



Power Macintosh 7100 Series

Power Macintosh 7100/66, 7100/66AV,
7100/80, 7100/80AV



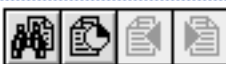
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Basics

Power Macintosh 7100 Series





Power Macintosh System Overview

PowerPC microprocessors are a family of processors built on reduced instruction-set computing (RISC) technology. RISC processors streamline the internal workings of computers. Whereas traditional (complex instruction-set computing, or CISC) processors contain a wide variety of instructions to handle many different tasks, RISC processors contain only those instructions that are used most often. When a complex instruction is needed, a RISC processor builds it from a combination of basic instructions.

RISC processors are designed to execute these basic instructions extremely quickly. The performance gains achieved by speeding up the most-used instructions more than compensate for the time spent creating less-used instructions.





Previously, RISC technology had been used only in high-end workstations and commercial database servers. With the introduction of Macintosh PowerPC computers, Apple succeeded in bringing RISC technology to personal computing.

Key Points

Three key points to remember about a PowerPC processor-based Macintosh system: It's a Macintosh; it's compatible; it offers tremendous performance.

Apple's PowerPC computers feature the same user interface as their 680x0-based predecessors. Users can mix RISC-based and 680x0-based Macintosh systems on the same network and exchange files and disks between them. In addition, users can run both 680x0 and native PowerPC applications on the same Power Macintosh system simultaneously.





Compatibility is not limited just to applications. INITs, CDEVs, drivers, and other Macintosh utility software also work on PowerPC processor-based Macintosh systems. So do AppleTalk devices (such as printers), SCSI devices (such as hard drives and scanners), ADB devices (such as mice, trackballs, and keyboards), and other Macintosh cards and peripherals.

The primary operating system for PowerPC processor-based Macintosh computers is System 7. The operating system has been optimized for the highest performance on the PowerPC processor. This optimization of System 7 benefits applications written for 680x0 systems as well as those developed specifically for PowerPC processor-based systems.

And while PowerPC-based Macintosh systems running native applications offer two to four times the performance





of the fastest 68040- and 80486-based personal computers, the real promise of PowerPC technology is that it enables Apple and other developers to deliver new software capabilities on Macintosh systems that were previously available only on high-end workstations.

Troubleshooting Tips

When troubleshooting Power Macintosh systems, keep in mind the following:

- 1 If a Power Macintosh system does not power up, you should first attempt to reset the logic board. Instructions are provided in the Additional Procedures chapter.
- 2 With Power Macintosh computers, you must install noncomposite RAM SIMMs only, and the RAM SIMMs must be installed in like pairs (that is, the same size and speed). Additional troubleshooting information is





provided in the Symptom Charts section of the Troubleshooting chapter under the “System” topic heading.

- 3 If a Power Macintosh system has bad RAM SIMMs installed, you will not hear death chimes. Instead, a dialog box will appear alerting you to the fact that a bad RAM SIMM has been detected. Additional troubleshooting information is provided in the Symptom Charts section of the Troubleshooting chapter under the “System” topic heading.
- 4 If the system hangs shortly after installing a new NuBus card, contact the vendor to verify that the card is compatible with the Power Macintosh system or to see if there is a software upgrade available. If the NuBus card is an Apple manufactured product, refer to the Service Tech Info Library for more information.





- 5 The Power Macintosh AV systems use the same logic board as the non-AV versions. The only difference is that the AV versions have the Power Macintosh AV Card installed in the PDS slot.

The Power Macintosh 7100/66 and 7100/80 systems **must** have a video card installed in the PDS slot. These systems use the Power Macintosh 2 MB Video Card. A missing card can result in a system that won't boot or a system that crashes.





HDI-45 Pinouts

This section includes an illustration of the HDI-45 connector and a table containing the pinout descriptions.

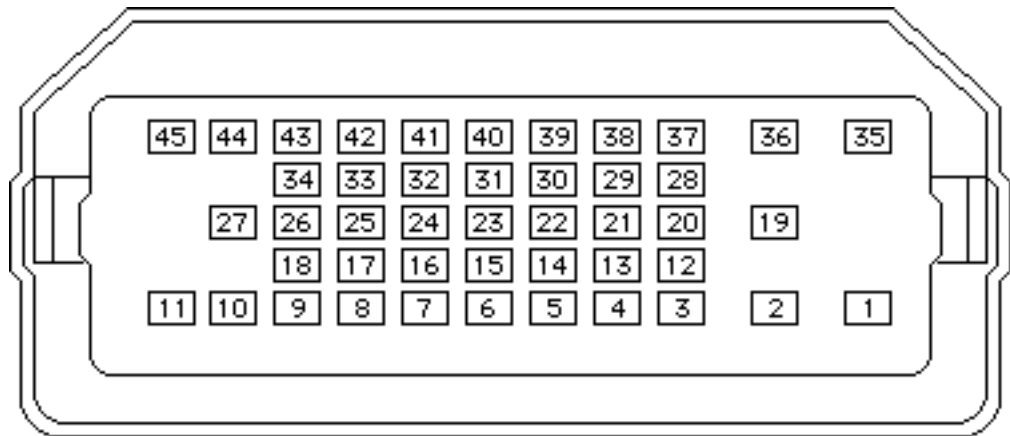


Figure: HDI-45 Connector on the Logic Board



**Table: HDI-45 Pinouts**

Pin	Description
1	Analog audio ground
2	Audio input shield
3	Left channel audio input
4	Right channel audio input
5	Left channel audio output
6	Right channel audio output
7	Reserved
8	Monitor ID sense line 1
9	Monitor ID sense line 2

(continued)





Pin	Description
10	Green ground (shield)
11	Green video output (75Ω)
12	Video input power ground
13	Power for camera +5 V
14	Reserved
15	Reserved
16	Reserved
17	Reserved
18	Monitor ID sense line 3
19	S-video input shield
20	S-video input luminance (Y)

(continued)





Pin	Description
21	S-video input chroma (C)
22	Reserved
23	Reserved
24	Reserved
25	Reserved
26	Red ground (shield)
27	Red video output (75Ω)
28	I ² C data signal
29	I ² C clock signal
30	Reserved
31	Monitor ID

(continued)





Pin	Description
32	Monitor ID
33	Vertical sync signal
34	Composite sync signal
35	ADB power +5 V
36	ADB ground
37	ADB data
38	Keyboard switch
39	Reserved
40	Reserved
41	Monitor ID
42	Horizontal sync signal

(continued)





Pin	Description
43	Video sync ground
44	Blue ground (shield)
45	Blue video output (75 Ω)

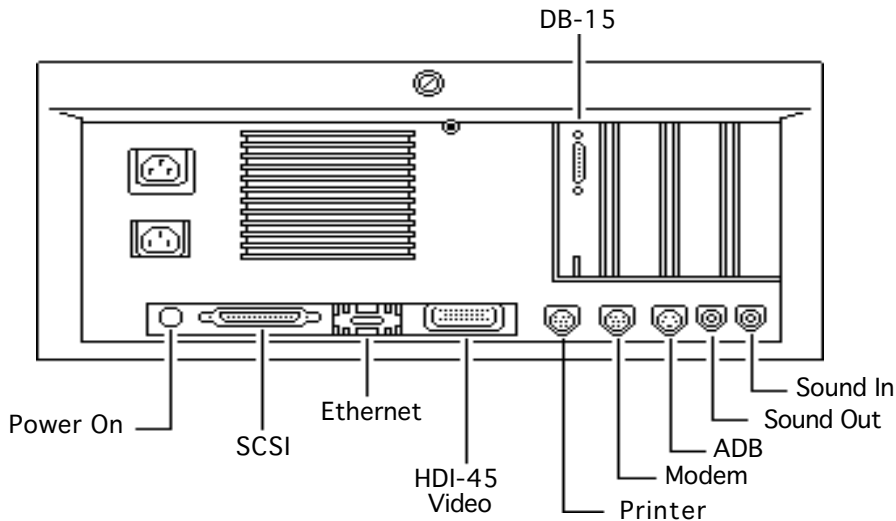




Rear Panel Connectors

The figure on the following page shows the rear panel of a Power Macintosh 7100 computer with a 2 MB Video Card installed. The AV version of the Power Macintosh 7100 would have a Power Macintosh AV Card installed instead of the 2 MB Video Card. In addition to a DB-15 connector, the AV Card includes an S-Video Input and an S-video Output port.





Power Macintosh 7100 Rear Panel

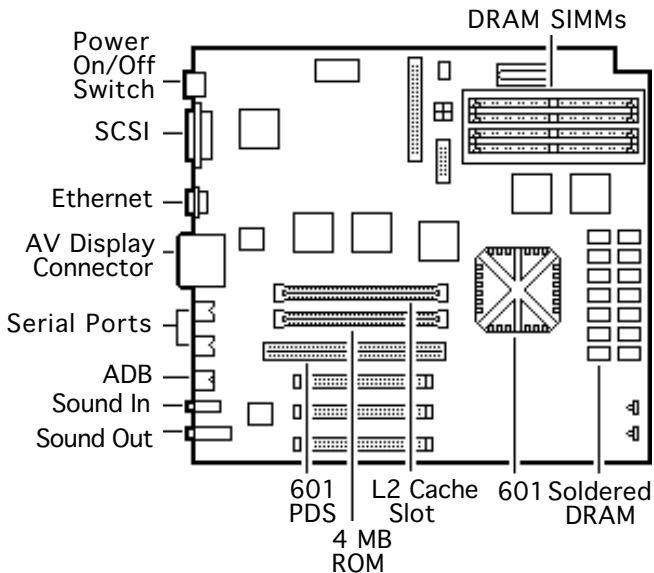




Logic Board Connectors

The figure on the following page shows a Power Macintosh 7100 Series logic board.





Power Macintosh 7100 Logic Board





Specifications

Power Macintosh 7100 Series





Processor

CPU

Built-in MMU and FPU
32K of on-chip cache memory

7100/66: 66 MHz PowerPC 601 RISC microprocessor
Requires system software version 7.1.2 or later

7100/80: 80 MHz PowerPC 601 RISC microprocessor
Requires system software version 7.5 or later

Note: To run System 7.5 on the Power Mac 7100/80, you must install enabler version 1.1.1 or later. This version of the system software, which ships with the unit, requires Finder version 7.1.5. You can verify that you have the correct Finder version installed by using the “Get Info” command.





Memory

RAM

8 MB RAM soldered on logic board, expandable to 136 MB via 4 SIMM sockets on logic board (using pairs of same size, 80 ns or faster, 72-pin noncomposite SIMMs); 16 MB configuration has two 4 MB SIMMs installed

Note: SIMMs must be installed in pairs of the same size and speed. Install noncomposite SIMMS only.

ROM

4 MB installed on SIMM socket





VRAM

7100/66 & 7100/80: 1 MB, expandable to 2 MB using four 256K VRAM SIMMs

**7100/66AV &
7100/80AV:** 2 MB

Cache

7100/66: 32K of on-chip cache; optional 256K level 2 cache available

7100/80: 32K of on-chip cache; 256K level 2 cache standard

Clock/calendar CMOS custom chip with long-life lithium battery





Disk Storage

Hard Drive

7100/66: 250 MB or 500 MB hard drive

7100/80: 500 MB or 700 MB hard drive

CD-ROM

7100/66: Optional internal CD-ROM drive

7100/66AV: Internal AppleCD 300i Plus CD-ROM drive

7100/80 & 7100/80AV: Internal AppleCD 300i Plus CD-ROM drive standard on some models and optional on others





Floppy Drive

1.4 MB Apple SuperDrive Manual Insert





I/O Interfaces

SCSI

One SCSI port; DB-25 connector

Supports a maximum of six external devices (five when internal CD-ROM is installed)

Serial

Two RS-232/RS-422 LocalTalk/GeoPort serial ports; mini DIN-9 connectors (backward compatible with mini DIN-8 connectors)

Apple Desktop Bus

One Apple Desktop Bus (ADB) port; mini-Din-4 connector
Maximum power draw 500 mA; maximum of three devices total

Ethernet

One built-in AUUI-15 Ethernet port



**Expansion Slot**

One processor-direct slot (PDS); 182-pin connector

NuBus

Three NuBus slots support standard size cards; 96-pin Euro-DIN connectors

Sound

16-bit stereo in and out

Sample rates of 48, 44.1, 24, and 22.05 kHz

Input/output line level: 1 V peak-to-peak

Input/output signal-to-noise ratio (SNR): 82 dB with no audible discrete tones

Bandwidth: 20 Hz–20 kHz (± 2 dB) at 44.100 kHz sample rate

THD+N (total harmonic distortion plus noise): less than 0.05%, measured 20Hz–20 kHz with a 1-V_{rms} sine wave input



**Video**

One HDI-45 DRAM-based video port on logic board supports direct connection to Apple AudioVision monitors and with optional HDI-45 to DB-15 adapter supports 12", 13", 14", 15" portrait, 16", and 17" monitors

7100/66 & 7100/80:

Also has a Power Macintosh 2 MB Video Card with one DB-15 VRAM-based video port that supports 12", 13", 14", 15" portrait, 16", and 17", 20", and 21" monitors

7100/66AV & 7100/80AV:

Also has a Power Macintosh AV Card with the following: one DB-15 VRAM-based video port that supports 12", 13", 14", 15" portrait, 16", and 17", 20", and 21" monitors; one S-video/composite input port; and one S-video composite output port

Note: Only one monitor can be attached to the card at one time (that is, either through the DB-15 port or the S-video port).





I/O Devices

Keyboard

Standard, extended, or adjustable keyboard
Keyboard draws 25–80 mA, depending on model of keyboard

Mouse

ADB Mouse II; Draws up to 10 mA

Microphone

7100/66: Optional Apple PlainTalk microphone; unidirectional and optimized for use with speech recognition

**7100/66AV, 7100/80
& 7100/80AV:** Apple PlainTalk microphone standard





Video Display

Video Support

System must have the Power Macintosh 2 MB Video Card or Power Macintosh AV Card installed

All Power Macintosh 7100 series computers support monochrome, color, VGA, and SVGA formats on the HDI-45 logic board connector, including:

- Macintosh 12" Monochrome Display (640 x 480)
- Macintosh 12" RGB Display (512 x 384)
- AppleColor High-Res RGB 14" Monitor (640 x 480)
- Apple AudioVision 14 Display (640 x 480)
- Macintosh Color Display (640 x 480)
- Macintosh 15" Portrait Display (640 x 870)
- Macintosh 16" Color Display (832 x 624)





Video Support

(continued)

All Power Macintosh 7100 series computers also support the following monitors via the DB-15 connector on their respective video cards:

- Macintosh 19" Color Display (1024 x 768)
- Apple Multiple Scan 20 Display (1280 x 1024)
- Macintosh 21" Color Display (1152 x 870)

And the AV versions support the following monitors via the DB-15 connector on the Power Macintosh AV Card:

- NTSC (512 x 384 and 640 x 480)
- PAL (640 x 480 and 768 x 576)





Electrical

A/C Line Input Voltage

100–240 VAC; RMS single phase, automatically configured

Input Line Frequency

50–60 Hz

Input Power

167 W maximum continuous, 230 W peak input (not including monitor power)

Power Supply DC Output

112 W continuous output





Physical

Dimensions

Height: 6.0 in. (152 mm)

Width: 13.0 in. (330 mm)

Depth: 16.5 in. (419 mm)

Weight

24 lb. (11.3 kg)

(Weight will vary based on internal devices installed.)





Environmental

**Operating
Temperature**

10-40° C (50-104° F)

**Storage
Temperature**

-40 to 47° C (-40 F to 116.6° F)

Relative Humidity

5-90% (noncondensing)

Altitude

0-3,048 m (0-10,000 ft.)





Troubleshooting

Power Macintosh 7100 Series





General

The Symptom Charts included in this chapter will help you diagnose specific symptoms related to your product. Because cures are listed on the charts in the order of most likely solution, try the first cure first. Verify whether or not the product continues to exhibit the symptom. If the symptom persists, try the next cure. (Note: If you have replaced a module, reinstall the original module before you proceed to the next cure.)

If you are not sure what the problem is, or if the Symptom Charts do not resolve the problem, refer to the Flowchart for the product family.

For additional assistance, contact Apple Technical Support.





Symptom Charts

Power Supply

System does not
power up

- 1 Reset logic board. (Refer to Additional Procedures.)
- 2 Reseat ROM SIMM and cache SIMM.
- 3 Replace power supply.
- 4 Replace logic board.





Error Chords

One-part error
chord sounds during
startup sequence

- 1 Disconnect hard drive power cable and hard drive data cable. Reboot system. If startup sequence is normal, run Macintosh Hard Disk test and replace hard drive if necessary.
- 2 Disconnect floppy drive cable and reboot system. If startup sequence is normal, replace floppy drive.
- 3 Replace logic board. Retain customer's SIMMs.





System

Does not power on;
screen is black, fan is
not running and LED
is not lit

- 1 Check cables.
- 2 Plug monitor directly into wall socket, and verify that monitor has power.
- 3 Reset logic board. (Refer to Additional Procedures.)
- 4 Reseat ROM SIMM and cache SIMM.
- 5 Replace power cord.
- 6 Replace power supply.
- 7 Replace logic board.

Clicking, chirping or
thumping

- 1 Replace power supply.
- 2 Replace logic board. Retain customer's SIMMs.





System (Continued)

System shuts down intermittently

- 1 Check that air vents are clear. Thermal protection circuitry may shut down system. After 30 to 40 minutes, system should be OK.
- 2 Replace power cord.
- 3 Check batteries. Refer to "Battery Verification" in Additional Procedures.
- 4 Replace power supply.
- 5 Replace logic board. Retain customer's SIMMs.





