ScreenPlay 7205 Service Guide

InFocus®
CORPORATION

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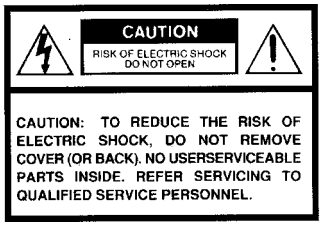
SAFETY PRECAUTIONS



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: **TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDETHE ENCLOSURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIRED PERSONNEL ONLY.**

CAUTION: Laser beam is emitted when the laser button of the remote control is pressed. Do not look from the front of the remote control. Do not face toward a person or to a mirror.

FCC Radio Frequency Interference Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiates radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING: Changes or modifications made to this equipment, not expressly approved by Toshiba, or parties authorized by Toshiba, could void the user's authority to operate the equipment.

Notice: This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

IMPORTANT PRECAUTIONS

Save Original Packing Materials

The original shipping carton and packing materials will come in handy if you ever have to ship your LCD projector. For maximum protection, repack the set as it was originally packed at the factory.

Avoid Volatile Liquid

Do not use volatile liquids, such as an insect spray, near the unit. Do not leave rubber or plastic products touching the unit for a long time. They will mar the finish.

Moisture Condensation

Never operate this unit immediately after moving it from a cold location to a warm location. When the unit is exposed to such a change in temperature, moisture may condense on the crucial internal parts. To prevent the unit from possible damage, do not use the unit for at least 2 hours when there is an extreme or sudden change in temperature.

In the spaces provided below, record the Model and Serial No. located at the rear of your LCD projector.

Mode No._____ Serial No. _____

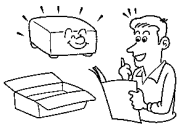
Retain this information for future reference.

IMPORTANT SAFETY INSTRUCTIONS

CAUTION: PLEASE READ AND OBSERVE ALLWARNINGS AND INSTRUCTIONS GIVEN IN THIS OWNER'S MANUAL AND THOSE MARKED ON THE UNIT. RETAIN THIS BOOKLET FOR FUTURE REFERENCE.

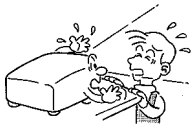
This set has been designed and manufactured to assure personal safety. Improper use can result in electric shock or fire hazard. The safeguards incorporated in this unit will protect you if you observe the following procedures for installation, use and servicing. This unit is fully transistorized and does not contain any parts that can be repaired by the user.
DO NOT REMOVE THE CABINET COVER, OR YOU MAY BE EXPOSED TO DANGEROUS VOLTAGE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.

1. Read Owner's Manual
After unpacking this product, read the owner's manual carefully, and follow all the operating and other instructions.



2. Power Sources
This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company.
For products intended to operate from battery power, or other sources, refer to the operating instructions.

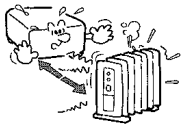
3. Source of Light
Do not look into the lens while the lamp is on. The strong light from the lamp may cause damage to your eyes or sight.



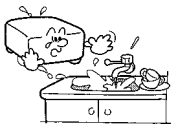
4. Ventilation
Openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

IMPORTANT SAFETY INSTRUCTIONS

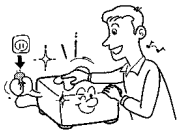
5. Heat
The product should be situated away from heat sources such as radiators heat registers, stoves, or other products (including amplifiers) that produce heat.



6. Water and Moisture
Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool and the like .

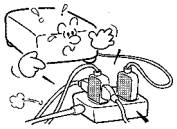


7. Cleaning
Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.



8. Power-Cord Protection
Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

9. Overloading
Do not overload wall outlets; extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.



10. Lightning
For added protection for this product during storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet.
This will prevent damage to the product due to lightning and power-line surges.

Parts Replacement

This section is designed to let you quickly access information on removal and replacement of FRUs. Go to the section for the part you want to replace. If there are other parts you must remove to access the part you want, you should go to those removal instructions.

NOTE You can also see a flow chart of FRU removal. FRU Hierarchy on page 6 shows a chart of which parts must be removed to access any FRU in the projector.

Generally, the replacement procedure is the reverse of the removal process. Sometimes you will find special instructions under Assembly Notes.

