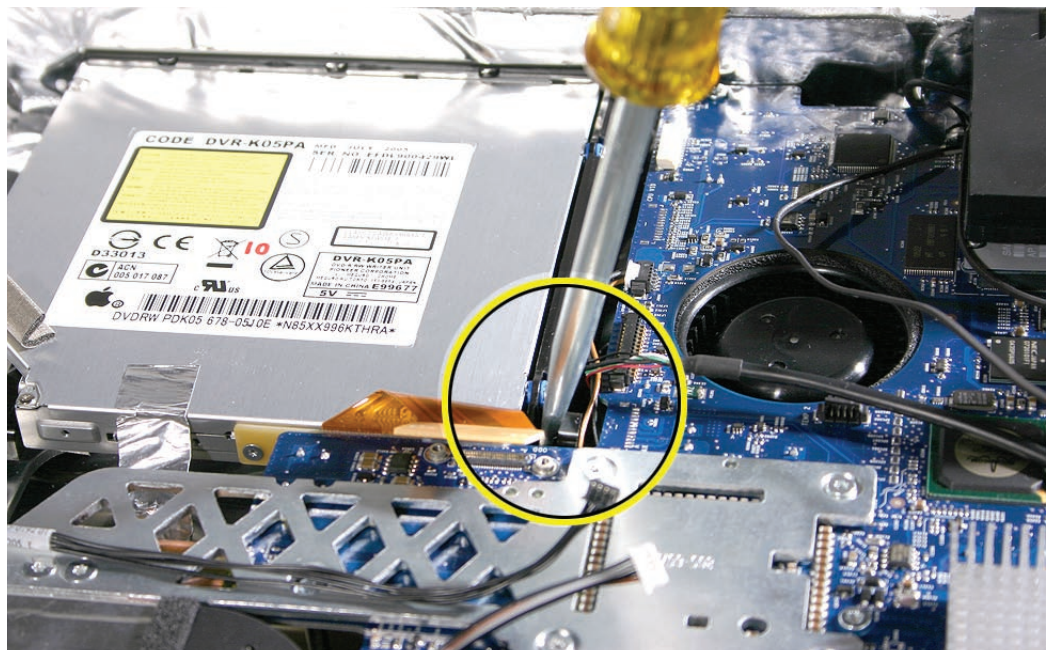
922-7817



2. Locate the black release levers on the mounting bracket. Using a flat-blade screwdriver as shown, press straight down at the base of the release lever, while pushing the release lever toward the center of the drive. Pressing down disengages the lever from the chassis. Repeat the process to unhook the other release lever. Refer to step 4 for another visual aide.

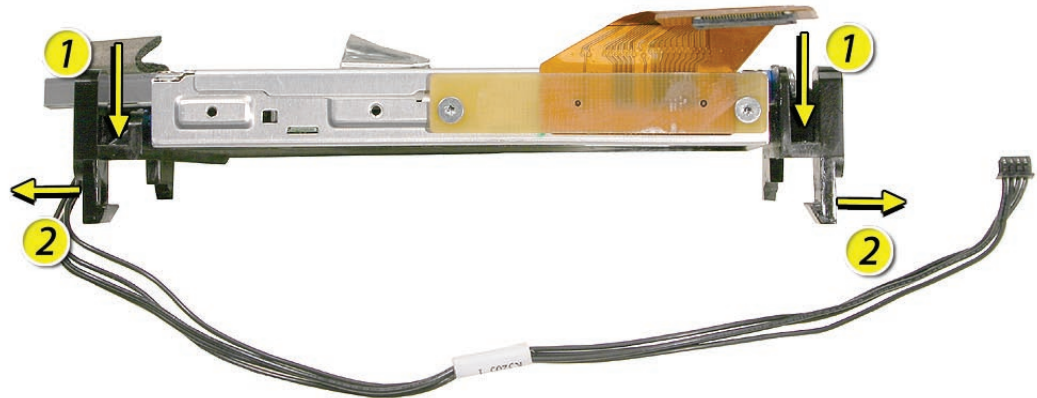


3. Repeat the release process on the second lever. Press down with the screwdriver, press the lever inward, toward the center of the optical drive. Lift the drive out of the rear housing.



- This photo shows the optical drive out of the computer so you can visualize how the clips move. Pressing down (#1) releases the clips (#2) outward from the metal chassis.

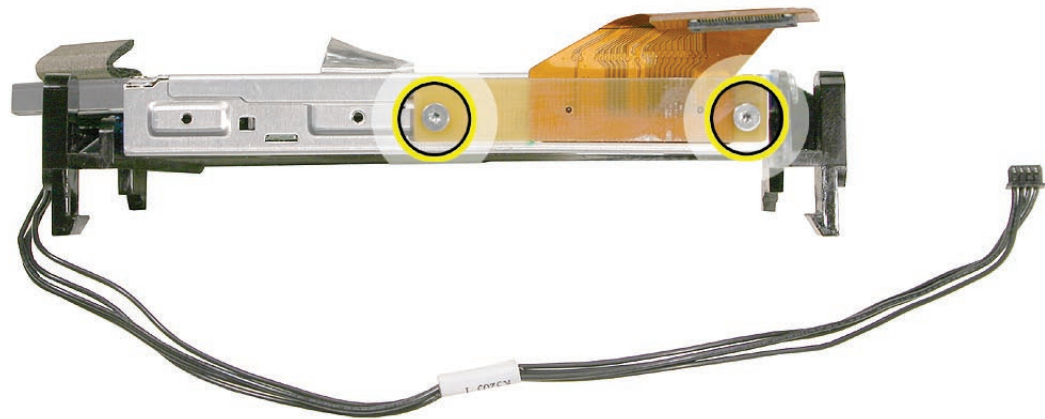
Caution: Never press down on or grasp the body of the optical drive when removing or installing it. Pressing or squeezing the body of the optical drive could damage the mechanism.



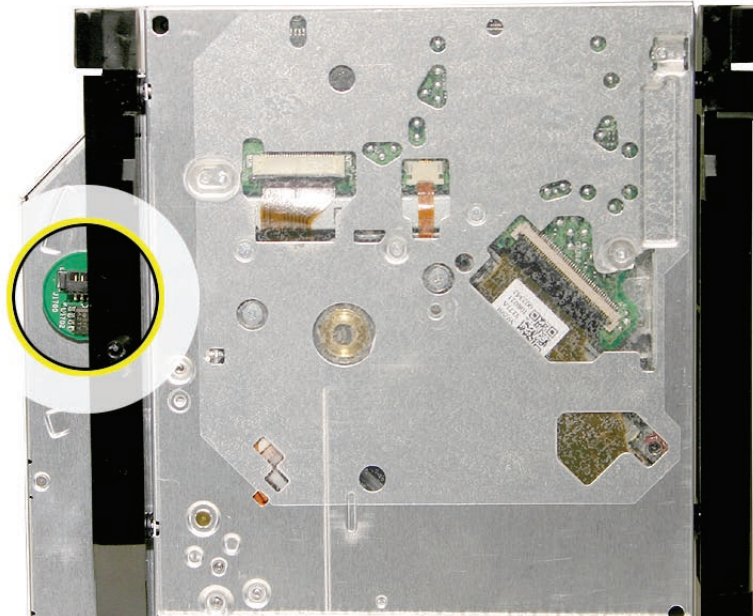
- If replacing the optical drive, use a T6 torx screwdriver to remove two flex cable screws attaching to the optical drive. **Note:** Disconnect the flex cable and transfer it to the replacement drive. Go on to the next step.



922-7817

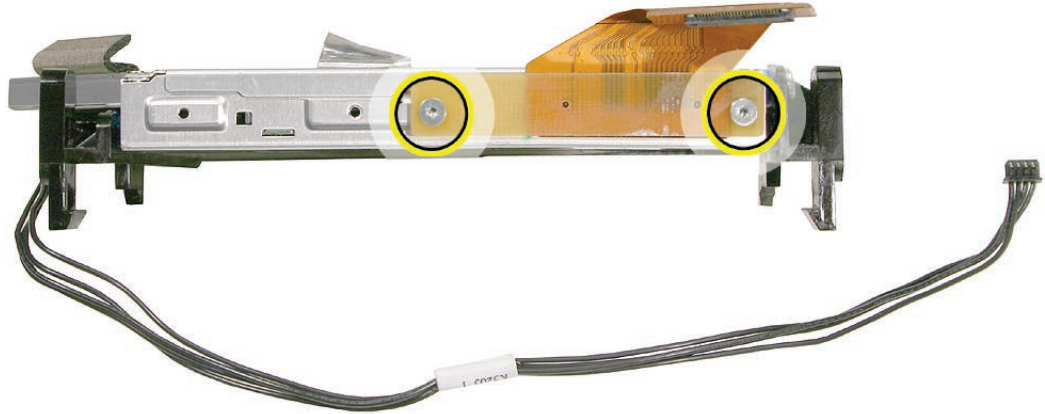


-
6. If replacing the optical drive, disconnect the sensor cable from the optical sensor located on the underside of the optical drive. Transfer the sensor cable to the replacement drive.



Replacing the Optical Drive

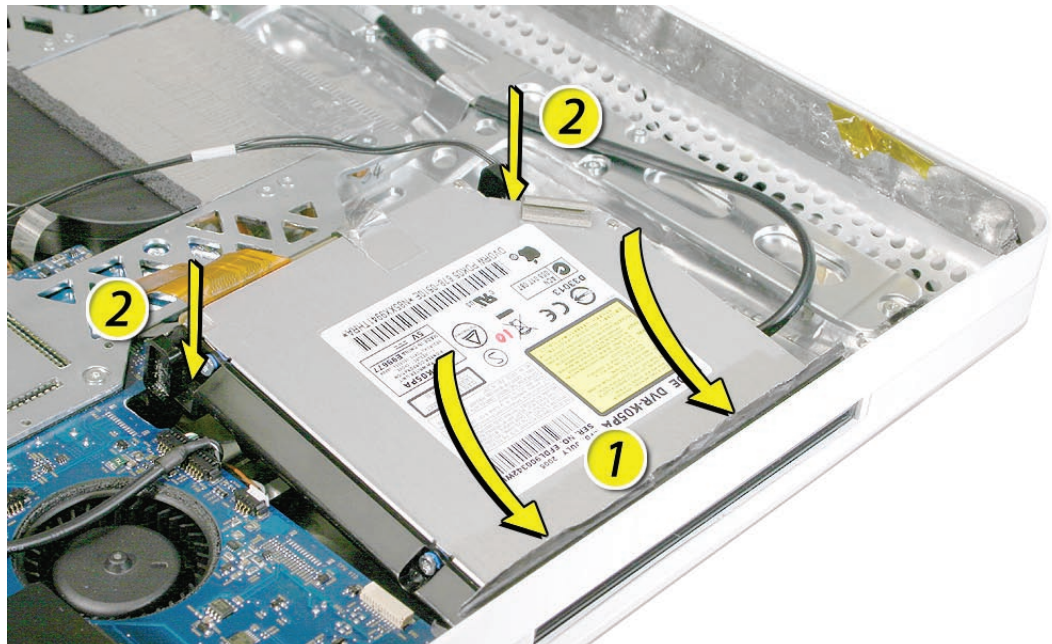
1. Install the flex cable to the optical drive with two T6 screws.



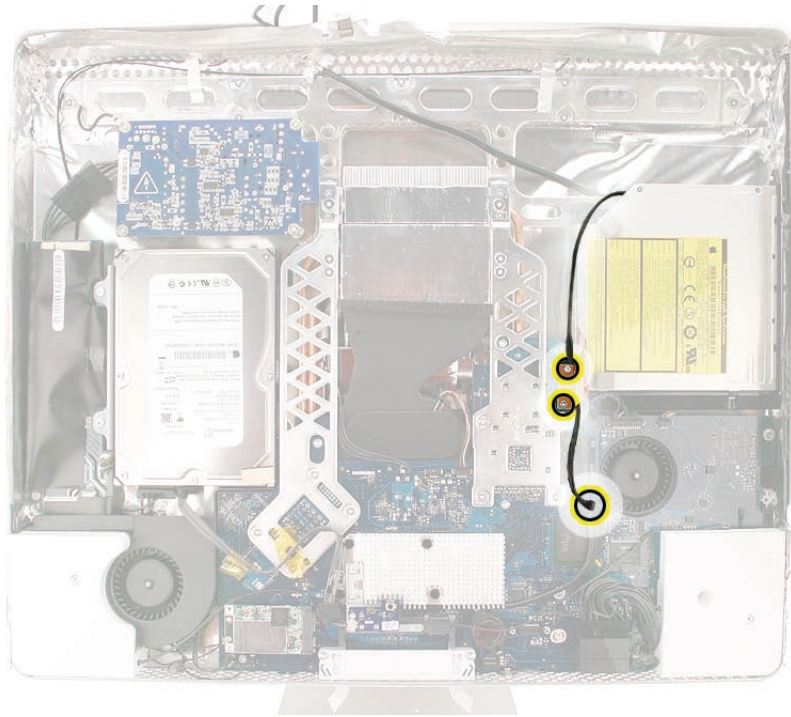
2. Insert the optical drive bezel into the rear housing, lining up the bezel with the slot opening (#1). Be sure to align the two guide holes in the front bezel with guide posts at each end of the drive access hole.

Push down on the mounting brackets (#2) to lock the optical drive securely into place on the chassis.

Caution: Never press down on or grasp the body of the optical drive when installing it. Pressing or squeezing the body of the optical drive could damage the mechanism.



-
3. Connect the optical sensor cable to the logic board. Route the sensor cable under the optical flex cable. Connect the flex cable to the logic board and replace the T6 screws.



4. Replace the display panel.
5. Replace the lower EMI shield.
6. Replace the front bezel.
7. Replace the access door.



Hard Drive

Tools

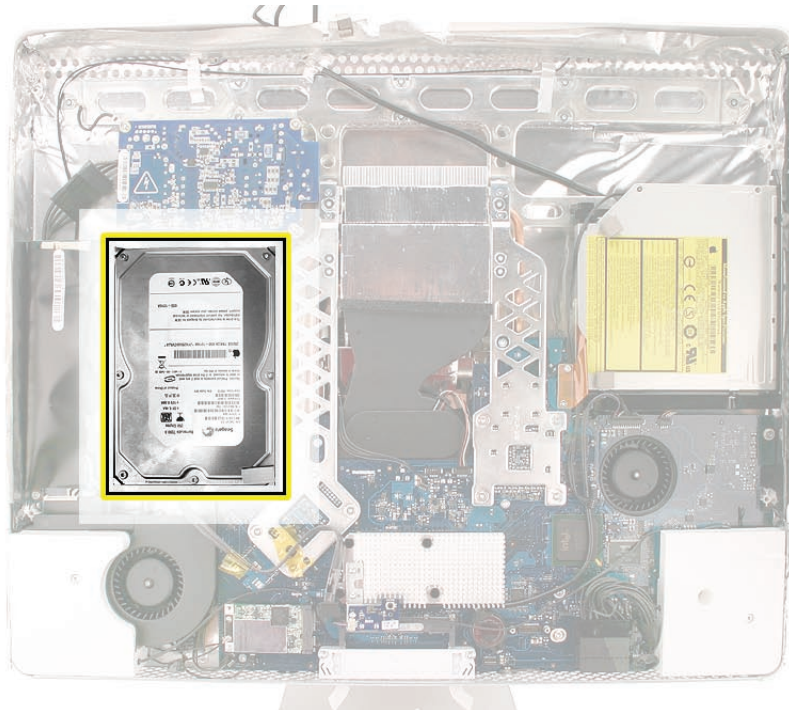
- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)

Part Location



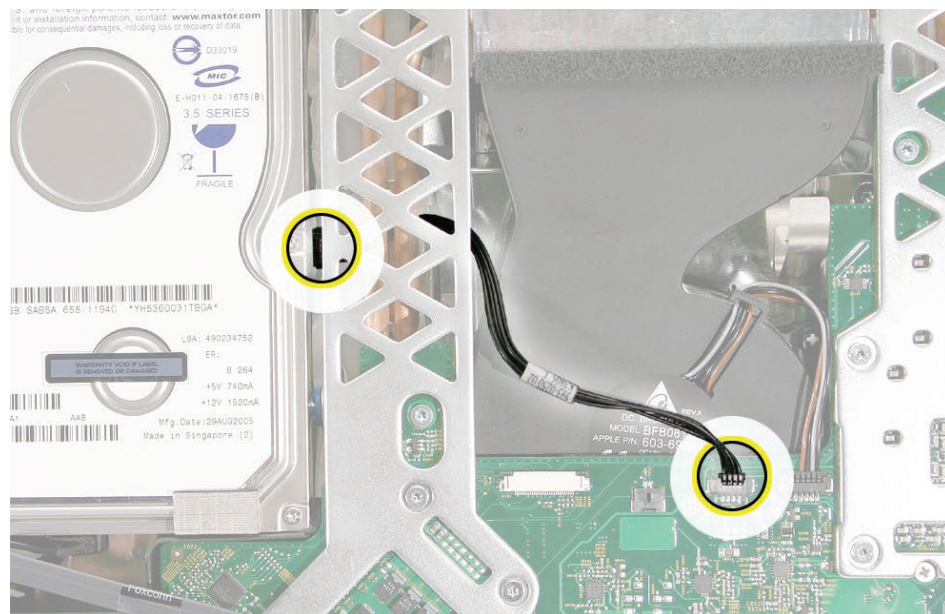
Removing the Hard Drive

1. Remove the two T10 screws attaching the hard drive to the DC/DC inverter board

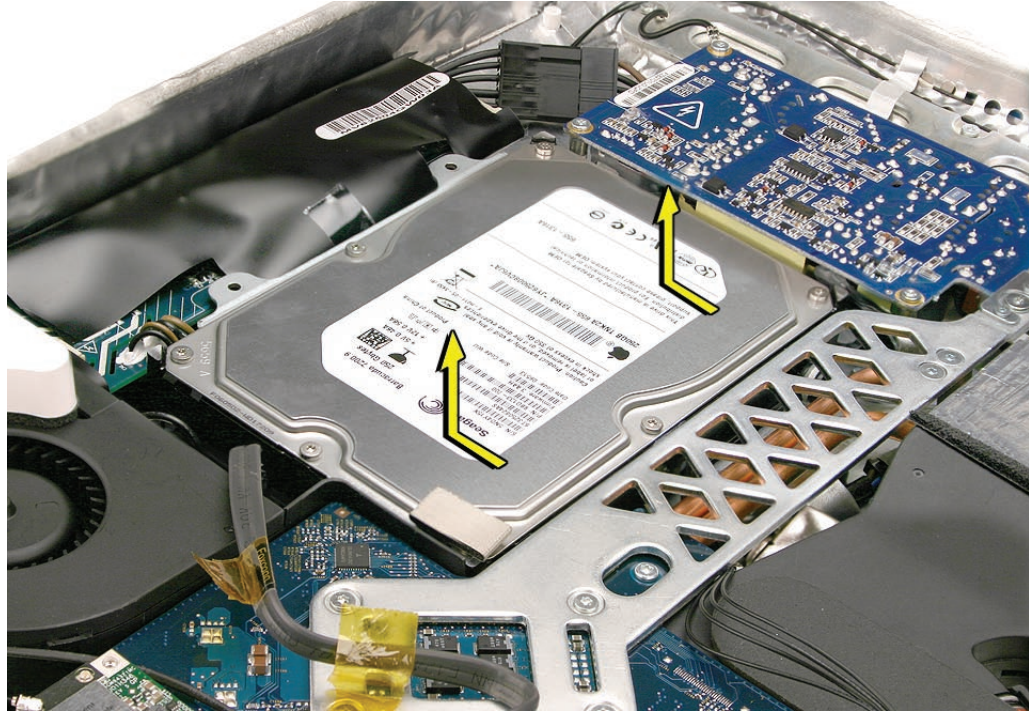
922-6800



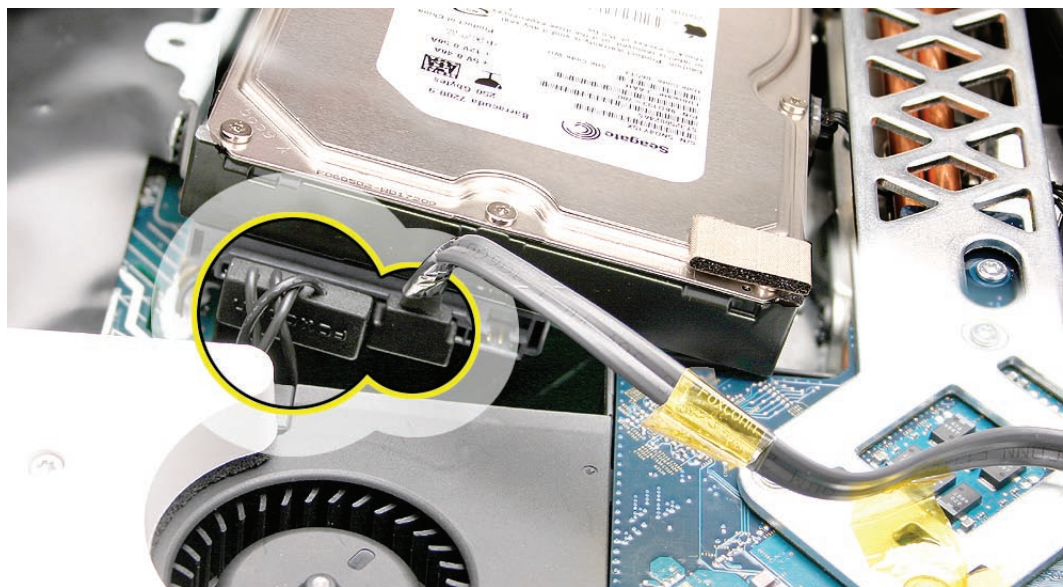
2. Disconnect the hard drive sensor cable from the connector on the logic board. Note the location of the sensor on the side of the hard drive and the routing of the sensor cable under the heat pipes.



3. Holding the drive by the metal bracket, pull the hard drive toward the inverter and then up to release the hard drive mounting pins from the grommets on the chassis.



4. Disconnect the hard drive power and data cables from the end of the hard drive.



- 

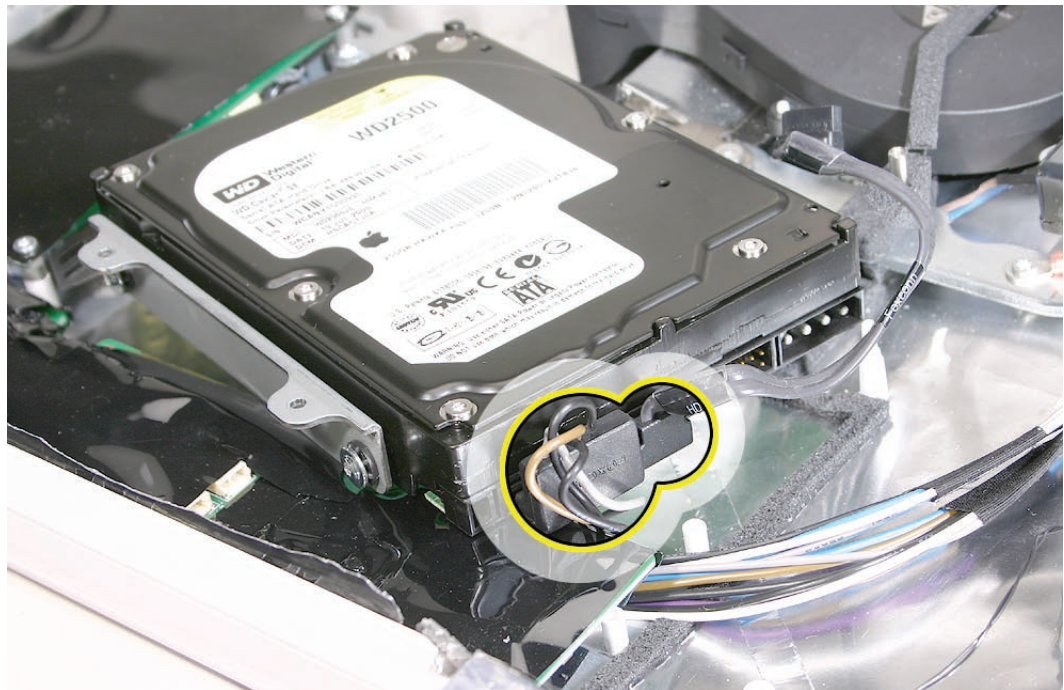
[illegible]

Replacing the Hard Drive

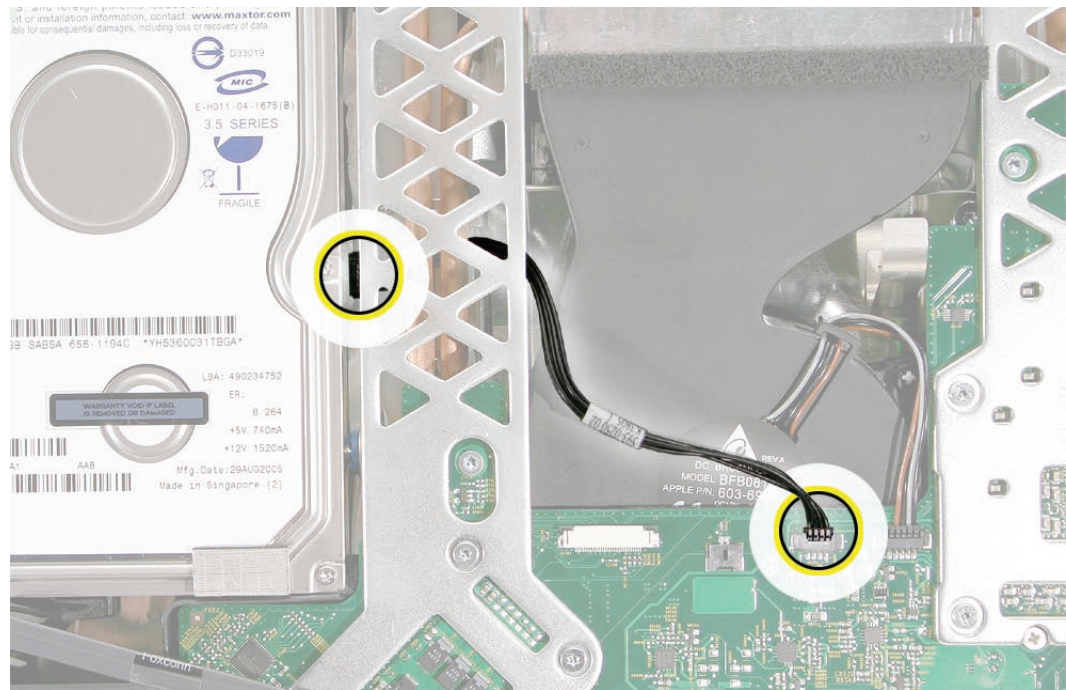
1. Attach the hard drive sensor and sensor cable to the side of the hard drive.