System (Continued)

- System
intermittently
crashes or locks up
- 1 Verify that system software is version 7.1.2 or later.
 - 2 Verify SIMMs are noncomposite and installed in like pairs (same size/speed).
 - 3 Verify that software is known-good.
 - 4 Verify that software is Power Macintosh compatible (contact developer).
 - 5 Verify that a video card is installed in the PDS slot.
 - 6 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before "Welcome to Macintosh" appears.
 - 7 Replace cache SIMM (if installed).
 - 8 Replace DRAM SIMMs. Refer to Memory manual.
 - 9 Replace power supply.
 - 10 Replace logic board. Retain SIMMs.





Video

Screen is dark, audio and at least one drive operate, fan is running, and LED is lit

- 1 Adjust brightness on monitor.
- 2 Replace video cable.
- 3 Try using known-good RAM SIMMs.
- 4 If monitor is attached to DB-15 connector, attach monitor to HDI-45 connector. If problem goes away, verify VRAM SIMMs on video card are good. If SIMMs are bad, replace them. If SIMMs are good, replace video card.
- 5 Replace monitor. Refer to appropriate monitor manual to troubleshoot defective monitor.
- 6 Replace logic board. Retain customer's SIMMs.





Video (Continued)

Screen is dark, audio and drive do not operate, fan is running, and LED is lit

- 1 Remove peripherals.
- 2 Remove NuBus cards.
- 3 Replace DRAM SIMMs
- 4 Replace VRAM SIMMs.
- 5 Replace video card.
- 6 Replace power supply.
- 7 Replace logic board.

Partial or whole screen is bright and audio is present, but no video information is visible

- 1 Replace video cable.
- 2 Replace VRAM SIMMs.
- 3 Replace video card.
- 4 Replace monitor. Refer to appropriate monitor manual to troubleshoot defective monitor.
- 5 Replace logic board. Retain customer's SIMMs.





Video (Continued)

Screen is completely dark, fan is not running, and LED is not lit

- 1 Verify that external power cables are properly connected.
- 2 Reset logic board. (Refer to Additional Procedures.)
- 3 Remove peripherals.
- 4 Remove NuBus cards.
- 5 Replace power supply.
- 6 Replace logic board. Retain customer's SIMMs.

Multiple Scan monitor attached to Power Macintosh 7100/66AV displays ghosting or video smearing

Replace Power Macintosh AV Card.





Floppy Drive

Audio and video are present, but internal floppy drive does not operate

- 1 Replace internal floppy drive cable.
- 2 Replace internal floppy drive.
- 3 Replace logic board. Retain customer's SIMMs.

Floppy disk ejects, and display shows Mac icon with blinking "X"

- 1 Try a different floppy disk.
- 2 Replace floppy drive cable.
- 3 Replace internal floppy drive.
- 4 Replace logic board. Retain customer's SIMMs.

Floppy disk does not eject

- 1 Switch off system and hold mouse button down while switching on.
- 2 Eject disk manually.
- 3 Replace floppy drive cable.
- 4 Replace floppy drive.





Floppy Drive (Continued)

Floppy drive
attempts to eject disk
but doesn't

- 1 Push floppy disk completely in.
- 2 Eject floppy disk manually.
- 3 Replace floppy drive.
- 4 Reseat or replace top housing assembly.





Hard Drive

Internal hard drive runs continuously

- 1 Update driver software of hard drive using HD-SC Setup.
- 2 Reinstall system software.
- 3 Replace SCSI data cable.
- 4 Replace internal hard drive.
- 5 Replace logic board. Retain customer's SIMMs.

Internal hard drive does not operate

- 1 Replace SCSI data cable.
- 2 Replace SCSI power cable.
- 3 Replace hard drive.
- 4 Replace logic board. Retain customer's SIMMs.





CD-ROM Drive

CD-ROM drive does not accept a compact disc

- 1 Exchange disk (if disk is dirty or damaged).
- 2 Replace CD-ROM drive mechanism.

Macintosh does not display CD-ROM drive icon

- 1 Verify that CD-ROM extension is in System Folder.
- 2 Replace CD-ROM drive mechanism.
- 3 Replace SCSI data cable.

Compact disc won't eject from the drive

- 1 Turn off file sharing in Sharing Setup Control Panel.
- 2 Manually eject the compact disc.
- 3 Press the eject button behind the front bezel (if it is accessible).
- 4 Replace the CD-ROM drive mechanism.





Peripheral

Works with internal or external SCSI device, but does not work with both

- 1 Replace external SCSI cables.
- 2 Verify that there is only one terminator on external devices.
- 3 Verify that SCSI select switch on any external device is set differently from any internal SCSI device.
- 4 Verify that the hard drive is terminated and the CD-ROM drive is not terminated.
- 5 Replace the terminator on external SCSI device.
- 6 Replace the SCSI select cable on external SCSI device.





Peripheral (Continued)

Cursor does not move

- 1 Reboot computer.
- 2 Verify that mouse is connected properly.
- 3 If mouse was connected to keyboard, connect mouse to computer ADB port instead. If mouse works, replace keyboard.
- 4 If mouse does not work in any ADB port on computer, replace mouse.
- 5 Replace logic board. Retain customer's SIMMs.

Cursor moves, but clicking the mouse button has no effect

- 1 Replace mouse.
- 2 Replace logic board. Retain customer's SIMMs.
- 3 If mouse was connected to keyboard, connect mouse to computer ADB port instead. If mouse works, replace keyboard.





Peripheral (Continued)

Double-click does not open application, disk, or server

- 1 Remove duplicate system files from hard drive.
- 2 Clear parameter RAM. Hold down <Command> <Option> <P> <R> during startup but before "Welcome to Macintosh" appears.
- 3 If mouse was connected to keyboard, connect mouse to computer ADB port instead. If mouse works, replace keyboard.
- 4 If mouse does not work in any ADB port on computer, replace mouse.
- 5 Replace logic board. Retain customer's SIMMs.

No response to any key on the keyboard

- 1 Verify that keyboard is connected to ADB port.
- 2 Replace keyboard cable.
- 3 Replace keyboard.
- 4 Replace logic board. Retain customer's SIMMs.





Miscellaneous

About This Macintosh reports more system memory than is installed

- 1 Verify that RAM SIMMs are installed in matching pairs (same size and speed).
- 2 Replace RAM SIMMs.

About This Macintosh reports less system memory than is installed

- 1 Verify that RAM SIMMs are installed in matching pairs (same size and speed).
- 2 Replace RAM SIMMs.

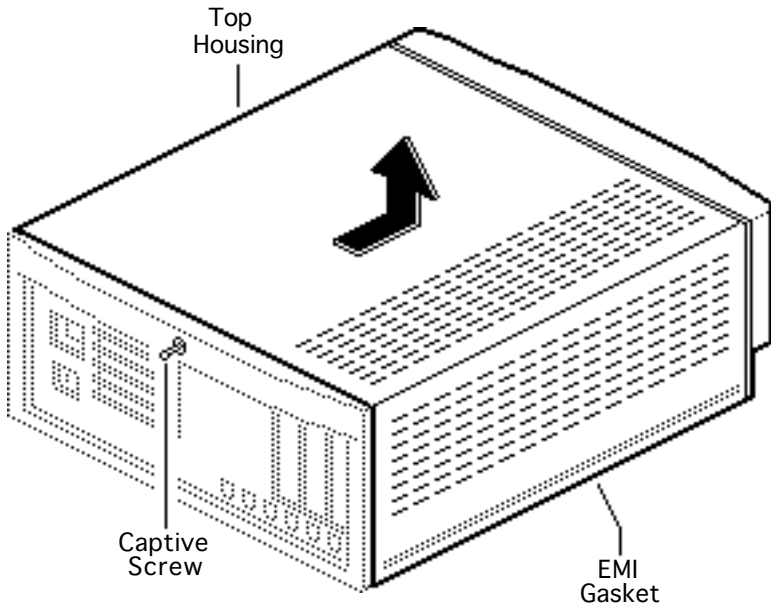




Take Apart

Power Macintosh 7100 Series





Top Cover

No preliminary steps are required before you begin this procedure.

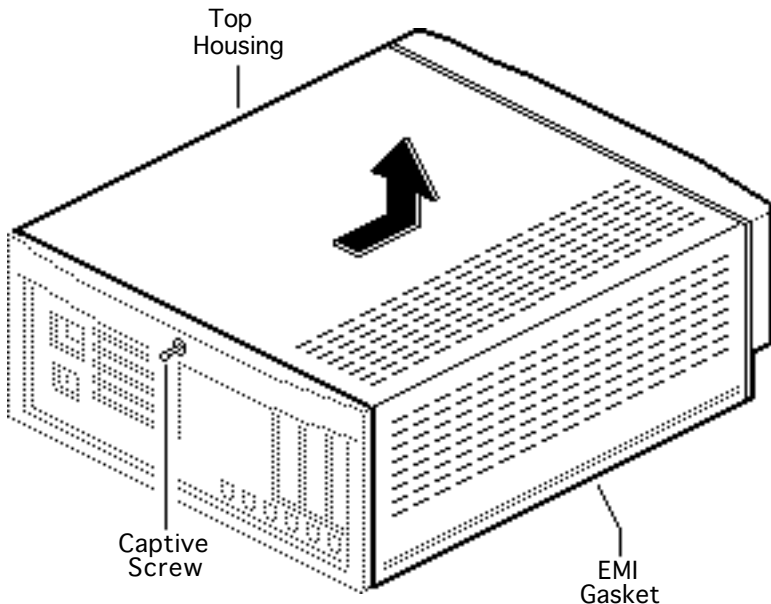
- 1 Gently loosen the captive screw.

Note: Do not force the screw.

- 2 Slide the top housing toward the front 1 inch. Lift the top housing straight up.

Caution: Do not attempt to tilt the top housing when you remove it.





Replacement Note: The top housing must have EMI gaskets inside the bottom edge of each side of the housing.

Replacement Note: Do not jar the interrupt switch and light pipe out of alignment when you replace the top housing.

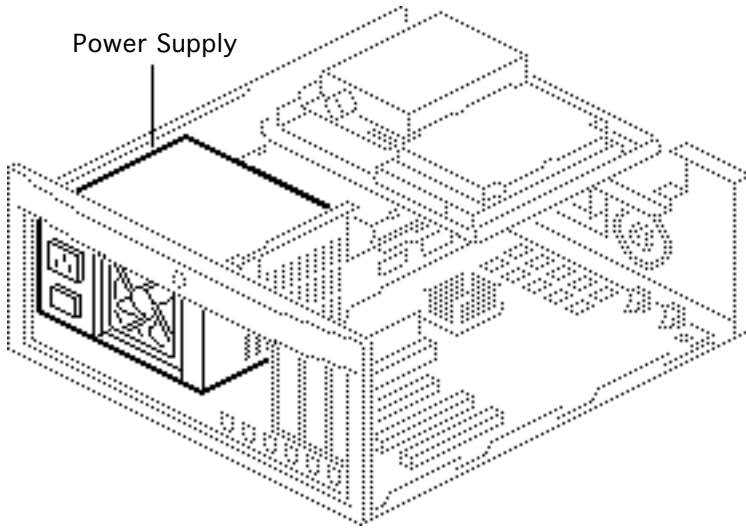


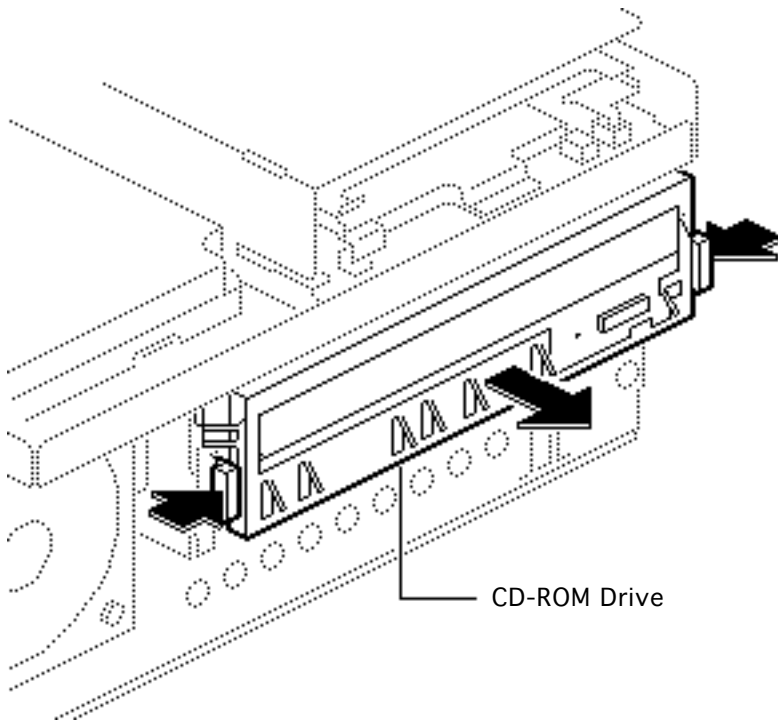


Power Supply

Before you begin, remove the top housing.

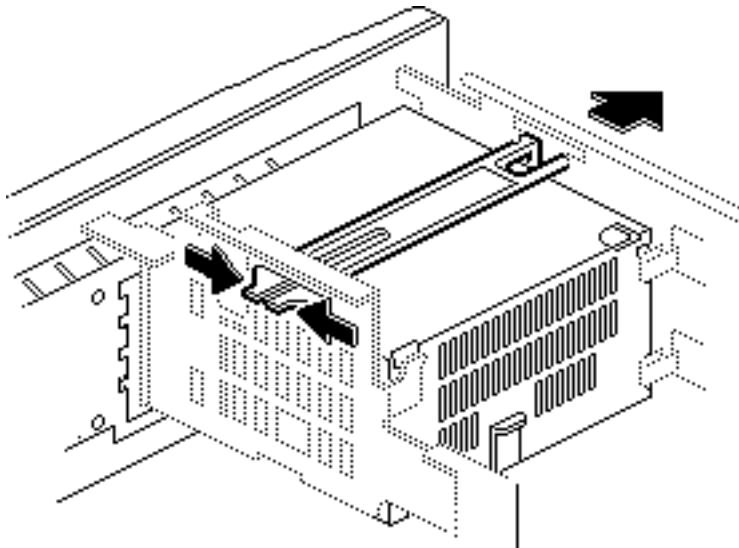
Caution: Review the ESD precautions in Bulletins/ Safety.





- 1 If a CD-ROM drive is installed, squeeze its side tabs and pull the drive out an inch or two to more easily reach the power supply.

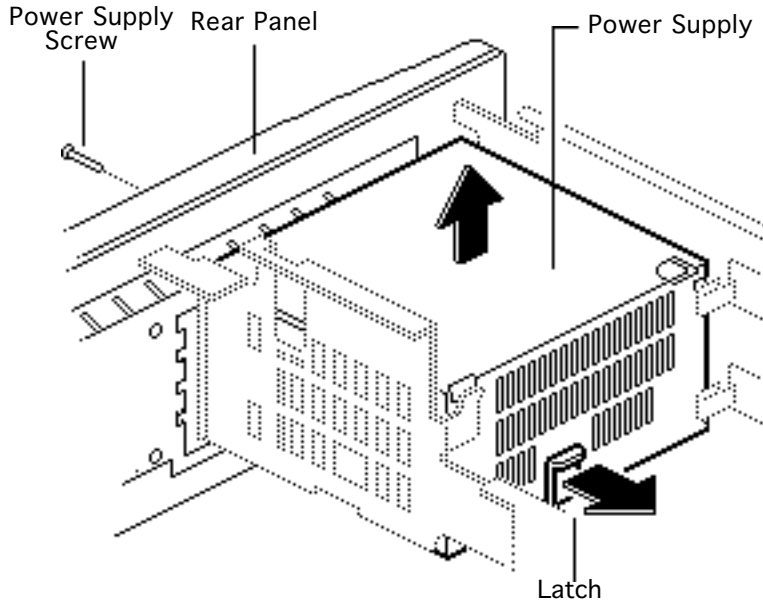




- 2 If there is a power supply strap installed on the unit, squeeze on the two ends of the strap and push it through the metal opening to remove it.

Note: The power supply strap is part of the shipping packaging for some power supplies. When replacing the power supply you should replace the strap if present.





- 3 Remove the power supply screw from the rear panel.
- 4 Pry the latch away from the base of the power supply.
- 5 Grasp the power supply and firmly lift it out of the drive mount chassis.

Note: The firm lifting motion disconnects the power supply's connector from the logic board.