Removable Parts Hierarchy

The flow chart below shows what parts must be removed to access each FRU in the projector. The parts on the first level (the lamp door, for example) are accessible without removing any other parts. The more levels down a part is, the more parts you need to remove.

Ballast

The ballast is located in the chassis above and forward of the power supply. The ballast steps up power from the power supply to ignite the lamp module.

DANGER Do not attempt to measure the output voltage from the ballast when the lamp strikes. High voltage produced by the ballast to strike the lamp can ruin test instruments as well as cause personal injury.

1. Remove the following items:

   Lamp module (page 35)

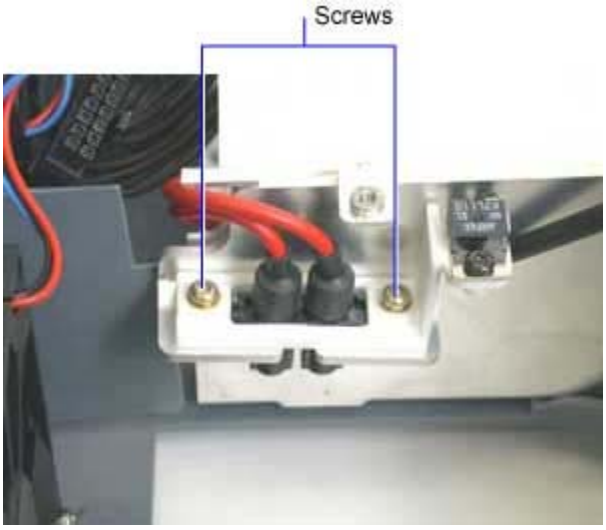
   Outer handle (page 37)

   Rear bezel (page 42)

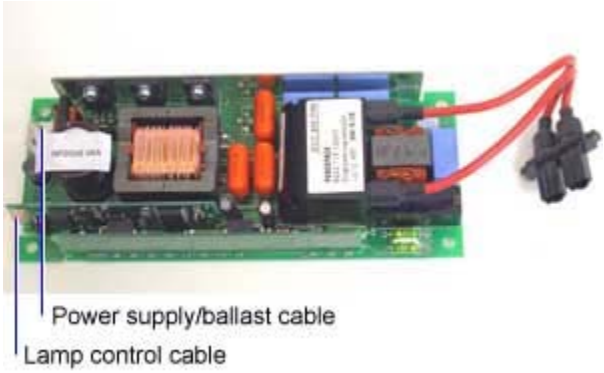
   Top case (page 47)

   Controller ECA (page 14)

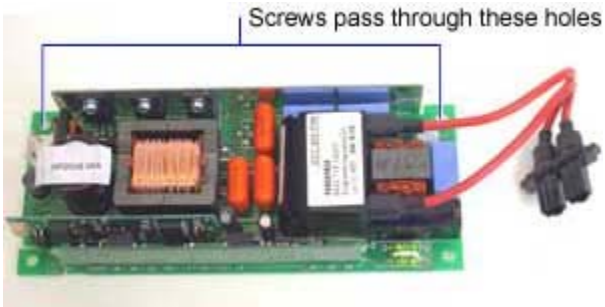
2. Remove the two M3x6 Torx screws from the lamp connector retainer on the front of the chassis.



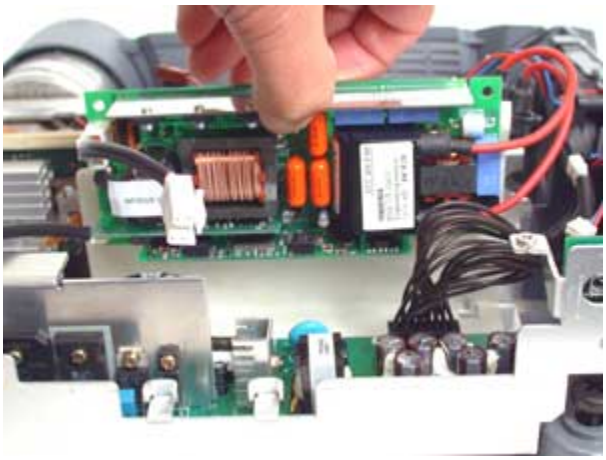
3. Unplug the ballast/power supply cable from X1 and the lamp control cable from the connector on the ballast. Squeeze the latch on the side of the power supply/ballast cable connector to release it. (The illustrations below show the ballast already removed so you can see it more clearly.)