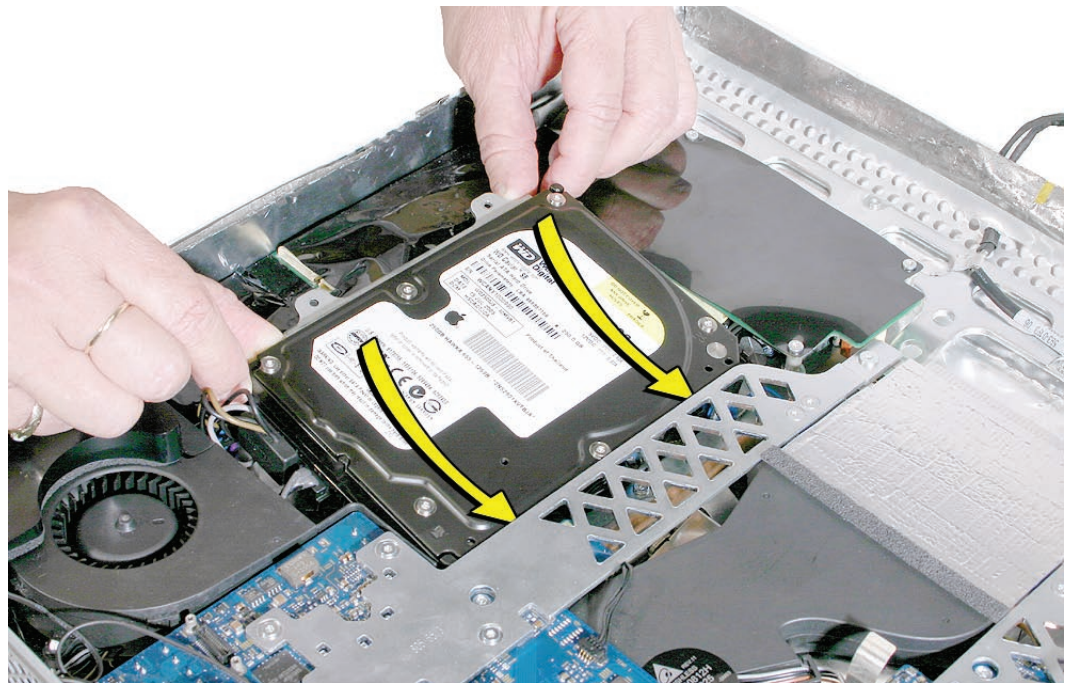
2. Attach the mounting bracket and pins if they were removed. Connect the hard drive data and power cables.



3. Route the hard drive sensor cable under the metal chassis. Connect the sensor cable to the logic board.



4. Insert the hard drive pins into the grommets. Lower the drive into the rear housing.



5. Secure the two T10 screws on the hard drive mounting bracket to the inverter board.



6. Replace the display panel.
7. Replace the lower EMI shield.
8. Replace the front bezel.
9. Replace the access door.



Power Supply

Tools

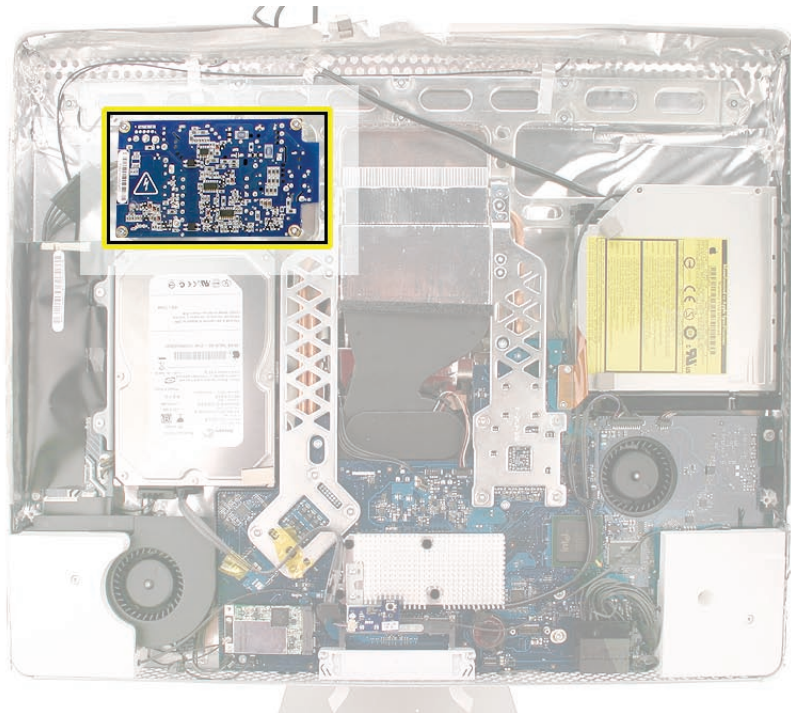
- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Hard drive](#)
- [Logic board](#)

Part Location



Removing the AC/DC Power Supply

WARNING: The AC/DC power supply PCB remains powered up whenever the system is plugged in, whether or not the system has been turned on. Use extreme caution when troubleshooting the system with the front bezel removed.



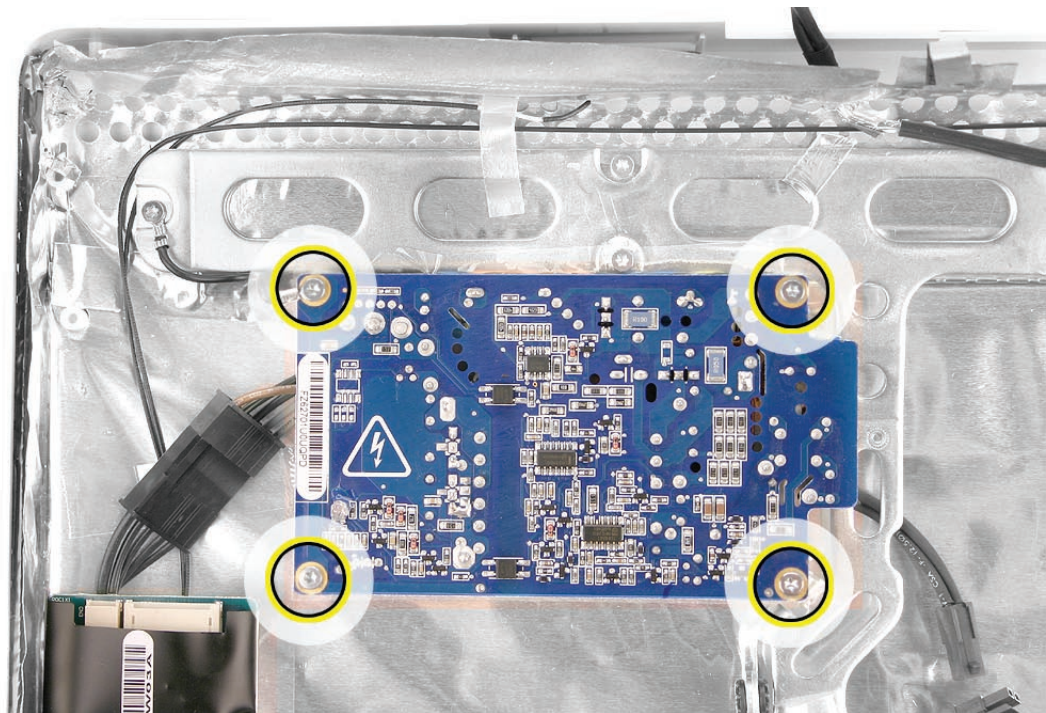
- Don't work alone. In the event of an electrical shock it is important to have another individual present who can provide assistance.
 - Keep one hand in your pocket when working on any iMac (20-inch Late 2006) system that is plugged in. This will help ensure that your body does not provide a path to ground in the event that you accidentally make contact with the line voltage.
 - Don't wear jewelry, watches, necklaces, or other metallic articles that could present a risk if they accidentally make contact with the power supply circuitry.
1. Using a torx screwdriver, remove three self-tapping screws and one machine screw (bottom right corner) on the power supply board. The top left screw also connects a ground cable to the chassis; leave it attached to the chassis. **Replacement Note:** Install the machine screw first when installing the power supply.



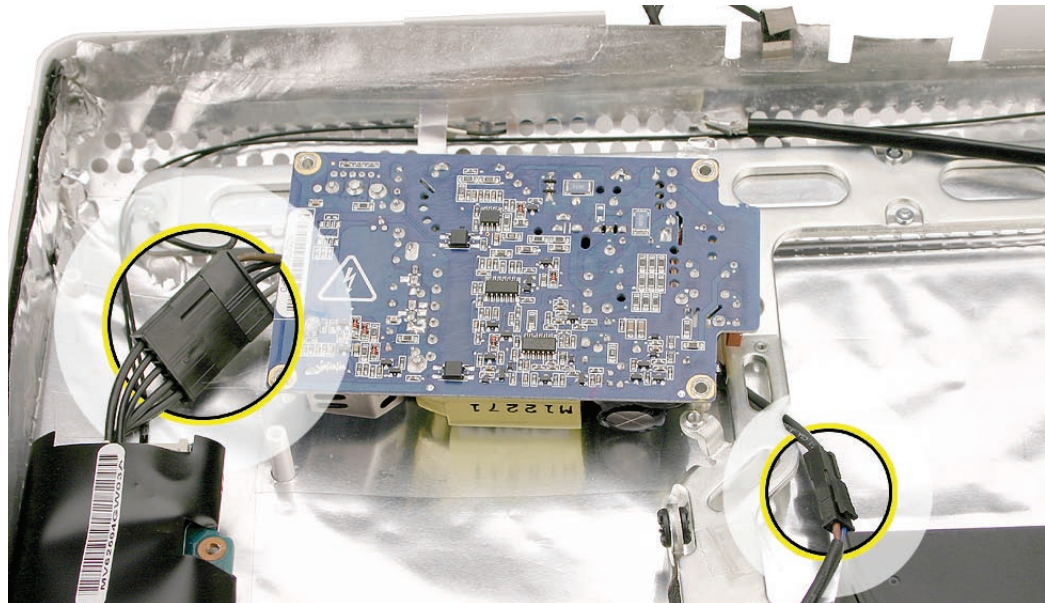
922-7159 (x3)



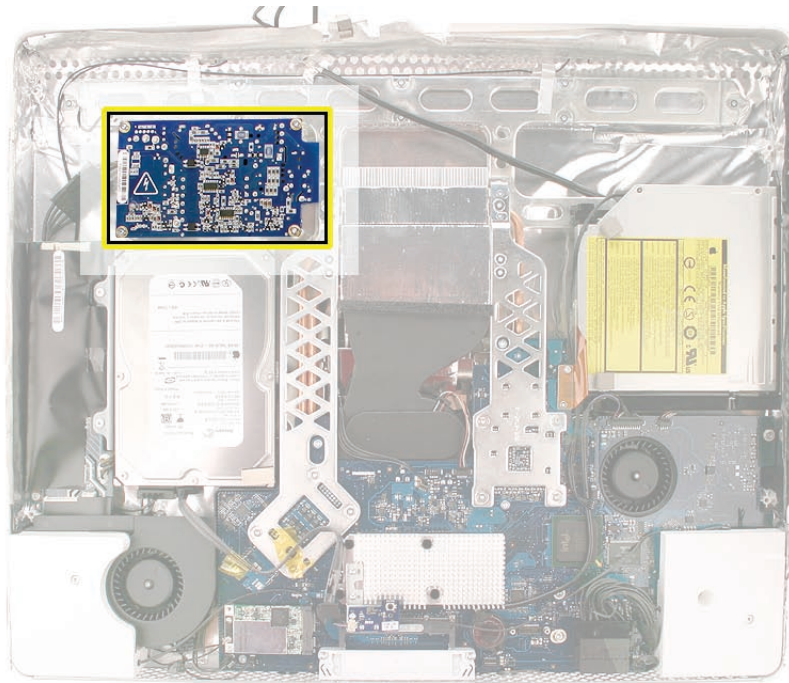
922-6842



-
2. Disconnect the two cables; the inverter cable on the left and the AC-DC power supply to AC power inlet cable on the right. The AC cable is tucked under the metal chassis. With your fingers or a black stick, pry the cable free from the chassis and disconnect it. Lift the power supply out of the chassis.



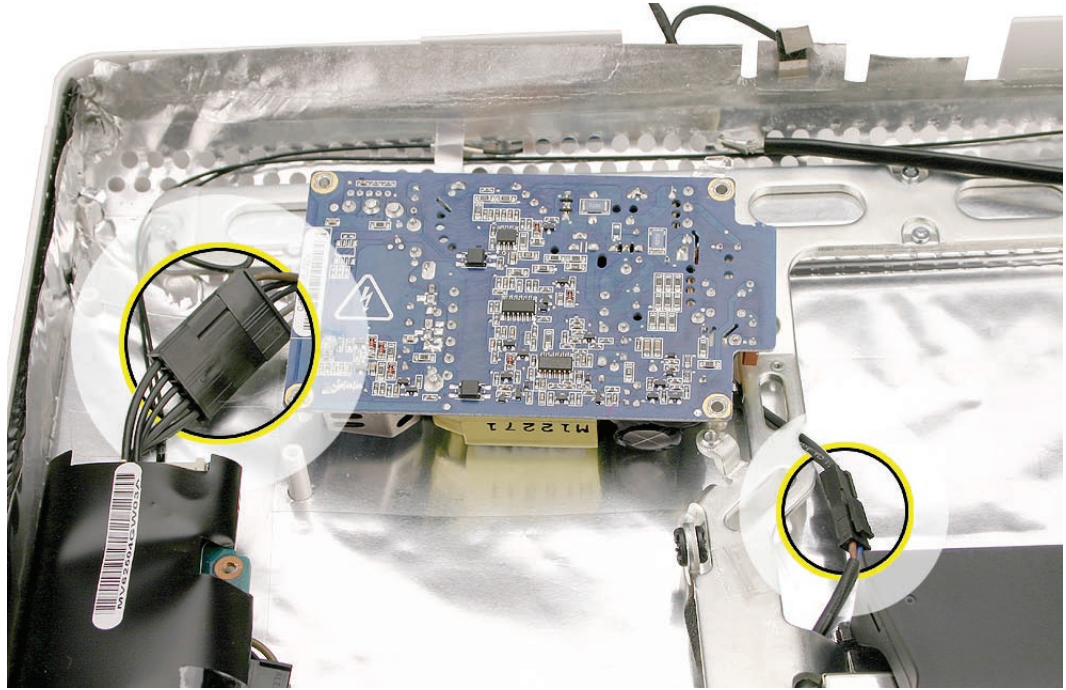
Replacing the AC/DC Power Supply



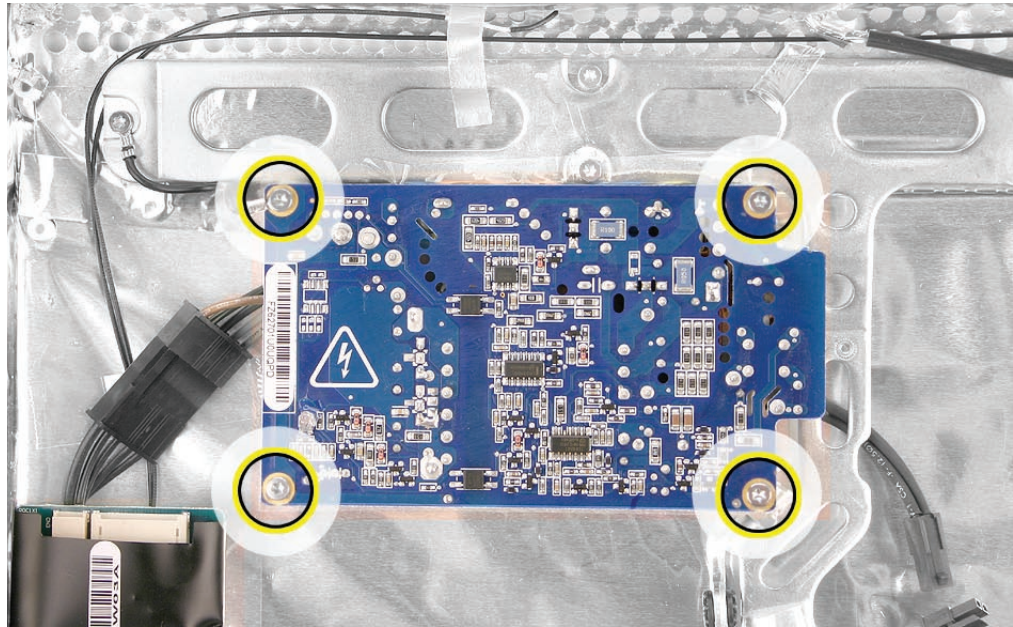
WARNING: The AC/DC power supply PCB remains powered up whenever the system is plugged in, whether or not the system has been turned on. Use extreme caution when troubleshooting the system with the front bezel removed.

- Don't work alone. In the event of an electrical shock it is important to have another individual present who can provide assistance.
- Keep one hand in your pocket when working on any iMac system that is plugged in. This will help ensure that your body does not provide a path to ground in the event that you accidentally make contact with the line voltage.
- Don't wear jewelry, watches, necklaces, or other metallic articles that could present a risk if they accidentally make contact with the power supply circuitry.

1. Connect the AC-DC power supply cable to the inverter on the left. Reconnect the power supply to AC power inlet cable. Tuck the AC power inlet cable under the metal chassis.



2. Replace the four power supply screws. Install the machine screw (bottom right corner) first when installing the power supply.



3. Replace the hard drive.

-
4. Replace the logic board.
 5. Replace the display panel.
 6. Replace the lower EMI shield.
 7. Replace the front bezel.
 8. Replace the access door.
 9. Replace the display panel.
 10. Replace the lower EMI shield.
 11. Replace the front bezel.
 12. Replace the access door.



Logic Board

Tools

- Torx T10 screwdriver
- Torx T6 screwdriver

Preliminary Steps

Before you begin, remove the following:

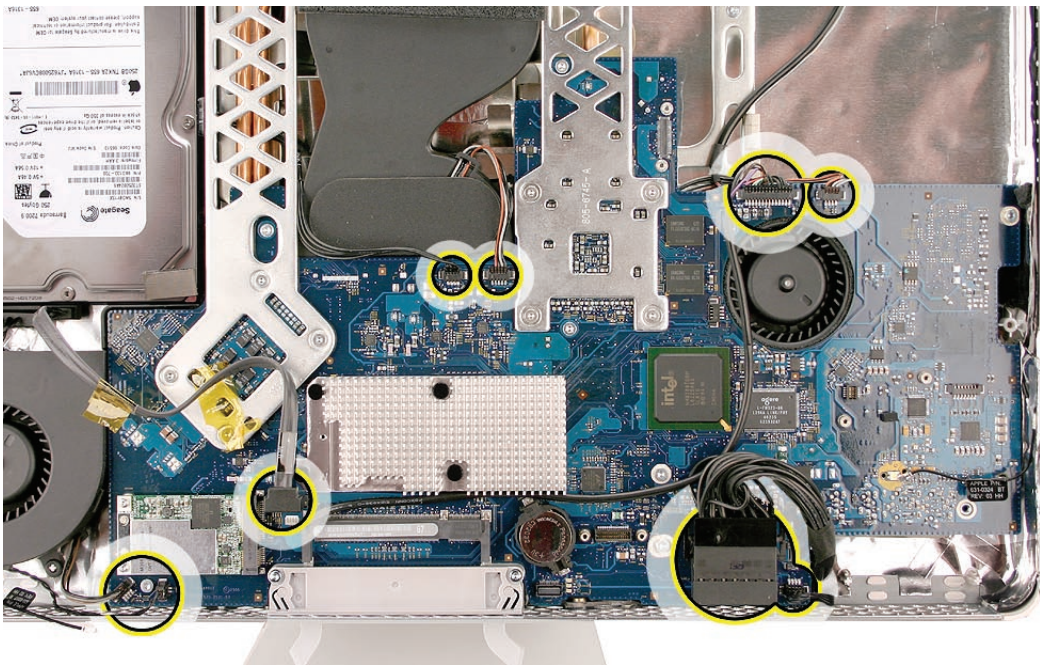
- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Optical Drive](#)
- [Disconnect the IR board](#)
- [Disconnect the AirPort antennas](#)
- [Disconnect the Bluetooth antenna](#)

Part Location

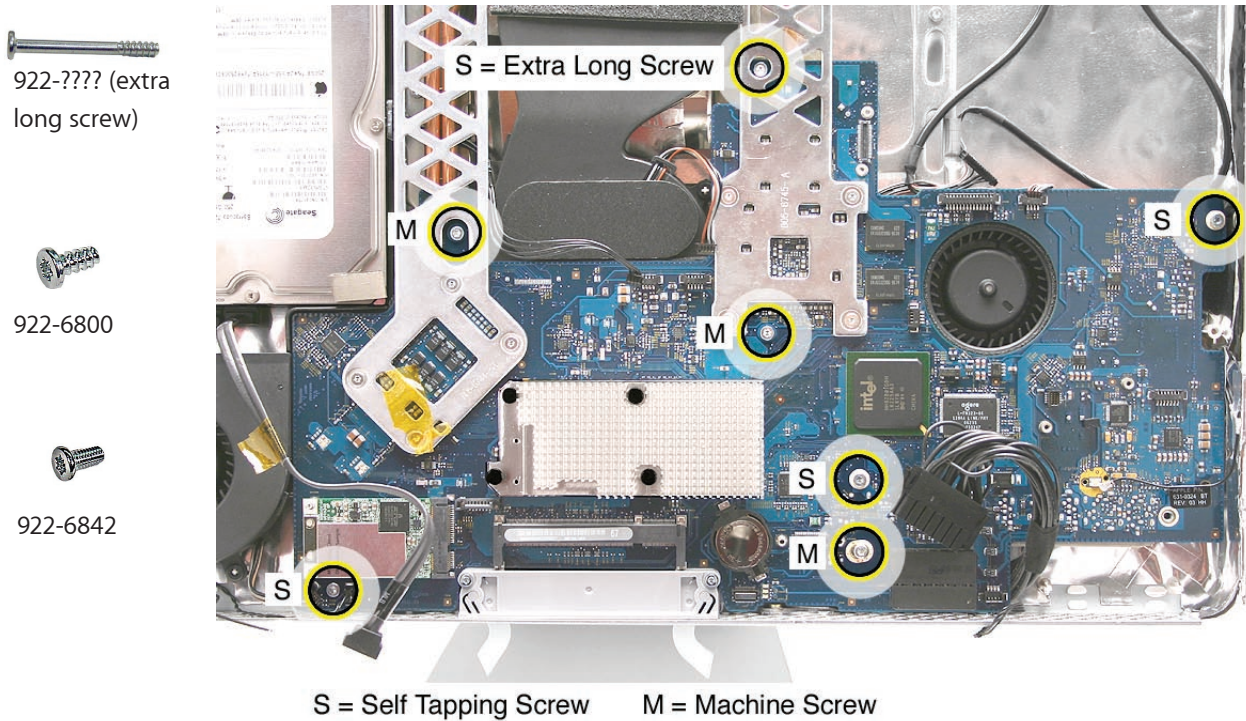


Removing the Logic Board

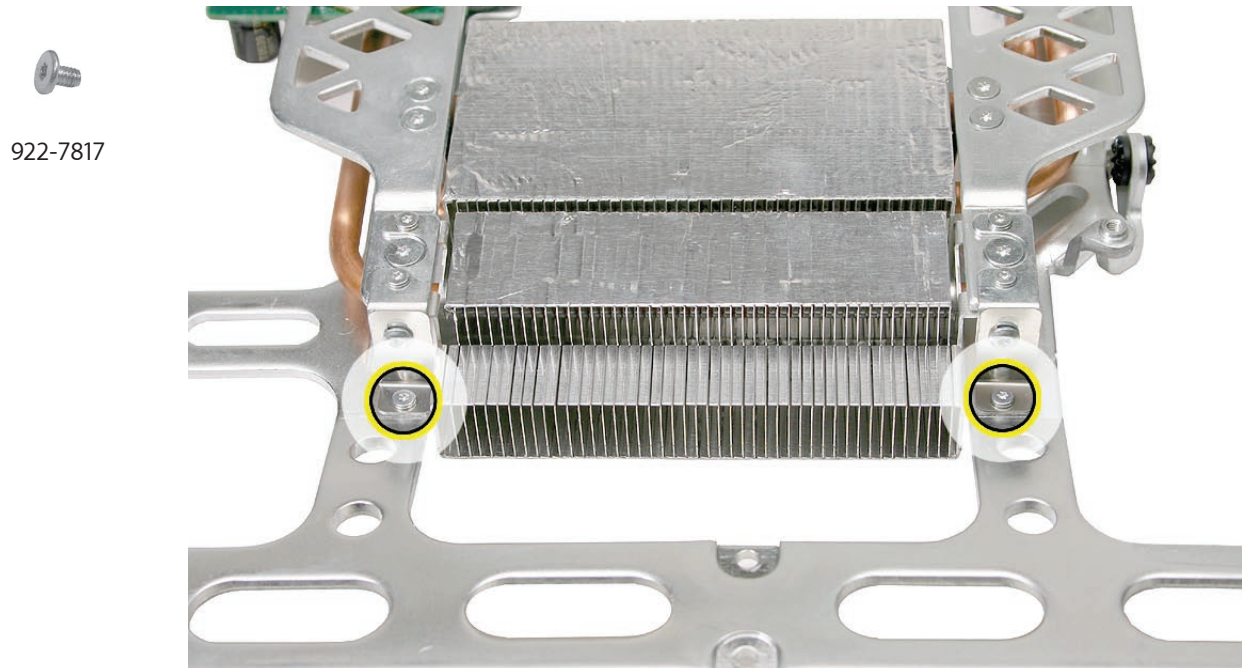
- 1. Disconnect the eight cables from the connectors on the logic board.



- 2. Remove seven T10 screws. Screws are labeled below as self-tapping or machine screws.-



3. At the top of the heatsink, remove the two T6 screws that attach the logic board support brackets (clips) to the chassis. **Note:** The L-shaped support brackets must be removed and transferred to the heatsink on the replacement logic board.

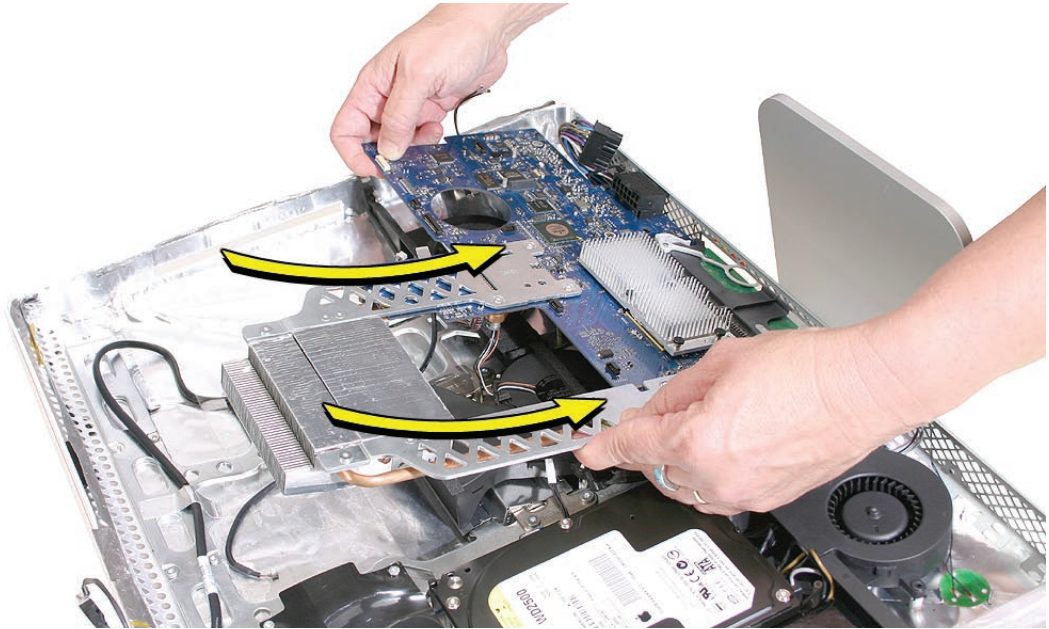


4. Holding the board on each side, lift it up and toward the top of the computer. **Note:** Remove the memory module from the slot before returning the board to Apple.