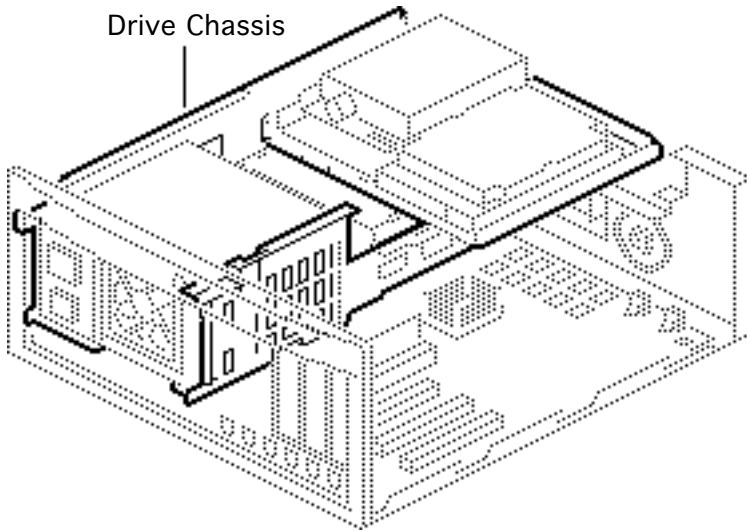


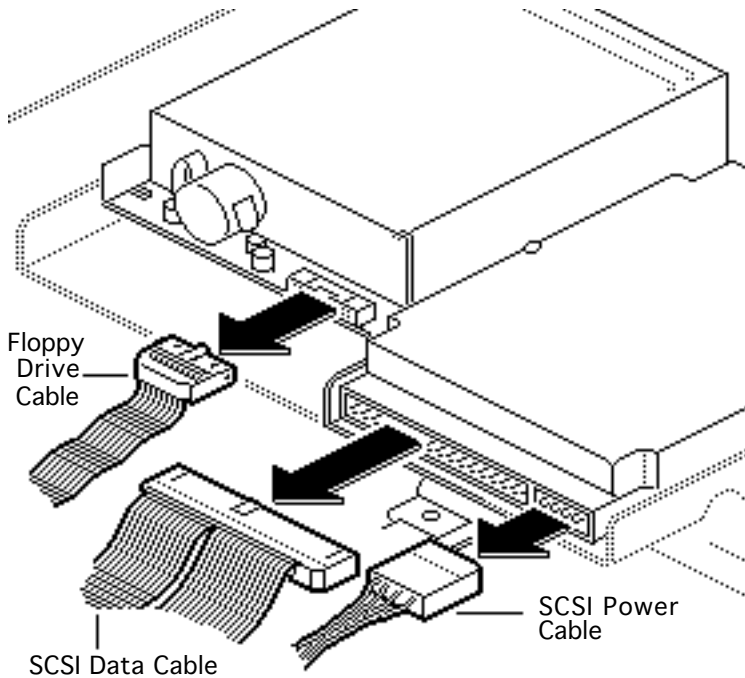


Drive Chassis

Before you begin, remove the following:

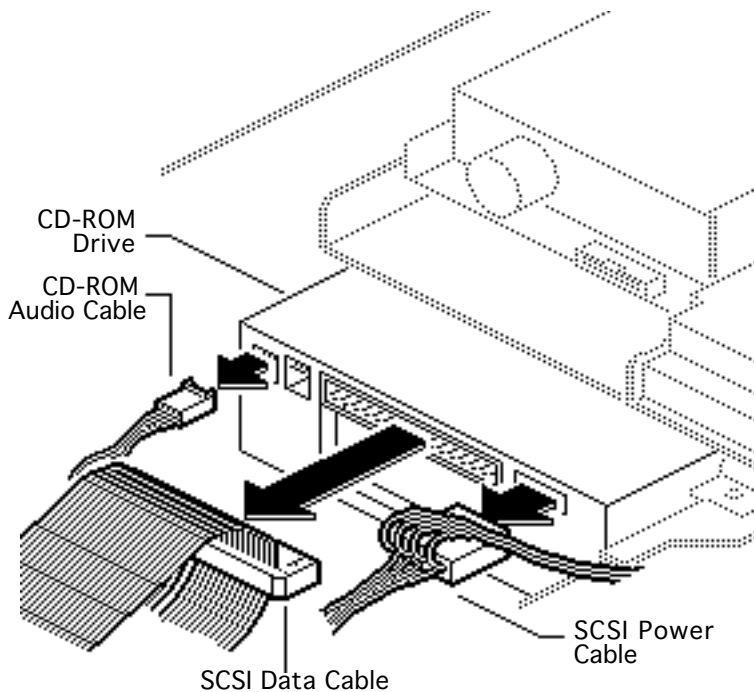
- Top housing
- Power supply





- 1 Disconnect these cables:
 - Floppy drive cable
 - SCSI power cable
 - SCSI data cable



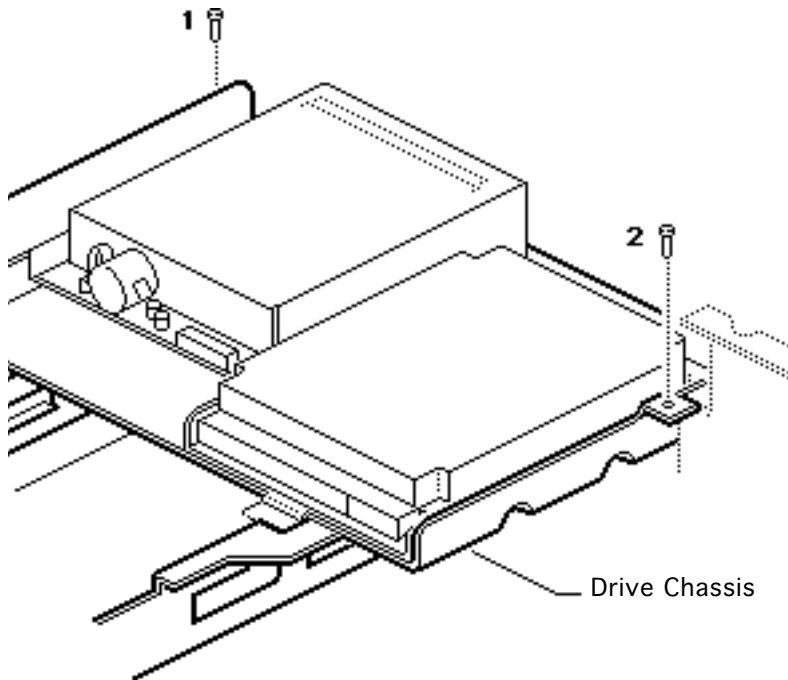


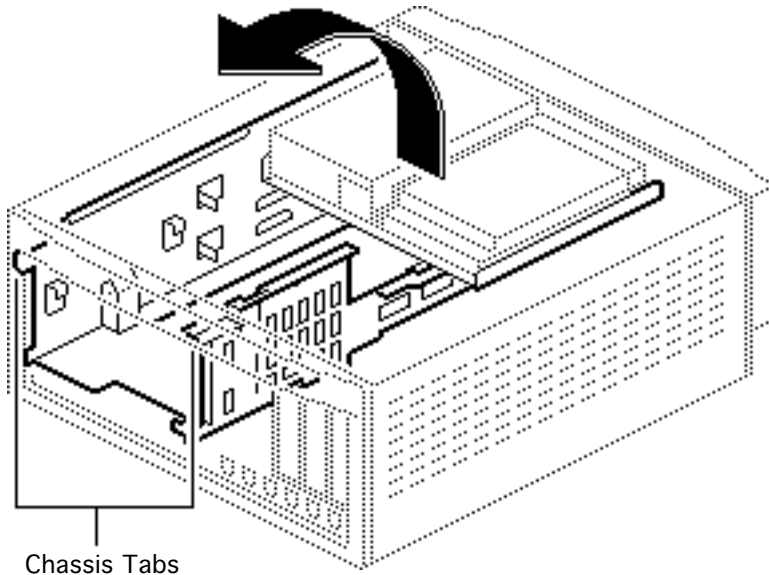
- 2 If a CD-ROM drive is installed, disconnect these cables:
- SCSI power cable
 - SCSI data cable
 - CD-ROM audio cable





- 3 Remove the two drive chassis screws.

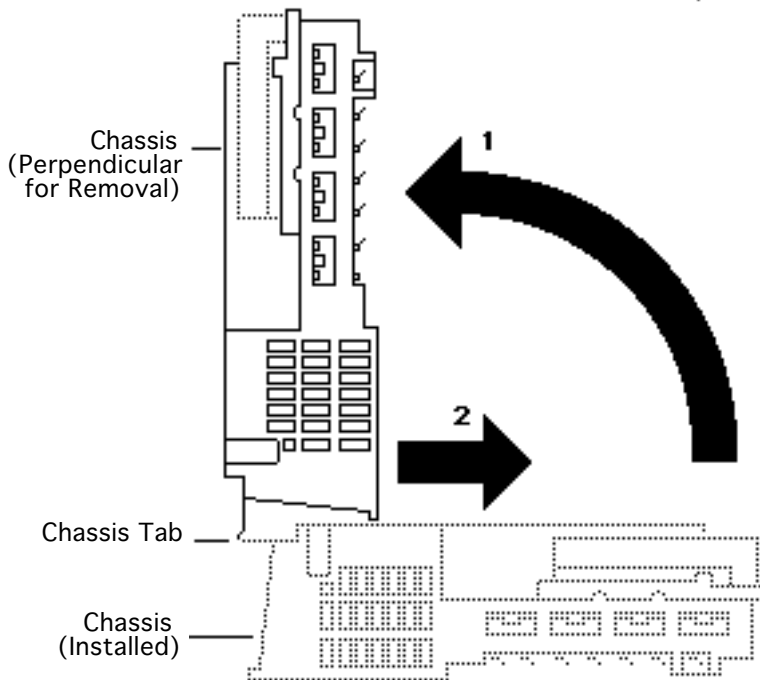




- 4 Lift the front of the drive chassis until the chassis is perpendicular to the bottom case.

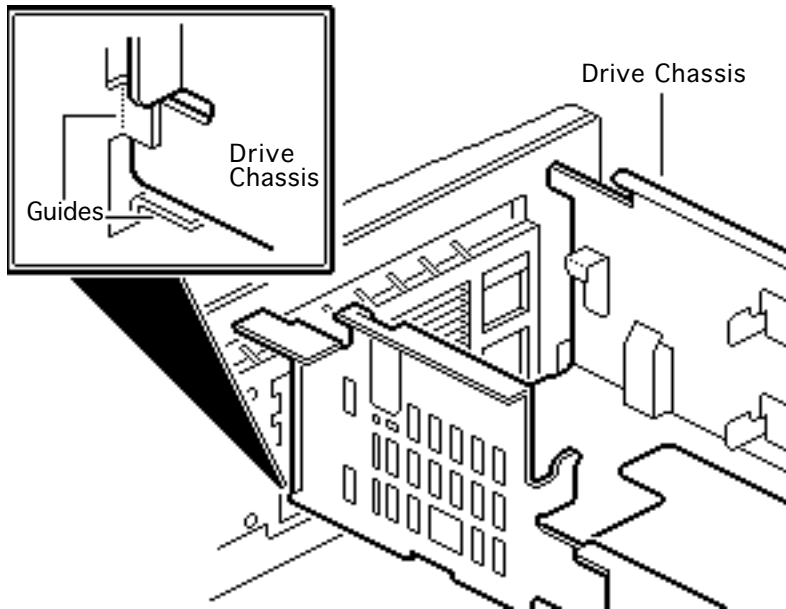
Note: The chassis swivels where the chassis tabs meet the bottom housing.





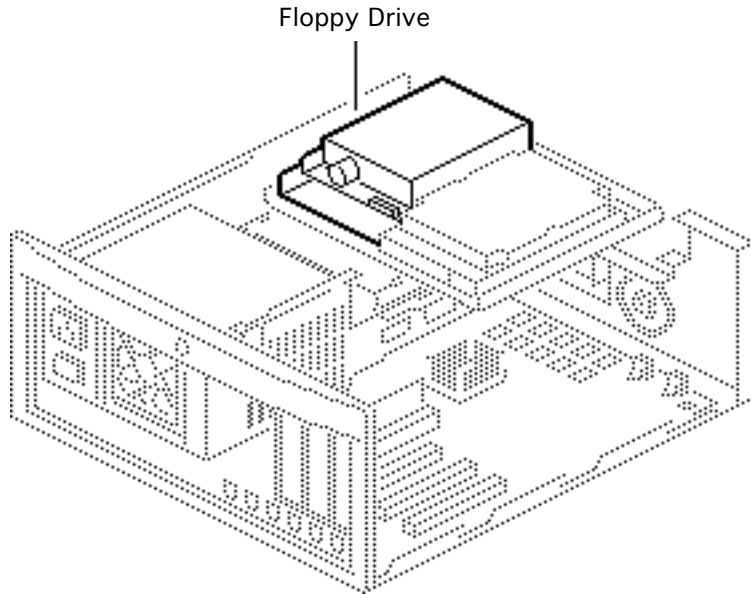
- 5 Guide the chassis tabs out of the slots in the bottom housing and remove the chassis.





Replacement Note: Carefully seat the bottom corners of the drive chassis into the guides in the bottom housing.





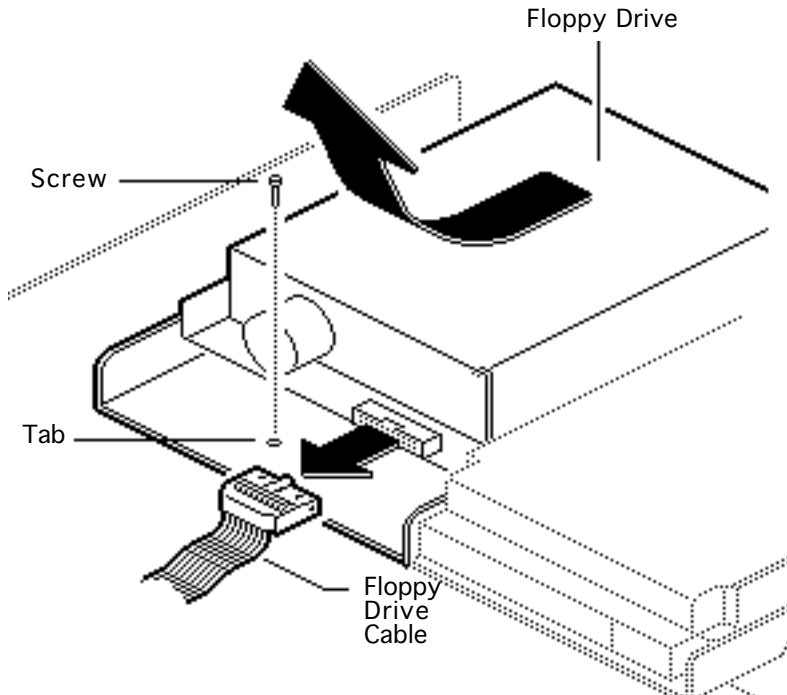
Floppy Drive

Before you begin, remove the top housing.

Caution: Review the ESD precautions in Bulletins/Safety.

Caution: Review the precautions in Bulletins/Safety.





- 1 Disconnect the floppy drive cable from the floppy drive.
- 2 Remove the floppy drive mounting screw.
- 3 Pry up the mounting tab and slide out the floppy drive.

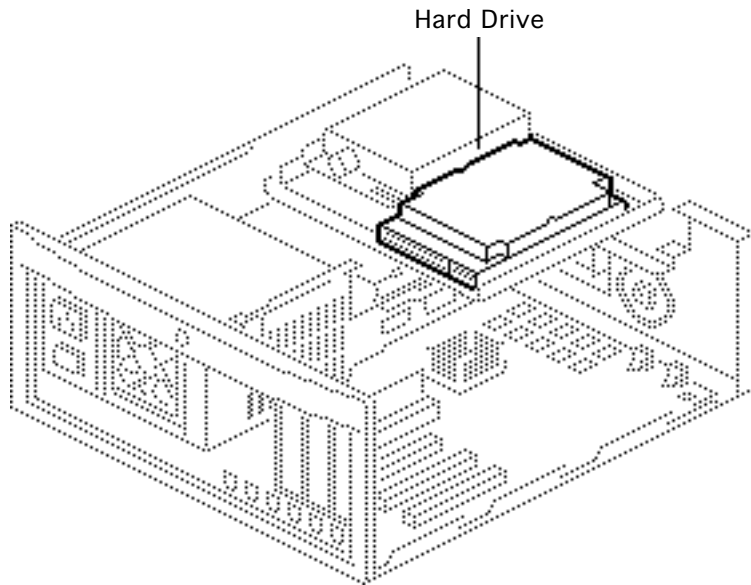


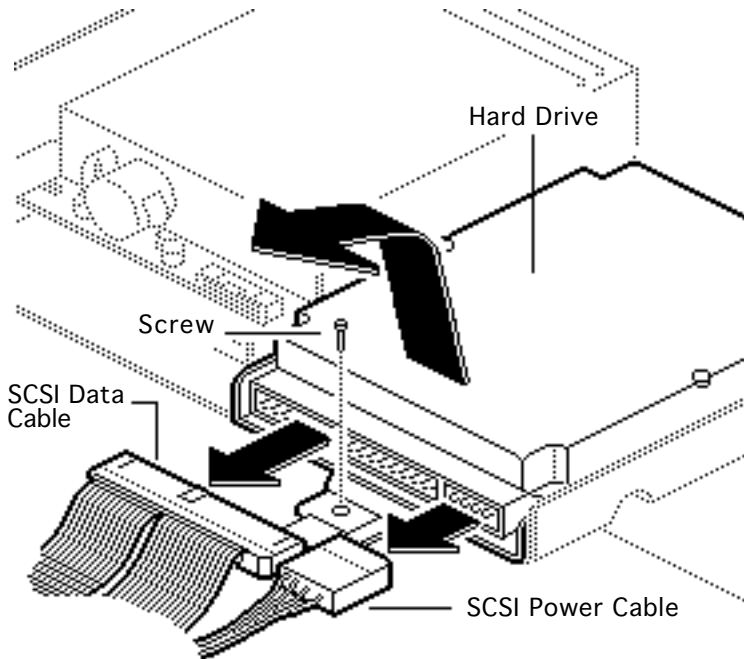


Hard Drive

Before you begin, remove the top housing.