4 Remove the two M3x8 screws that fasten the ballast to the chassis.

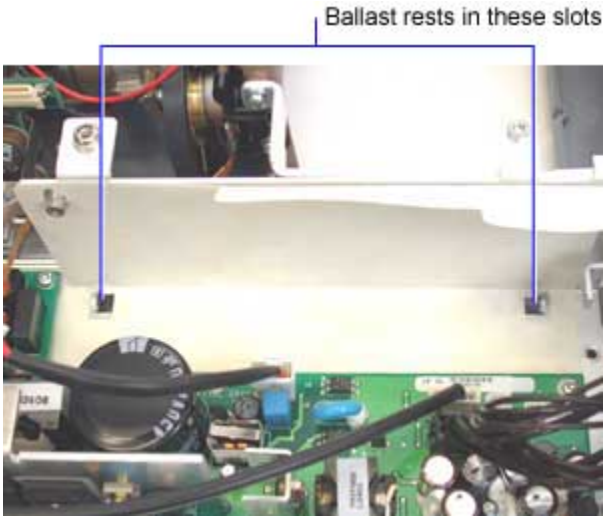


5 Lift the ballast away from the chassis.



Assembly Notes

- Plug in the power supply/ballast cable and the lamp control cables to their connectors on the ballast.
- Position the bottom of the ballast in the slots in the chassis. Make sure the two screw holes in the ballast align with the threaded standoffs on the wall of the chassis.



- Install and torque the two M3x8 Torx screws to 6 in/lbs (.68 Nm).

Bottom Case

The bottom case encloses the bottom half of the projector. When you replace a bottom case, you also need to adhere a new **certification label**.

1. Remove the following items:

   Lamp door and lamp module (page 35)

   Outer handle (page 37)

   Rear bezel (page 42)

   Top case (page 47)

   Inner handle and front vent (page 31)

   Controller ECA (page 14)

   Fan assembly (page 26)

   Chassis (page 11)

   Optical engine (page 24)

   Side IR receivers and lenses (page 42)

   Rubber feet (page 45)

   Leveling foot (page 37)

2. Remove the serial number label from the certification label. To do this, carefully use a heat gun or hair drier to soften the adhesive on the back of the label, then peel it off. Do not lose the serial number. It is not a replaceable part.

Assembly Notes

- Adhere a new certification label to the bottom case. Then adhere the original serial number label in the serial number box.

- Adhere one of the old rubber feet to the foot at the rear of the bottom case. Adhere the other rubber foot to the center of the leveling foot knob. Use new rubber feet if the adhesive was damaged when you removed the old ones from the old bottom case.
- Replace the parts in the bottom case reversing the order you used to remove them.

Chassis

The metal chassis provides the necessary rigidity for the projector's internal components, yet it adds very little to the overall weight. The power supply, ballast, rear IR receiver, lamp connector retainer and safety switch fasten to the chassis. The ballast/power supply insulator provides electrical insulation between the chassis and components inside it.

1. Remove the following items:

   Lamp module (page 35)

   Outer handle (page 37)

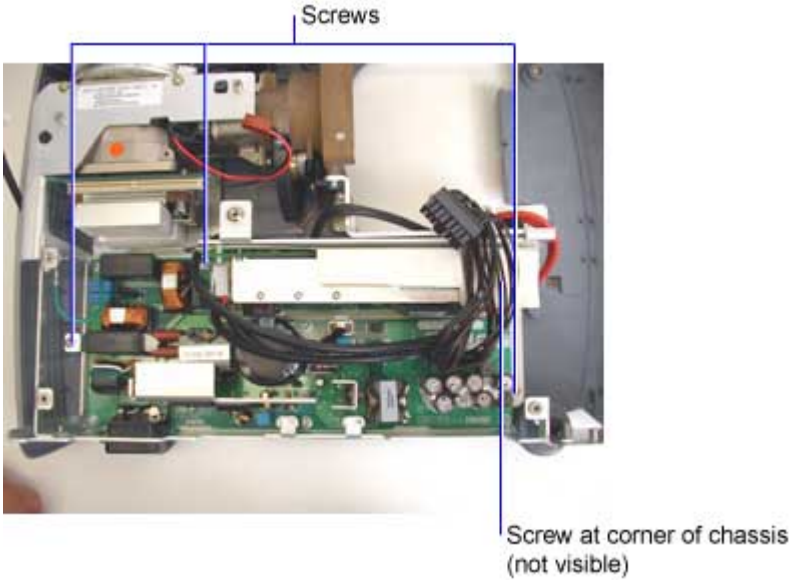
   Rear bezel (page 42)