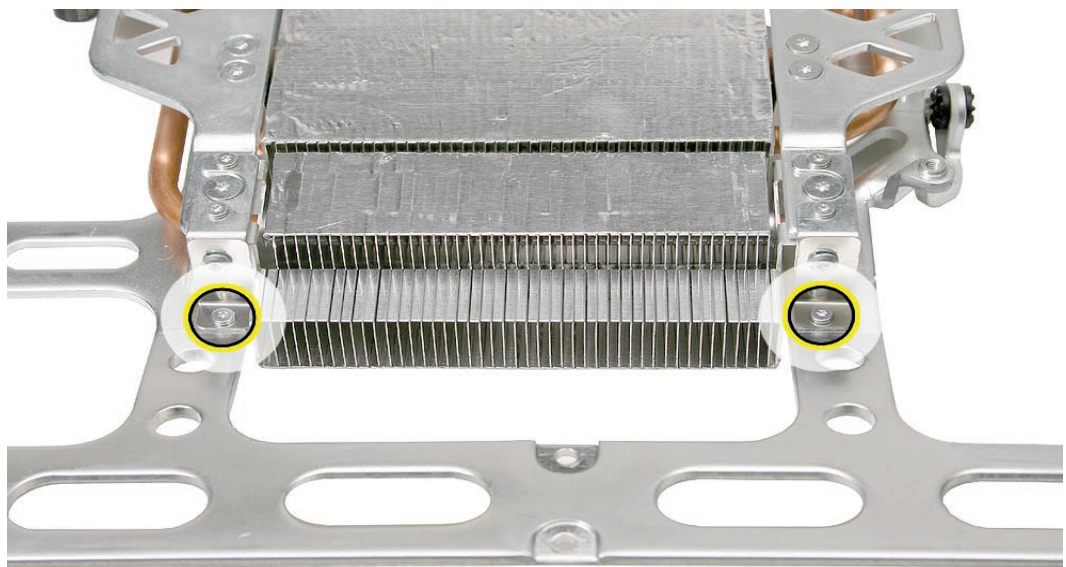


Replacing the Logic Board

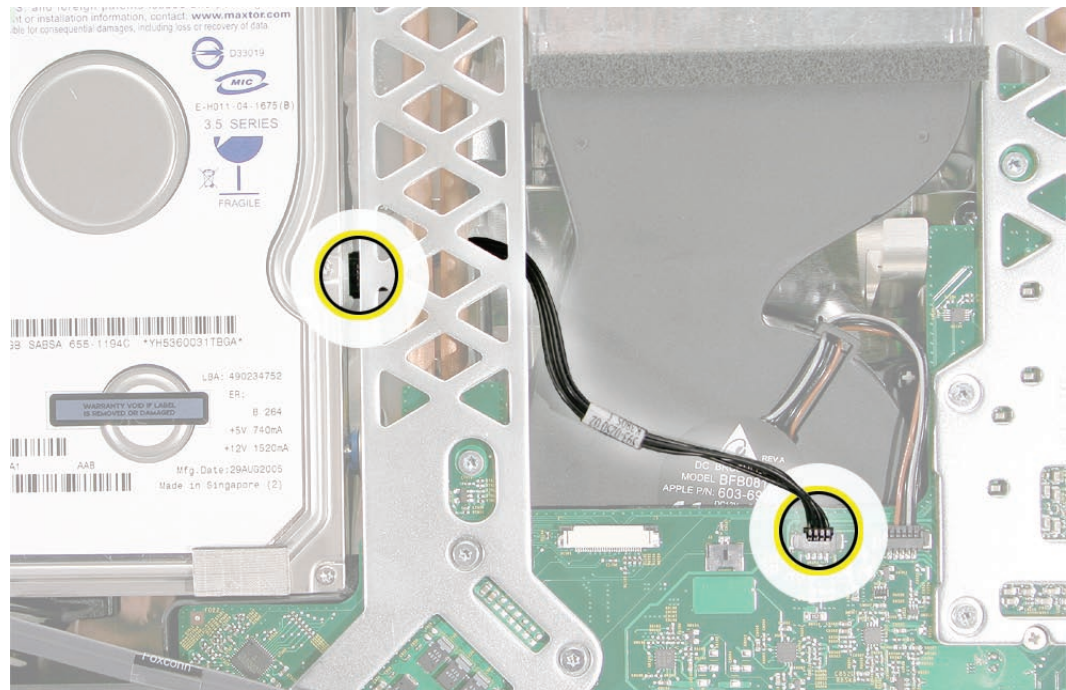
1. Position all the logic board cables out of the way so the logic board can be placed into the rear housing.
2. As you lower the board into the rear housing, make sure the memory levers are lowered through the access door opening and the logic board screw holes line up with the board.



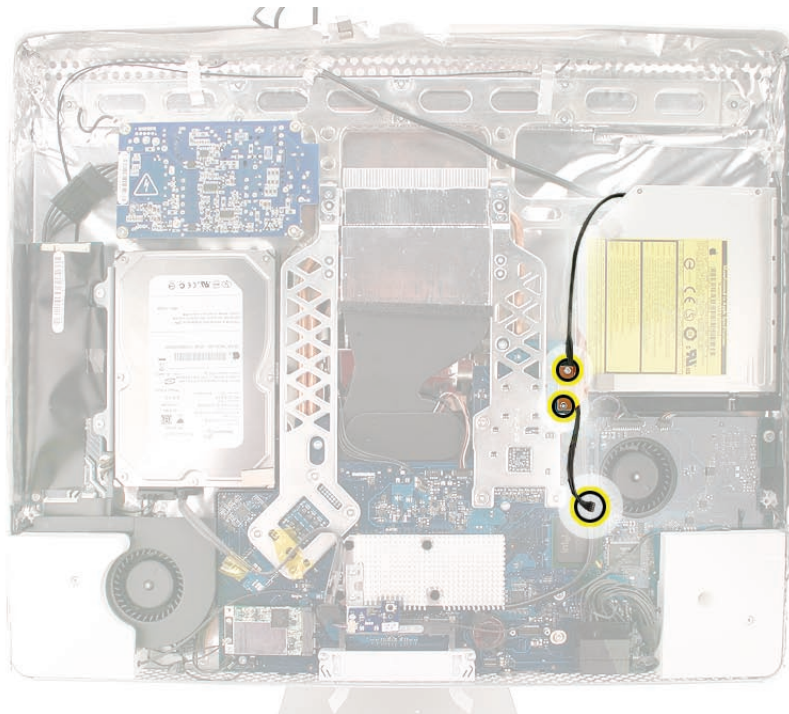
3. At the top of the heatsink, replace the two T6 screws attaching the logic board support bracket to the chassis. **Note:** The L-shaped support brackets must be transferred to the replacement logic board.



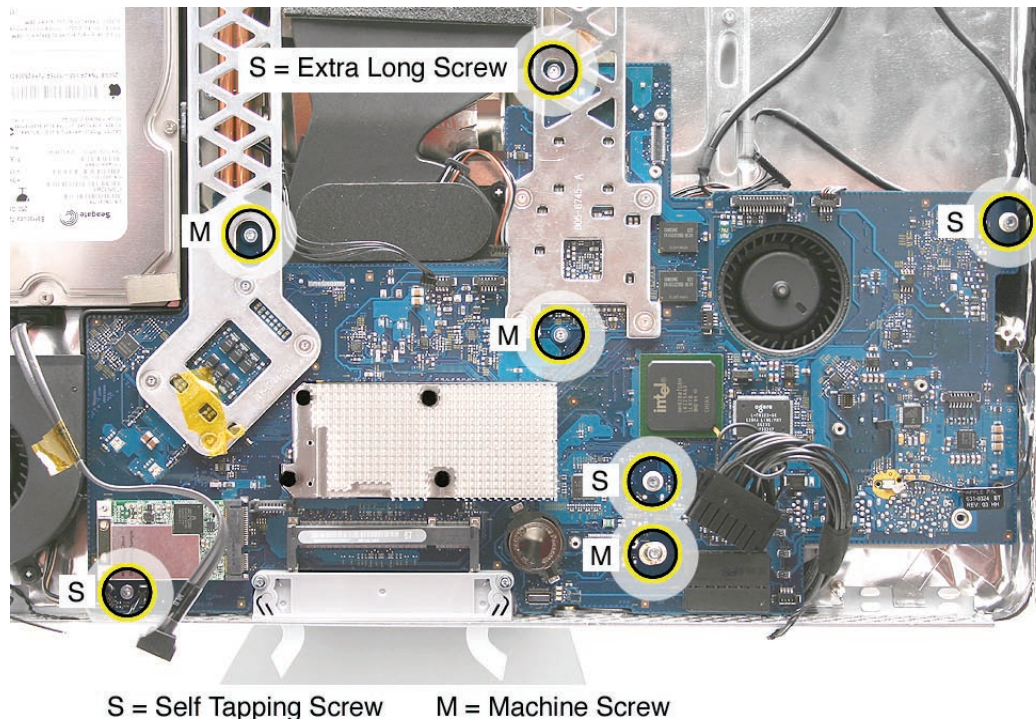
4. Make sure the hard drive sensor and the sensor cable are attached to the side of the hard drive. Route the sensor cable under the chassis and connect it to the logic board.



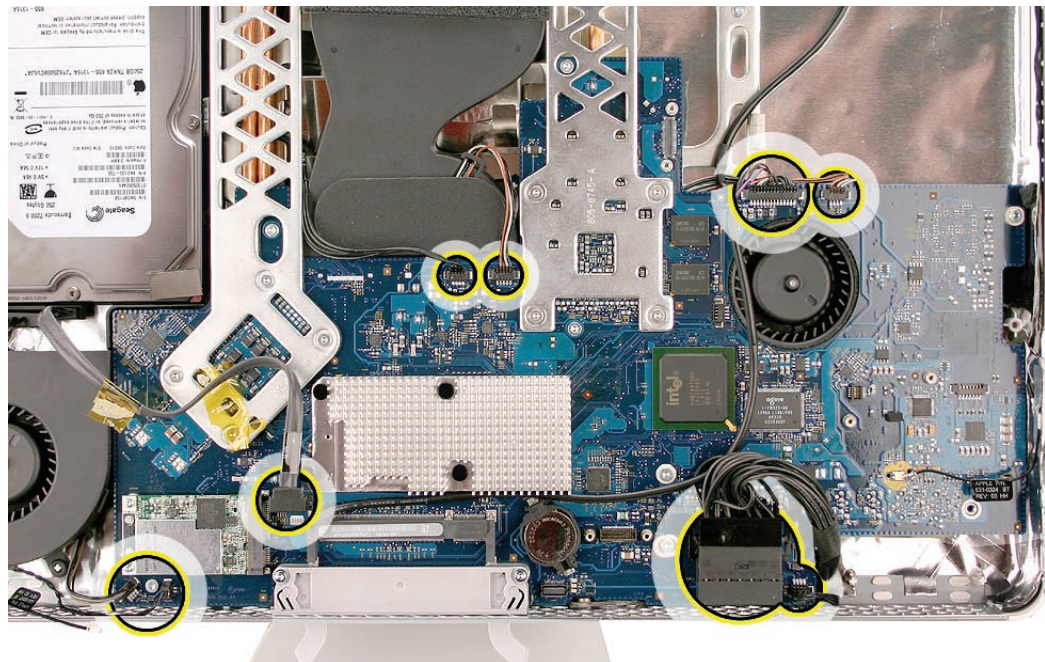
5. Connect the optical drive sensor cable, optical flex cable, optical clip, and replace the optical clip screws.



- Using a T10 torx screwdriver, replace the seven screws on the board. Always install the machine screws before installing the self-tapping screws.



- Connect the cables to the connectors on the logic board.



-
8. Connect the AirPort and Bluetooth antennas.
 9. Replace the speakers.
 10. Replace the IR board and connect the IR cable.
 11. Replace the display panel.
 12. Replace the lower EMI shield.
 13. Replace the front bezel.
 14. Replace the memory access door.



AC Power Inlet

Tools

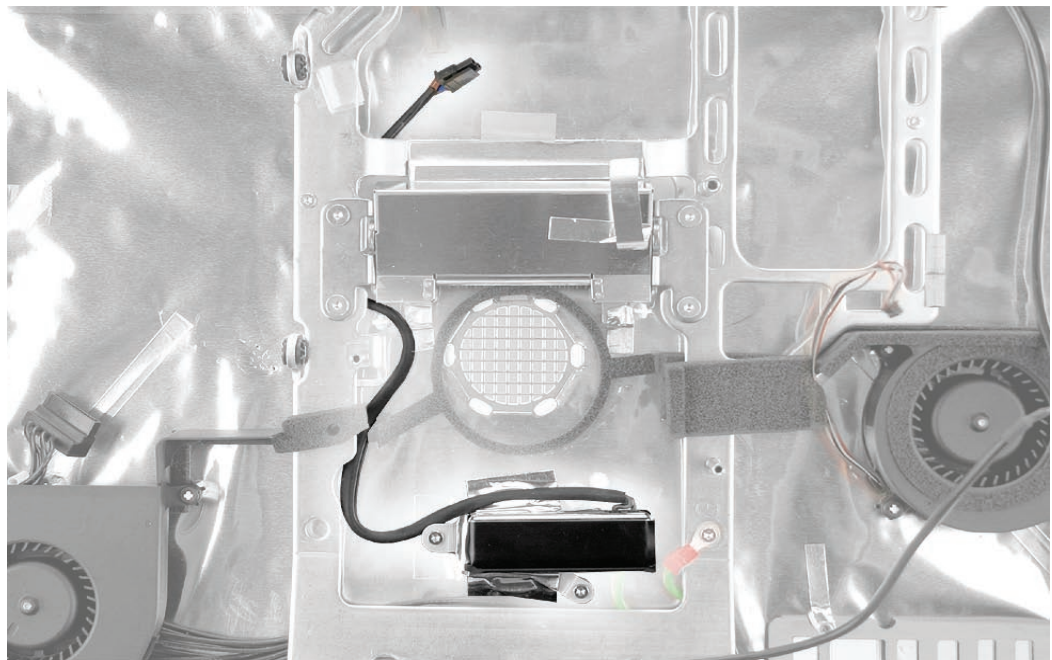
- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Speakers](#)
- [Hard drive](#)
- [Logic board](#)
- [CPU Fan](#)

Part Location



Removing the AC Line Filter

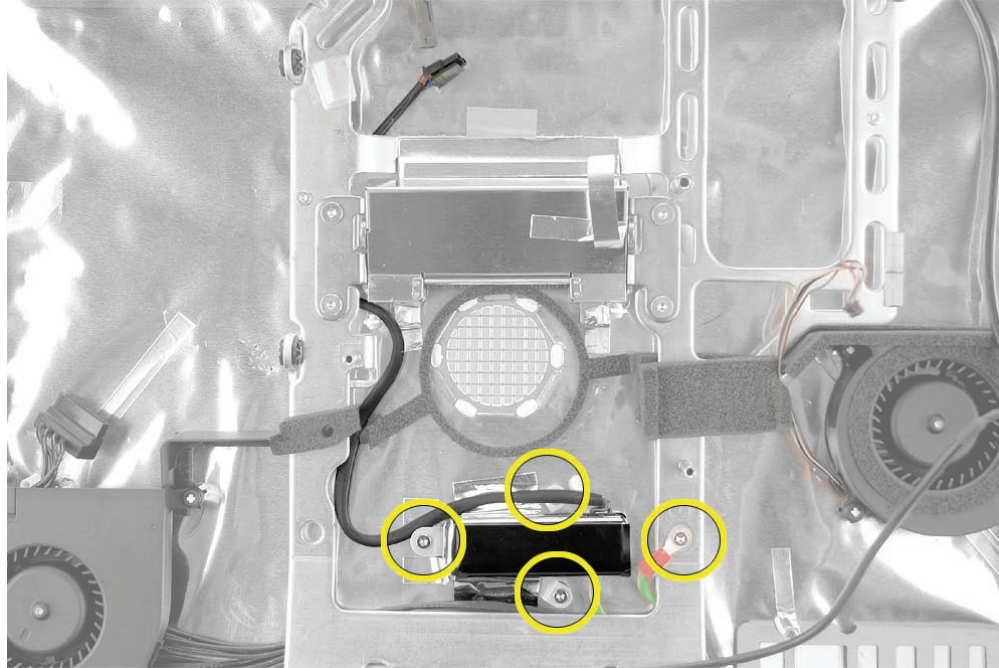
1. Using a torx T10 screwdriver, remove the three self-tapping screws from the power inlet and the machine screw from the ground cable . Remove the EMI tape on the filter.



922-6800



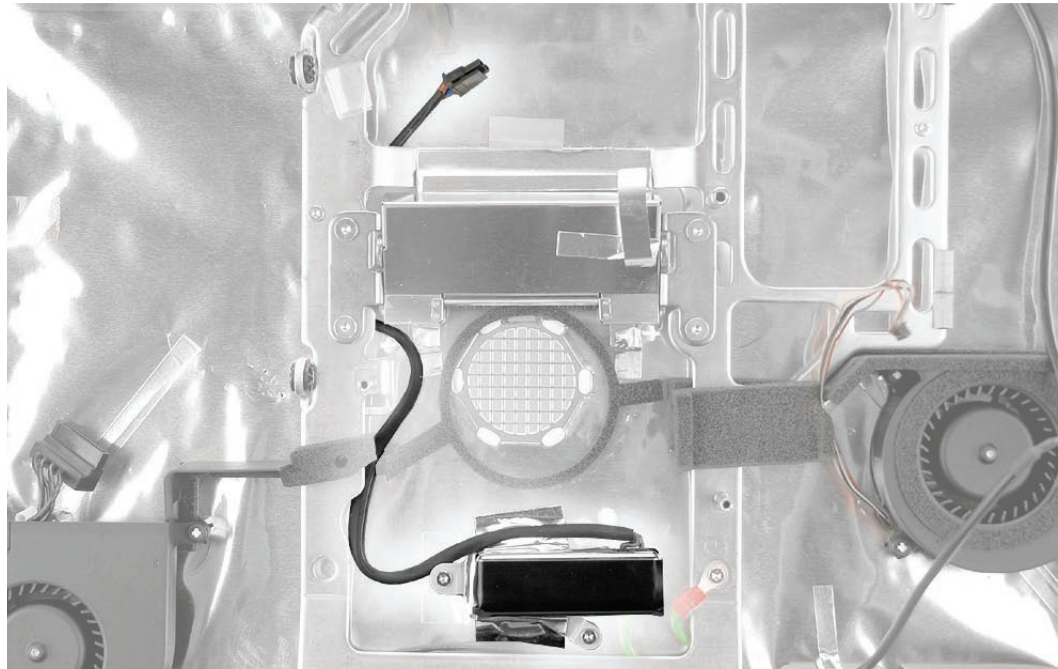
922-7069 (x1)



2. Disconnect the AC filter cable from the power supply. Notice the routing of the AC filter cable under the chassis.
3. Lift the AC filter out of the rear housing.

Replacing the AC Line Filter

1. Install the AC power filter on the rear housing screw mounts with three self tapping screws.
2. Install the power inlet ground cable to the chassis with a machine screw.
3. Route the power inlet cable beneath the chassis as shown in the photo below Connect this cable to the power supply.



4. Using the EMI tape, securely tape the top and bottom edges of the AC power inlet to the rear housing.
5. Replace the power supply (if removed).
6. Replace the hard drive.
7. Replace the logic board.
8. Replace the speakers.
9. Replace the display panel.
10. Replace the IR Board (if removed).
11. Connect the antennas.
12. Replace the lower EMI shield.
13. Replace the front bezel.
14. Replace the memory access door.



Fan, Hard Drive

Tools

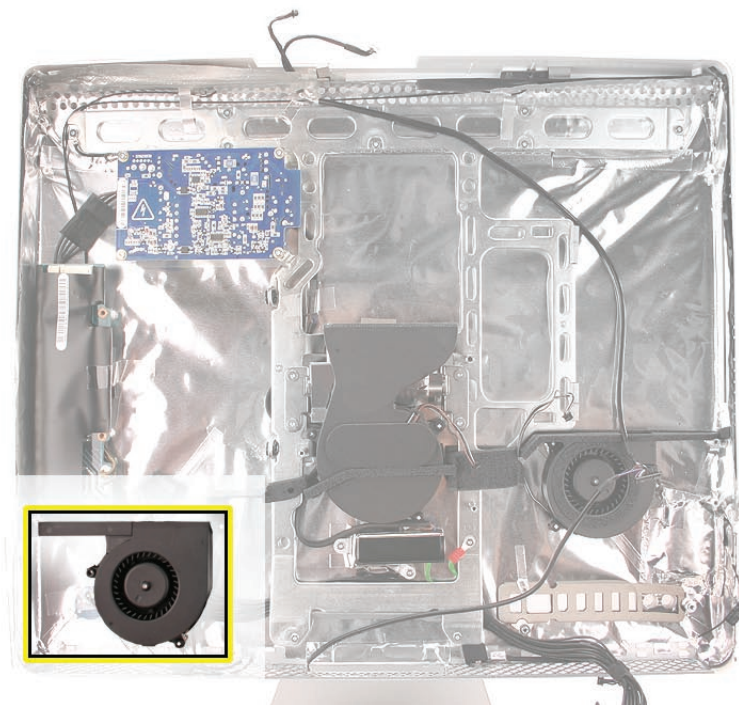
- No tools are required to remove the hard drive fan.

Preliminary Steps

Before you begin, remove the following:

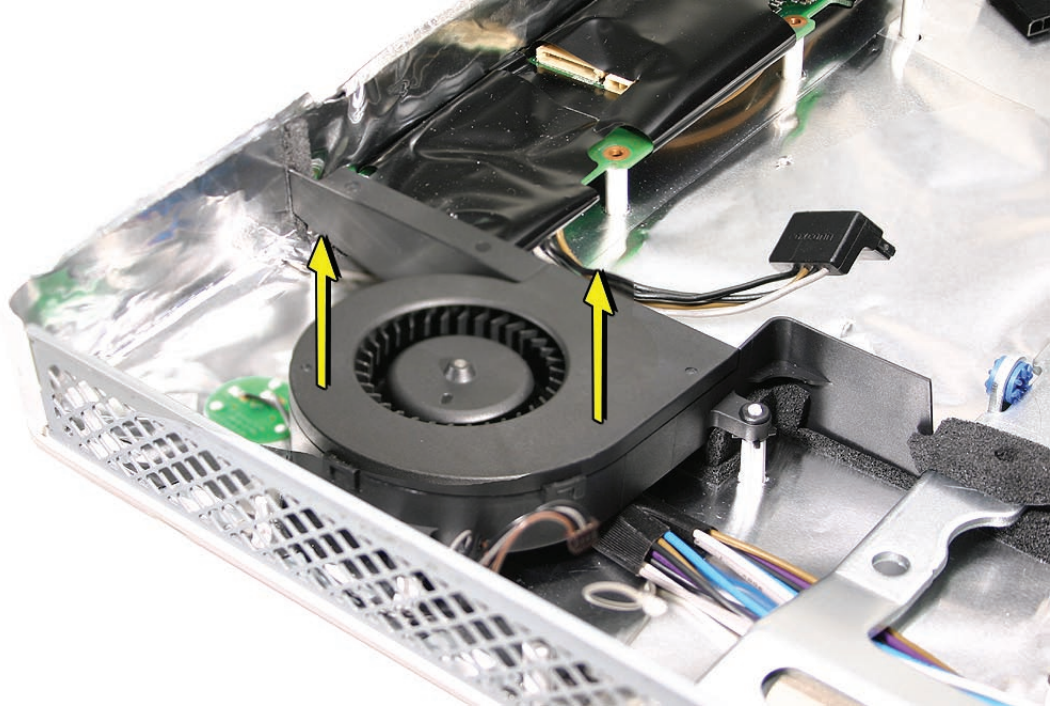
- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Speakers](#)
- [Hard drive](#)
- [Logic board](#)

Part Location



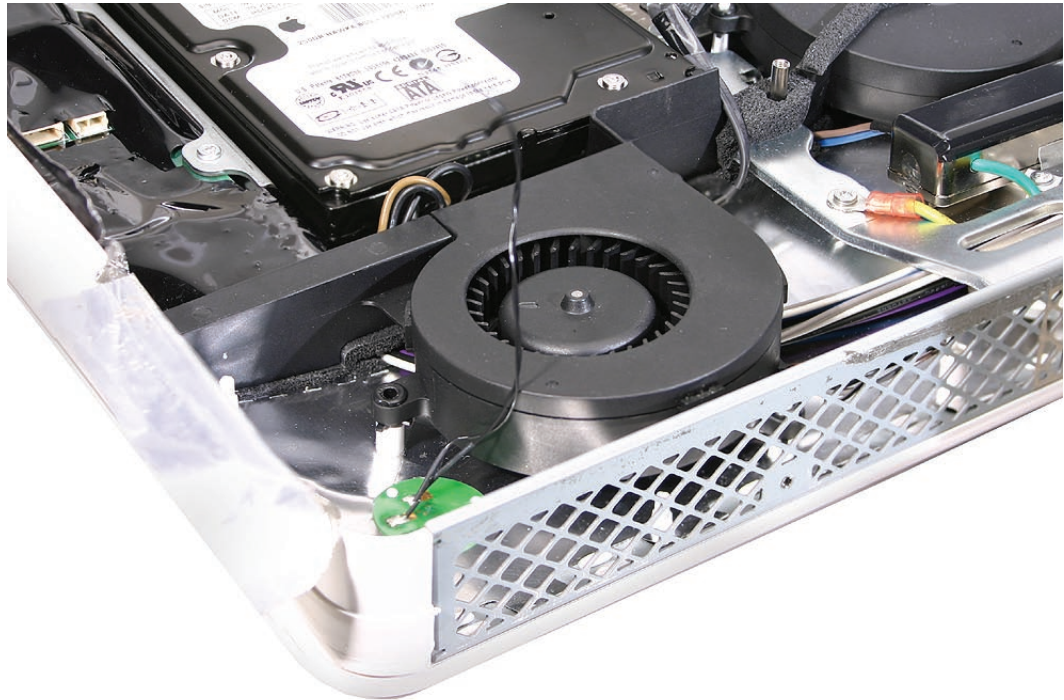
Removing the Hard Drive Fan

Once the logic board and speakers have been removed, the fan will already be disconnected. Lift the fan straight up and out of the rear housing.



Replacing the Hard Drive Fan

1. Lower the fan onto the white posts in the rear housing. Push it down snug onto the posts.



2. Replace the logic board.
3. Replace the speakers.
4. Replace the display panel.
5. Replace the IR Board.
6. Attach the antennas.
7. Replace the lower EMI shield.
8. Replace the front bezel.
9. Replace the memory access door.





Fan, Optical Drive

Tools

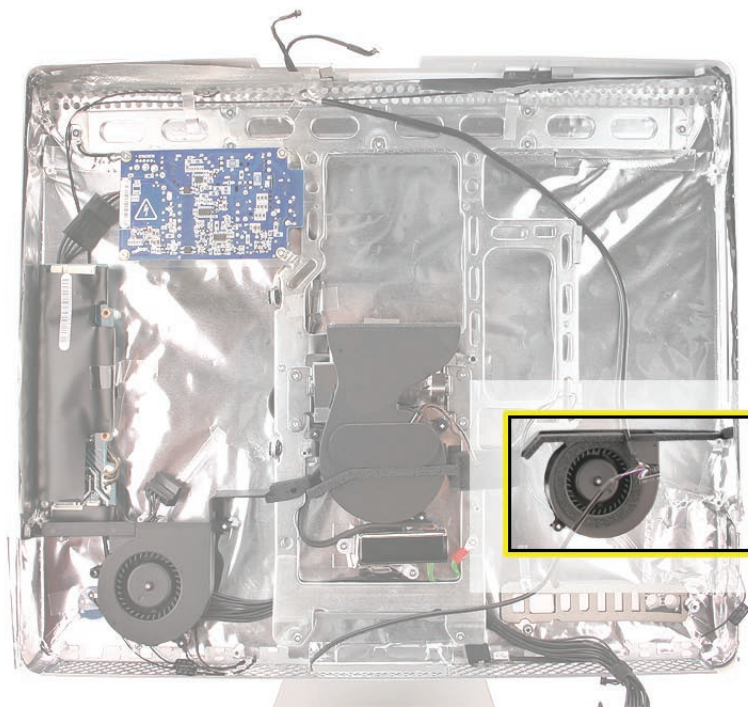
- No tools are required to remove the optical drive fan.