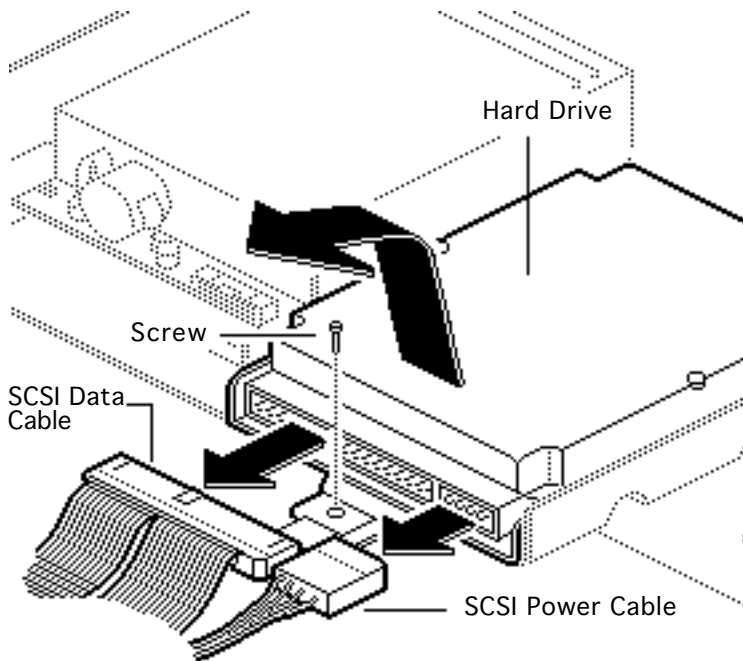
Caution: Review the ESD precautions in Bulletins/Safety.





- 1 Disconnect the SCSI data cable and the SCSI power cable from the hard drive.
- 2 Remove the hard drive mounting screw from the carrier.
- 3 Lift the back of the hard drive and slide the hard drive carrier out of the drive chassis.





Replacement Note: For information on removing the hard drive from the carrier and returning drives, cables, and carriers to Apple, refer to the Parts chapter in this manual.



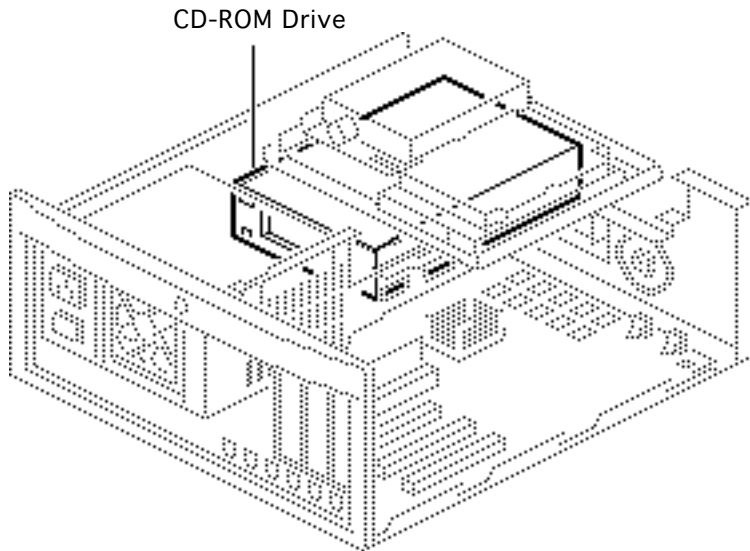


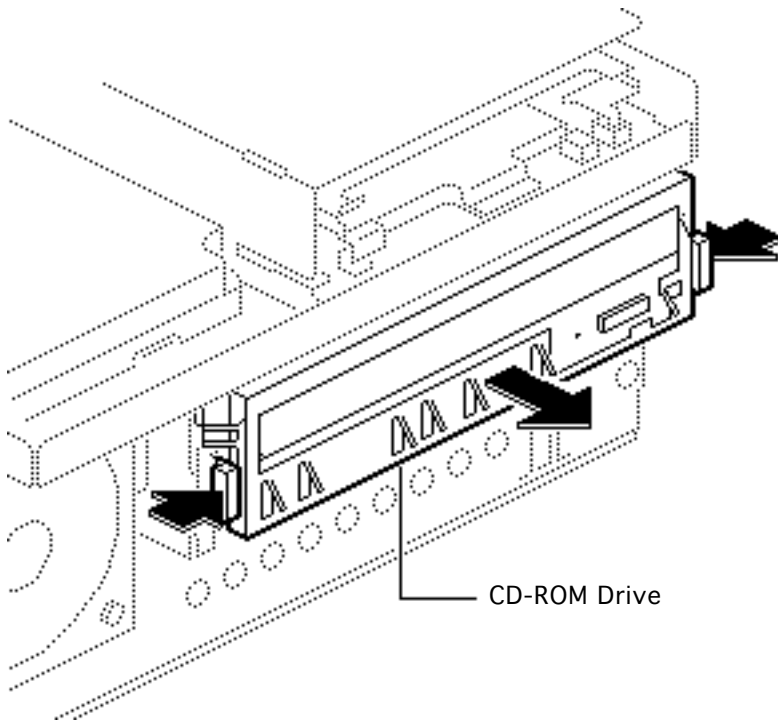
CD-ROM Drive

Before you begin, remove the top housing.

Caution: Review the ESD precautions in Bulletins/Safety.

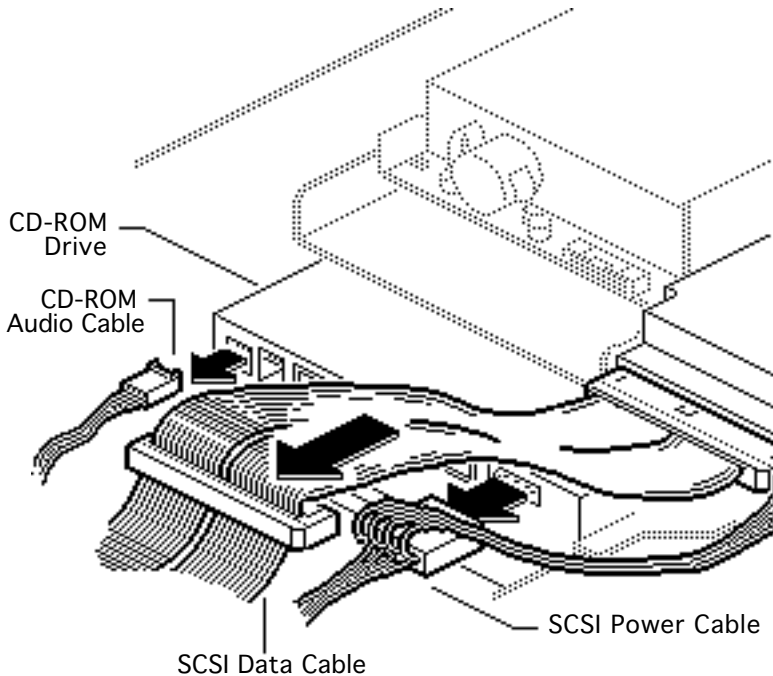
Note: A CD-ROM drive is optional.





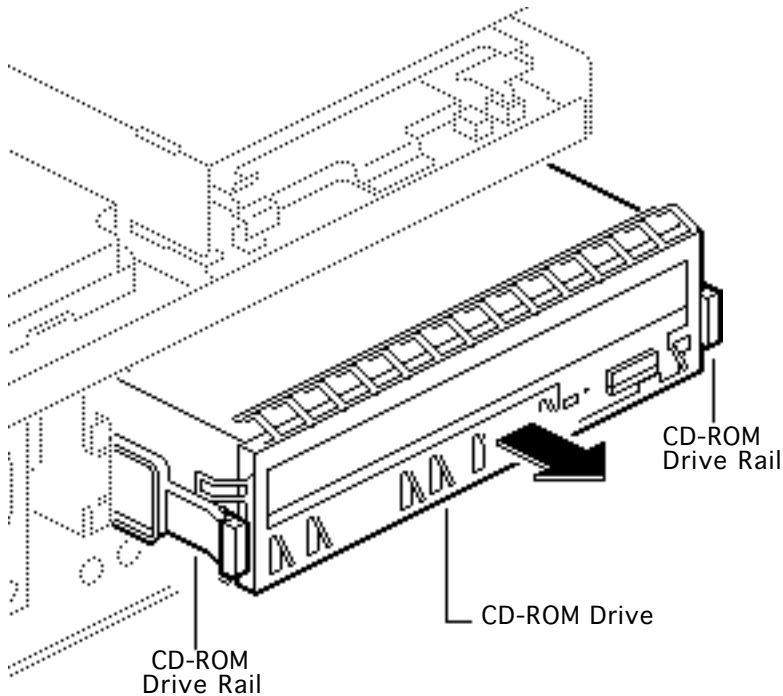
- 1 Squeeze the side tabs and pull the drive out a few inches to more easily perform the next step.





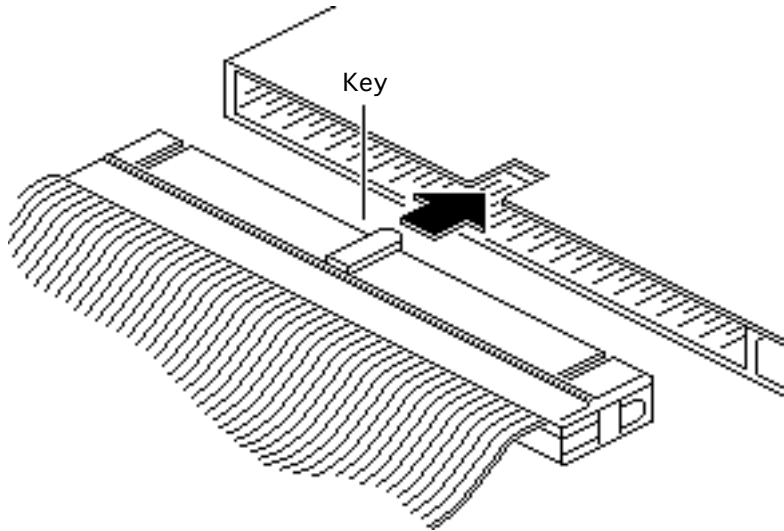
- 2 Disconnect these cables from the CD-ROM drive:
- Audio cable
 - SCSI power cable
 - SCSI data cable





- 3 Slide out the CD-ROM drive.
- 4 Remove the drive rails and EMI shield from the CD-ROM drive.





Replacement Note: The connectors on the SCSI data cable are keyed. You may need to twist the cable to insert the connector properly.

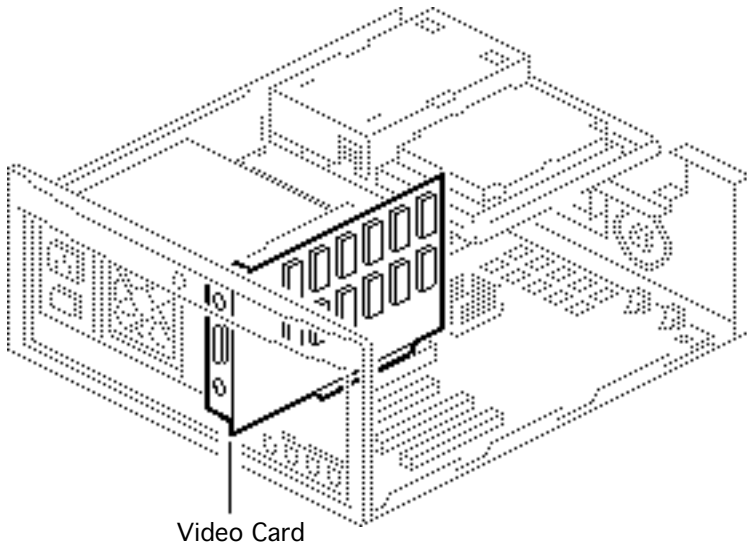


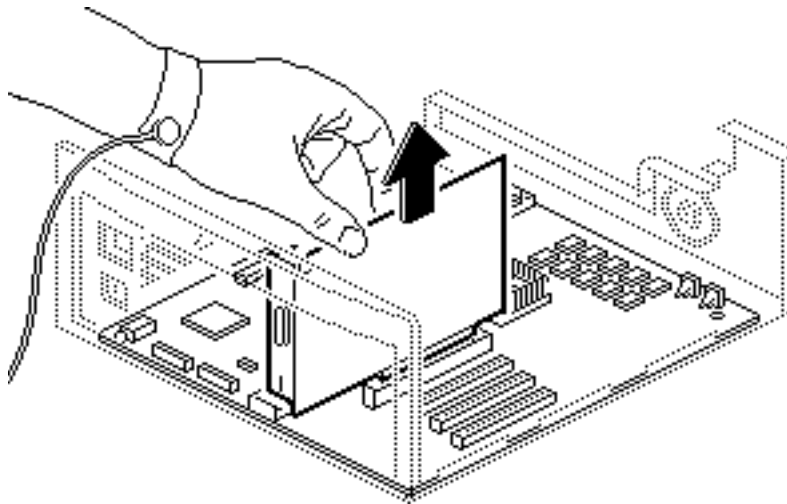


Video Card

Before you begin, remove the top housing.

Caution: Review the ESD precautions in Bulletins/ Safety.





- 1 **Caution:** Pull up evenly on both sides of the video card to avoid bending the connector pins, and remove the card from the expansion slot.

Replacement Caution: When replacing the card, do not force it into the expansion slot. If the card does not seat properly, remove it and try again.



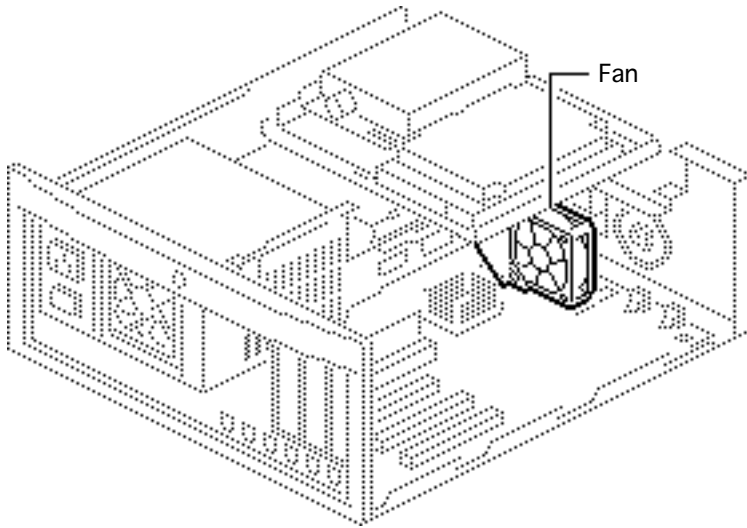


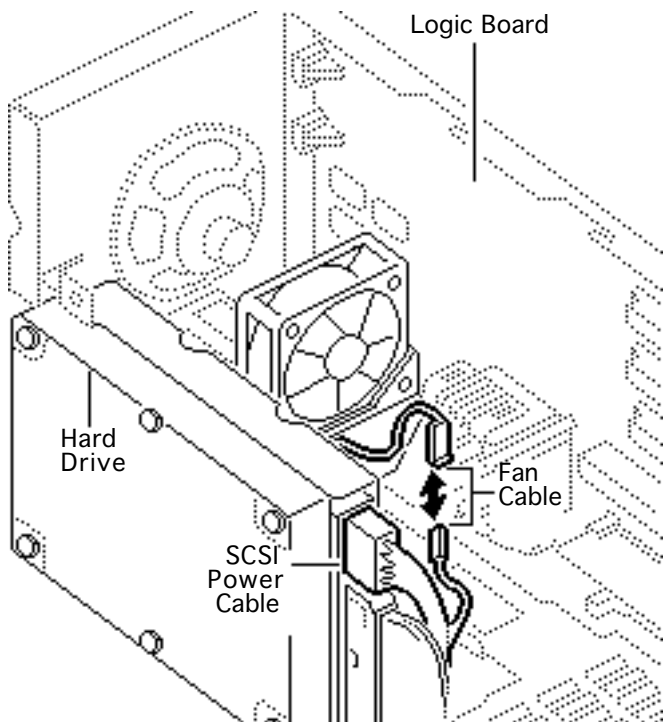
Fan

Before you begin, remove the top housing.

Caution: Review the ESD precautions in Bulletins/ Safety.

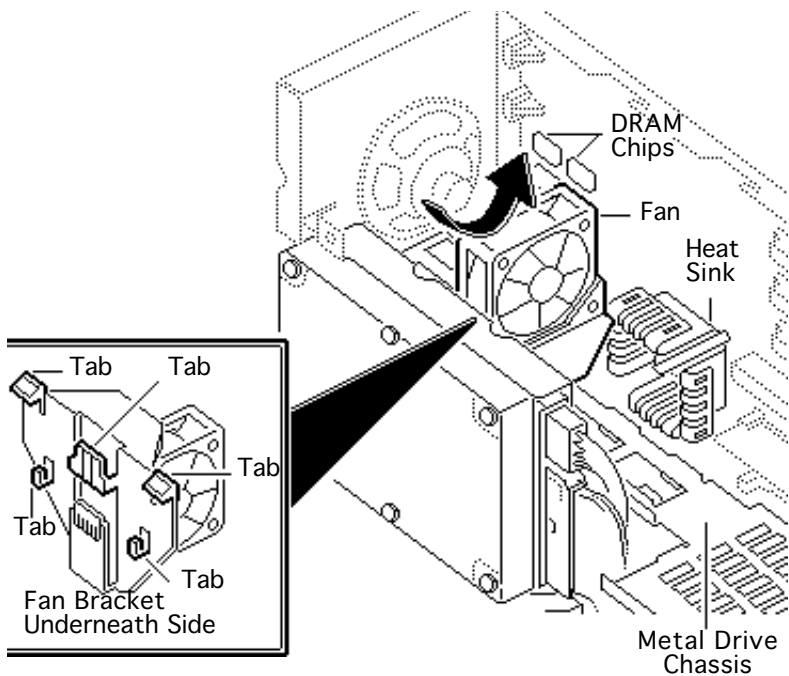
Note: The fan is present only in the 7100/80 and 7100/80AV models.





- 1 Turn the computer chassis on its side so that the hard drive is facing up.
- 2 Disconnect the SCSI power cable from the fan cable.