   Top case (page 47)

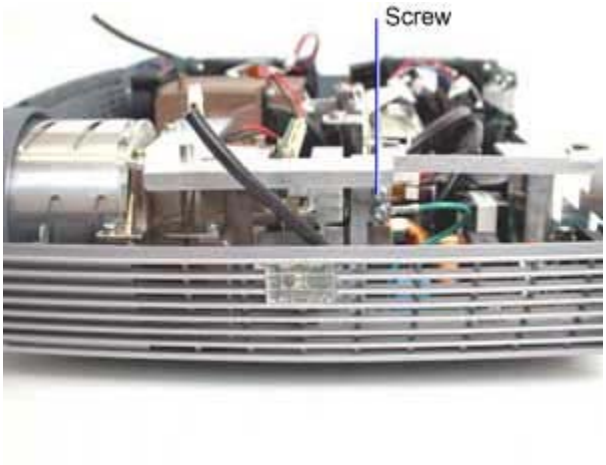
   Controller ECA (page 14)

   Rear IR receiver (page 42)

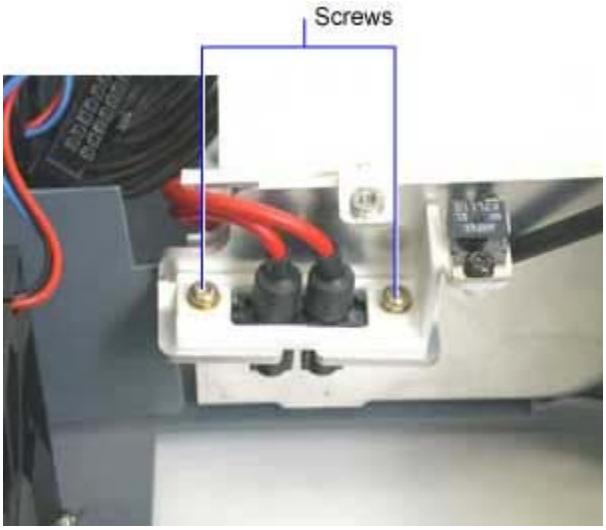
2. Remove the four M3x8 Torx screws that fasten the chassis to the bottom case.



3 Remove the M3x8 Torx screw from the side of the chassis above the power supply ground terminal.



4 Remove the two M3x6 Torx screws from the lamp connector retainer on the front of the chassis. The lamp connector and lamp connector retainer remove with the chassis.



5 Lift the chassis from the bottom case.

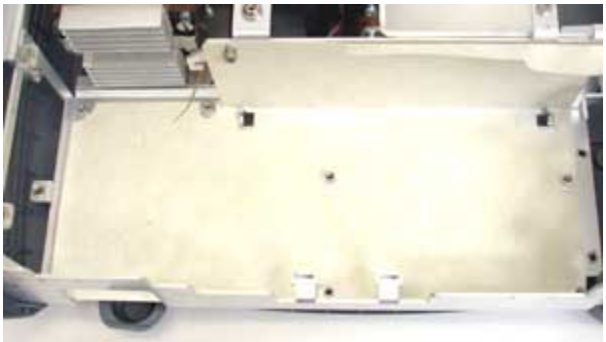
6 Place the chassis on the bench and remove the following parts:

Safety switch (page 45)

Power supply (page 39)

Ballast (page 7)

7 Remove the ballast/power supply insulator. To do this, tilt the insulator away from the front wall of the chassis and the ballast mounting standoffs. Then lift the insulator out of the projector.



You are left with the bare chassis.

Assembly Notes

- Position the ballast/power supply insulator in the chassis so that the holes in the bottom of the insulator align with the ballast mounting slots and power supply standoffs that protrude from the floor of the chassis. Then press the insulator over the ballast mounting standoffs on the front of the chassis.