Preliminary Steps

Before you begin, remove the following:

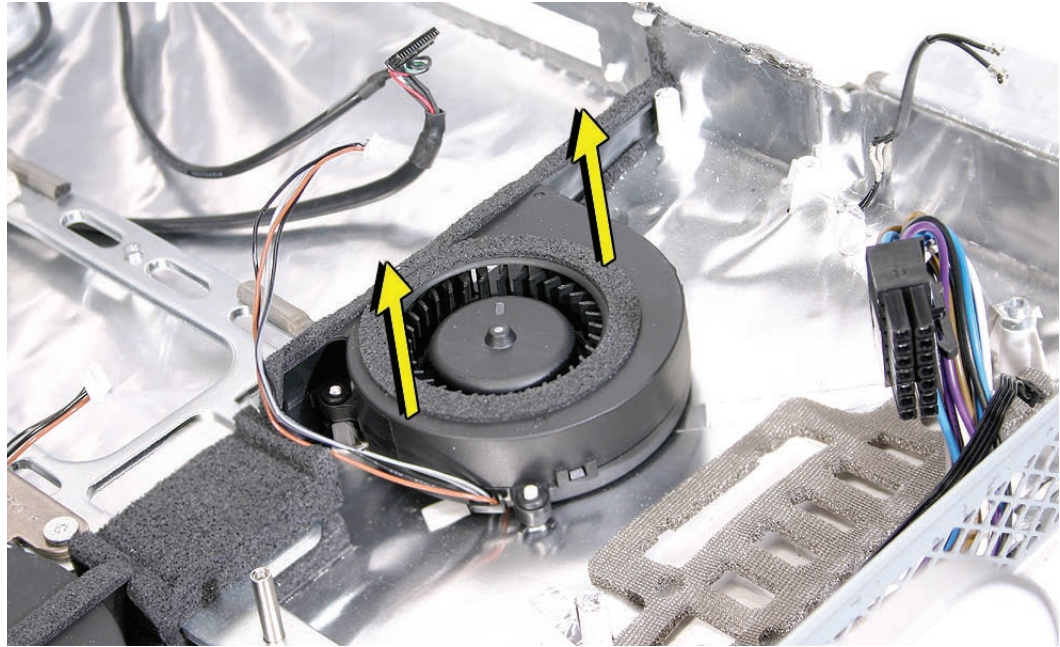
- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Speakers](#)
- [Hard drive](#)
- [Logic board](#)

Part Location



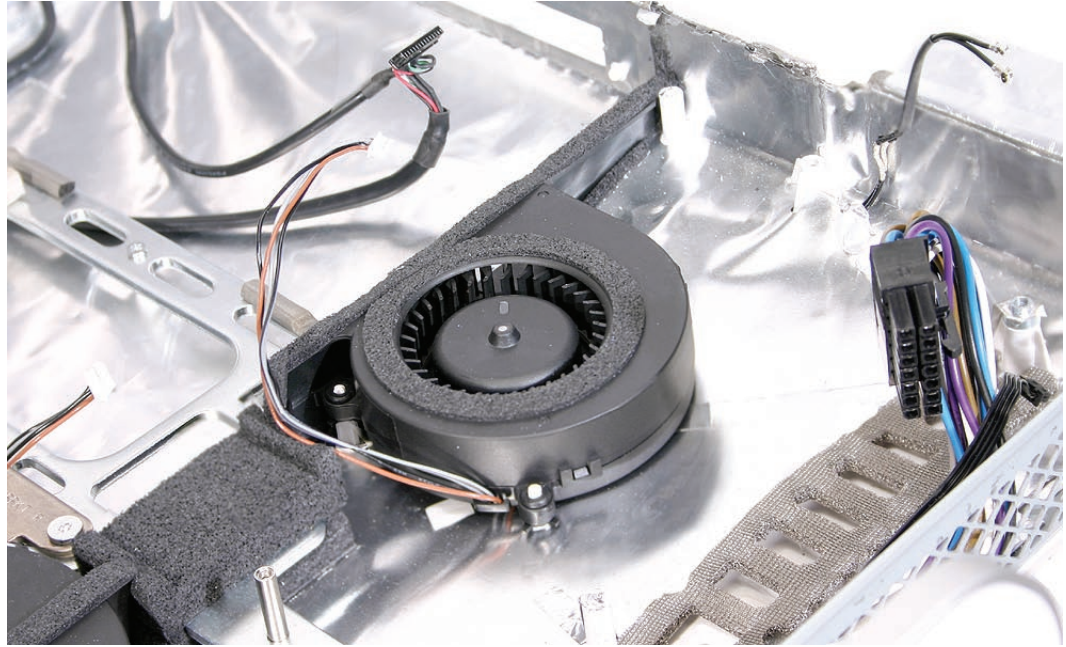
Removing the Optical Drive Fan

Once the logic board and speakers have been removed, the fan will be disconnected. Lift the fan straight up and out of the rear housing.



Replacing the Optical Drive Fan

1. Lower the fan onto the white posts in the rear housing, above the port openings. Route the fan cable around the left side of the fan, through the foam gaskets. Push it down snug onto the posts.



2. Replace the logic board.
3. Replace the speakers.
4. Replace the display panel.
5. Replace the IR Board.
6. Replace the antennas.
7. Replace the lower EMI shield.
8. Replace the front bezel.
9. Replace the memory access door.



Fan, CPU

Tools

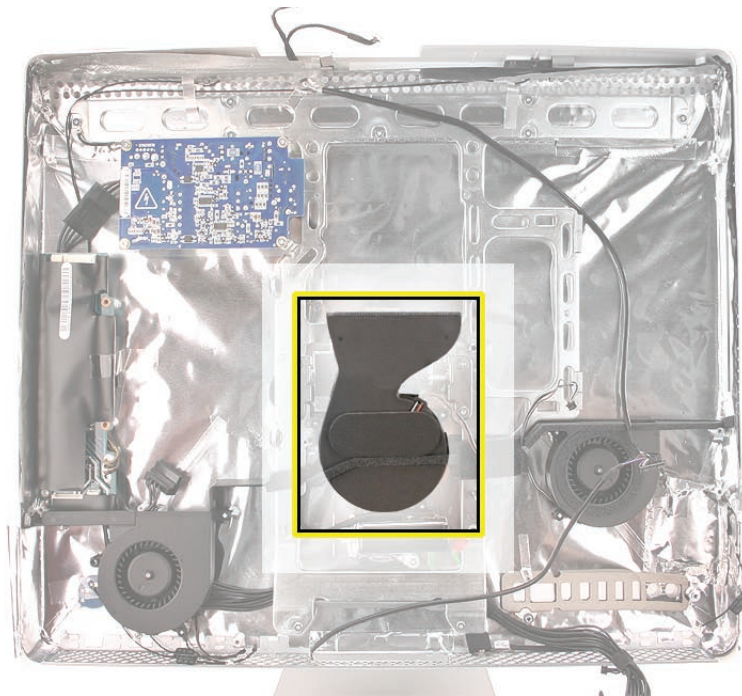
- No tools are required to remove the CPU fan.

Preliminary Steps

Before you begin, remove the following:

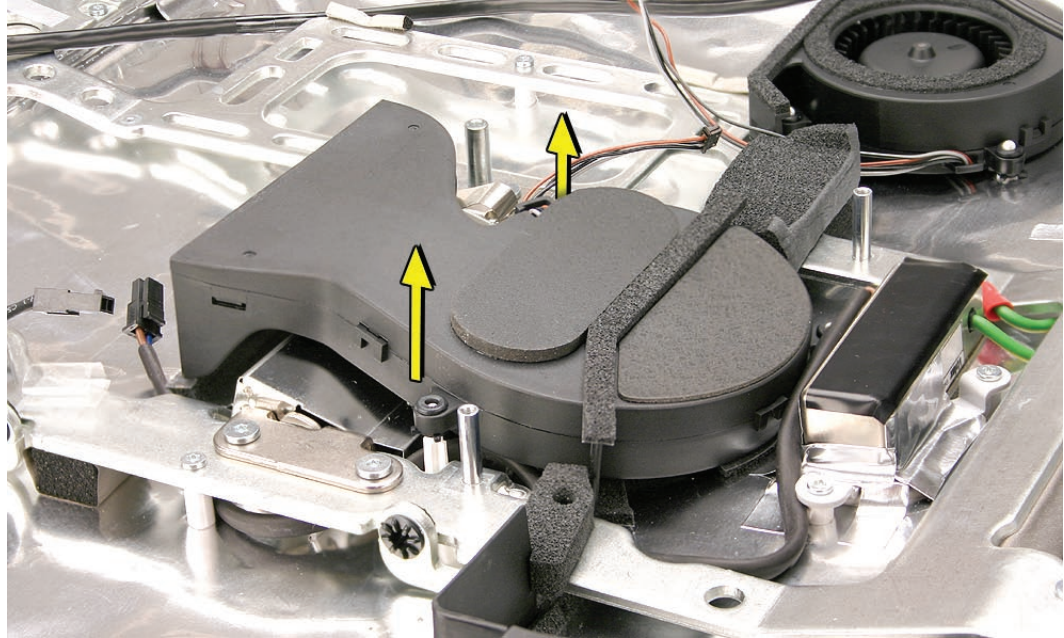
- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Speakers](#)
- [Hard drive](#)
- [Logic board](#)

Part Location



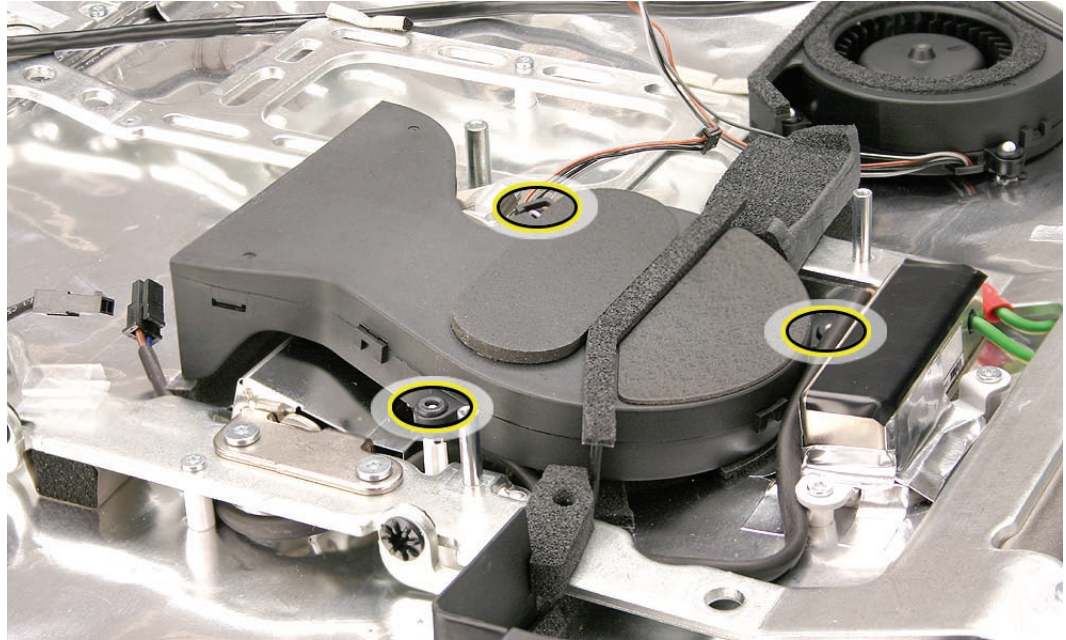
Removing the CPU Fan

Once the logic board and speakers have been removed, the fan will be disconnected. Lift the fan straight up and out of the rear housing.



Replacing the CPU Fan

1. Lower the fan onto the white standoffs in the rear housing. Push it down snug onto the posts.



2. Replace the logic board.
3. Replace the speakers.
4. Replace the display panel.
5. Replace the IR Board.
6. Replace the antennas.
7. Replace the lower EMI shield.
8. Replace the front bezel.
9. Replace the memory access door.



Inverter

Tools

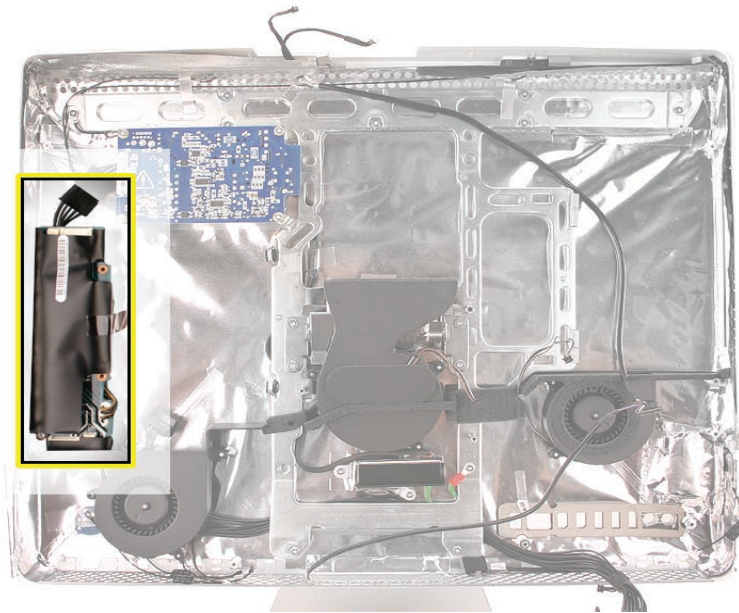
- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Speakers](#)
- [Hard drive](#)

Part Location

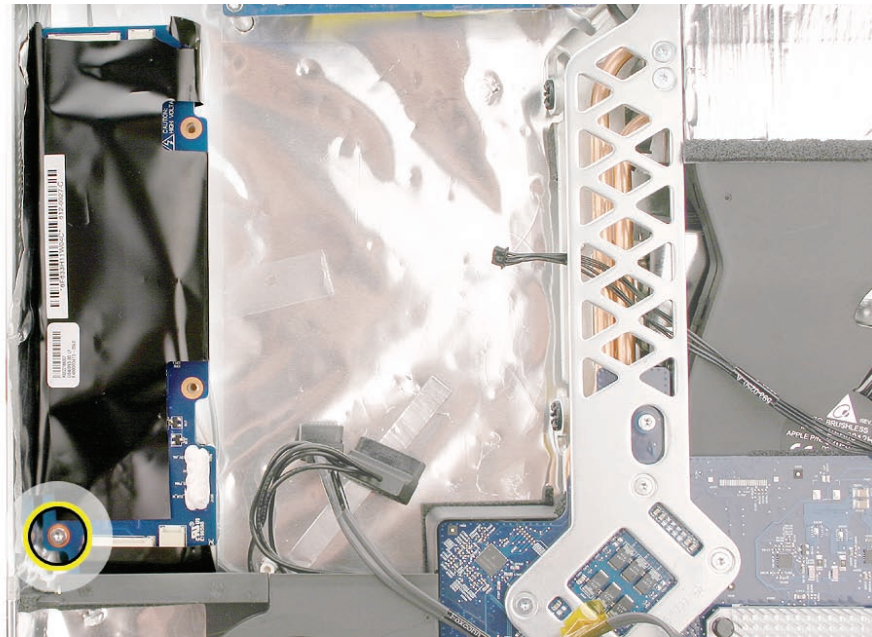


Removing the Inverter

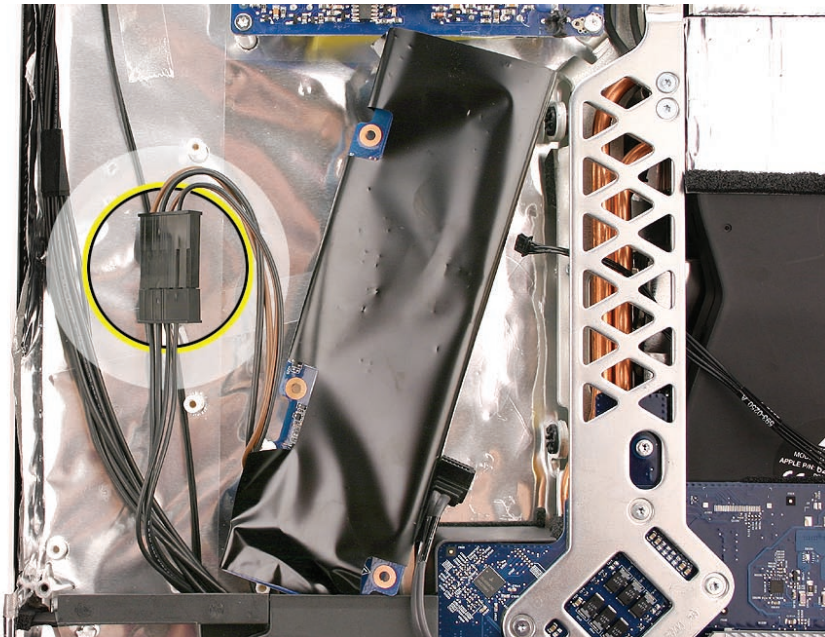
1. Remove the T10 screw located in the bottom left corner on the inverter board. ..



922-6800

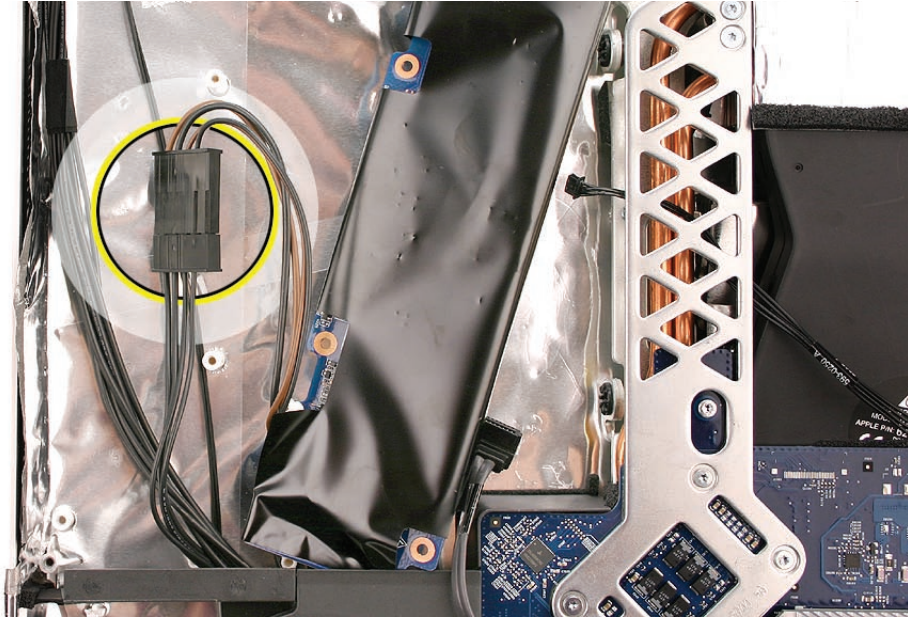


2. Flip over the inverter board to locate the inverter-to-DC cable connector. Disconnect the cable; lift the inverter out of the rear housing.



Replacing the Inverter

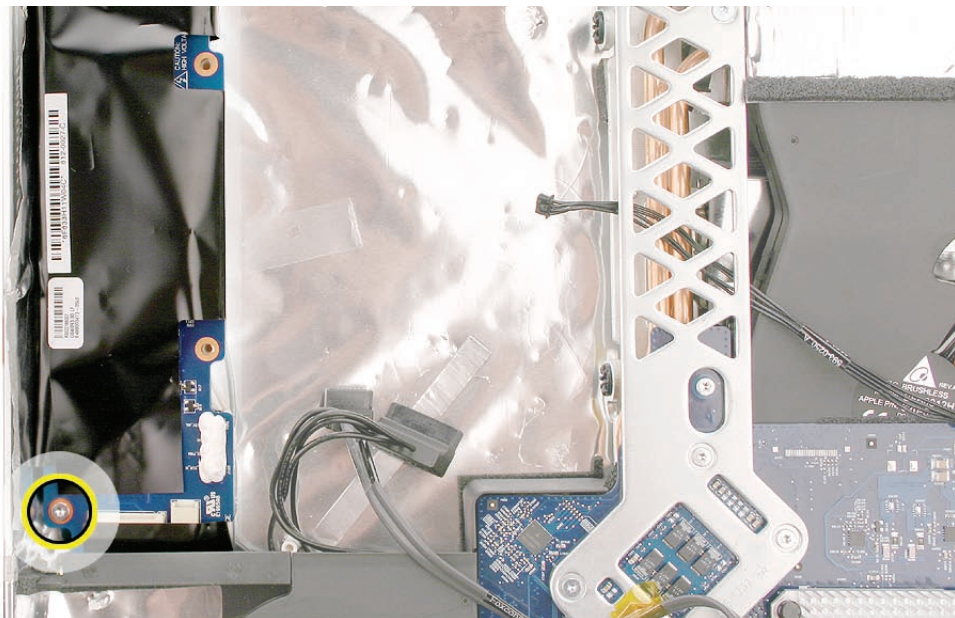
1. Connect the inverter cable to the DC cable. Tuck the cable under the inverter board as you flip the inverter over to the left.



2. Replace the inverter screw.



922-6800



3. Replace the hard drive. Connect the two hard drive cables.
4. Replace the logic board.

-
5. Replace the speakers.
 6. Replace the display panel.
 7. Replace the IR Board.
 8. Replace the lower EMI shield.
 9. Replace the front bezel.
 10. Replace the memory access door.



Ambient Light Sensor Board

Tools

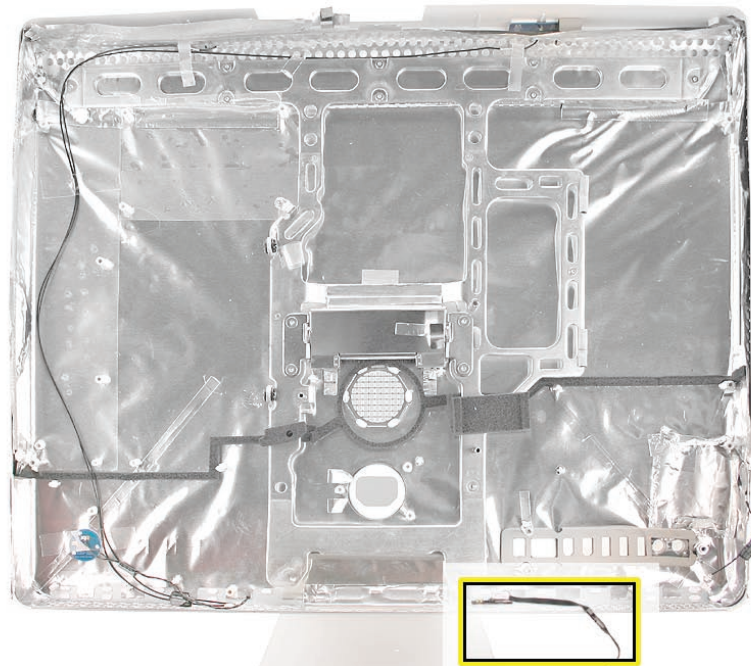
- A black stick or equivalent tool

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Speakers](#)
- [Hard drive](#)
- [Logic board](#)

Part Location



Removing the Ambient Light Sensor Board

1. With a black stick, remove the rubber bumper between the chassis and the ambient light sensor board.



2. With the rubber bumper gone, use a black stick, pry the ambient light sensor off the inside of the rear housing. **Note:** Never poke the ambient light or you could damage the sensor board.

Replace the Ambient Light Sensor Board

1. Press the sticky side of the ambient light sensor board to the bottom inside edge of the rear housing.
2. Install the rubber bumper between the back of the sensor board and the chassis.
3. Replace the logic board.
4. Replace the speakers.
5. Replace the display panel.
6. Replace the lower EMI shield.
7. Replace the front bezel.
8. Replace the memory access door.



Cable, Camera and IR

Tools

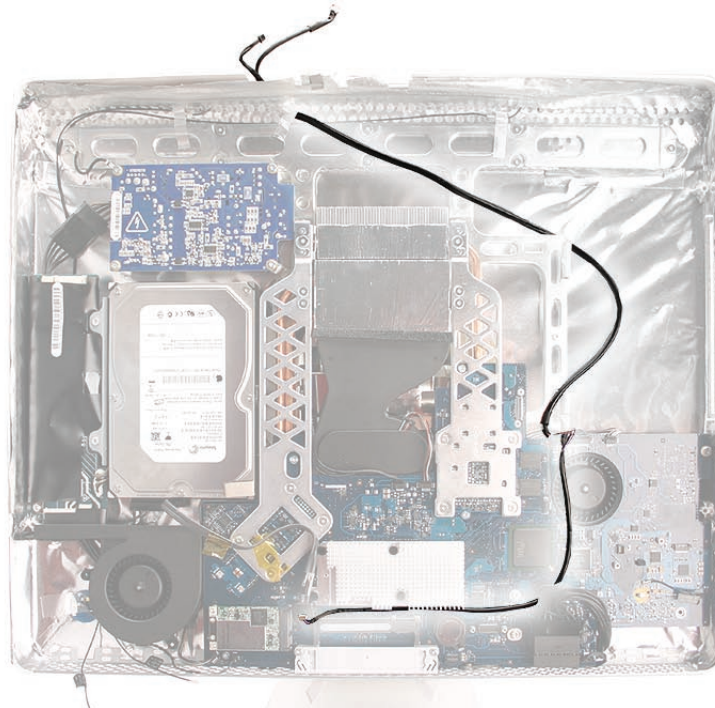
No tools are required to remove the camera cable.

Preliminary Steps

Before you begin, remove the following:

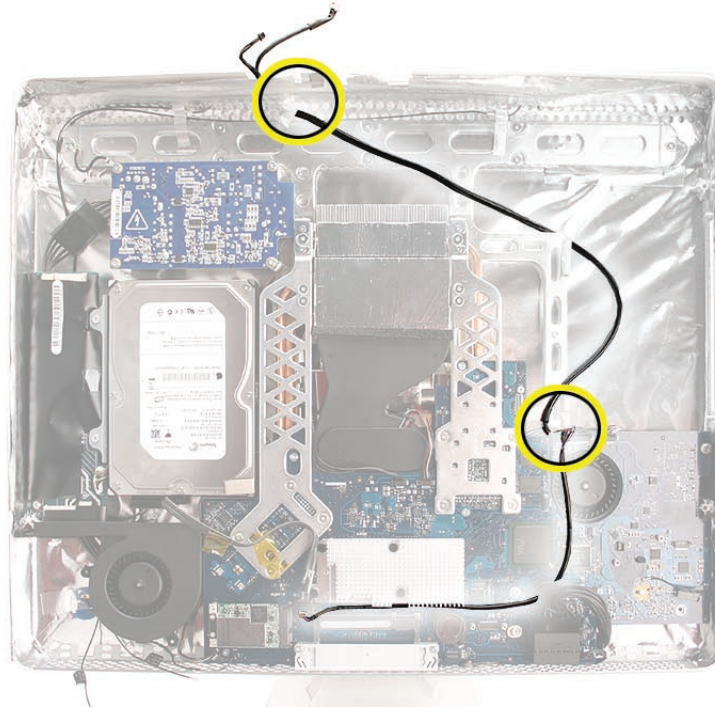
- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [IR Board](#)
- [Display panel](#)
- [Optical drive](#)

Part Location



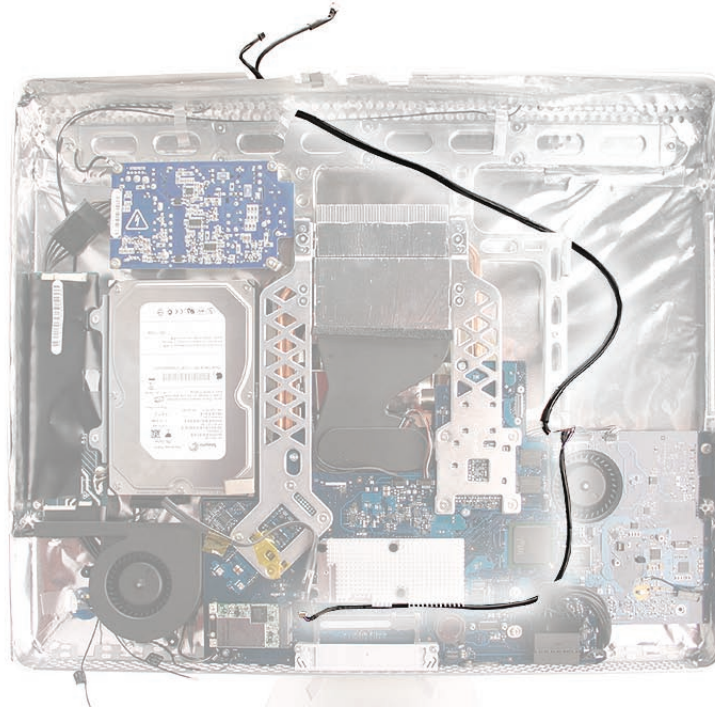
Removing the Camera and IR Cable

1. Remove the two-headed end of the cable from the access hole in the upper EMI shield.
2. Remove the tape (under the optical drive) that secures the cable to the rear housing and disconnect the cable from the logic board. Remove the camera cable.