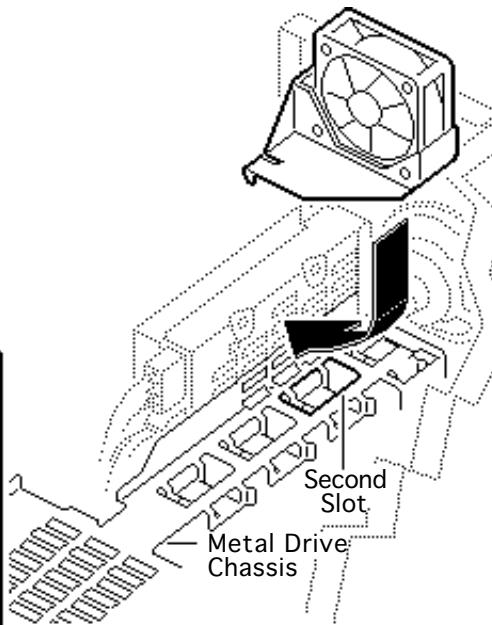
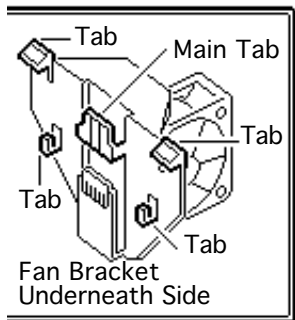


- 3 **Caution:** When removing the fan, be careful that you don't knock the heat sink or damage the DRAM chips on the logic board.

Grasp the fan and gently pull down and out on the fan to release it from the metal drive chassis.

Note: The fan bracket has five plastic tabs underneath that attach to a metal slot in the drive chassis. You may need to wiggle the fan slightly to release the tabs.





Replacement Caution: When replacing the fan, be careful that you don't knock the heat sink or damage the DRAM chips on the logic board.

- 4 The fan bracket has five plastic tabs on its underneath side that are used to attach the fan to the metal drive chassis.

To replace the fan, insert the main plastic tab in the middle of the bracket into the second metal slot from the right on the drive chassis.





Important: Before you replace the top housing, verify that the replacement fan is working.

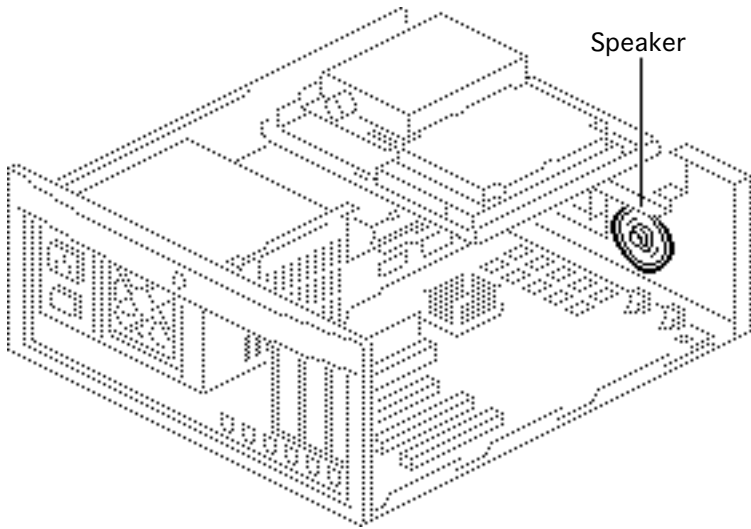


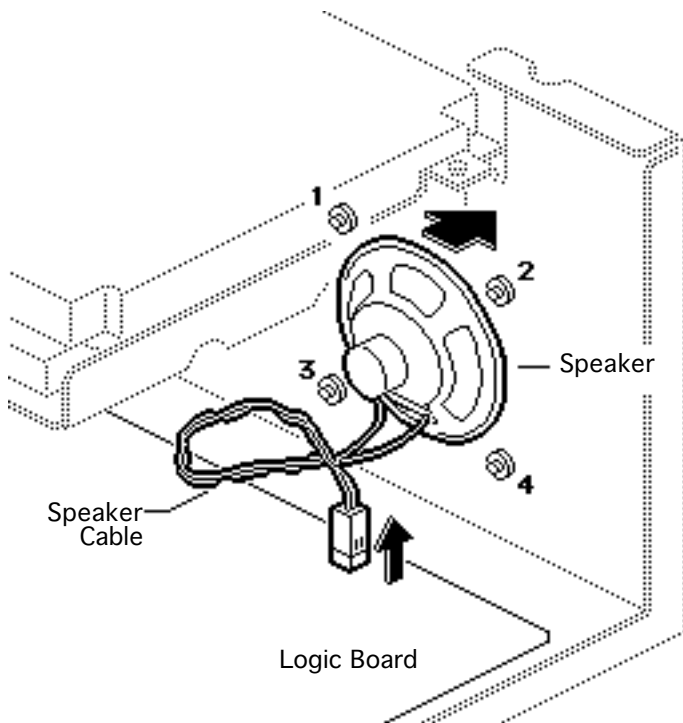


Speaker

Before you begin, remove the top housing.

Caution: Review the ESD precautions in Bulletins/Safety.





- 1 Disconnect the speaker cable from the logic board.
- 2 Remove the speaker mounting screws and pull out the speaker.

Note: There is more than one version of speaker for the computer. Speakers install with four or two screws, depending on the version.

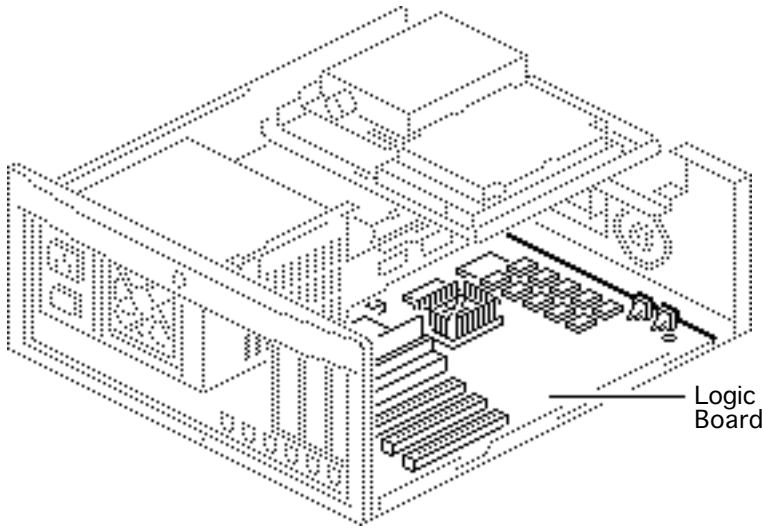




Logic Board

Before you begin, remove the following:

- Top housing
- Power supply
- Drive chassis
- Video card
- Reset/Interrupt actuator
- Speaker (Optional)



Logic Board



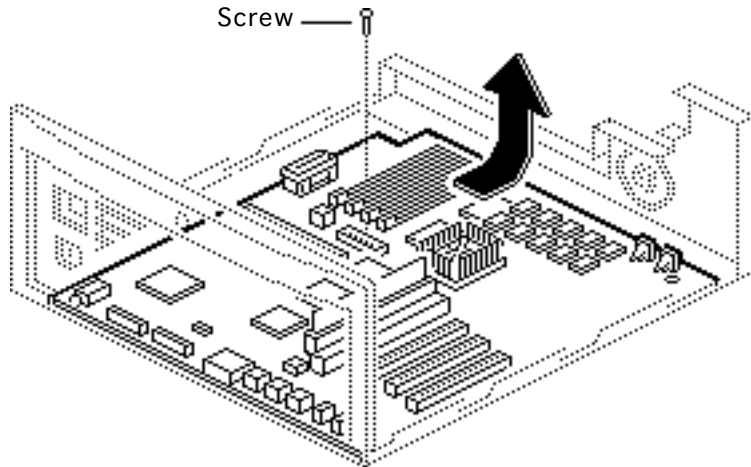


- 1 Remove the customer's RAM SIMMs and 256K cache SIMM before returning the logic board to Apple.

Note: Grasp the cache SIMM by its corners and pull up firmly to remove it.

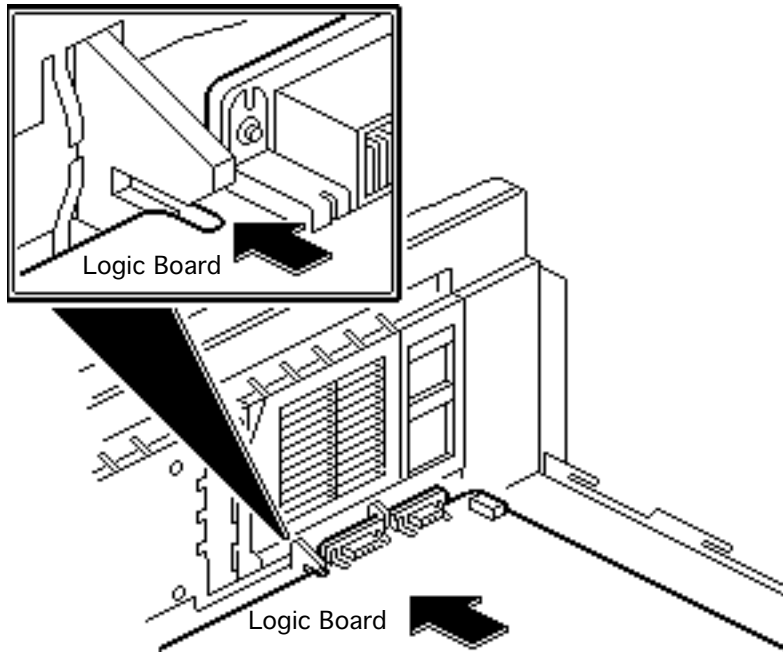
Note: The connectors for the cache and ROM SIMMs are functionally the same, and the ROM and 256K cache SIMMs may be installed in either connector. Be sure you remove the cache SIMM and not the ROM SIMM. The 256K cache SIMM has five chips on each side.





- 2 Remove the screw in the center of the logic board.
- 3 Slide the logic board toward the front about 1/2 inch and lift the board out of the bottom housing.





Replacement Note: Remove the customer's SIMMs from the defective logic board and install them on the replacement logic board.

Replacement Note: Position the center rear edge of the logic board in the plastic bracket and slide the board straight back.





Upgrades

Power Macintosh 7100 Series





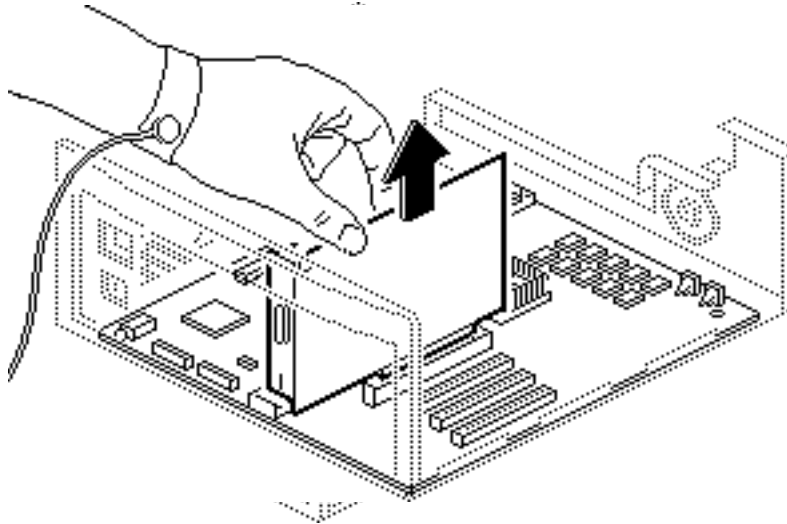
Expansion Cards

Before you begin, remove the top housing.

Caution: Review the ESD precautions in Bulletins/ Safety.

Note: The Power Macintosh 7100/66 must have the Power Macintosh 2 MB Video Card installed in its PDS slot. The Power Macintosh 7100/66AV must have the Power Macintosh AV Card installed in its PDS slot.

Caution: Pull up evenly





on both sides of the expansion card to avoid bending the connector pins and remove the card from the expansion slot.

Replacement Caution:

When replacing the card, do not force it into the expansion slot. If the card does not seat properly, remove it and try again.

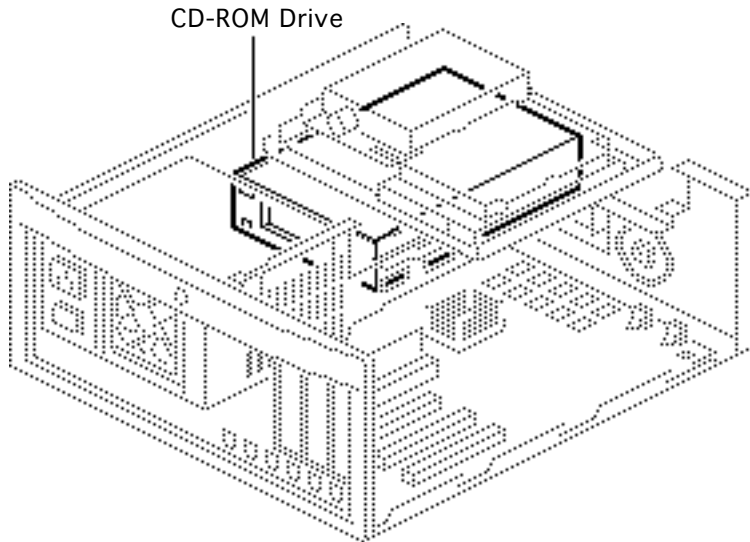


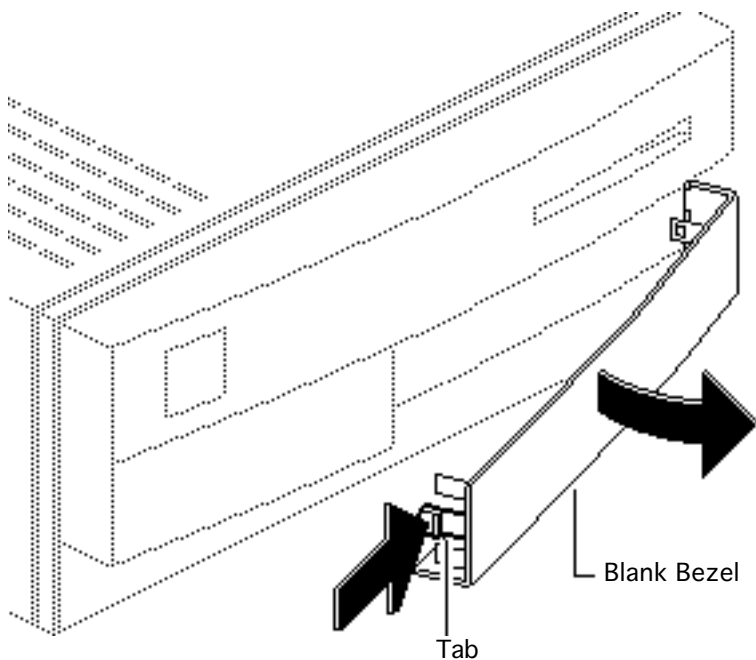


CD-ROM Upgrade

Before you begin, remove the top housing.

Caution: Review the ESD precautions in Bulletins/Safety.



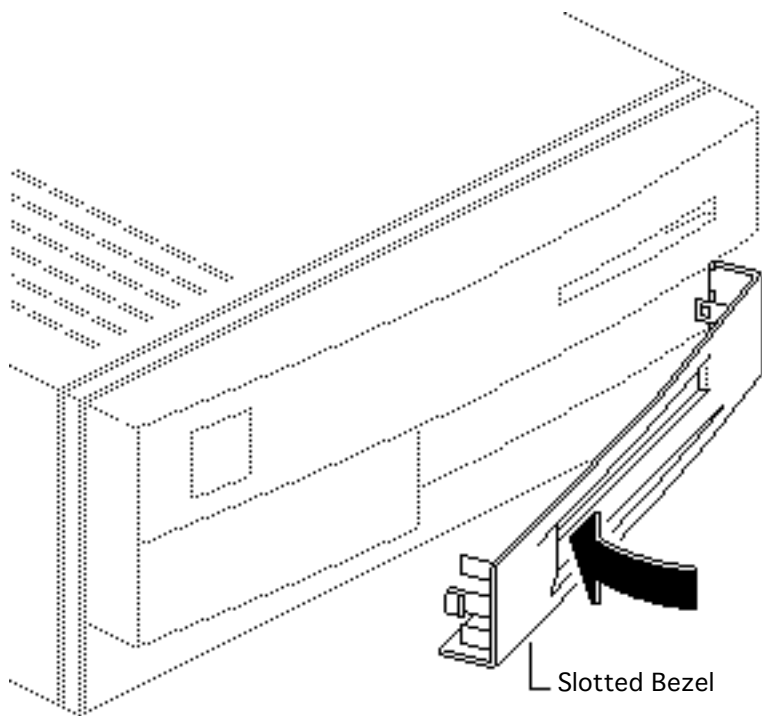


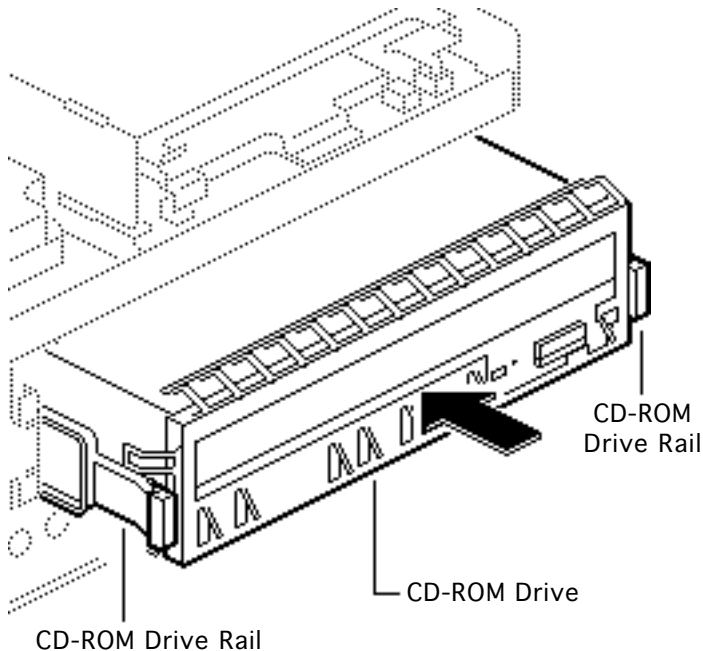
- 1 From the inside of the top housing, squeeze in the tabs of the blank bezel and push out the bezel





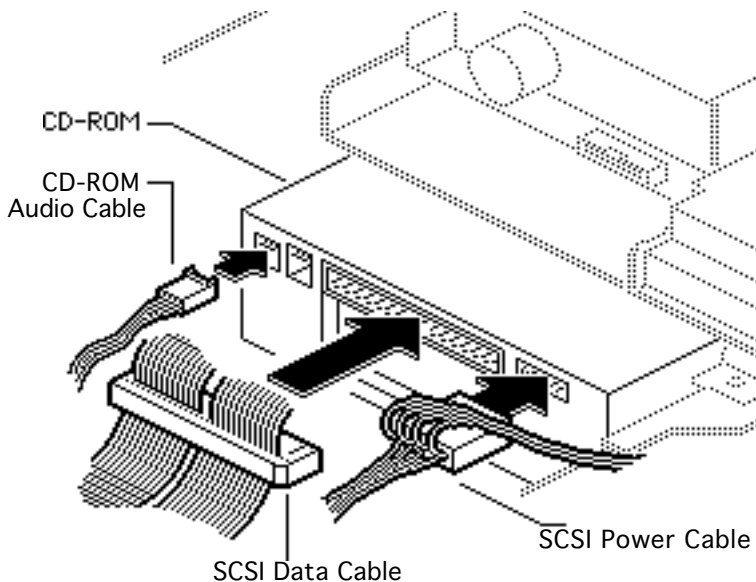
- 2 Push in the slotted bezel.