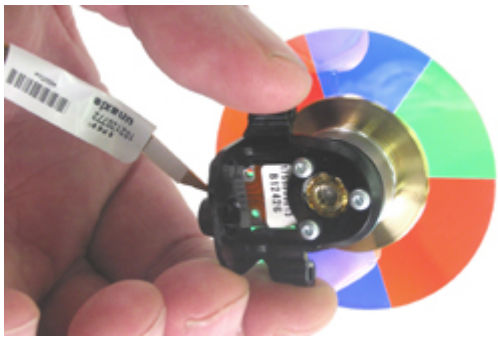
WARNING The insulator must always be installed between the ballast and power supply and the chassis. Inspect the gasket closely whenever the ballast or power supply is removed. Never use a gasket with holes or tears.

- Torque the two M3x6 Torx screws on the lamp connector retainer to 6 in/lbs (.68 Nm).
- Torque the five M3x8 Torx screws that secure the chassis in the projector to 6 in/lbs (.68 Nm).

Remove and Replace the Color Wheel Assembly

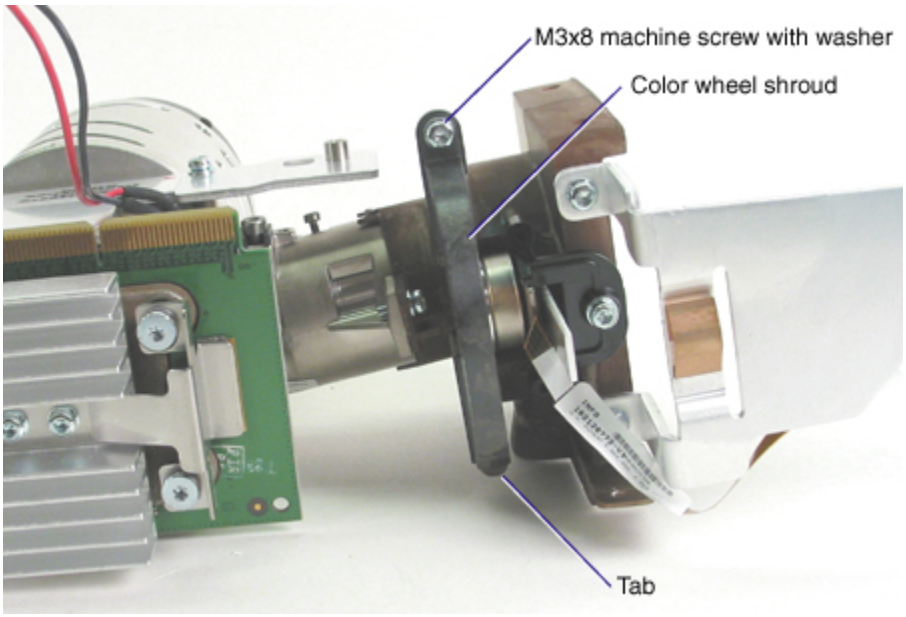
The color wheel assembly includes the glass color wheel, a motor and an ECA. The assembly mounts to the side of the metal optical engine. The color wheel ECA connects to the controller ECA via a removable **color wheel cable** and by a ribbon cable that is hardwired to the color wheel ECA.

After replacing the color wheel, you must confirm whether the color wheel requires calibration. Calibration instructions follow this procedure.