Replacing the Camera and IR Cable

1. Insert the two-headed end of the camera cable through the access hole in the upper EMI shield.
2. Route the camera cable as shown below. Tape the camera cable to the rear housing.



3. Connect the camera cable to the logic board connector.
4. Replace the optical drive, flex drive cable and screws, and optical drive sensor cable.
5. Replace the logic board.
6. Replace the speakers.
7. Replace the display panel.
8. Replace the IR Board. Connect the camera cable to the IR board.
9. Replace the lower EMI shield.
10. Replace the front bezel.
11. Replace the memory access door.
12. Replace the front bezel.
13. Replace the memory access door.



Bluetooth Antenna

Tools

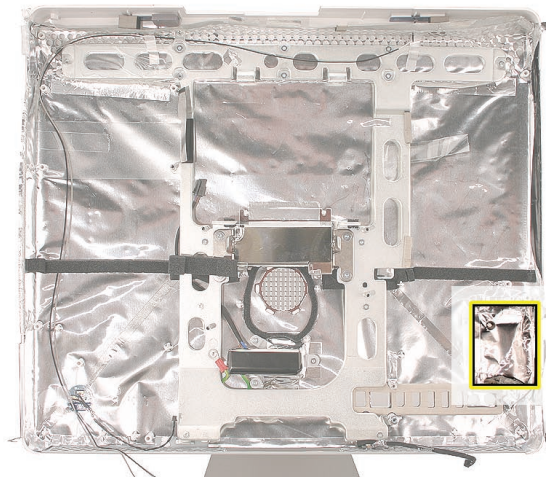
- Black stick (or other nonconductive nylon or plastic flat-blade tool)

Preliminary Steps

Before you begin, follow steps for removing the following:

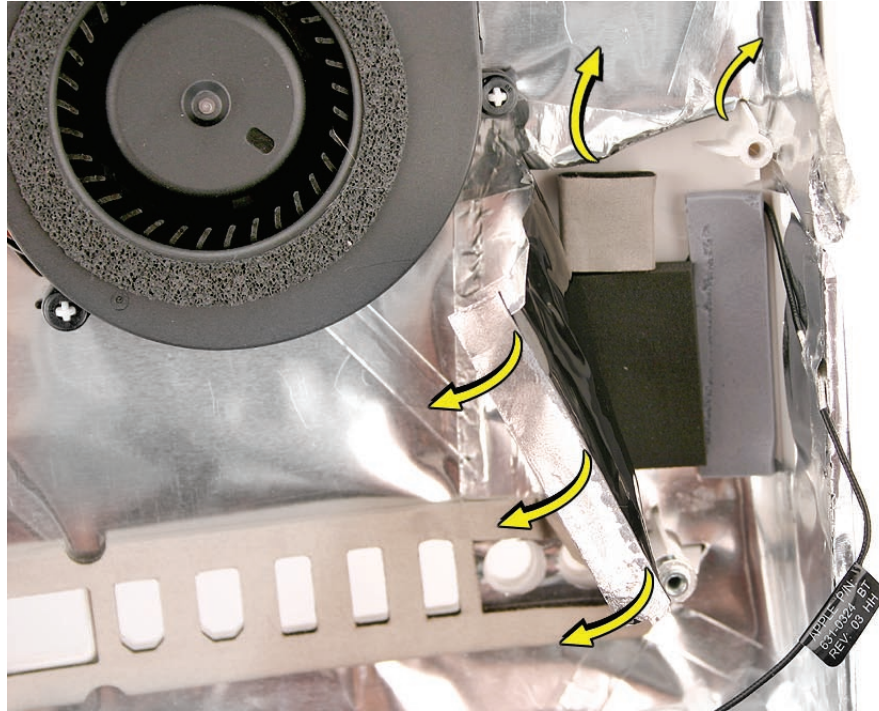
- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Disconnect the IR board](#)
- [Disconnect the AirPort antennas](#)
- [Disconnect the Bluetooth antenna](#)
- [Logic board](#)

Part Location

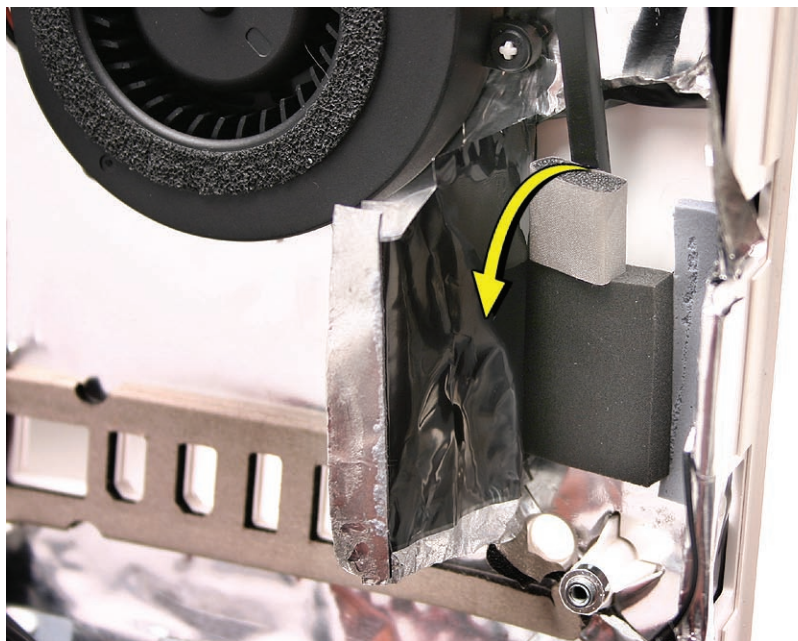


Removing the Bluetooth Antenna

1. Carefully peel back the EMI shield and the EMI tape from the rear housing to access the antenna.

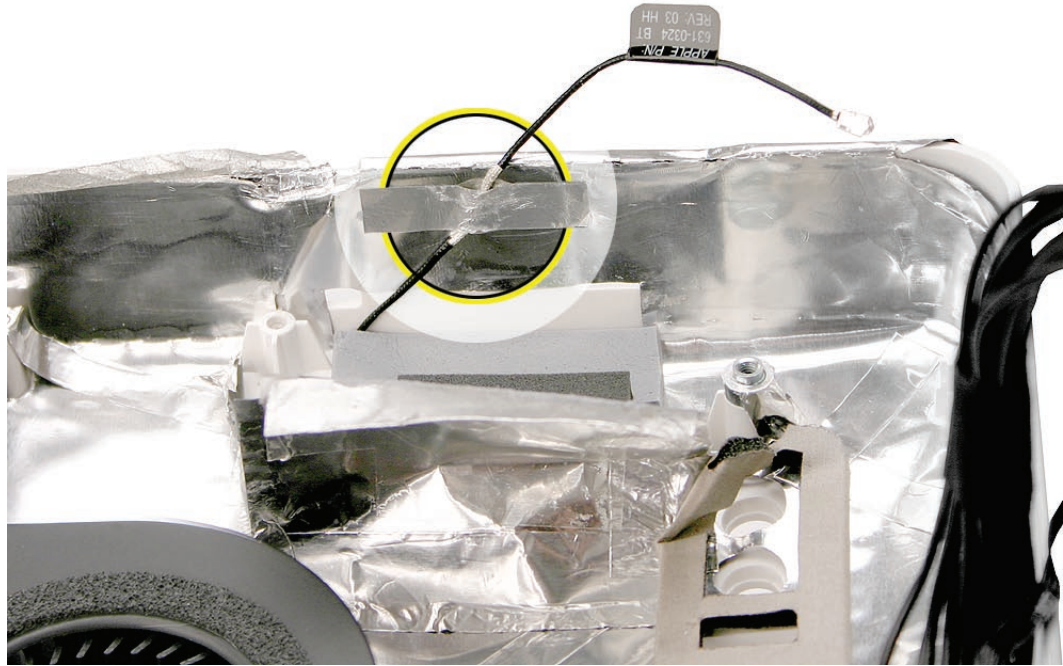


2. Using a black stick, pry the antenna board off the rear housing.



Replacing the Bluetooth Antenna

1. Position the antenna board into the rear housing, with the antenna wire on the right side. Compress the sticky side of the antenna board to the housing until securely fastened.
2. Adhere the exposed section of antenna wire to the inside (side wall) of the rear cover with a piece of EMI tape (see below). Make sure the antenna wire is positioned correctly so it reaches the antenna connector on the Bluetooth board (on the top side of the logic board).



3. Replace the logic board.
4. Replace the speakers.
5. Replace the display panel.
6. Reconnect the AirPort and Bluetooth antennas.
7. Replace the lower EMI shield.
8. Replace the front bezel.
9. Replace the memory.
10. Replace the memory access door.





AirPort Antennas

Tools

Removing the wireless antenna requires using the following tools:

- Flat-blade screwdriver
- Black stick (or other nonconductive nylon or plastic flat-blade tool)

Preliminary Steps

Before you begin, follow steps for removing the following:

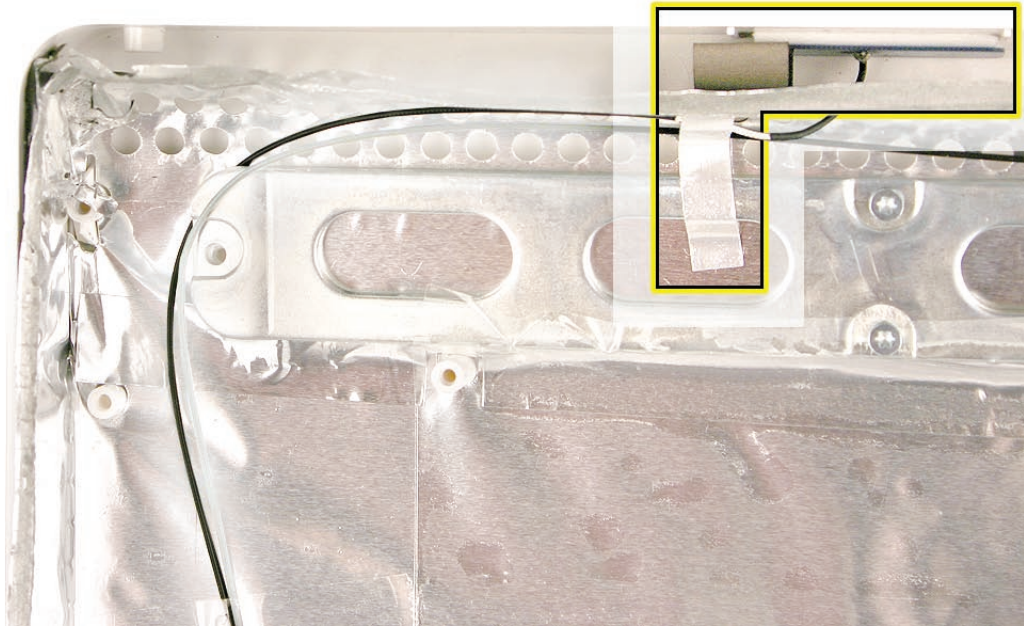
- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Disconnect the IR board](#)
- [Disconnect the AirPort antennas](#)
- [Disconnect the Bluetooth antenna](#)
- [Logic board](#)
- [Inverter](#)
- [Hard drive fan](#)

Part Location



Removing the AirPort Extreme Antennas

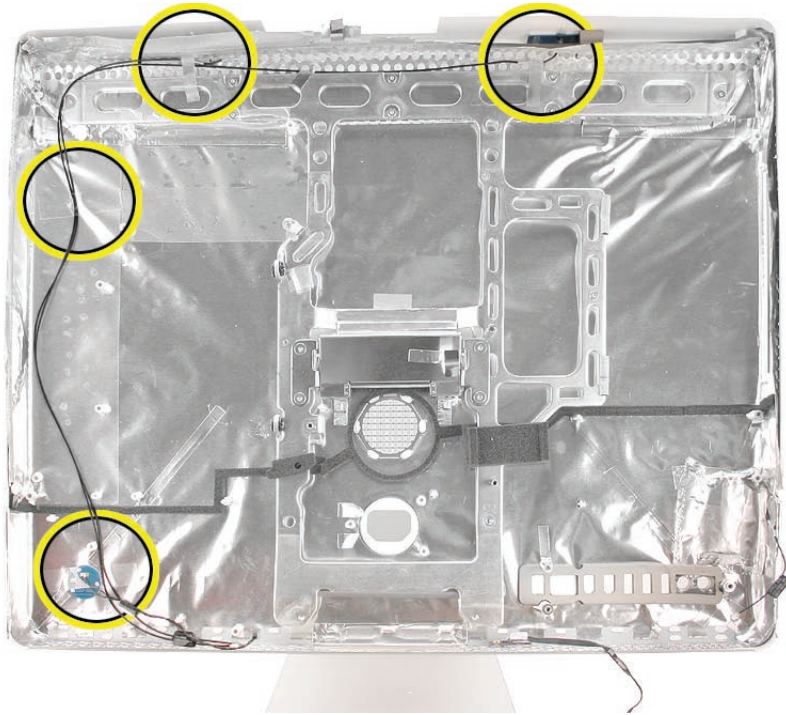
1. To remove the left antenna, carefully peel back the EMI tape from the rear housing as shown below. Peel back just enough EMI shield to access the antenna board. Using a flat-blade screwdriver or black stick, pry the antenna board off the rear housing.



2. Repeat step 1 to remove the right antenna.



-
3. Remove any other tape that secures the antenna cables to the rear housing. Pull the antenna cable(s) through the access hole at the top of the EMI shield, near the antenna board.



Replacing the AirPort Extreme Antennas

1. Locate the antenna mounting channel inside the left and/or right corner of the rear housing, and position the antenna board in the channel. Compress the sticky side of the antenna board to the housing until securely fastened.
2. Route the antenna cables through the EMI shield.
3. Secure the antenna cables to the rear housing with tape.
4. Replace the CPU fan.
5. Replace the logic board.
6. Replace the optical drive.
7. Replace the speakers.
8. Replace the display panel.
9. Replace the lower EMI shield.
10. Replace the front bezel.
11. Replace the memory access door.



Clutch Mechanism

Tools

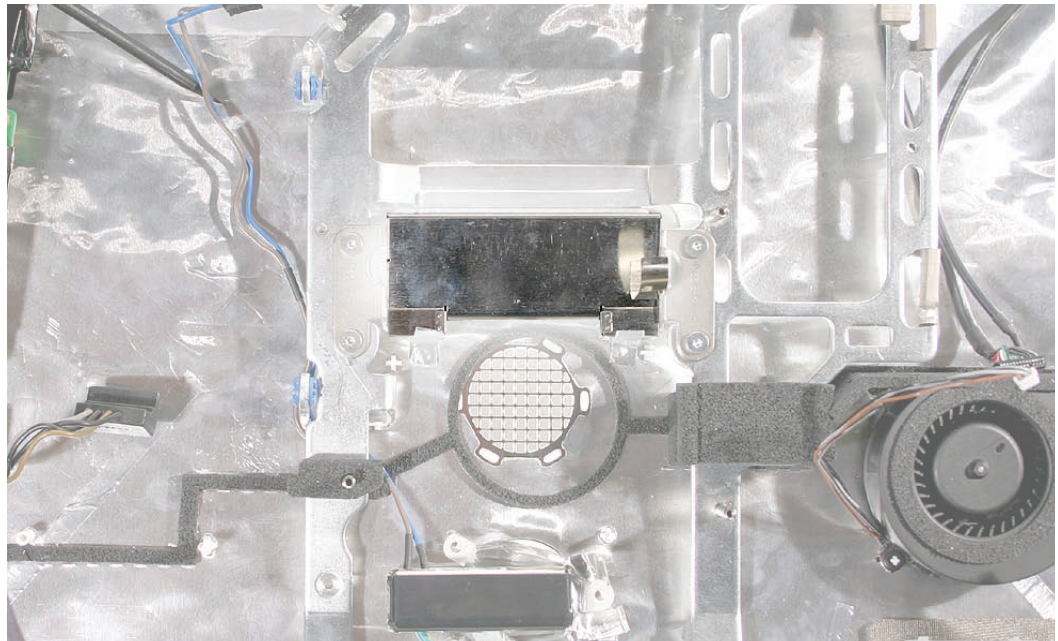
- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

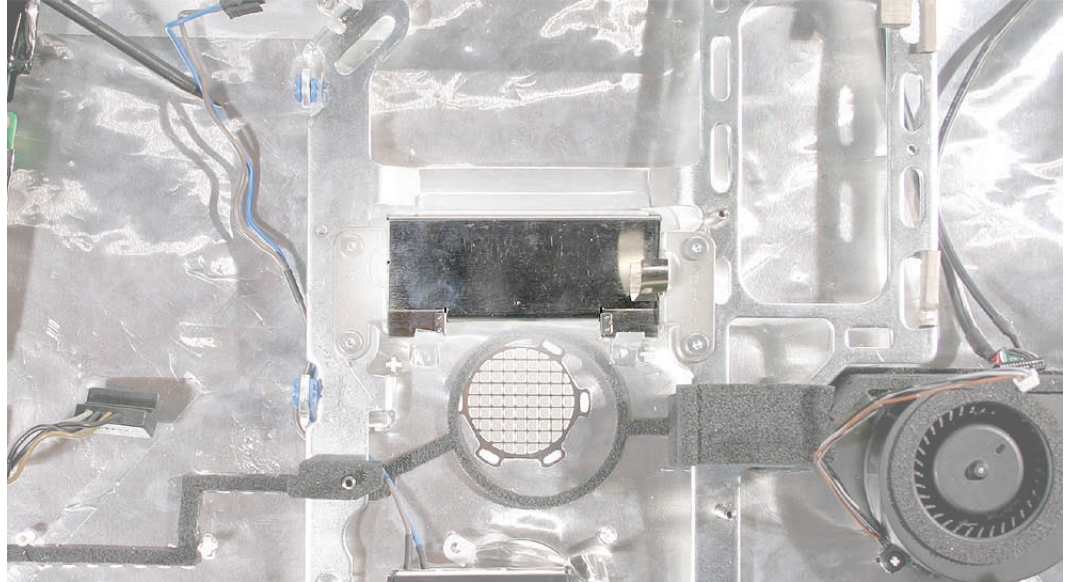
- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Disconnect the IR board](#)
- [Disconnect the AirPort antennas](#)
- [Disconnect the Bluetooth antenna](#)
- [Logic board](#)
- [CPU Fan](#)

Part Location



Removing the Clutch

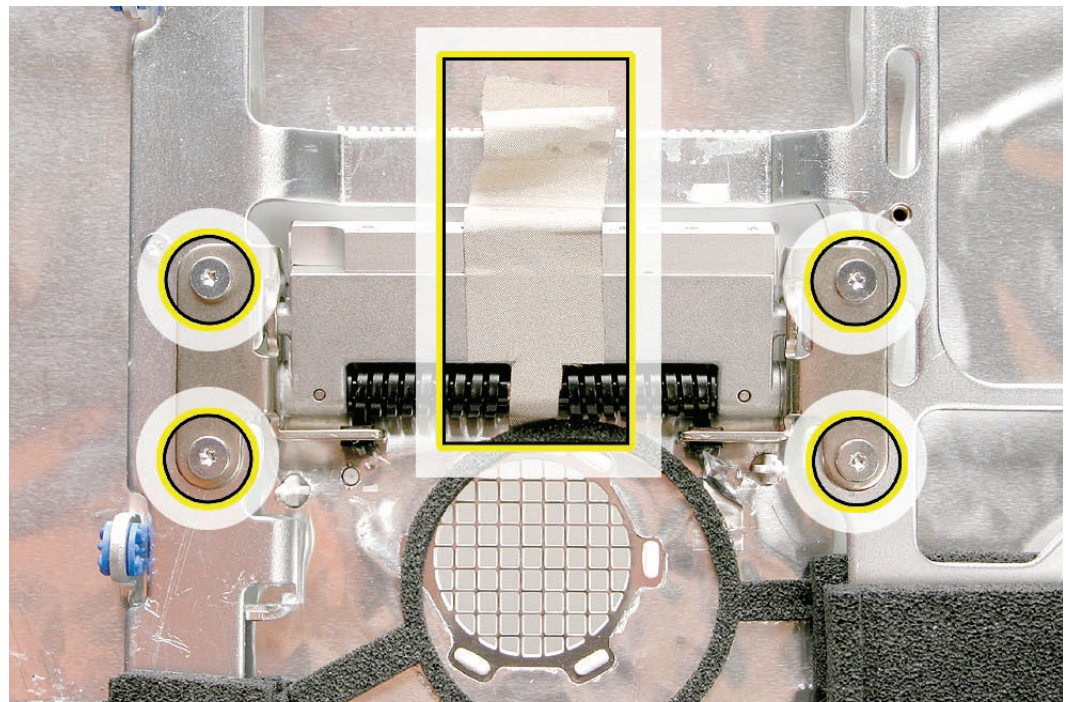
1. Remove the EMI tape attached along the top and bottom sides of the clutch mechanism cover. After removing the tape, pull the cover straight off the clutch.



2. Peel back the EMI tape on top of the mechanism. Using a torx T10 screwdriver, remove the four clutch mounting screws.



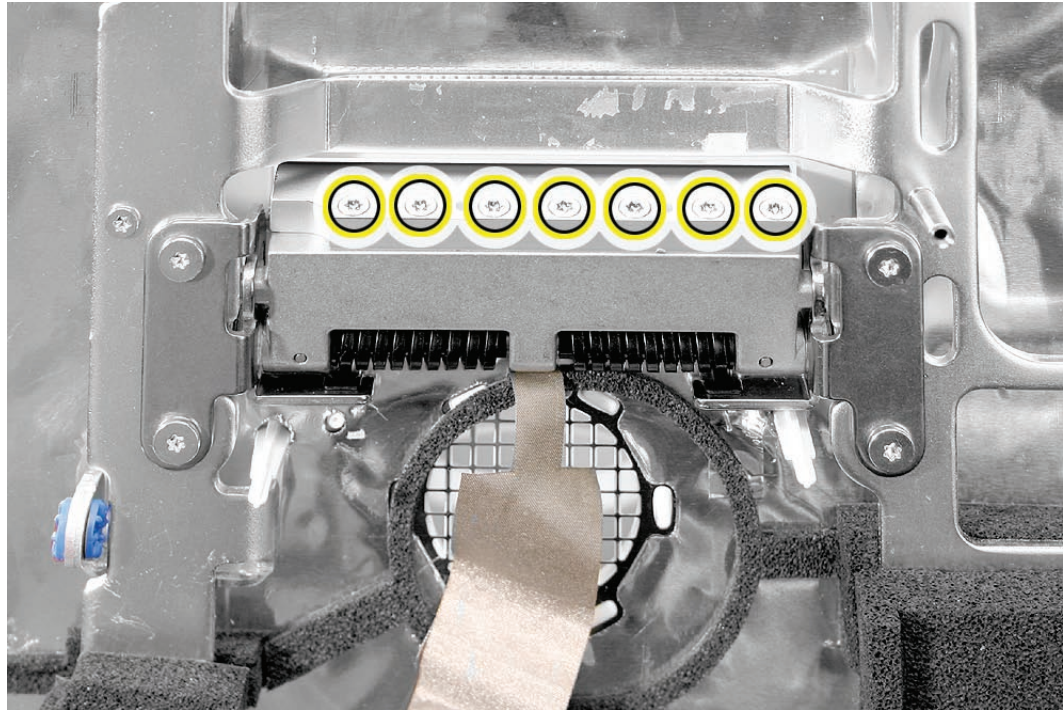
922-7020



3. Stand up the unit, to access the clutch-to-stand mounting screws.
4. Using a T10 torx screwdriver, remove the seven clutch-to-stand screws. Separate the mechanism and the stand from the rear housing.

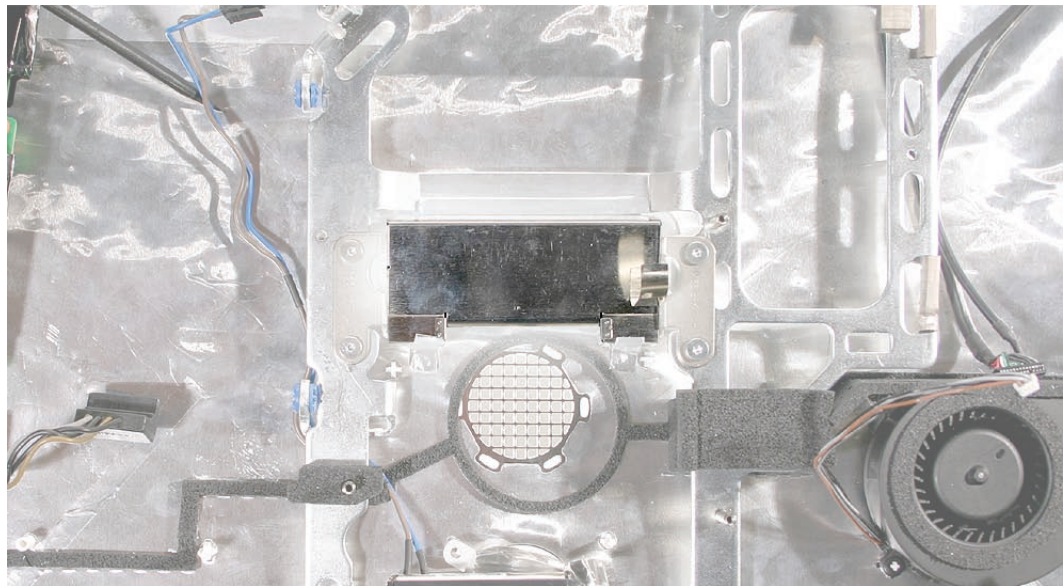


922-7012



Replacing the Clutch

1. Make sure the stand is erect and the end of the stand is inserted through the mounting hole in the rear housing.
2. Position the clutch on the stand, with the clutch springs at bottom. Install the seven long, clutch-to-stand mounting screws.
3. Adjust the clutch so that its chassis mounting holes align, and install the four screws that secure the clutch to the chassis.
4. Replace the silky EMI tape on top of the mechanism, press it into place.
5. Replace the metal mechanism cover.
6. Replace the EMI tape along the top and bottom of the mechanism cover. Make sure the spring clip on the right side of the mechanism cover is attached to the mechanism cover.



7. Replace the CPU fan.
8. Replace the logic board.
9. Replace the speakers.
10. Replace the display panel.
11. Replace the lower EMI shield.
12. Replace the front bezel.
13. Replace the memory access door.