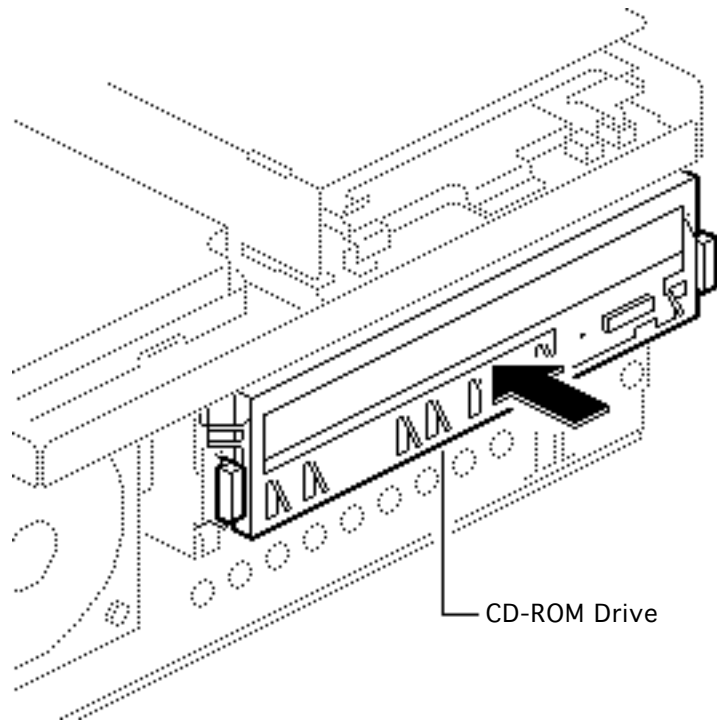
- 3 Install the EMI shield on the front on the CD-ROM drive.
- 4 Attach the CD-ROM drive rails to the CD-ROM drive.
- 5 Slide the CD-ROM drive about three quarters of the way into the drive mount chassis.





- 6 Connect these cables to the CD-ROM drive:
 - CD-ROM audio cable
 - SCSI data cable
 - SCSI power cable
- 7 Connect the CD-ROM audio cable to the logic board.





- 8 Push the CD-ROM drive completely into the CD-ROM slot until you hear a click.



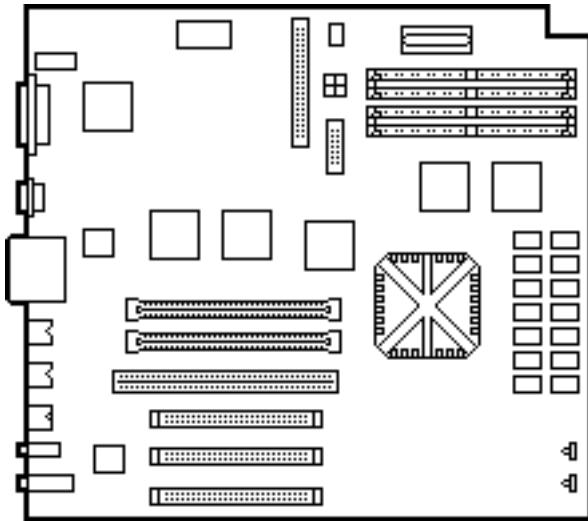


Power Macintosh Upgrade

Before you begin, remove the following:

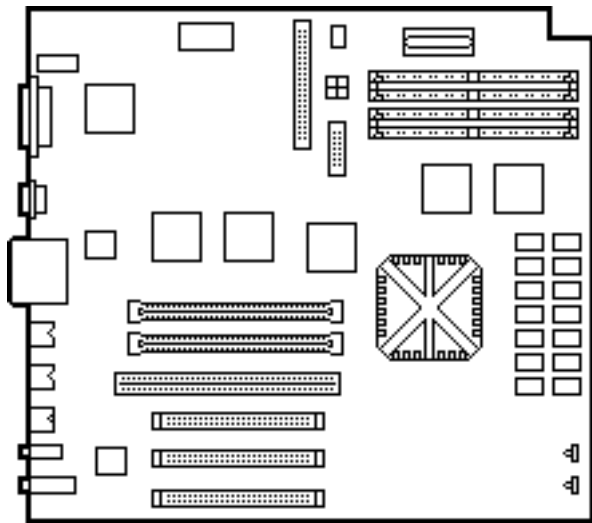
- Top housing
- Power supply
- CD-ROM drive (if present)
- Hard drive

Caution: Review the ESD precautions in Bulletins/ Safety.



Power Macintosh 7100/66 Logic Board

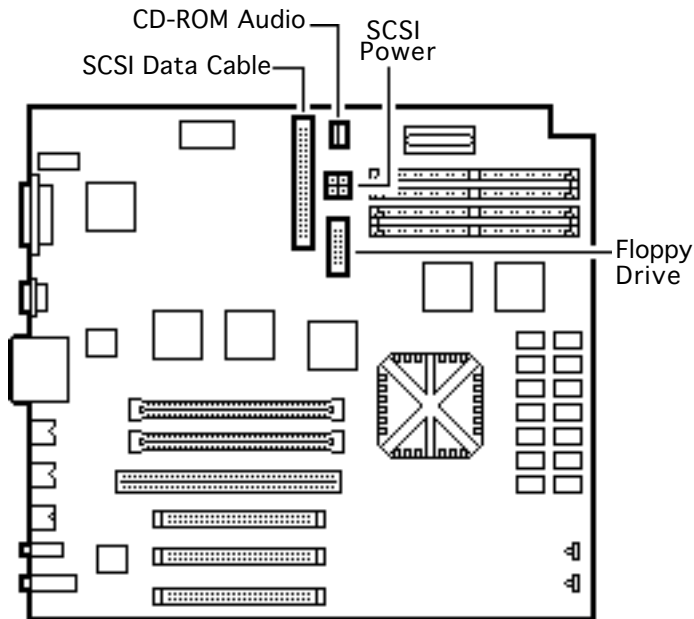




Power Macintosh 7100/66 Logic Board

Note: The Power Macintosh 7100/66 Upgrade Kit for the Centris 650 or Macintosh Quadra 650 includes a Power Macintosh 7100/66 logic board, top housing, bottom chassis, 1.4 MB manual insert floppy drive, video card, SCSI power cable, and CD-ROM EMI shield.



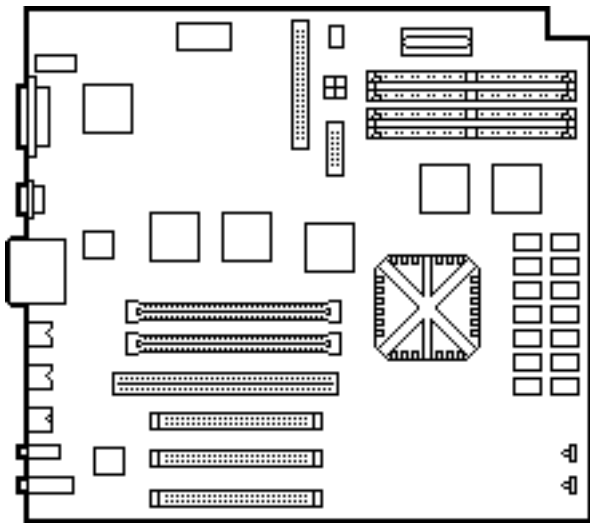


- 1 Disconnect the following cables from the old logic board and reconnect them to the new board:
 - CD-ROM audio cable (if present)
 - Floppy drive cable
 - SCSI data cable

Note: You may find it easier to connect the cables if you remove the drive chassis. Refer to *Take Apart*.

Note: The new SCSI power cable is already connected to the upgraded logic board.



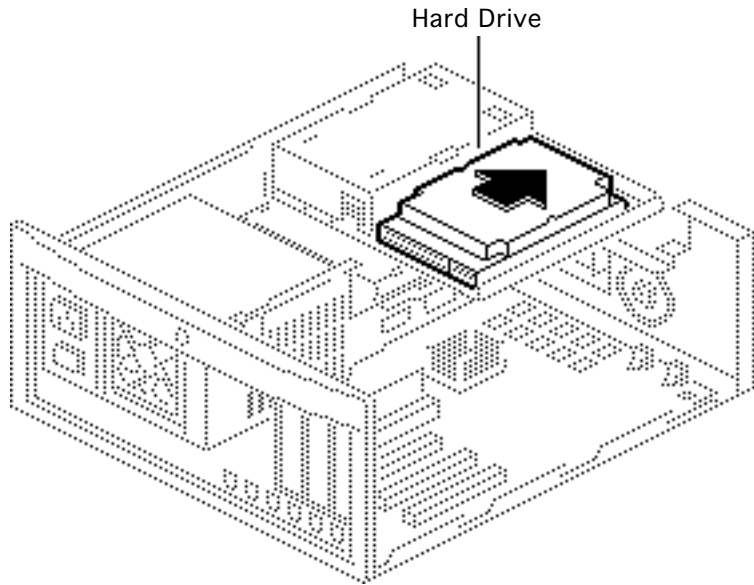


- 2 If the customer's old logic board had DRAM SIMMs installed, remove them and install them on the upgraded logic board.

Important: You must install DRAM SIMMs in matching pairs (that is, SIMMs of the same size and speed). The SIMMs must be 80 ns or faster, 72-pin, noncomposite SIMMs.

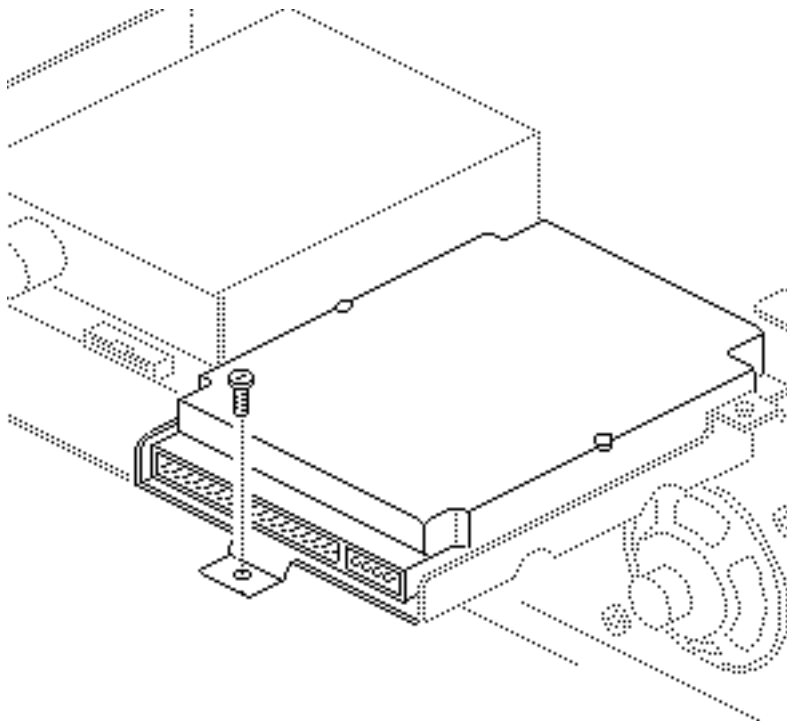
Replacement Note: Return all VRAM and nonmatching DRAM SIMMs from the old logic board to the customer.





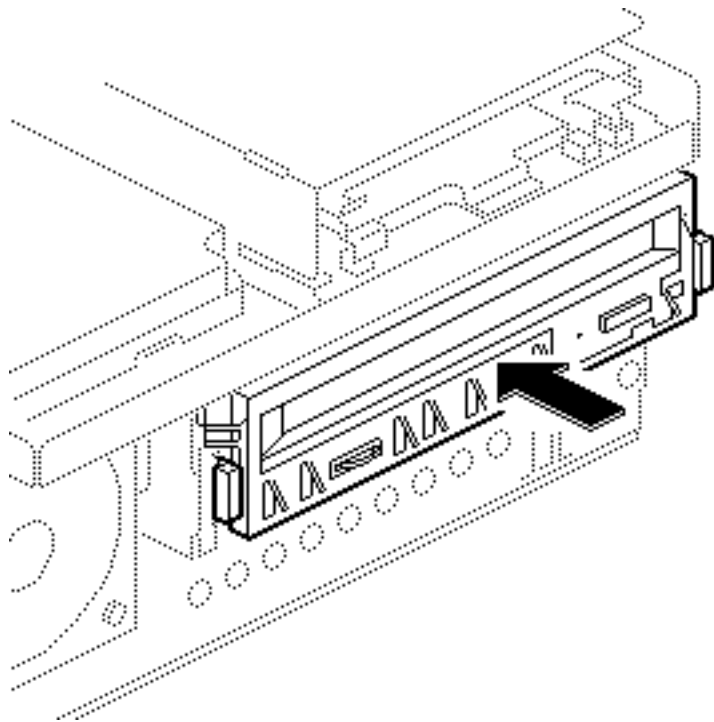
- 3 Guide the mounting tabs on the hard drive carrier into the slots in the upgraded drive chassis.
- 4 Slide the hard drive carrier into place.





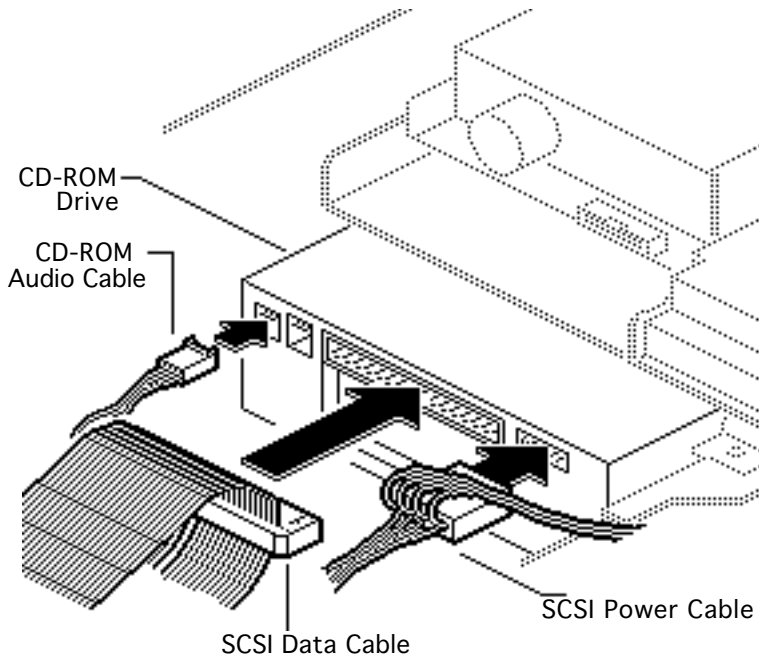
- 5 Insert the mounting screw that secures the hard drive carrier to the drive chassis.





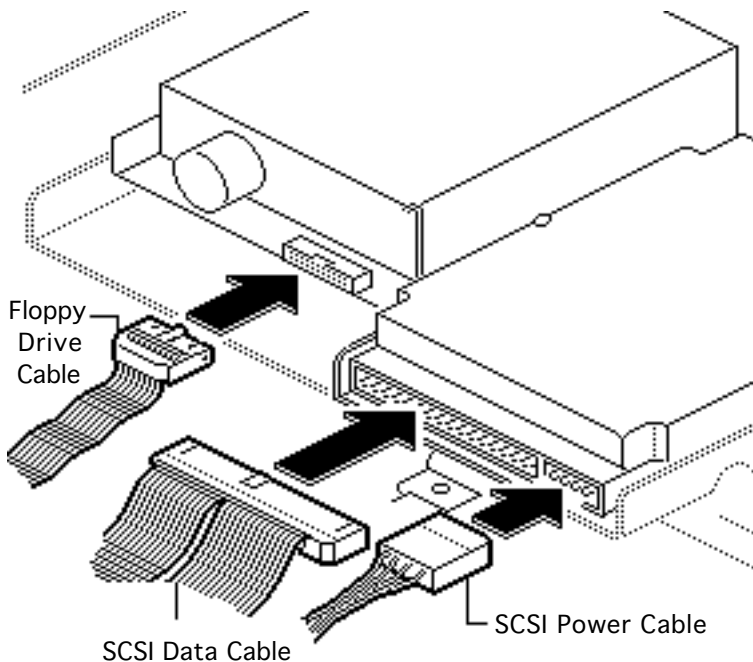
- 6 Install the EMI shield on the front of the CD-ROM drive (if present).
- 7 Slide the CD-ROM drive into the upgraded drive chassis.