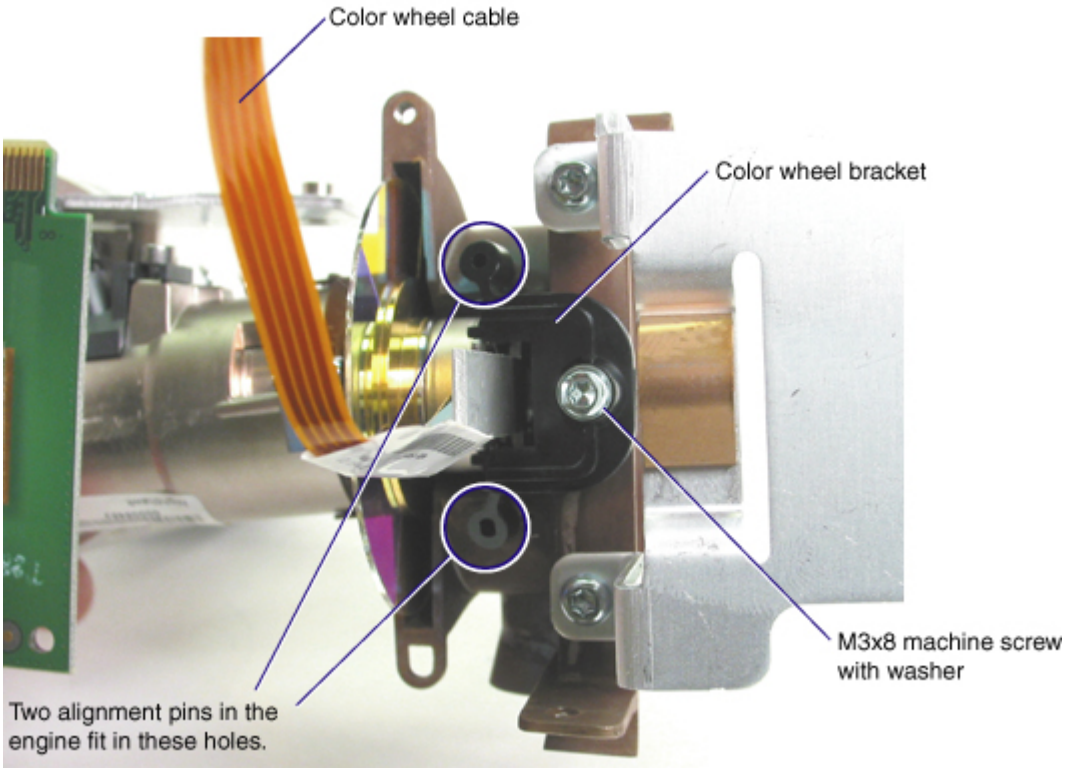


WARNING The color wheel is made from glass and is extremely fragile. If it breaks, the glass shards are sharp and can cut your fingers. When working with the color wheel, take care not to scrape it against the metal portions of the optical engine. Handle the color wheel only by the motor. Do not touch the glass with your fingers. Ccontamination from oil on the fingers can cause hot spots on the color wheel, which could lead to breakage.

8. Remove the optical engine.
9. Place the optical engine on a soft, ESD-protected surface.
10. Unplug the color wheel cable from its connector on the color wheel ECA.
11. Remove M3x8 Torx screw with washer that fastens the color wheel shroud to the engine. There is only one screw at the top of the shroud. A tab that fits into a slot in the engine secures the bottom of the shroud.