Chassis

Tools

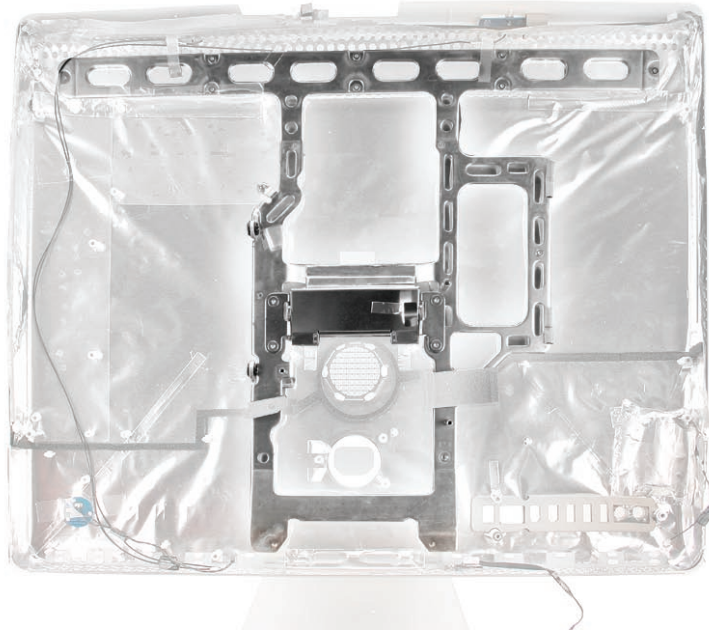
- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Disconnect the IR board](#)
- [Disconnect the AirPort antennas](#)
- [Disconnect the Bluetooth antenna](#)
- [Logic board](#)
- [CPU Fan](#)
- [Optical fan](#)
- [Power Supply](#)
- [Hard drive fan](#)
- [AC Power Inlet](#)
- [Hard drive](#)
- [Inverter](#)
- [Camera cable](#)
- [Bluetooth antenna](#)
- [Clutch](#)
- [Stand](#)

Part Location

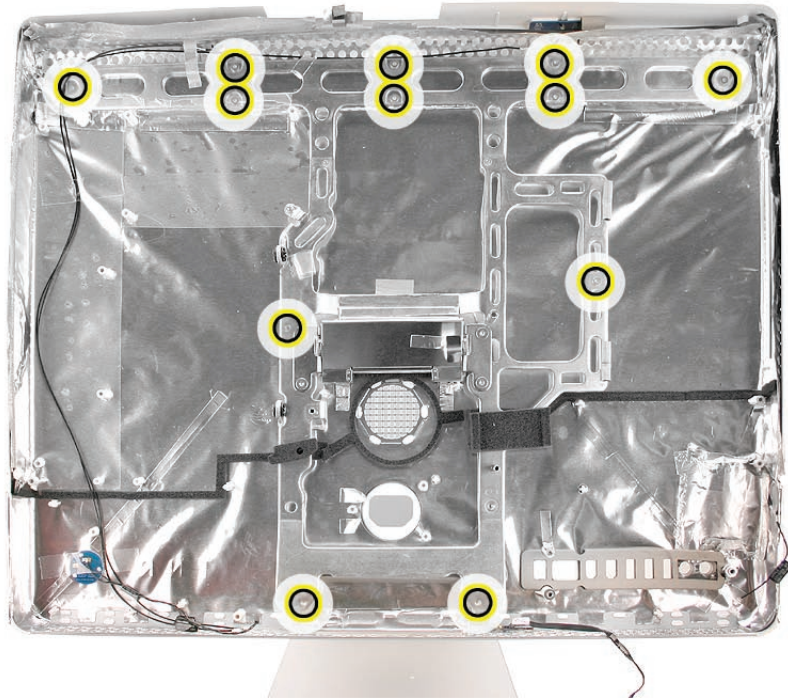


Removing the Chassis

Using a T10 screwdriver, remove 12 self-tapping screws from the chassis, and remove the chassis from the rear housing.



922-6850



Replace the Chassis

1. Position the chassis on the rear housing as shown and install 12 self-tapping mounting screws.
2. Replace the clutch mechanism.
3. Replace the AC power inlet.
4. Replace the power supply.
5. Replace the hard drive.
6. Replace the optical drive.
7. Replace the hard drive and optical drive fans (if removed).
8. Replace the CPU fan.
9. Replace the logic board.
10. Replace the speakers.
11. Replace the display panel.
12. Replace the lower EMI shield.
13. Replace the front bezel.
14. Replace the memory access door.



Rear Housing

Tools

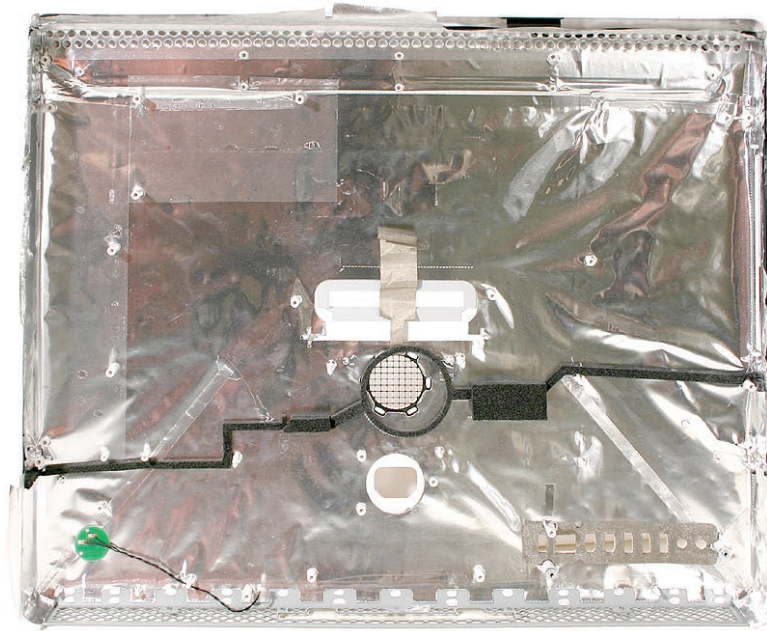
No tools are required to remove the rear housing.

Preliminary Steps

Before you begin, remove the following:

- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Disconnect the IR board](#)
- [Disconnect the AirPort antennas](#)
- [Disconnect the Bluetooth antenna](#)
- [Logic board](#)
- [CPU Fan](#)
- [Optical fan](#)
- [Power Supply](#)
- [Hard drive fan](#)
- [AC Power Inlet](#)
- [Hard drive](#)
- [Inverter](#)
- [Camera cable](#)
- [Bluetooth antenna](#)
- [Clutch](#)
- [Stand](#)
- [Ambient Light Sensor](#)
- [Chassis](#)

Part Location



Removing the Rear Housing

When all the parts are removed, you are left with the rear housing. The antennas remain in the rear housing.

Replace the Rear Housing

1. Position the chassis on the rear housing as shown and install 12 self-tapping mounting screws.
2. Replace the clutch mechanism.
3. Replace the stand.
4. Replace the AC power inlet.
5. Replace the power supply.
6. Replace the hard drive.
7. Replace the optical drive.
8. Replace the hard drive and optical drive fans.
9. Replace the CPU fan.
10. Replace the logic board.
11. Replace the speakers.

-
12. Replace the display panel.
 13. Replace the IR Board.
 14. Replace the lower EMI shield.
 15. Replace the front bezel.
 16. Replace the memory access door.



Stand

Tools

- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove everything, including the chassis:

Part Location

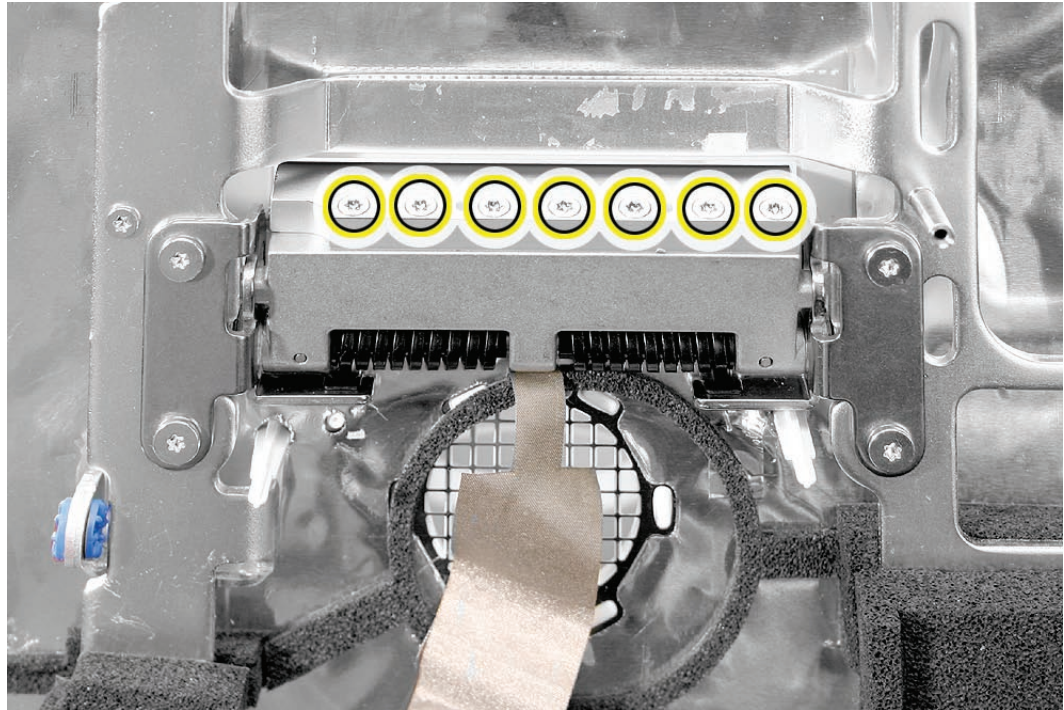


Removing the Stand

1. Stand up the unit, to access the clutch-to-stand mounting screws.
2. Using a T10 torx screwdriver, remove the seven clutch-to-stand screws. Separate the mechanism and the stand from the rear housing.

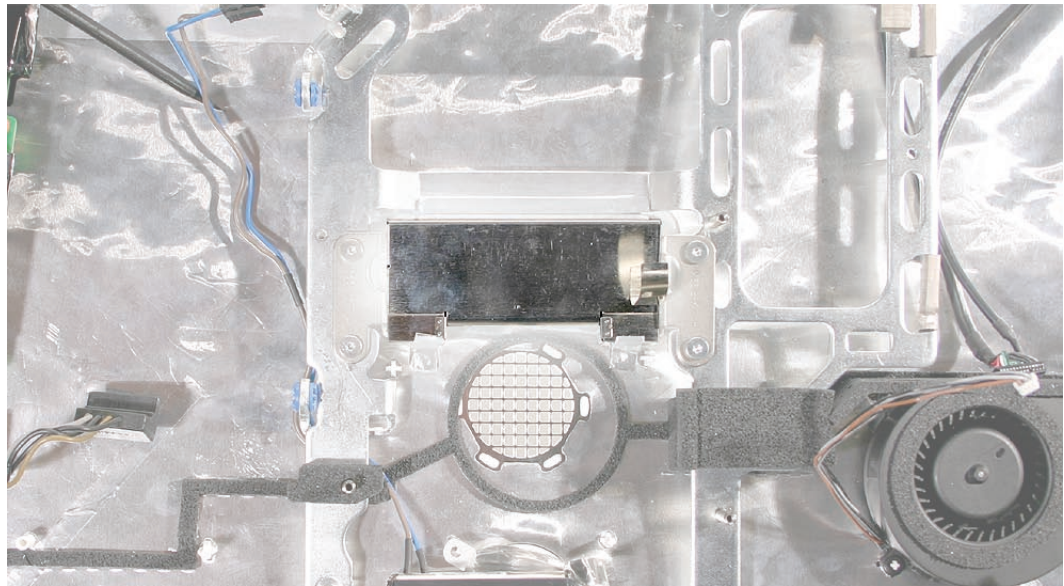


922-7012



Replacing the Stand

1. Make sure the stand is erect and the end of the stand is inserted through the mounting hole in the rear housing.
2. Position the clutch on the stand, with the clutch springs at bottom. Install the seven long, clutch-to-stand mounting screws.
3. Adjust the clutch so that its chassis mounting holes align, and install the four screws that secure the clutch to the chassis.
4. Replace the silky EMI tape on top of the mechanism, press it into place.
5. Replace the metal mechanism cover.
6. Replace the EMI tape along the top and bottom of the mechanism cover. Make sure the spring clip on the right side of the mechanism cover is attached to the mechanism cover.



7. Replace the CPU fan.
8. Replace the logic board.
9. Replace the speakers.
10. Replace the display panel.
11. Replace the IR Board.
12. Replace the lower EMI shield.
13. Replace the front bezel.
14. Replace the memory access door.





Cable, AC/DC SATA, Inverter Power

Tools

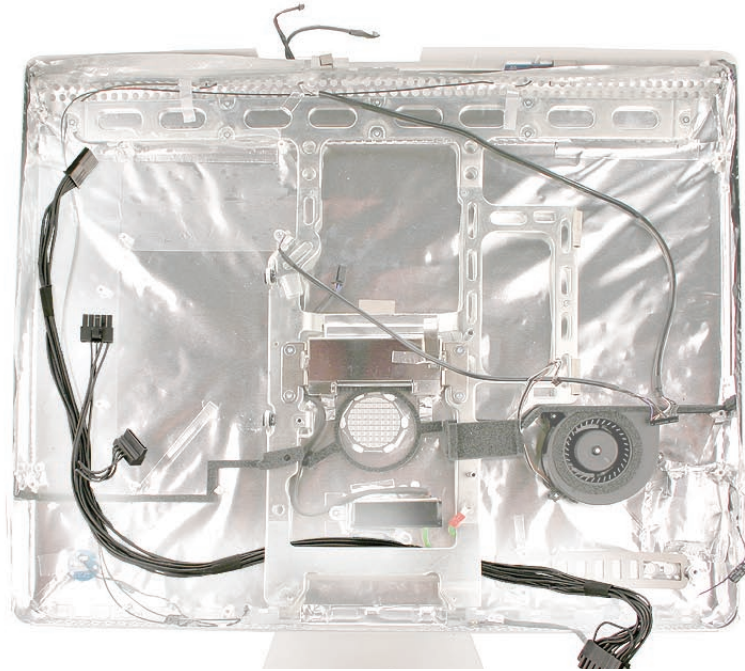
- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

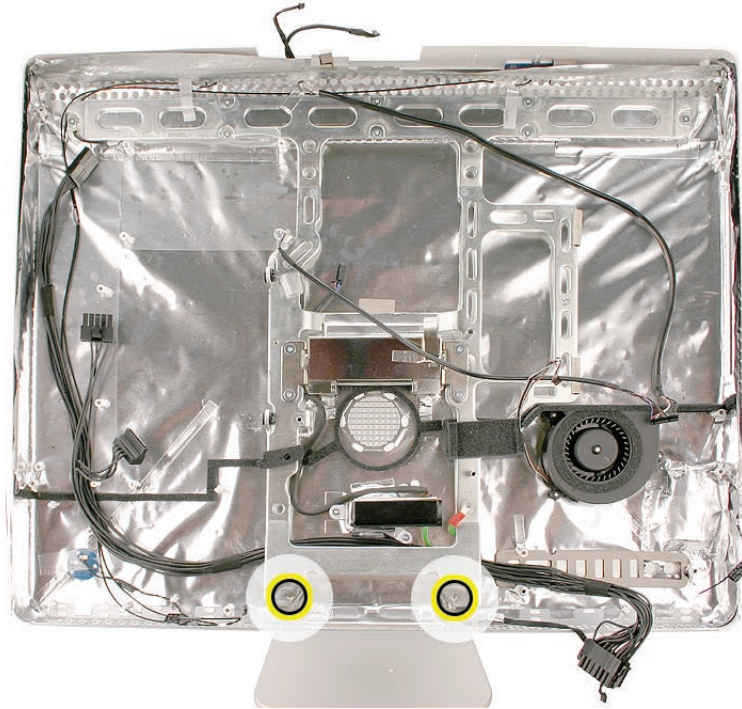
- [Access door](#)
- [Front bezel](#)
- [Lower EMI shield](#)
- [Display Panel](#)
- [Speakers](#)
- [Hard drive](#)
- [Logic board](#)
- [Power Supply](#)
- [Hard drive fan](#)
- [Inverter](#)

Part Location



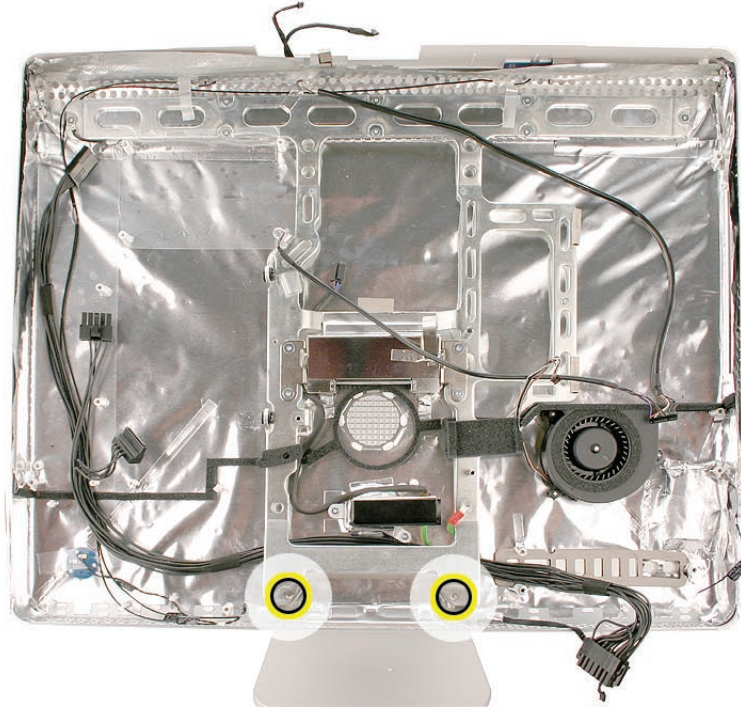
Removing the Cable

1. Remove at least two chassis screws (shown) along the bottom. Slide the cable out from underneath the chassis.



Replacing the Cable

1. Replace the cable in the rear housing. Route the cable under the chassis, below the AC power inlet.
2. Replace the two chassis screws if removed.



3. Replace the inverter.
4. Replace the hard drive fan.
5. Replace the hard drive.
6. Replace the power supply.
7. Replace the logic board.
8. Replace the optical drive.
9. Replace the speakers.
10. Replace the display panel.
11. Replace the lower EMI shield.
12. Replace the front bezel.
13. Replace the memory access door.

Service Source



Troubleshooting

iMac (20-inch Late 2006)

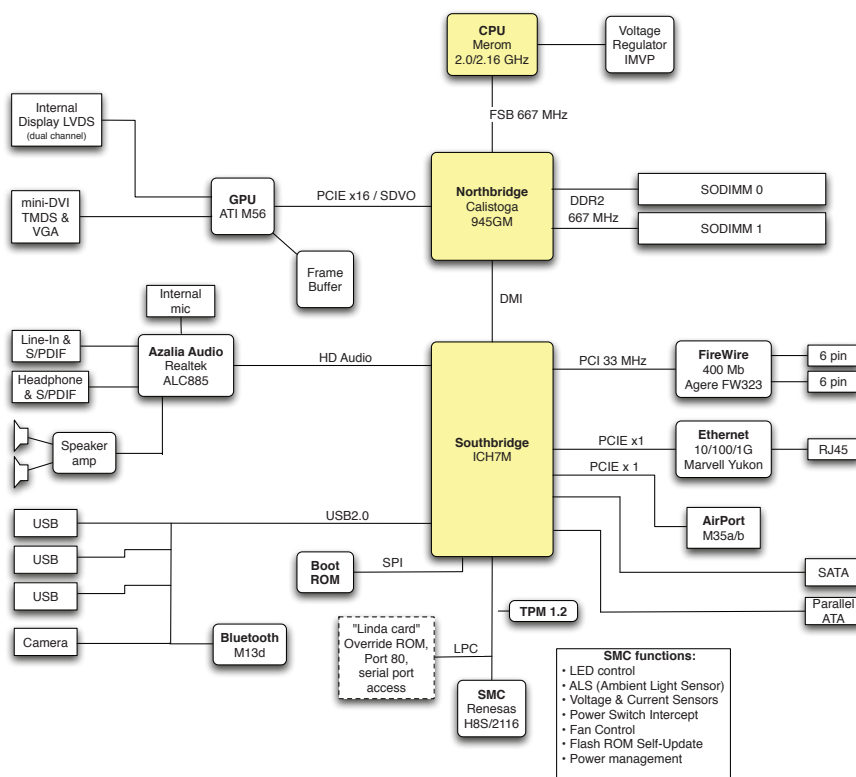


General Information

Serial Number Location

iMac (20-inch Late 2006) serial numbers are located on the bottom of the computer stand.

Block Diagram



Power On Self Test (POST)

Intel-based Macintosh computers such as the iMac (20-inch Late 2006) rely on a combination of tones and blinking LEDs to display Power On Self Test (POST) error codes.

If the computer detects out-of-specification memory or no RAM installed, the screen will be black and the power LED on the front of the computer will blink once a second to indicate bad or no RAM. Bad RAM can include physically damaged, the incorrect type, or not present.

If the RAM is good enough to pass the POST test but it is marginal and cannot be used by the operating system, the computer will show a gray screen, three tones will sound and the power LED on the front of the computer will blink three times, pause, and repeat until the computer is turned off.

The solution to both these situations is to install known good memory.

DDR Memory

The iMac (20-inch Late 2006) computer has two SDRAM slots in the bottom of the computer. The iMac ships from the factory with at least 512 MB of DDR2 SDRAM, installed as a 256 MB DIMM in the top slot and a 256 MB DIMM in the bottom slot. (The computer may come with more RAM, depending on how the computer was ordered from Apple.)

Although you can install a single SO-DIMM, it is recommended that memory be installed in matched pairs for improved graphics performance.

The maximum amount of RAM you can install in the iMac is 3 GB total (however the system only recognizes up to 3GB). You can use small-outline dual inline memory modules (SO-DIMMS) that meet all of these criteria:

- PC2-5300
- unbuffered
- nonparity
- 200-pin
- 667 MHz DDR2 SDRAM

Note: DIMMs with any of the following features are NOT supported in this iMac:

- registers or buffers
- PLLs
- ECC
- parity
- EDO RAM

How to Reset the System Management Controller (SMC)

The System Management Controller (SMC) is a chip on the logic board that controls all power functions for your computer. If your computer is experiencing any power issue, resetting the SMC may resolve it. The SMC controls several functions, including:

- Telling the computer when to turn on, turn off, sleep, wake, idle, and so forth.
- Handling system resets from various commands.
- Controlling the fans.

Note that resetting the SMC does not reset the PRAM. Resetting the SMC will not resolve issues in which your computer is unresponsive—in these situations, restarting your computer will generally suffice. If your computer isn't responding, perform these steps one at a time, in this order, until the issue has been resolved:

1. Force Quit (Option-Command-Escape).
2. Restart (Control-Command-Power).
3. Force Shut Down (press the power button for 10 seconds).

Resetting the SMC can resolve some computer issues such as not starting up, not displaying video, sleep issues, fan noise issues, and so forth. If your computer still exhibits these types of issues after you've restarted the computer, try resetting the SMC.

To reset the SMC

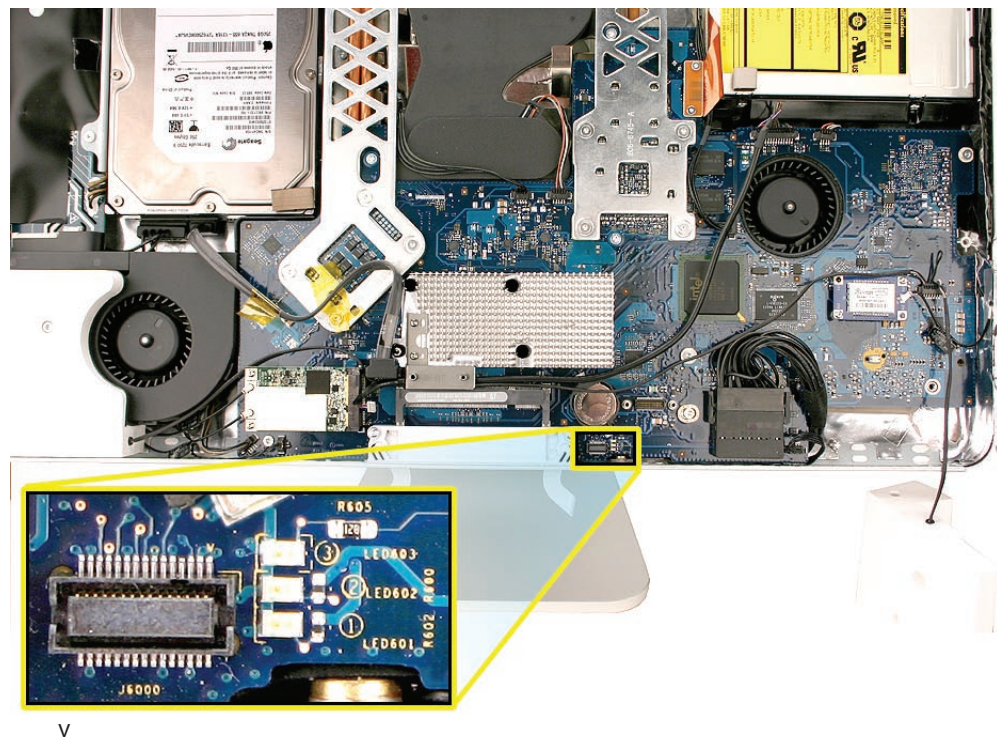
1. From the Apple menu, choose Shut Down (or if the computer is not responding, hold the power button until it turns off).
2. Unplug all cables from the computer, including the power cord.
3. Wait at least 15 seconds.
4. Plug the power cord back in, making sure the power button is not being pressed at the time.
5. Reconnect your keyboard and mouse to the computer.
6. Press the power button on the back to start up your computer.

Diagnostic LEDs

The iMac (20-inch Late 2006) has three built-in diagnostic LEDs and a front power-on/sleep LED on the main logic board that can help you to troubleshoot the computer.

To Access the Diagnostic LEDs:

1. Follow the take apart instructions to remove the RAM access door, front bezel, and lower EMI shield.
2. Locate the SO-DIMM slot and LVDS video connector. The three diagnostic LEDs 1, 2, and 3 are located below the battery and to the right of the memory slot. Note that the LEDs are marked 1, 2, 3 as show below. An additional front bezel LED is located in an opening at the center of the right speaker, (see photo on the next page).



LED #1

- Indicates that the trickle voltage from the power supply has been detected by the main logic board. This LED will remain ON whenever the iMac is connected to a working AC power source. The LED will remain on even when the computer has been shut down or put to sleep. The LED will turn off only if the AC power source is disconnected or the power supply is faulty.

LED #2

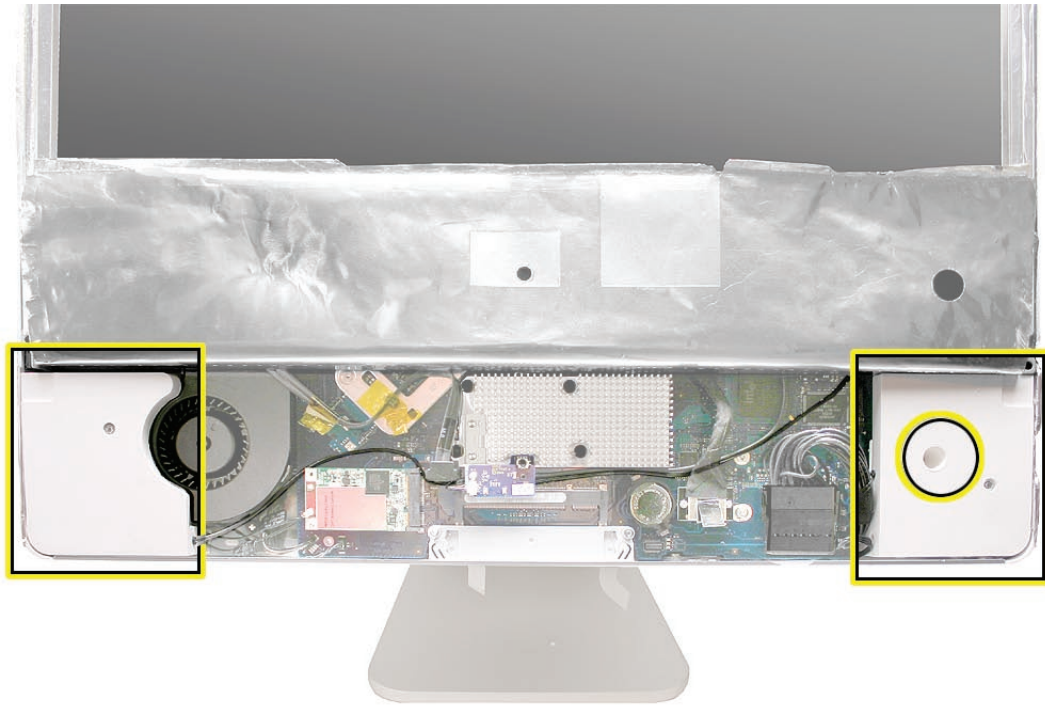
- Indicates that the main logic board has detected proper power from the power supply when the computer is turned on. This LED will be ON when the computer is turned on and the power supply is working correctly.