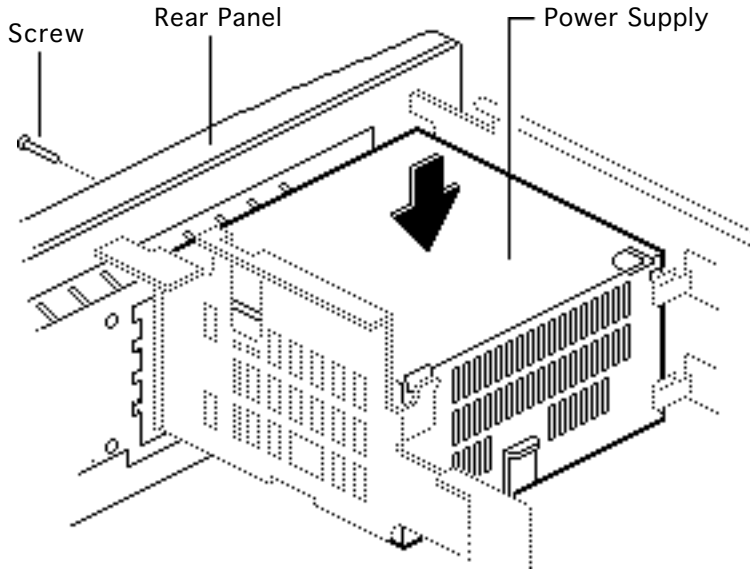
- 8 If there is a CD-ROM drive present, connect these cables:
- SCSI power cable
 - SCSI data cable
 - CD-ROM audio cable





- 9 Connect these cables:
- Floppy drive cable
 - SCSI power cable
 - SCSI data cable

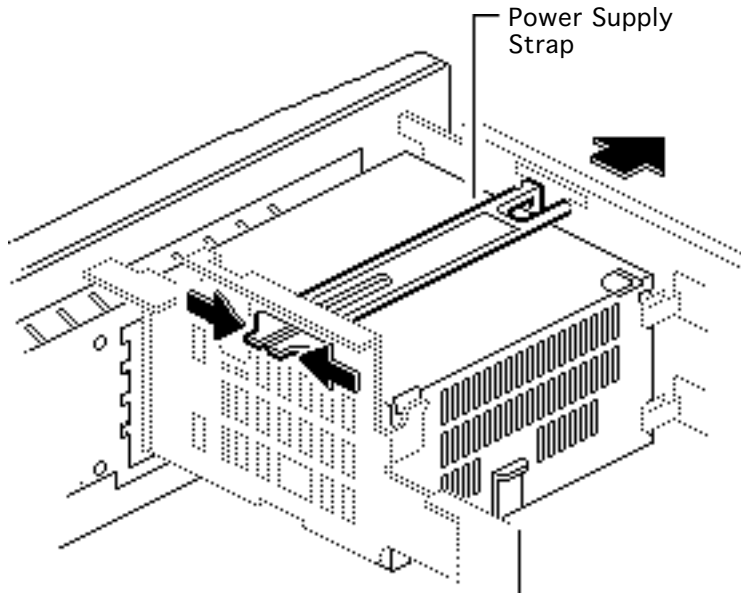




- 10 Reinstall the power supply in the drive chassis. Press down on the power supply until it snaps into place.
- 11 Replace the power supply screw at the rear panel.

Note: An extra power supply screw is provided in the upgrade kit.



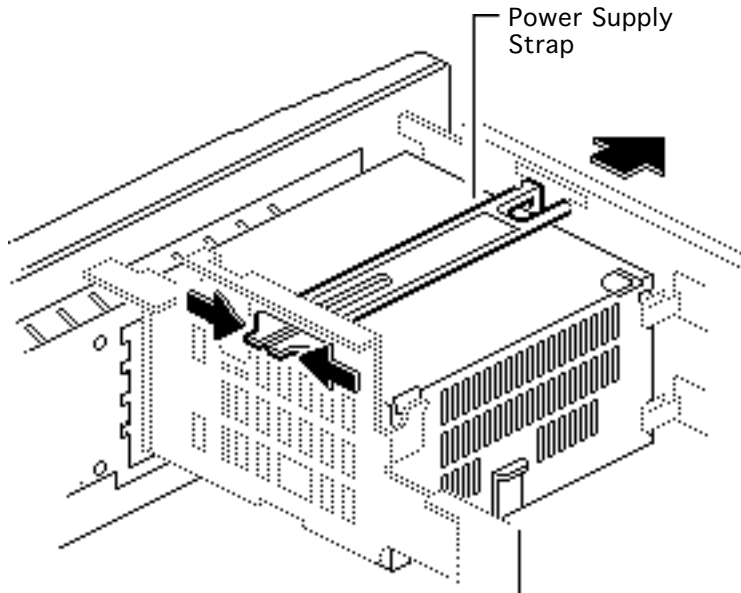


12 If there was a power supply strap installed on the old unit, squeeze on the two ends of the strap and push it through the metal opening on the chassis.

13 Install the strap on the upgraded unit.

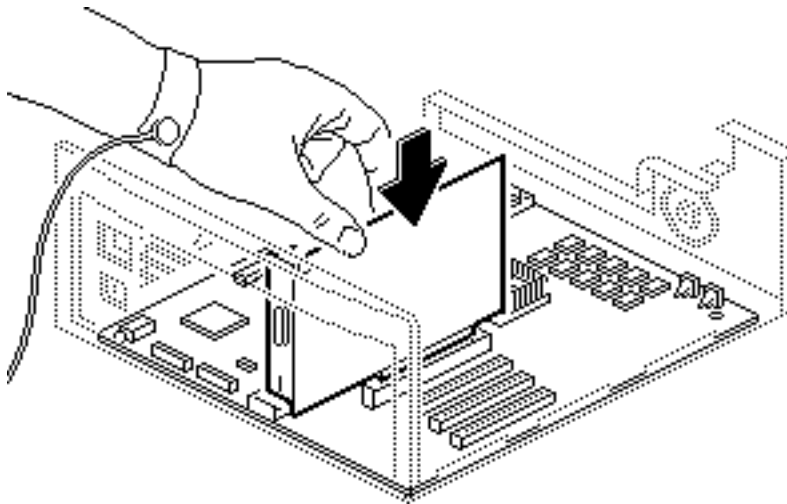
Note: The power supply strap is part of the shipping packaging for some power supplies. When replacing the power supply you should replace the strap if present.





Note: The height of the power supply will determine whether you install the power supply strap in the top or bottom slot. When installed, the strap should be flush with the power supply.

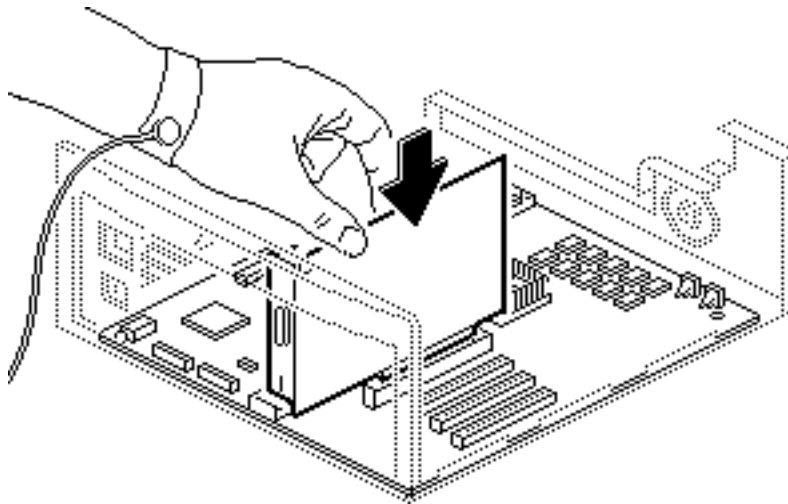




14 **Caution:** When installing a video card, push down evenly on both ends of the card. Do not force the card into the expansion slot. If the card does not seat properly, remove it and try again.

To upgrade to a Power Mac 7100/66, install the Power Macintosh 2 MB Video Card in the PDS slot on the logic board. To upgrade to a Power Mac 7100/66AV, install the Power Macintosh AV Card.



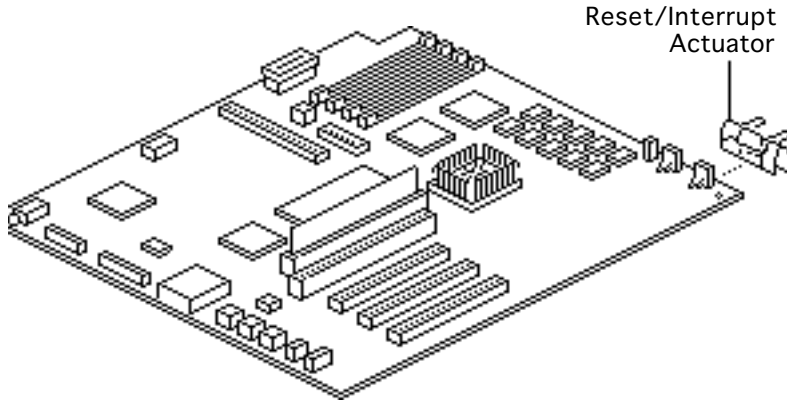


Note: The Power Macintosh 7100/66 and 7100/66AV **must** have a video card installed for proper bus termination.



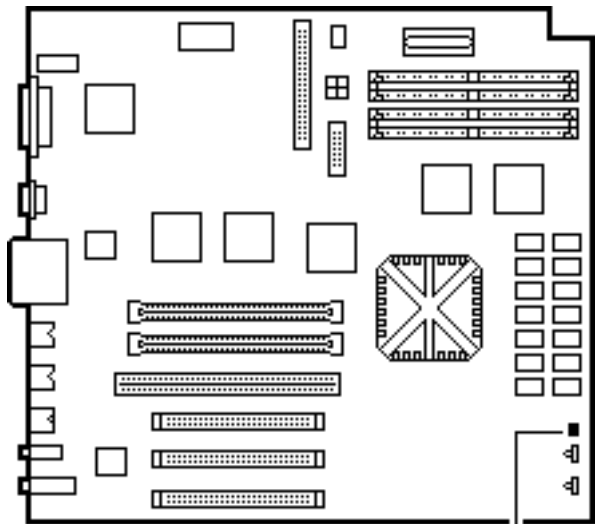


- 15 Remove the reset/interrupt actuator from the old chassis and install it in the upgraded chassis.



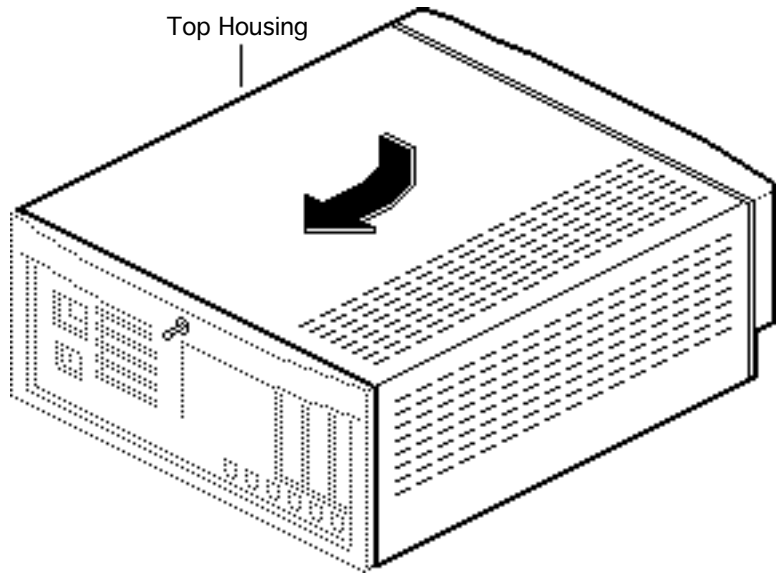


- 16 Connect the speaker cable to the upgraded logic board.



Speaker Cable
Connection





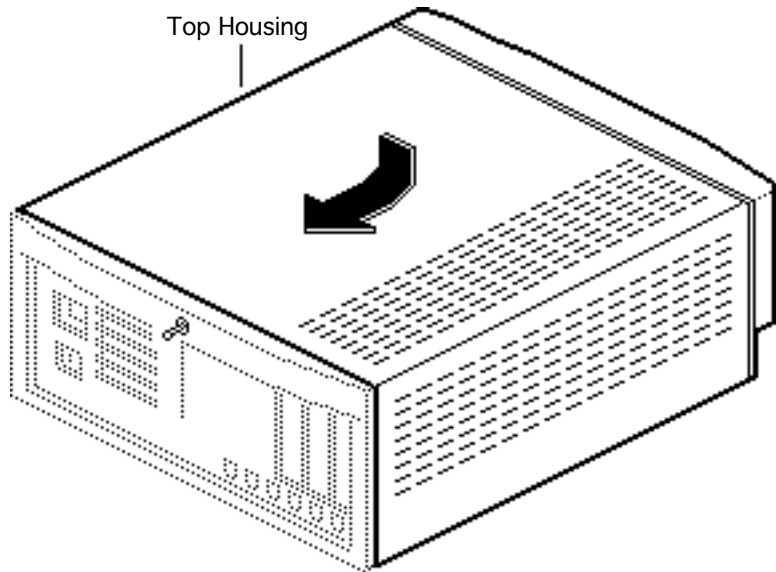
- 17 Copy the computer's serial number from the old top housing to the new top housing.

Note: A blank serial number label is provided on the back of the upgraded bottom housing.

- 18 Lower the top housing down so that it clears the drives and slide the top housing back into place.

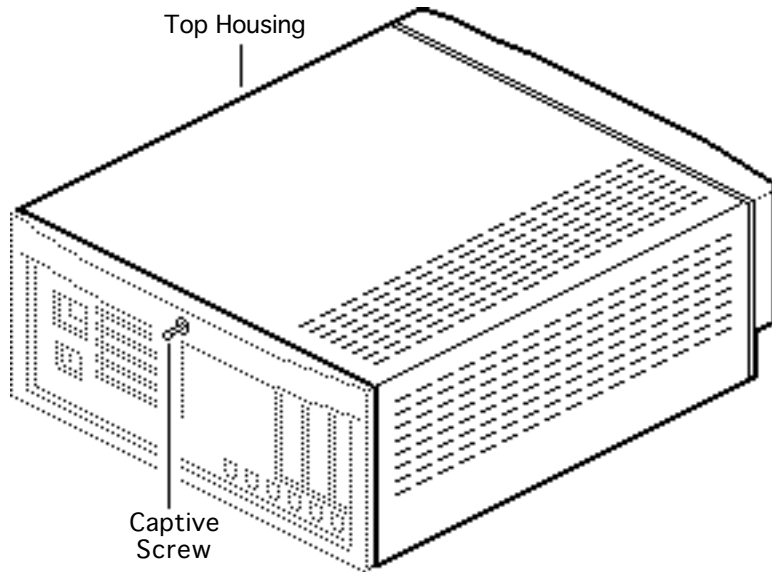
Replacement Note: Do not attempt to tilt the top housing when you install it.





Replacement Note: Do not jar the reset/interrupt actuator and light pipe out of alignment when you replace the cover.





19 **Caution:** Excessive force on the captive screw will damage the top housing.

Tighten the captive screw on the top housing.

Note: You must install the System 7.1.2 software that came with the Power Macintosh Logic Board Upgrade Kit. Refer to the user manual provided in the upgrade kit for installation instructions.





- 20 Run MacTest Pro in looping mode or other software in demo mode for 1 hour as a burn-in test.
- 21 **Note:** Contact Finished Goods for an RMA number to return the old logic board. Return the old logic board and floppy drive in the old housing.