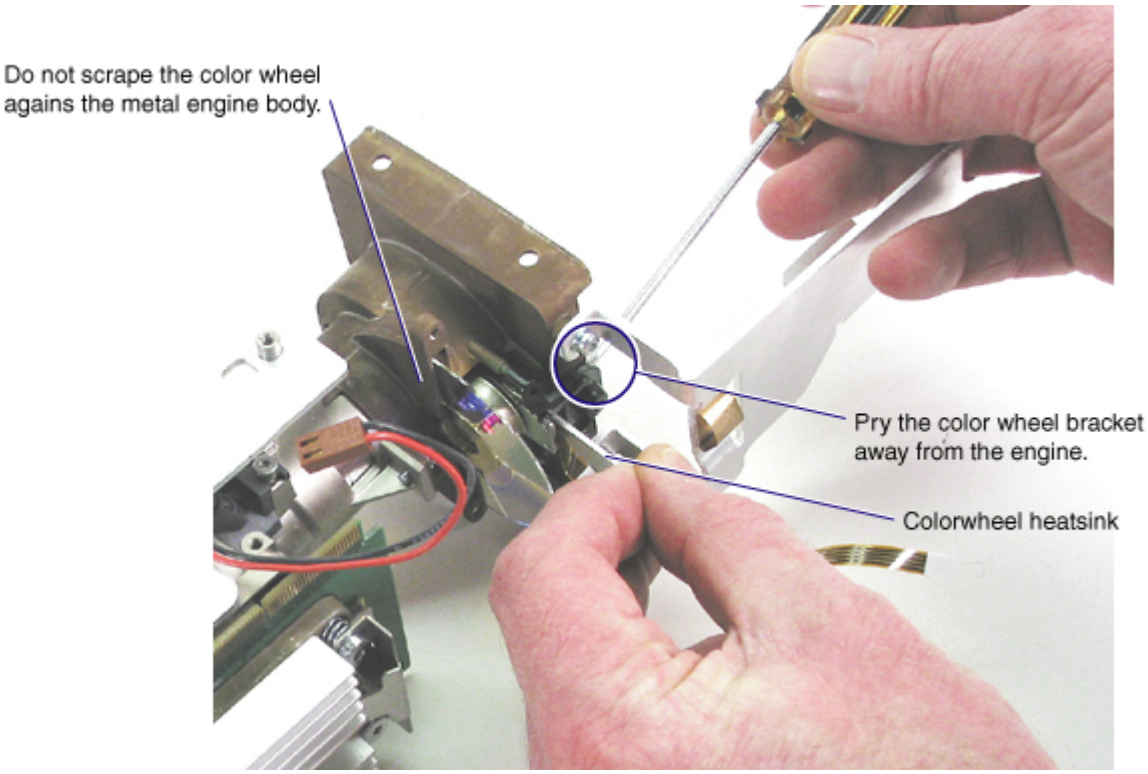


12 Remove the M3x8 Torx screw with washer that fastens the color wheel bracket to the engine.

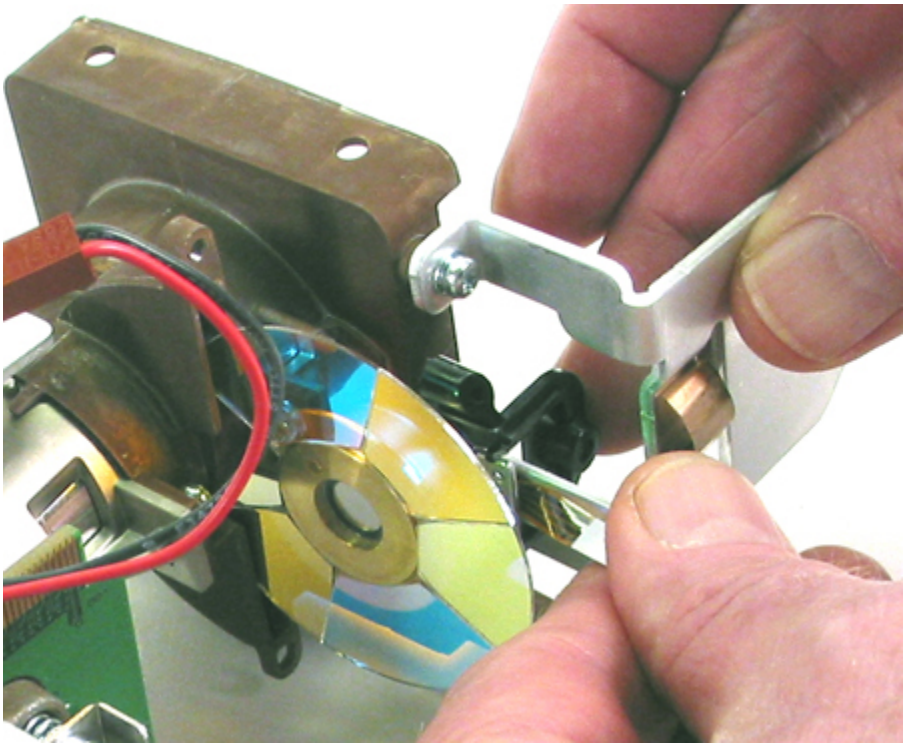


Once you remove the screw, all that is holding the color wheel to the engine are two alignment pins that insert into two matching holes on the color wheel bracket.

13 Remove the color wheel from the engine. To do this, grasp the metal heatsink, and carefully pry the bracket away from the engine with a small bladed screwdriver.



7 Once the color wheel separates from the engine, use a finger to stabilize the bracket as you slide the color wheel out of the engine.



8 Place the color wheel assembly on a lint free cloth.

CAUTION Please note that the bearings in the color wheel are extremely fragile and can be damaged when any pressure is placed on them.

Assembly Notes

- Handle the new color wheel only by the heatsink and bracket. Do not touch the glass or flex the color wheel. Bearing damage could occur.
- Torque the color wheel and color wheel shroud screws to 6 in/lbs (.67 Nm). InFocus recommends that you use a calibrated driver to avoid stripping the threads in the aluminum engine.
- Connect the color wheel cable to the color wheel ECA before you install the engine in the projector.
- After you reassemble the projector, you must check and adjust (if necessary) the color wheel calibration. Go to the next page for calibration instructions.