LED #3

- Indicates that the computer and the LCD display are communicating. This LED will be ON when the computer is turned on and video signal is being generated.

Front LED

- Indicates that the computer has power but no video signal (e.g., the computer is starting up or the display has entered Sleep mode, turning off the video signal). This LED will pulse when the entire system has entered Energy Saver mode.





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. Because cures are listed on the charts in the order of most likely solution, try the cures in the order presented. Verify whether or not the product continues to exhibit the symptom. If the symptom persists, try the next cure.

Note: If a cure instructs you to replace a module, reinstall the original module before you proceed to the next cure.

Power Issues

No Power.

The iMac will not turn on. The display remains black and there are no sounds from the fans or drives.

1. Verify the power outlet is good. Plug a different device into the socket to ensure there is power, or plug the iMac into another outlet. Does the iMac power on now?

Yes: Resolved. Bad outlet.

No: Go on to the next step.

2. Check the power cord. Use a known good power cord. Does the iMac power on now?

Yes: Your power cord has failed. Replace the AC power cord.

No: Go on to the next step.

3. Check the connection of the power cord on both ends. Verify that the power cord is securely plugged into both the AC outlet and back of the computer. Does the iMac power on now?

Yes: You may have a loose fit to your power cord. Replace the AC power cord and test.

No: Go on to the next step.

4. Plug a bus powered FireWire device in like an iPod using a FireWire cable or other FireWire drive or device with a power LED. Does the iPod show charging or the FireWire device show a power LED on?

Yes: The AC Power Inlet is good. Go on to the next step.

No: AC power is not being detected. If you've verified the outlet and power cord, replace the AC Power Inlet.

5. Plug a bus powered USB device into the USB ports on the rear of the computer like a keyboard, iPod Shuffle or USB 2.0 iPod using a USB cable and press the power button. Does the iPod show power or the keyboard caps lock LED light?

Yes: The Power Supply is functioning. Go on to the next step.

Yes, but only for a moment: The Power Supply cannot maintain power; replace the Power Supply.

No: The Power Supply has failed. Replace the Power Supply.

6. At this point in the Power On process, you should hear a boot chime and see the front LED on the computer light up. When the main logic board and LCD panel communicate to deliver video, the front LED should go out. Does the Front LED go off?

Yes: The LCD and main logic board have communicated. If there is no picture on the display, follow No Video troubleshooting.

No: Your logic board is not communicating with LCD panel. Open the unit and re-seat the TMDs cable and test again. If the issue persists, replace the main logic board.

No Video

No Video, No Boot Chime, White LED ON (Symptom 1)

The iMac will turn on (indicated by the front LED ON), but there is NO boot chime and No Video on the display. The faint sound of the fans, hard drive, and optical drive may also be heard.

1. Reset the SMC (Formerly SMU).
 - Turn off the computer by choosing Shut Down from the Apple menu, or by holding the power button until the computer turns off.
 - Unplug all cables from the computer, including the power cord.
 - Wait 15 seconds.
 - Plug in the power cord while simultaneously pressing and holding the power button on the back of the computer.
 - Let go of the power button.
 - Press the power button once more to start up your iMac.

Does the computer display video after successfully resetting the SMC?

Yes: Problem solved.

No: Continue to next step.

2. Verify that only supported SDRAM memory has been installed and that it has been installed correctly. Unsupported and/or defective memory can prevent the iMac from booting. It may be necessary to install known good memory for testing purposes and replace any unsupported or defective SO-DIMM's identified during this process.

Does the computer display video after verifying and/or replacing the memory with known good memory?

Yes: Problem solved. Verify full system functionality before return the system to the customer.

No: Replace the logic board.

No Video, Boot Chime heard, White LED ON (Symptom 2)

The iMac will turn on, the boot chime can be heard, a white LED appears on the front bezel and sounds from the fan or drive activity can be heard, but the display has no picture or color.

1. Check if the computer is sleeping. Press the space bar to wake the computer from sleep mode. Did the computer wake from sleep?

Yes: Put the computer to sleep from the Apple menu and wake the computer again to test. Check Energy Saver setting to see when the computer has been designated to sleep.

No: Continue to next step.

2. Reset your computer's PRAM (Parameter RAM):

- If your iMac is on, turn it off by holding the power button until the unit powers off. You should hear the fans go quiet.
- While the computer is off, with your left hand, hold down the Apple key, the Option key next to it, and the letter "R" key on the keyboard. When you have these keys all pressed down, push the power button with your right hand and then quickly move that hand to hold down the letter "P" on the keyboard. Keep these four keys pressed while the computer starts up.
- Make sure you hold down the four keys (P - R - Apple - Option) while the computer is starting up. When you hear the computer's start up chime for the second time, you can let go of the keys on the keyboard.
- If you didn't hear at least two startup chimes, go to the top of this section and begin again. It's important that you hear two startup chimes when performing this procedure. This indicates that you have successfully reset the computer's PRAM (Parameter RAM).

3. Does the computer display video after successfully resetting the computer's PRAM?

Yes: Restart the computer from the Apple menu and make sure the computer is now working correctly.

No: Continue to next step.

4. Make sure the machine is powered off; power off the machine by holding in the Power Button on the rear of the machine. Turn on the machine. Observe the white LED on the front bezel during startup; it should go out after a few moments. Did the LED go off?

Yes: If the LED went off, this indicates that the main logic board has communicated with the LCD display for video signal and your main logic board should be good. You can confirm by connecting an external monitor and checking to see that you have video out. Go to Step 8.

No: Continue with the next step to reset system power management (SMC).

5. Reset the SMC (Formerly SMU).

- Turn off the computer by choosing Shut Down from the Apple menu, or by holding the power button until the computer turns off.
- Unplug all cables from the computer, including the power cord.
- Wait 15 seconds.
- Plug in the power cord while simultaneously pressing and holding the power button on the back of the computer.
- Let go of the power button.
- Press the power button once more to start up your iMac.

Does the computer display video after successfully resetting the SMC?

Yes: Press and hold the power button until the computer powers off. Start the computer again and confirm that front LED is reliably going off. If the computer still has no video but the LED is reliably going off, continue with step 8.

No: Go to the next step.

6. Unplug the iMac and remove the SDRAM. Replace with known good SDRAM. Plug the iMac back in and power the unit on. Does the front LED go off after a few moments now?

Yes: Replace the original SDRAM and test again. If the front LED does not go off with the only the original SDRAM installed, replace the SDRAM. If the LED is now reliably going off after a few moments, but yet you still do not have any video, go to step 8.

No: If the LED remained on, the main logic board is not communicating with the LCD panel to generate video. Replace the main logic board.

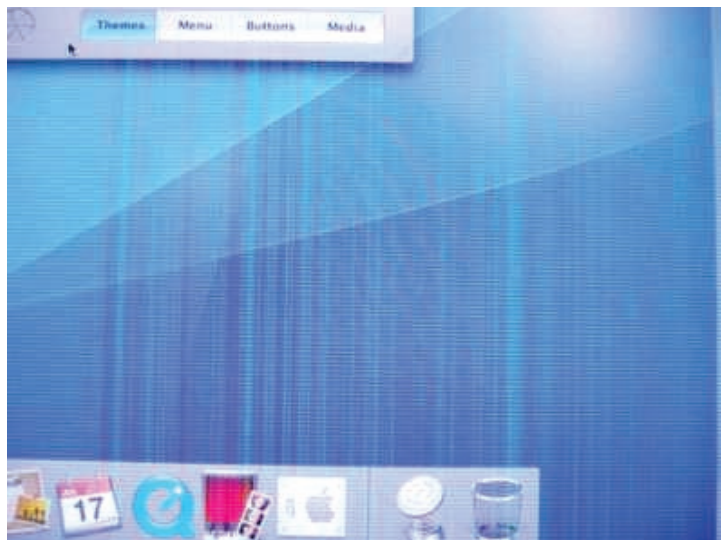
7. With the LED going off, you may have a No Backlight condition or an LCD failure. In a dim room, turn the display at an angle to you and look closely at the display. Is the display completely black or can you see a dim, purplish light or glow to the display?

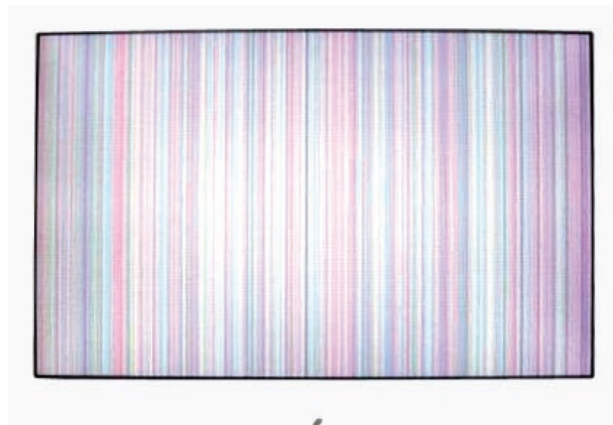
- Completely black: Replace the inverter
- Dim purplish light or glow: Replace the LCD panel.

Video Distortion After Waking From Sleep

Shimmering, Vertical Lines, Horizontal Lines

The iMac will wake from sleep, but a slight shimmering of the image may be visible. In some cases the shimmering on the display may worsen so that the display fills with vertical lines, horizontal lines, or the image begins to shake (refer to the following four images samples.) Continue with the procedure to correct the issue.





1. Open the Energy Saver System Preferences and temporarily set the display to sleep after one minute. Set the computer to sleep after ten minutes. Once the Energy Saver preferences have been set, wait for the display to go to sleep.

-
2. Wake the display from sleep and observe the display. Does the image on the display shimmer or fill with horizontal or vertical lines when waking from sleep?

Yes: Replace the main logic board

No: Continue troubleshooting using appropriate symptom charts

Note: To ensure optimal image quality the system should be left unplugged for approximately two hours after reproducing this failure. Once the logic board has been replaced wait until the system has been off for approximately two hours before powering up the system. Be sure to restore the customer's Energy Saver preferences to their previous values before returning the system to the customer.

Display

When displaying a single color over the screen area, the LCD panel shows one or more pixels that are not properly lit

Active-matrix LCD technology uses rows and columns of addressable locations (pixels) that render text and images on screen. Each pixel location has three separate subpixels (red, green, and blue) that allow the image to be rendered in full color. Each subpixel has a corresponding transistor responsible for turning the subpixel on or off.

There are typically millions of these subpixels on an LCD display. For example, the LCD panel used in the Apple Cinema HD display is made up of 2.3 million pixels and 6.9 million red, green, and blue subpixels. Occasionally, a transistor does not work perfectly, which may result in the affected subpixel being turned on (bright) or turned off (dark). With the millions of subpixels on a display, it is quite possible to have a low number of faulty transistors on an LCD. Therefore, a certain number of subpixel anomalies is considered acceptable. Rejecting all but perfect LCD panels would significantly increase the retail price for products using LCD displays. These factors apply to all manufacturers using LCD technology—not just Apple products.

To determine whether or not the display has an acceptable number of pixel anomalies, follow the steps below:

1. Set the display image to one of the following colors: all-white display, all-red display, all-green display, or all-blue display.
2. Using a jeweler's loupe, pocket microscope, or other magnifying device, identify and count each subpixel anomaly:
 - Bright subpixel anomaly = subpixel that is always on
 - Dark subpixel anomaly = subpixel that is always off
3. **Important:** Check the number of subpixel anomalies with the following chart:

LCD Size (inches)	Acceptable Number of Subpixel Anomalies			Replace the Display		
	Bright	Dark	Both	Bright	Dark	Both
17 to 20	up to 4	up to 6	up to 8	5 or more	7 or more	9 or more

4. If the number of subpixel anomalies exceeds the acceptable number listed in the chart, replace the LCD panel.
5. If the number of subpixel anomalies is acceptable, explain to the customer that the pixel anomalies are within specifications, and no repair is necessary.

Important: Do not release the specifications to customers. Instead, inform them that a certain number of subpixel anomalies is considered acceptable, and these factors apply to all manufacturers using LCD technology—not just Apple products.

Hard Drive

Flashing question mark, or an alternating question mark and Mac OS (face or a folder)

Note: When troubleshooting hard drive problems it is a good idea, if possible, to back up any important data. Some troubleshooting steps may require erasing the contents of the hard drive.

1. Boot from the system CD that came with the computer, and open Disk Utility. Does the hard drive show in Disk Utility?
Yes: Run Repair Disk and Repair Permissions to correct any directory and permissions issues. Go on to Step 2.
No: Go to Step 3.
2. Did Disk Utility successfully repair directory or permissions?
Yes: Restart the computer to the hard drive. Go on to Step 3.
No: Go to Step 3.
3. Did the computer successfully start to the internal Hard Drive?
Yes: Run Apple Hardware Test version 3A108 or later for this machine and return to the customer if it passes.
No: Boot the machine to Apple Hardware Test, version 3A108 or later, or to Apple Service Diagnostic for iMac, version 3S106 or later.
4. Did the machine successfully boot to the Diagnostic?
Yes: Run the test suites.
No: Make sure you're using the correct version of the Diagnostic, and that the disc is able to boot another machine that it supports. If so, then try booting from an external optical drive. If this is successful, you should replace the optical drive and retest the machine booting to the diagnostic disc.
5. Did the tests pass?
Yes: Reinstall the System Software that came with the computer and test.
No: Replace the component (s) indicated by the test results.

Hard Drive Issues

Note: The following information is for Intel-based and PPC Macintosh drive compatibility

- Drives to be used in booting Intel-based Macintosh hardware should be formatted and partitioned with an Intel-based Macintosh disk utility running on Intel-based Macintosh hardware. That should ensure you get the correct default partition map and structure for reliable booting.
- Intel-based Macintosh CPUs in Target Disc Mode will only mount on PPC machines running Mac OS X 10.4 or later, and may show one contiguous partition rather than separate partitions on the host machine.
- Always make sure to use the OS that came with the machine if you need to reinstall software (ask the customer for the discs if necessary), and the diagnostics specifically designated for that hardware.

System hangs during normal startup process

1. Boot from the system CD that came with the computer. Use Disk Utility to verify the hard drive.
2. Using Disk Utility, reformat the hard drive.
3. Check all cable connections to and from the hard drive.
4. Replace the hard drive data cable.
5. Replace the hard drive.
6. Replace the logic board.

Optical Drive

CDs or DVDs don't show up on the Desktop.

1. Select Preferences from the Finder menu and make sure the option to show CDs, DVDs and iPods is checked: in the General window as shown below.



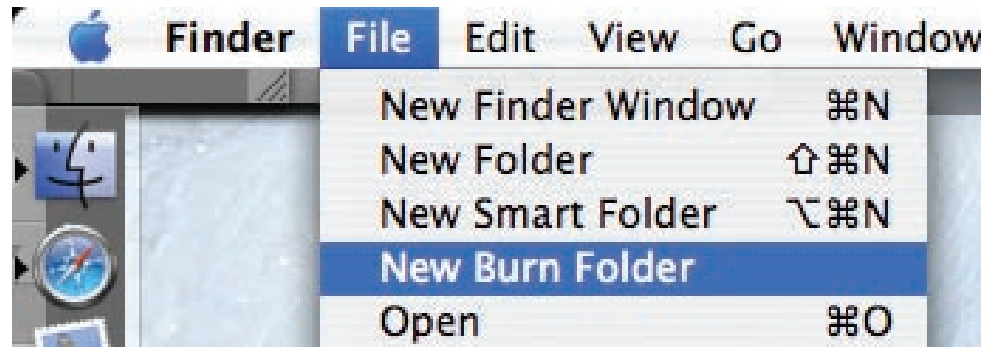
2. Select System Preferences from the Apple menu and open the CDs & DVDs preferences window. Make sure that audio CDs are set to launch iTunes and movie DVDs set to launch DVD Player when those media are inserted, as shown below.



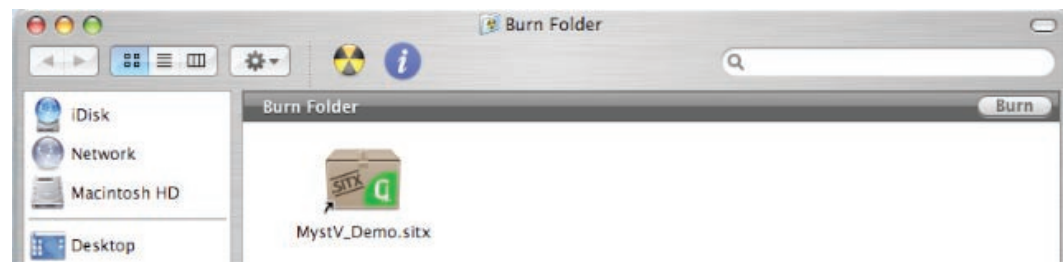
3. Check that the drive can read discs normally. Insert an audio CD and check whether it shows up on your desktop or launches iTunes.
Does the audio CD mount on the desktop or in iTunes?
Yes: The drive seems to read CD discs okay. Go on to Step 4.
No: Make sure the disc is readable by other computers. Try other CD discs. If none mount or no audio CDs launch iTunes, replace the optical drive.”
4. Eject the audio CD and insert the iMac Software Install and Restore DVDs that came with the customer’s computer, or insert a DVD movie.
Does this disc show up on the desktop, or does the movie launch DVD Player?
Yes: The computer is reading CD and DVD media. This may be related to a specific disc or discs the customer is using and you should examine those discs.
No: The optical disc is reading CD media, but not DVD media. Try other DVD discs. If none mount or movie DVDs do not launch DVD Player, replace the optical drive flex cable.
5. If after replacing the optical drive flex cable the drive still won’t mount any optical media, replace the optical drive. If the issue persists, then replace the logic board.

The computer won't burn discs.

1. Check whether the drive can read CDs and DVDs normally. Perform the steps above for "CDs or DVDs don't show up on the Desktop."
2. Try a test burn by creating a Burn Folder, as follows.
 - In the Finder, choose "New Burn Folder" from the File menu.



- Open the Burn Folder, drag an item inside for testing, and click "Burn" in the upper right corner of the window.



- When prompted, insert a blank disc and follow the dialog instructions.
Does the disc burn successfully (problem solved), fail with an error, or is the disc ejected?
3. If the disc fails to burn with an error, check for these error messages.
 - Unknown Error -2147352480.** See Knowledge Base article 25480 and 25750 for more information.
 - Buffer underrun error.** See Knowledge Base articles 25480 and 25750 for more information.
 - Unknown Error.** If you see "Unknown Error" without "-2147352480", you will want to see Knowledge Base article 152224 for more information.
 4. If the blank disc is ejected, try another blank disc. If the issue persists, try another brand and speed of blank media; if you're using blank CD media, see if this happens with blank DVD media. If the drive consistently rejects all blank media, or only rejects blank CD media while accepting blank DVD media or vice versa, replace the optical drive flex cable and test. Does the drive successfully burn to disc after replacing the optical flex cable?
Yes: Problem solved.

No: Replace the optical drive. Does it burn correctly now?

Yes: Problem solved.

No: Replace the logic board.

Discs won't insert.

1. Is there a disc already in the drive?

Yes: Eject the disc before inserting another. Refer to Knowledge Base article 106752, "Macintosh: How to Eject a Disc When Other Options Do Not Work." If none of these options will eject the disc, you may have to disassemble the drive to recover the disc. See Knowledge Base article 86382 - Macintosh: How to Remove a Stuck Disc From a Slot-Loading Drive.

No: Reseat the optical drive. Perform the "Optical Drive" procedure in Take Apart to reseat the drive in the mounting aperture and reconnect the optical flex drive cable connector.

2. After reinstalling the optical drive, can you now insert a disc?

Yes: Issue resolved. Run diagnostics and return the system to the customer.

No: Replace the optical drive flex cable.

Yes: Problem solved. Run diagnostics and try inserting a disc again.

3. After replacing the optical drive flex cable, can you insert a disc now?

Yes: Issue resolved. Run diagnostics and return the system to the customer.

No: Replace the optical drive.

Optical disc constantly ejects

1. Disconnect all peripheral devices, especially the mouse in cases where the disc is constantly ejecting. Retest. If the issue is resolved, reconnect peripherals one-at-a-time until faulty peripheral is identified.
2. Try cleaning the disc. If the disc is dirty or scratched, it may not mount.
Is the issue resolved?
Yes: Problem solved.
No: Try a different disc. If the issue persists, go on to the next step.
3. Boot from Apple Hardware Test (hold down the “D” key at startup). If you can boot to this volume, run the Quick and Extended tests.
Does the unit pass the tests?
Yes: Restart to the internal hard drive and test again.
No: Replace the component (s) indicated by the test results. If you cannot boot to Apple Hardware Test because it ejects, go on to step 4.
4. Boot from the system install DVD (use Startup Manager, hold down the Option key at startup). If you can boot from this volume, perform an Archive and Install with the Install DVD that came with the computer and test.
Is the issue resolved?
5. **Yes:** Problem solved.
No: If you cannot boot to Apple Hardware Test or to the Install DVD because they eject, reseal the optical drive flex cable and retest.
6. Replace the optical drive flex cable.
7. Replace the optical drive.
8. Replace the logic board

Fan Sound

Fans running at full speed after the computer turns on

The customer may have entered a diagnostic mode that causes the fans to run at full speed.* Restarting the system will not restore normal fan operation. To solve the problem, the user or technician should do the following:

1. Shut down the system.
2. Disconnect the power cord and wait 15 seconds.
3. Reconnect the power cord and wait 5 seconds.
4. Power on the system.

***Note:** Customers reporting this symptom should be told to press the power button AFTER the power cord has been fully inserted. Inserting the power cord while pressing the power button will cause the fans to run at full speed.

Loud fan noise coming from inside the computer

The iMac has a trio of fans that circulate air throughout the system. It also includes temperature sensors, and advanced thermal software that spins the fans fast or slow as needed. As the system usage increases, the fans will adjust their speed using advanced thermal software to meet the cooling needs of the system.

Under normal conditions, rotating fans will make a slight hum that varies in relationship with their rotational speed and the amount of air that they are moving. In addition, the normal functioning of the hard drive and optical drive will generate additional whirring and scratching sounds that may be audible. All of these sounds are normal and do not indicate a failure with your computer.

To begin troubleshooting a possible fan issue, we need to qualify the sound that you're experiencing.

1. Does the sound occur only under specific light/heavy usage conditions?

Yes: CPU intensive applications such as iTunes, Garage Band, DVD Player, etc., or two or more applications open at once will cause the fans to run at an increased rate making them more noticeable. If the sound only occurs when one or more of these applications is running, this is normal.

No: If the sound isn't affected by CPU intensive application it may be due to other factors. Go on to the next step.

2. Is the sound always present, or does the sound vary?

The sound is always present: The normal functioning of the hard drive and optical drive will generate additional whirring and scratching noises that may be audible. Check whether this sound is related to one of the components. Go to step 4.

The sound varies: Under normal conditions rotating blowers will make a slight hum that varies in relationship with their rotational speed and the amount of air that they are moving. Let's see if this is indeed the case. Go to Next Step.

3. Are the fans making a normal humming sound that increases/decreases in relation to processor usage? As the fans increase their speed to cool the system the sound level will increase.

Launch the Activity Monitor application included with Mac OS X in the Utilities folder to determine whether the noise corresponds with heavy usage of the CPU. Does fan activity increase / decrease with the CPU Usage graph in Activity Monitor? Check by running CPU intensive applications such as iTunes.

Yes: This is normal operation and none of the fans require replacement.

No: If the fan activity does not coincide with CPU usage, the sound you're hearing may not be fan activity. Go to the Next Step.

4. The normal functioning of the hard drive and optical drive will generate additional whirring and scratching noises that may be audible. We can isolate these noises by booting the computer to the iMac Install Mac OS X Install Disc 1.

- Place the disc in the drive, and restart your machine while holding down the "C" key as the machine starts up.

- Once at the Installer window, choose Open Disk Utility from the Installer Menu.

- Once Disk Utility is open, select the system's hard drive and on the toolbar choose Unmount. **Note:** if the drive has multiple partitions, unmount each of these partitions. This will spin down the hard drive. The optical drive will also be busy at this time; wait a moment for the optical drive to spin down also and then listen to the machine.

Is the sound still present?

Yes: With the hard drive and optical drive inactive, all you should be hearing are the fans in the machine. While booted to the CD, these fans should be running at a lower level since CPU activity is low with both drives inactive. Fan sound that includes objectionable ticking, whistling, or squealing may require further investigation and/or replacement of the particular fan. Go on to the next step.

No: The normal functioning of the hard drive and optical drive will generate additional whirring and scratching sounds that may be audible. All of these sounds are normal and do not indicate a failure with the machine. If you wish to check the health of the hard drive, see

article 152349, "Replacing a disk before it fails."

5. Shut down the computer, remove the power cord and any other connected cables, and remove the access door, front bezel, and EMI shield.
Stand up the computer, plug it in, and start it up by pressing the external power button.

As the machine starts up, listen carefully to each of the three fans, and see if you can locate the fan from which the objectionable ticking, whistling, or squealing sound is coming. The CPU fan is the left-most fan, the hard drive fan is in the center, and the optical drive fan is on the right.

Can you pinpoint the fan making the sound?

Yes: Replace the noisy fan.

No: If you can hear an objectionable ticking, whistling, or squealing sound, but you cannot identify the source of the sound, contact Apple Technical Support.

Fans are running at a constant high speed

If the fans on the system are running at a constant high speed, or ramp very quickly to high speed and do not vary once this speed is reached, the fans are most likely receiving incorrect thermal input. Follow these steps:

1. Reset the SMC and then test to see if the fans still exhibit the issue.
2. Boot to Apple Service Diagnostic tests. This will test the fans and thermal input of the sensors. If the tests fail, replace the component (s) indicated by the test.
3. Verify that the hard drive temperature sensor cable, and the optical drive temperature sensor cable are plugged in correctly. If necessary, replace the hard drive and optical drive temperature sensor cables.
4. Replace the hard drive and optical drive temperature sensors.
5. Replace the hard drive.
6. Replace the logic board.

Audible buzzing, whining, or ticking noise

The iMac contains several mechanical devices such as motors and fans that may make audible buzzing, ticking, or whining noises when they are operating in a normal manner. The sounds will vary depending on how the system is used.

When troubleshooting abnormal noises try the following:

1. Verify that the computer is running a supported version of the Mac OS X operating system. If an earlier version of the operating system has been installed then the fans may run at excessive speeds.

-
2. Determine that this noise is related to the computer by removing and shutting down all other devices in the vicinity of the computer that could be causing a sound.
 3. Eject any media inserted into the optical drive. The optical drive will make a variety of normal sounds when accessing the optical media.
 4. Quit all applications and test the computer again. Processor intensive applications may cause the fans to run at a higher RPM and therefore be more audible.
 5. Boot to Apple Service Diagnostic or later and select the EFI test suite by holding down the D key during startup. The diagnostic tests fan speeds and thermal sensor functionality. Should tests fail, replace any parts indicated by the diagnostic.
 6. Reboot the computer and check the computer again. If the noise persists and is unusually loud, contact Apple Technical Support.

AirPort

Not able to connect wirelessly with AirPort

1. From the Apple menu, choose About this Mac.
- 2- Click on More Info. System Profiler should open.
- 3- In System Profiler, in the column on the left, look under Network for a line called "AirPort Card". Select that line.
- 4- Does the section to the right say "No Information Found"?
 - Yes:** The computer doesn't realize it has an AirPort card installed. Go to step. 5
 - No:** The iMac recognizes that it has an AirPort card installed. Go to step 6.
- 5- Remove the front bezel, lower EMI shield, and two card mounting screws and reseal the AirPort card. Re-install the two card mounting screws and check System Profiler again to see if the computer sees the AirPort card. Does it recognize the card now?
 - Yes:** Problem solved. Replace the lower EMI shield and front bezel and re-test the system to verify that the original symptom is resolved.
 - No:** Replace the AirPort card. Refer to the Take Apart section for AirPort Card. If the issue persists after replacing the AirPort card, replace the logic board.
- 6- Now that we know the iMac recognizes the AirPort card, check the antennas. If the antennas are not plugged in all the way, you may have very short AirPort range.
- 7- Remove the access door, front bezel, lower EMI shield, and the two AirPort card mounting screws. Disconnect the card, turn it over and reconnect the antenna cable connectors to the card. Make sure the antenna leads are firmly seated. Replace the card and other components and retest.
- 8- If the antenna leads are plugged in properly and the AirPort card is recognized but the problem persists, there are a number of other things that could cause issues with wireless networking. Refer to Knowledge Base document [106858](#) for more networking information.
- 9- Replace the AirPort card. Refer to Take Apart/Airport Card.
- 10- Replace the AirPort antennas. Refer to Take Apart/AirPort Antennas.
- 11- Replace the logic board. Refer to Take Apart/Logic Board.