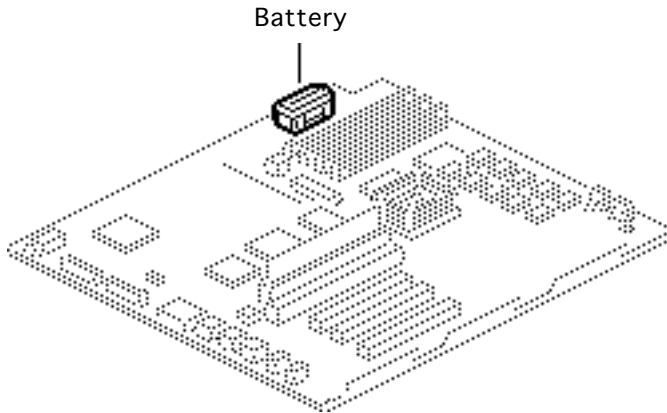
Additional Procedures

Power Macintosh 7100 Series





Battery Verification

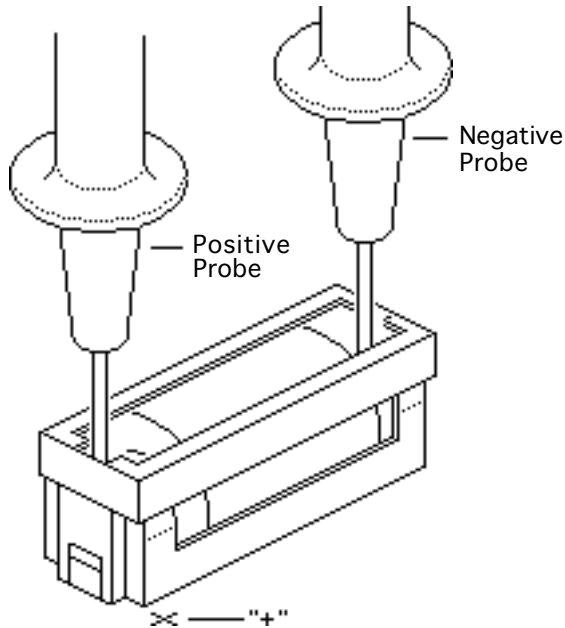


Before you begin, remove the following:

- Top housing
- Power supply
- Drive chassis

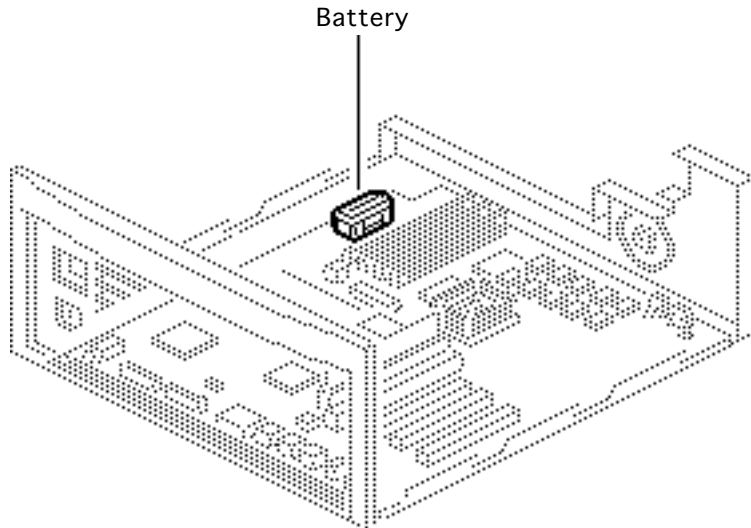
⚠ Warning: If handled or discarded improperly, the lithium battery in the computer could explode. Review battery handling and disposal instructions and the ESD precautions in Bulletins/Safety.





- 1 Set the voltmeter to the 10 volts DC scale.
- 2 Hold the positive probe of the voltmeter to the positive end of the battery (marked “+” on the logic board) and the negative probe to the negative end of the battery.
- 3 If the battery voltage is below 3.2 volts, replace the battery. Refer to “Battery Replacement” in this chapter.





Battery Replacement

Before you begin, remove the following:

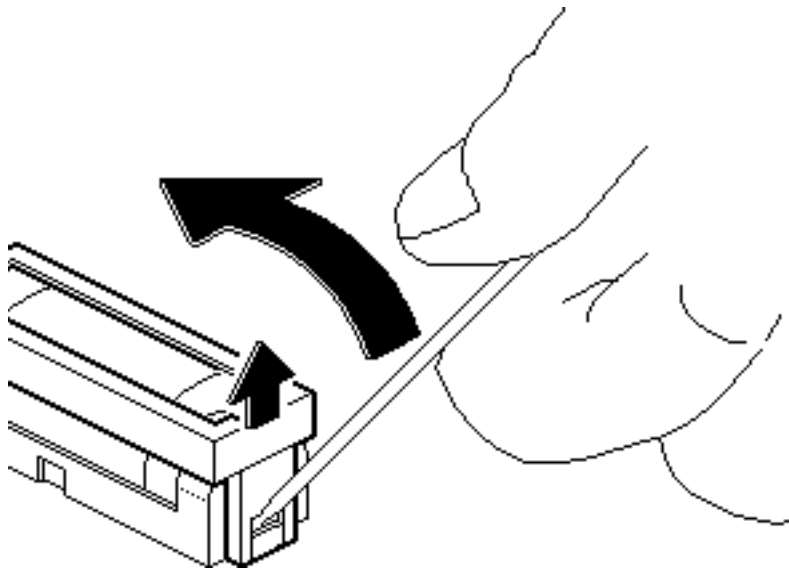
- Top housing
- Power supply
- Drive chassis

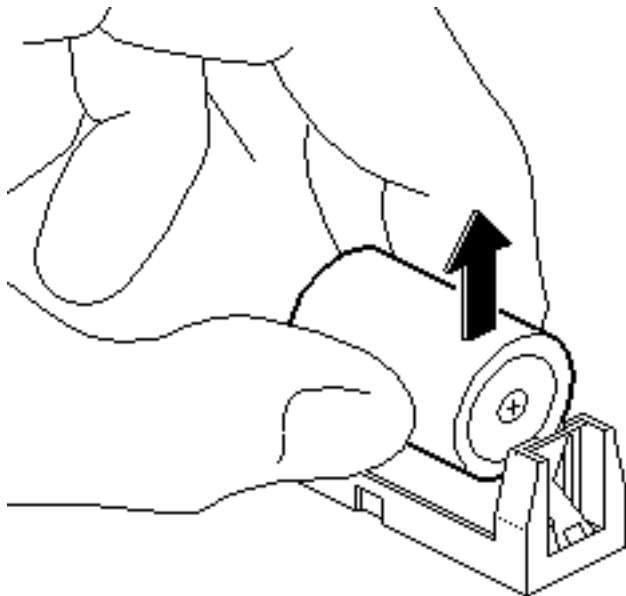
⚠ Warning: If handled or discarded improperly, the lithium battery in the computer could explode. Review battery handling and disposal instructions and ESD precautions in Bulletins/Safety.





- 1 Using a small flat-blade screwdriver, pry open the latch at the end of the battery holder and lift off the cover.





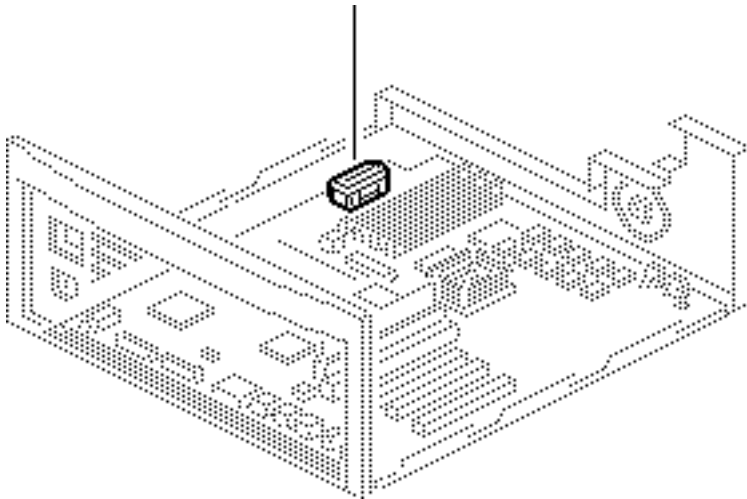
- 2 Grasp the battery and remove it from the holder.
- 3 Return the battery to Apple for proper disposal. For information on battery packaging and labeling, refer to the instructions in Bulletins/Safety.





Reset Logic Board

Battery



Before you begin, remove the following:

- Top housing
- Power supply
- Drive chassis
- Power cord

Note: Whenever you have a unit that fails to power up, you should follow this procedure to reset the logic board **before** replacing any modules.

Warning: If handled or



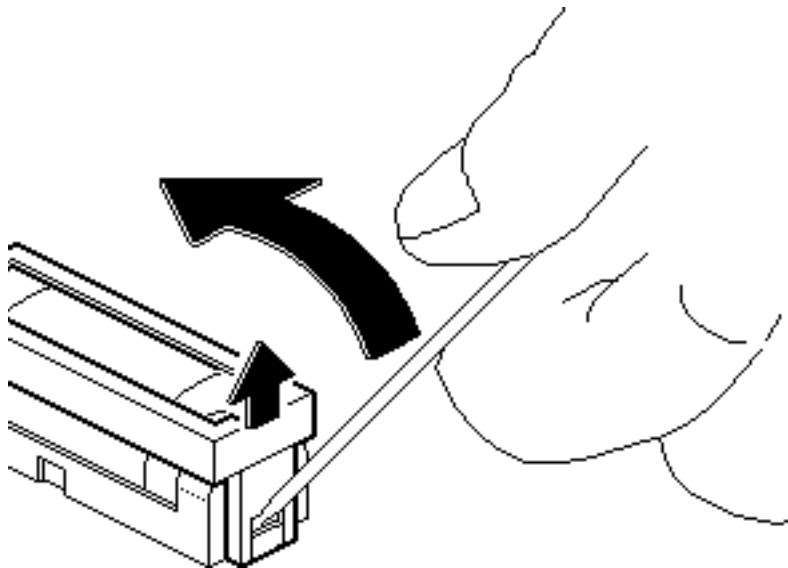


discarded improperly, the lithium battery in the computer could explode. Review battery handling and disposal instructions and ESD precautions in Bulletins/Safety.



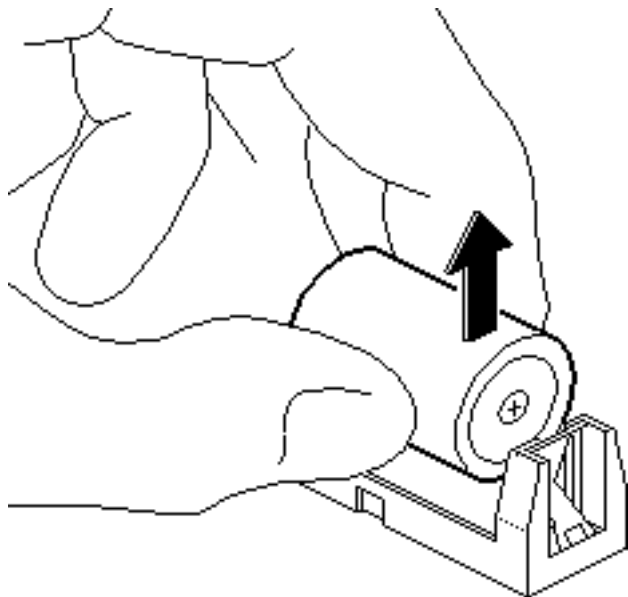


- 1 Unplug the computer first.
- 2 Using a small flat-blade screwdriver, pry open the latch at the end of the battery holder and lift off the cover.





- 3 Grasp the battery and remove it from the holder.





- 4 Press the computer's power-on button, which is located on the rear panel beneath the power outlet. Wait 5-10 minutes and then
 - Replace the battery
 - Replace the drive chassis
 - Replace the power supply

Replacement Note: Make sure the battery is facing in the correct (+/-) direction.

Note: This procedure resets PRAM. Be sure to check the computer's time/date and other system parameter settings.

Note: If this procedure resolves the problem, claim an adjustment on an SRO. If not, replace defective component and **do not** claim the adjustment procedure.

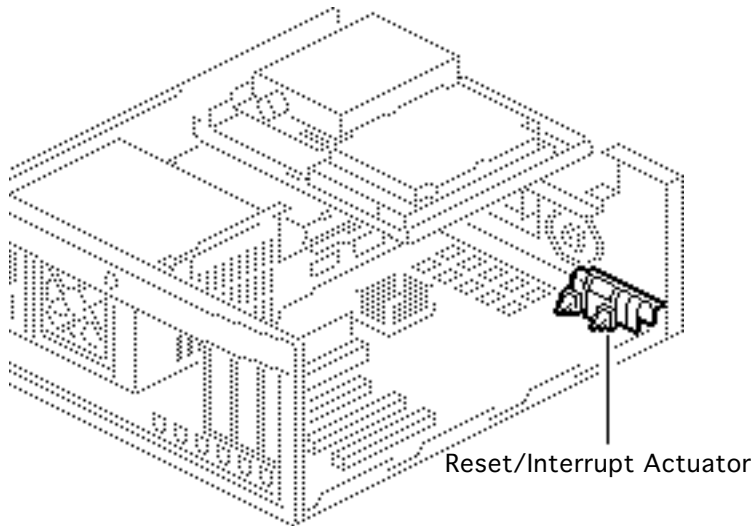




Reset/Interrupt

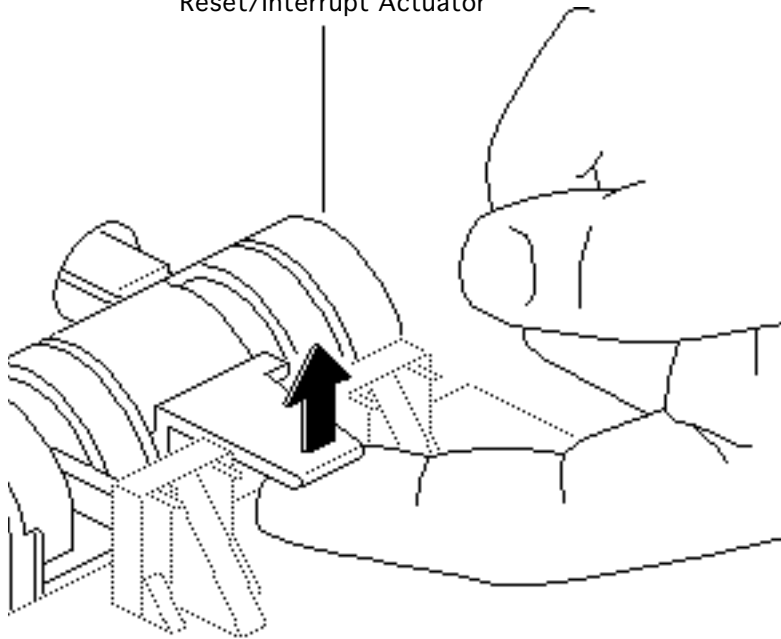
Before you begin, remove the top housing.

Caution: Review the ESD precautions in Bulletins/Safety.





Reset/Interrupt Actuator



- 1 With one finger, lift the center tab of the actuator.
- 2 Gently lift the rear of the actuator up and away from the front of the case.

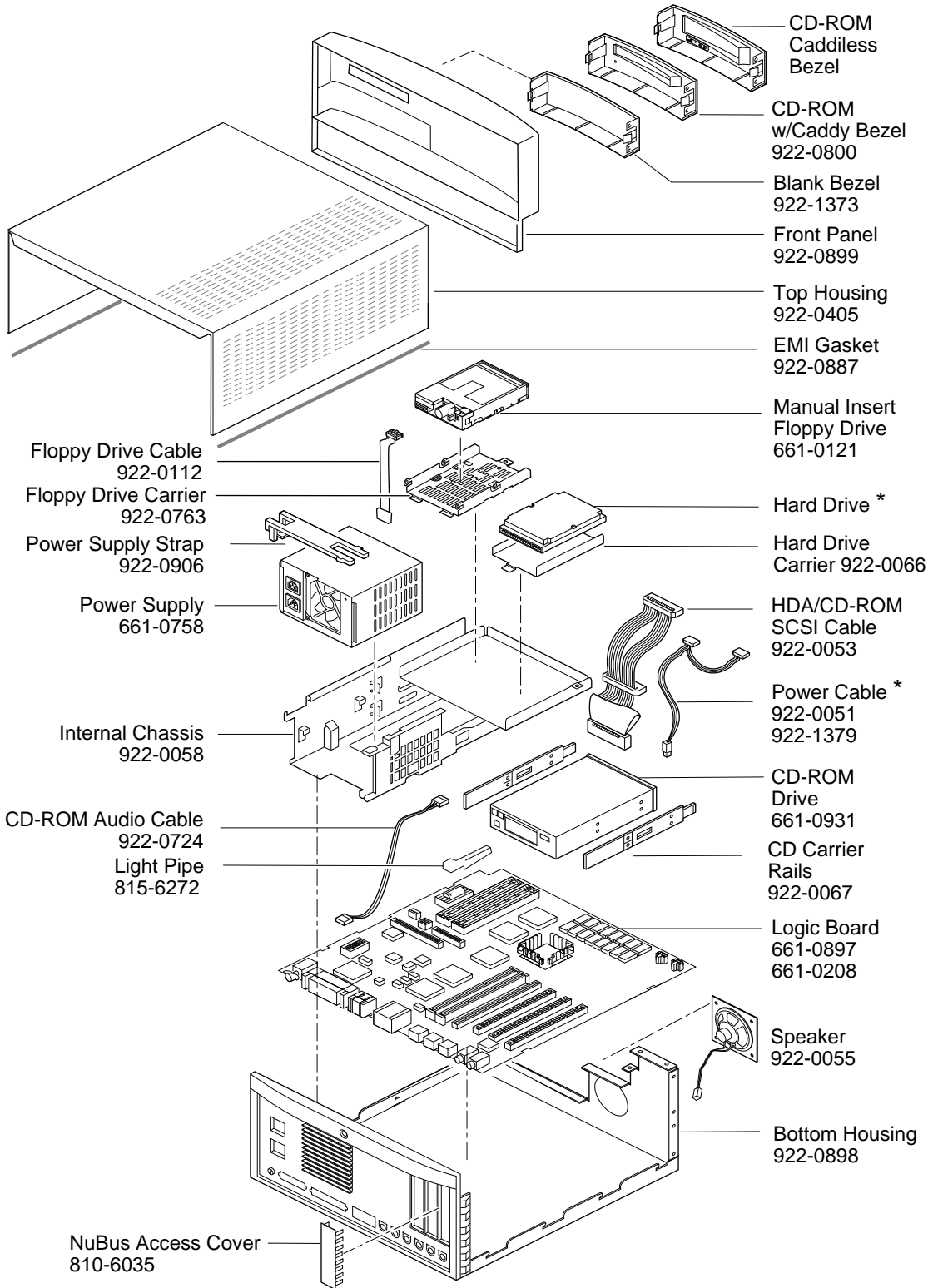




Exploded View

Power Macintosh 7100 Series





Product family configurations may vary. For parts with asterisk (*), refer to parts list.

Power Macintosh 7100