Bluetooth

Bluetooth devices won't sync with my computer

1. Make sure the computer has a Bluetooth board installed. Open System Preferences (from the Apple menu, choose System Preferences) and verify that "Bluetooth" appears in the Hardware section of the window.
2. Locate the Bluetooth board inside the computer. Reseat the Bluetooth board and the Bluetooth antenna.
- 3 Turn on Bluetooth. In System Preferences, click Bluetooth and then click the Settings tab. If you don't see "Bluetooth Power: On," click the "Turn Bluetooth On" button. Make sure that you also enable Bluetooth on your device too (please refer to your device's documentation for instructions).
- 4 Set up a new device. To set up a Bluetooth phone or PDA, click the Devices tab in Bluetooth preferences and then click "Set Up New Device" to open the Bluetooth Setup Assistant. Follow the onscreen instructions to set up your device. To set up an Apple Wireless Keyboard and Mouse, open System Preferences, click Keyboard & Mouse, click the Bluetooth tab, and then click "Set Up New Device" to open the Bluetooth Setup Assistant. Follow the onscreen instructions to set up your keyboard and mouse.
- 5 Recharge or replace your Bluetooth device's battery. If your Bluetooth device's battery is low, you may experience connection issues.
- 6 Download and install the latest software for the device.
- 7 Check for a Bluetooth update. Choose Software Update from the Apple menu (make sure that your computer is connected to the Internet). If newer Apple Bluetooth software exists, Software Update will find it.
- 8 Check for signal spoilers. Avoid situations in which metal objects come between your device and computer. Don't put the computer under a metal desk or locked away behind a metal cabinet. Keep cordless phone base stations, microwave ovens, and other electrical devices that operate on a 2.4 GHz bandwidth away. And make sure that the device and computer aren't more than 30 feet apart from each other.
- 9 Restart your computer. You may also want to try resetting your computer's PRAM and NVRAM.
- 10 Reset your Bluetooth device. First try turning your device off and then on again. If that doesn't work, see if you can reset your device.
11. Replace the Bluetooth board and test the computer again.
12. Refer to the Bluetooth Support site at <http://www.apple.com/support/bluetooth>.
- 13 Replace the logic board.

IR Remote

Remote won't communicate with system applications such as iTunes or iPhoto, or with the optical drive.

Make sure of the following when using the Apple Remote:

- You are within 30 feet of the front of the computer.
- You have an unobstructed line-of-sight to the front of the computer.
- You are pointing the lens end of the Apple Remote directly at the front of the computer.
- The computer is powered on and awake.
- The "Disable remote control infrared receiver" checkbox in the Security pane of System Preferences is NOT checked.
- Make sure the active application works with Apple Remote. Apple Remote uses Front Row, and from Front Row it can access DVD Player, iPhoto, iTunes, and QuickTime Player.
- Make sure the remote is paired with the computer. Access the System Preferences/Security pane and check "Unpair" if available. Close the Security pane, and re-pair the Apple Remote with the computer. See Knowledge Base article [302545](#).

1. Use a digital camera to test your Apple Remote.

If you have a digital camera or DV camera with an LCD display, you can use it to see if your Apple Remote is emitting a signal. Infrared beams are invisible to the human eye, but most digital cameras and video cameras use Charged-Coupled Device (CCD) chips or image sensors that are sensitive to infrared light.

To use a camera to test your Apple Remote, follow these steps:

- Turn on your digital camera or DV camera and remove any lens cover.
- Point your Apple Remote toward the camera lens.
- Press and hold the Menu button on the remote while looking at your camera's LCD display.
- If you see a faint blinking light coming from the Apple Remote in the camera's LCD, then the remote is working properly.
- If you don't see any blinking light in the camera's LCD, replace the battery in your Apple Remote and then test it again with your computer (see How to replace the Apple Remote battery" for instructions). (KBase article [302543](#))

2. Does the IR remote now communicate with an active application that works with Apple Remote?

Yes: IR remote is functioning correctly.

No: Replace Apple Remote.

IR Sensor/Receiver

Supported applications do not respond to input from the remote control.

1. Perform the checks above under “IR Remote” to verify that the Apple Remote is functioning correctly, and retest. Do supported applications now respond to input from the IR remote?

Yes: Problem resolved.

No: Go to the next step.

2. Verify that the IR Sensor can be seen in the Apple System Profiler. Open the Apple System Profiler and click on the “USB” section. You should see the following listed:

IR Receiver:

Version:	0.58
Bus Power (mA):	100
Speed:	Up to 12 Mb/sec
Manufacturer:	Apple Computer, Inc.
Product ID:	0x8240
Vendor ID:	0x05ac (Apple Computer, Inc.)

Do you see the IR Receiver listed under the USB section of the Apple System Profiler?

Yes: Go on to the next step.

No: Replace the IR cable and retest. Refer to the “IR Board” take apart procedure

Do supported applications now respond to input from the IR remote?

Yes: Problem resolved.

No: Replace the IR sensor board and retest. Refer to the “IR Board” take apart procedure.

If the issue persists after replacing these parts, replace the logic board.

3. Access System Preferences and click Security. In the Security pane check the following:
 - Make sure “Disable remote control infrared receiver” checkbox is not checked.
 - If “Unpair” is available in the Security pane of System Preferences, another Apple Remote may be paired to the computer (pairing allows only one Apple Remote to control the computer). To delete a pairing between the remote and the iMac G5 (iSight), click Unpair. (You may have to enter your Administrator password to make changes in the Security pane.) After making sure these features are disabled, does the Apple Remote control the machine now?

Yes: Problem resolved.

No: Replace the IR sensor board and retest. Refer to the “IR Board” take apart procedure.

Built-in iSight Camera

The built-in camera is not recognized.

1. Boot the iMac to the desktop and launch iChat AV. **Note:** You do not need to be connected to a network to use iChat AV to troubleshoot. Verify that the correct versions of Mac OS X and iChat AV are installed. Reinstall or update software as needed.
2. Open the iChat AV preferences and click on the 'Video' icon. Verify whether the camera is recognized by the iChat AV software. Is the camera recognized?

Yes: the camera is recognized and video preview is normal: This indicates the camera is functioning. Pull down the 'Video' options from the menu bar and verify that the camera is enabled. The camera must be enabled to function.

No: the camera is not recognized and no video preview is visible. This indicates the camera may not be functioning properly. Open the iMac and inspect the camera board (inside the front bezel) and the attached cable. Reseat the cable on the camera board and check the other end of the camera cable connections to the logic board. The camera cable connectors are on the right side of the logic board, below the optical drive and to the right of the fan. Go on to the next step if this didn't solve your problem.

3. Replace the camera board located inside the front bezel.
4. Replace the camera cable.
5. If the iSight camera still doesn't appear in System Profiler on the USB bus after replacing the camera board or camera cable, replace the logic board.

Camera recognized but no video.

1. Verify that the lens assembly for the iSight camera located in the top middle of the front bezel is not obstructed by anything including Post-It notes or other objects.
2. Replace the camera board in the front bezel and retest.

Camera image quality poor.

The built-in camera is recognized by iChat AV and other supported video applications however the image quality is poor.

1. Verify that the lens assembly for the iSight camera is clean. Fingerprints and other contaminants can affect image quality. Clean the lens using a lint free lens cleaning cloth being while being careful not to scratch the lens.
2. Verify that there is sufficient lighting to produce a good quality image. Lighting which is comparable to that found in a well lit office will product a good quality image. If possible, avoid having a brightly lit background. Diffused lighting is preferred over direct lighting.
3. Launch iChat AV and open the iChat AV preferences. Click on the 'Video' tab. Is the video quality acceptable?

Yes: The camera is functioning normally. The image quality problems may be caused by

bandwidth limitations when using iChat over the internet. Instruct the customer to use the iChat AV connection doctor feature to verify that there is sufficient bandwidth to have a video iChat session without a significant degradation of image quality.

No: The camera may not be functioning normally. Replace the camera board in the front bezel and retest.

Camera recognized but no audio

1. Open the System Preferences window and click on Sound.
2. Verify that the built in iSight camera has been selected as the device for sound input.
3. Verify that the volume settings (on the slider bar) are appropriate.
4. Launch iChat AV and open the iChat AV preferences. Click on the 'Video' icon. Speak into the microphone while monitoring the microphone level indicator. Does the line level meter respond while you are speaking?

Yes: The microphone circuit is functioning correctly. Check the preference settings of any supported AV applications the customer is experiencing problems with to make sure that the microphone feature is enabled and that the internal iSight microphone has been selected as the input device.

No: Inspect the microphone / camera cable attached to the camera board inside the front bezel. If the cable is damaged, replace the cable and retest. If the issue continues, replace the front bezel. The front bezel contains the microphone.

Audio Quality Poor

The camera is recognized but the built-in microphone's audio quality is poor.

1. Open the System Preferences window and click on Sound.
 - Verify that the built-in camera has been selected as the sound input port.
 - Verify that the input volume settings are appropriate. Use the volume level meter to verify settings.
2. Open iMovie and create a new project. Click on the Audio button and record a sound sample. Is the sound quality acceptable?

Yes: The microphone is functioning normally. The audio quality problems may be caused by bandwidth limitations when using iChat over the internet. Instruct the customer to use the iChat AV connection doctor feature to verify that there is sufficient bandwidth to have an audio iChat session without a significant degradation of audio quality.

iChat AV allows the user to limit the allocated bandwidth which could impact audio quality. Check the settings and increase the bandwidth if needed.

No: The microphone may be faulty. Replace the front bezel which houses the microphone.

Speakers

Can't hear sound from the speakers.

1. Disconnect any external microphones, speakers, or headphones.
2. Access System Preferences and select Sound. In the Sound pane, select Output and make sure the Internal speakers are selected as the device for sound output, the Output volume is adequate, and Mute is not selected. Do you have sound now?
Yes: Problem resolved.
No: Go to the next step.
3. Reset parameter RAM. Press Command-Option-P-R during startup but before "Welcome to Macintosh" appears. Do you have sound now?
Yes: Problem resolved.
No: Go to the next step.
4. Plug headphones or external speakers into the Line out /headphone port. Do you have sound through these devices when plugged in?
Yes: Verify that the speaker cable connector is securely attached to the logic board. If the issue persists, replace the speakers.
No: Replace the logic board
5. Verify that the speaker cable connector is securely attached to the logic board. Do you have sound now?
Yes: Problem resolved.
No: Replace the speakers.

I hear sound out of only one speaker.

1. Are there any external microphones, speakers or headphones plugged into the iMac?
Yes: Disconnect any external microphones, speakers, or headphones. Do you hear audio from both of the built in speakers on your iMac?
Yes: Good. It looks like the built-in speakers are working properly. This may be an issue with the microphone, speakers or headphones that were plugged into your iMac. Please work with the manufacturer to troubleshoot this issue.
No: Go to step 2.
No: Check your speaker balance. If your balance setting was set to the left or right speaker, you would only hear sound from one speaker. Go to step 2.
2. Open System Preferences. (System Preferences can be found under the Apple menu.)
3. Click once on the sound icon.
4. Click once on the Output tab.
5. Make sure your balance setting is in the middle. After adjusting the audio balance, do you have audio from both speakers now?
Yes: It looks like the issue was the balance was not set properly.
No: Replace the speakers.
6. If the speakers did not solve the problem, replace the logic board.

Mouse

The mouse is slow or not tracking smoothly

Refer to Knowledge Base article [93369](#).

The Apple Wireless keyboard and mouse have connection issues.

If you have any of these issues, refer to Knowledge Base article [86496](#) for more information.

- If you can't wake the computer up using the Apple Wireless Keyboard or Apple Wireless Mouse.
- You can't pair the computer with the Apple Wireless Keyboard or Apple Wireless Mouse.
- You can't maintain a connection between the computer and the Apple Wireless Keyboard or Apple Wireless Mouse.

My mouse doesn't work at all.

1. Turn over the mouse and check the if the red LED on the underside of the mouse. Is the LED lit?

Yes: The mouse has power. Try using the mouse on another surface. Non-reflective, opaque surfaces without repetitive patterns work best. The surface should be clean, but not shiny. Optical mice won't work on glass, mirrored surfaces, glossy materials or mouse pads with pictures.

No: There is no power to the mouse. Try plugging the mouse into one of the USB ports on the machine. If the mouse won't power on from any USB port, try it on a known good machine. If the mouse fails to power on with known good machine, replace the mouse. If the mouse will power on with a known good machine, replace the main logic board.

2. If the underside LED is lit and the surface is good, and the mouse still does not track, try plugging the mouse into another USB port on the machine. Does the mouse track now?

Yes: Issue resolved. Try the other USB ports on the system to make sure you don't have a bad port.

No: Try using a known good mouse. If a known good mouse resolves the issue, replace the mouse. If a known good mouse does not resolve the issue, replace the main logic board.

My mouse works intermittently (the cursor freezes randomly) or is slow to respond.

1. Try using the mouse on another surface. Non-reflective, opaque surfaces without repetitive patterns work best. The surface should be clean, but not shiny. Optical mice won't work on glass, mirrored surfaces, glossy materials or mouse pads with pictures. Does the mouse track correctly on a proper surface?

Yes: Issue resolved.

No: Check the Mouse Tracking setting in the Mouse control panel.

2. Boot to another volume (like the System Install Disc). Does the mouse track properly now?

Yes: Reinstall System Software

No: Try a using a known good mouse. If a known good mouse resolves the issue, replace the mouse. If the issue persists with a known good mouse, replace the main logic board.

Keyboard

The Apple Wireless keyboard and mouse have connection issues.

If you have any of these issues, refer to Knowledge Base article [86496](#) for more information.

- If you can't wake the computer up using the Apple Wireless Keyboard or Apple Wireless Mouse.
- You can't pair the computer with the Apple Wireless Keyboard or Apple Wireless Mouse.
- You can't maintain a connection between the computer and the Apple Wireless Keyboard or Apple Wireless Mouse.

Certain keys or none of the keys on the keyboard function.

1. Unplug all devices from your computer, including your mouse and keyboard as well as printer, scanner, external hard drives, and hubs. (Warning: Some devices may require you to perform steps before it is safe to unplug them, e.g., external storage devices.) Be sure to unplug your hub, if you have one.
2. Plug your keyboard into the back of your computer firmly and securely. Plug your mouse into the back of your computer firmly and securely. Take special care to make sure the connector is completely in the socket. Go on to step 3.
3. Does your keyboard work now?

Yes: Problem solved.

No: Unplug your keyboard and plug it into another USB slot on the back of your iMac. Does it work now?

Yes: Replace the logic board.

No: Unplug your keyboard and plug your mouse into the port the keyboard just occupied. Go on to step 4.

4. Does your mouse work now?

Yes: Replace the keyboard.

No: Replace the logic board.

My keys are sticky or slow to respond.

1. Try a known good keyboard.
2. Open System Preferences. Click on the keyboard and mouse icon. Adjust the “key repeat speed and delay until repeat” rate.
3. Replace the keyboard.

When I type, strange characters appear on the screen.

1. Depending on your iMac’s settings, a simple keystroke can change your keyboard from English to Japanese. This can result in some pretty funny characters showing up when you type. To switch to the US keyboard.
2. Open System Preferences.
3. Click on the International icon.
4. Click on the Input Menu near the top of the screen.
5. Scroll down the list and uncheck any non-US keyboard layouts.
6. Close the System Preferences. Try typing a few characters. Did it solve the problem?
Yes: Problem solved.
No: Replace the keyboard.

The USB port on my keyboard doesn’t work.

1. Unplug all devices from your keyboard.
2. Plug your Apple mouse into the left USB port on your keyboard. Does your mouse work when it’s plugged into this port?

Yes: Now plug the mouse into the right port. Does it work?
Yes: Try a known good keyboard.
No: Try a known good mouse to rule out the mouse. Then go to step 3.
No: Try a different mouse or keyboard.
3. Now unplug the keyboard from the USB port on the back of the iMac, and plug the mouse into the port the keyboard had been in. Does the mouse work now?
Yes: Replace the keyboard?
No: It appears that your USB port isn’t functioning properly. Go on to step 4.
4. Replace the logic board.

Error Beep(s)

Refer to [Power On Self Test \(POST\)](#) covered in the General Information section of this manual.

USB

A USB device doesn't work

1. Please unplug all of your USB devices from your iMac except your Apple Keyboard and Apple mouse.
2. Now plug your device directly into the back of your iMac. Does it work as expected now?

Yes: Your device works when plugged directly into the computer. This indicates a conflict with one of the other USB devices. You can test by gradually adding your devices back and seeing where the issue occurs, then contacting the manufacturer of the device(s) for assistance.

No: Unplug your device from the iMac and plug the keyboard into the port your device just occupied. Is your keyboard still working?

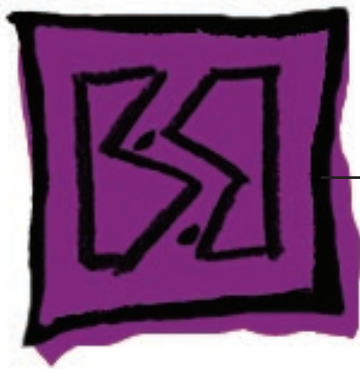
Yes: Your Apple Keyboard works when plugged into the USB port your device was plugged into. This points to an issue with your device. Please review the documentation that came with your device. Install any necessary drivers and contact the manufacturer of your device for assistance.

No: Replace the logic board

I see a message saying not enough power to function.

It appears that this device needs to be plugged into the computer's USB port, rather than the keyboard USB port. Any USB device connected to the keyboard needs to be either a self-powered device (a USB device with its own AC power supply), or a low-power device (a device that does not need a large amount of voltage to operate). Your device may draw more power than the keyboard can provide.

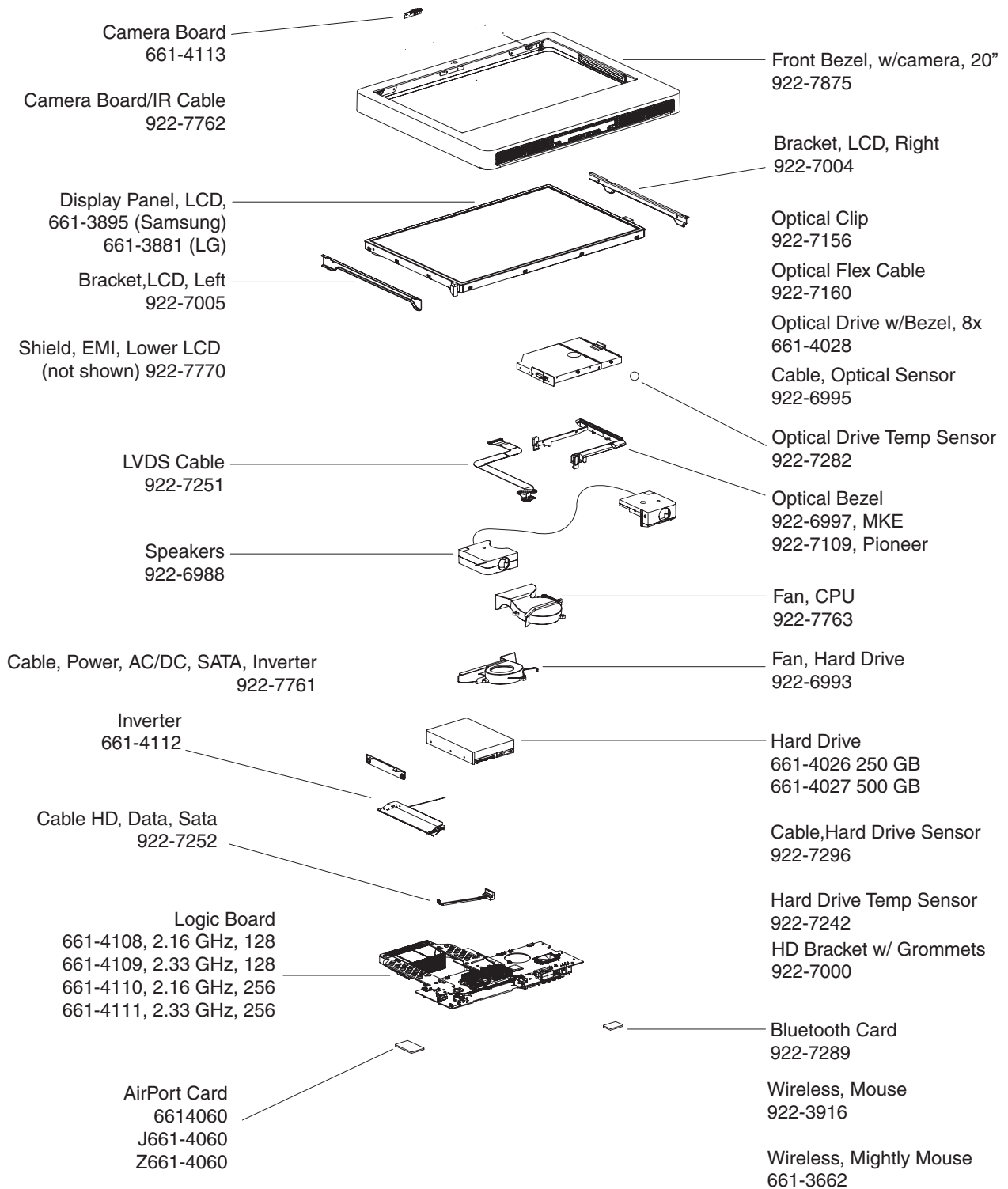
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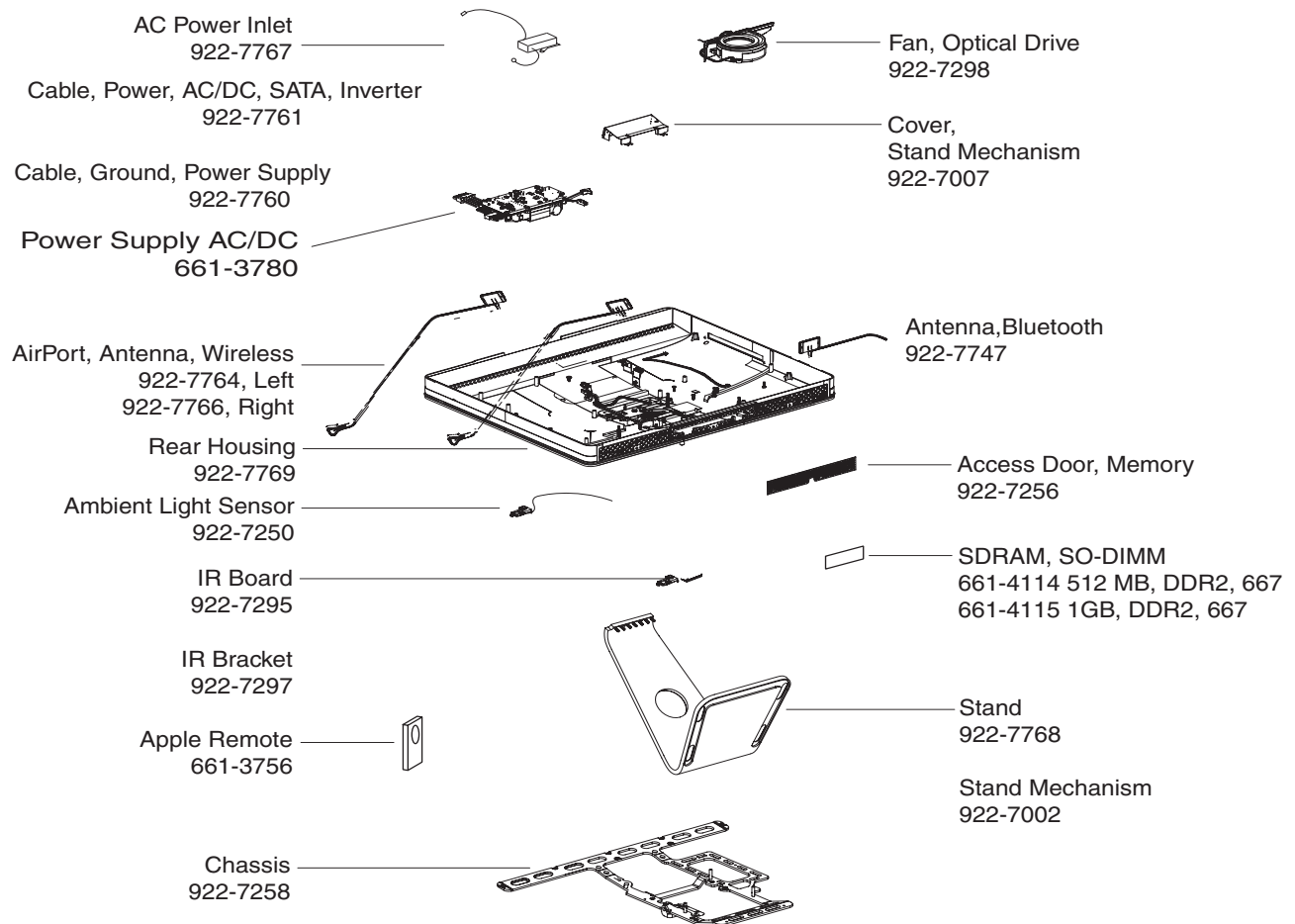
Views

iMac (20-inch Late 2006)

iMac (20-inch Late 2006)—Upper Exploded View



iMac (20-inch Late 2006)—Lower Exploded View



Not Shown:

Modem, External 661-3797

Battery 922-6476

Power Cord 922-7139

Access Tool 922-7172



Wireless Mighty Mouse 661-3662










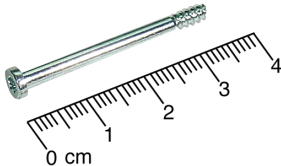
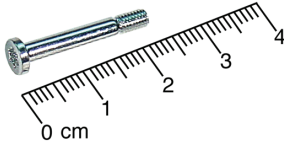




Screw Chart

Screw Chart : iMac (20-inch Late 2006): page 1

Note: Screws are not to scale.

922-6800 T10  <ul style="list-style-type: none">- LCD clips to front bezel- AC Power Inlet to chassis- Inverter board to rear cover- Logic board to chassis- Rear shield to rear cover- Support channel to rear cover	922-6850 T10  <ul style="list-style-type: none">- Chassis to rear cover	922-6842 T10  <ul style="list-style-type: none">- Power Supply board to rear cover- Logic board to chassis
922-xxx T10  <p>Logic to chassis, longest logic board screw</p>	922-7011 T8  <ul style="list-style-type: none">- Front bezel to bottom frame	922-7019 T8  <ul style="list-style-type: none">- Hard drive clip to hard drive

922-7010 T6  - IR board to IR bracket, - LVDS cable to logic - Bluetooth board to logic -AirPort card to logic	922-7159 T10  Power supply to rear cover	922-7012 T10  Stand to interconnect mechanism
922-7001 T8, round head  Hard drive pins (2)	922-7163 T10  LCD bracket to 20-inch LCD	922-7023 T10  LCD assembly to rear cover
922-7069 T10  A/C to chassis	922-7066 T10  DC board to rear cover	922-7817 T6  Optical flex board to optical
922-7014 T10  Left speaker, 20-inch	922-7015 T10  Right speaker, 20-inch	922-7018 T8  Optical bezel to optical drive

<div>922-7020</div> <div>T10</div> <div></div> <div>- Bracket mechanism to chassis</div>		
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