Calibrate the Color Wheel

After you install a color wheel, you must check the color wheel calibration to ensure that colors are reproduced smoothly on the screen.

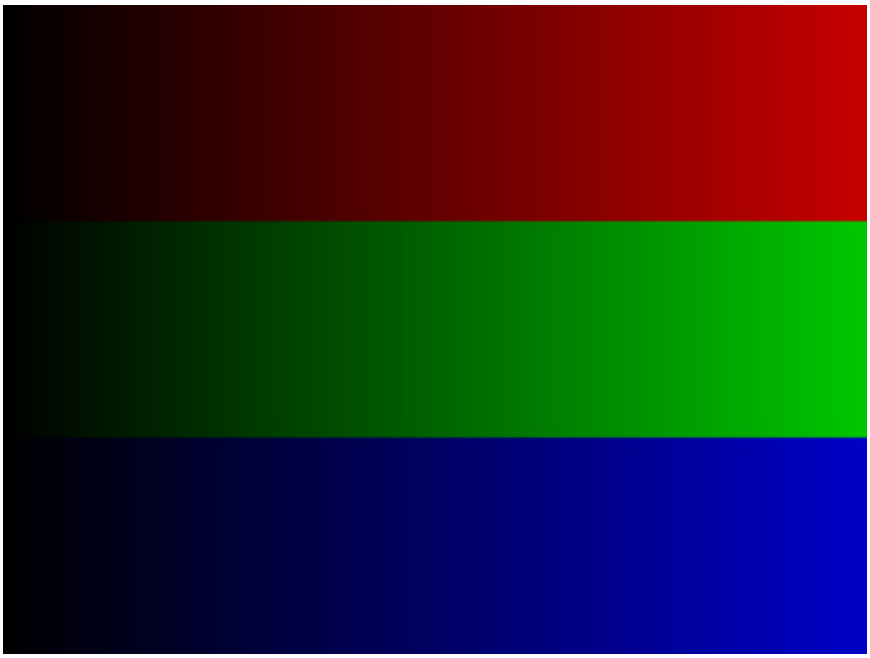
To do this, you need the following:

- **Director remote control**. This is the remote that ships with the SP7205, and is the only remote that contains the correct keys to enter the hidden Service menu.
- **The XGA Color Ramp screen**, which is available on the SP7205 ASC page (www.infocus.com/service/sp7205/asc-resources.asp).

  1. Connect the projector and computer. Display the computer image. The projector must be five feet from the projection screen.
  2. Open the Color Ramp screen in Microsoft Paint or similar application. Display it full screen.
  3. Observe the screen in a **dark** room. If the three colors do not smoothly progress from black to color, the color wheel index must be adjusted.

     The screen below shows even progression from black to color. This screen does not require calibration.

     If the color ramp you project appears like the one below, no calibration is required. *Make sure that you view the screen in a **dark** room.*



If the color ramp you project shows uneven progression from black to color, the color wheel requires calibration. Depending on how much out of calibration the color wheel is, the screen may look better or worse than the one below.

Go to the next step.

4 You use the Hidden Service menu to adjust the color wheel index. To enter the Hidden Service menu, do the following:

a Use the Director remote control to navigate to **Main > Settings > Service**.

b On the Service menu, select **Service Code** to display the password box.

c *Immediately* press the following keys in order on the remote control.

i. Source 1

ii. Source 3

iii. Source

iv. Overscan

v. Contrast –

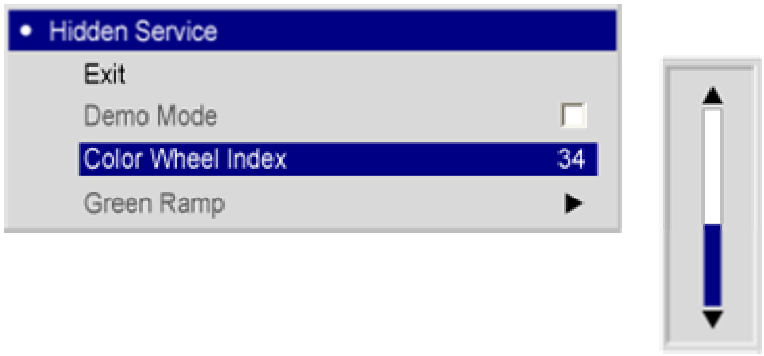
vi. Contrast +

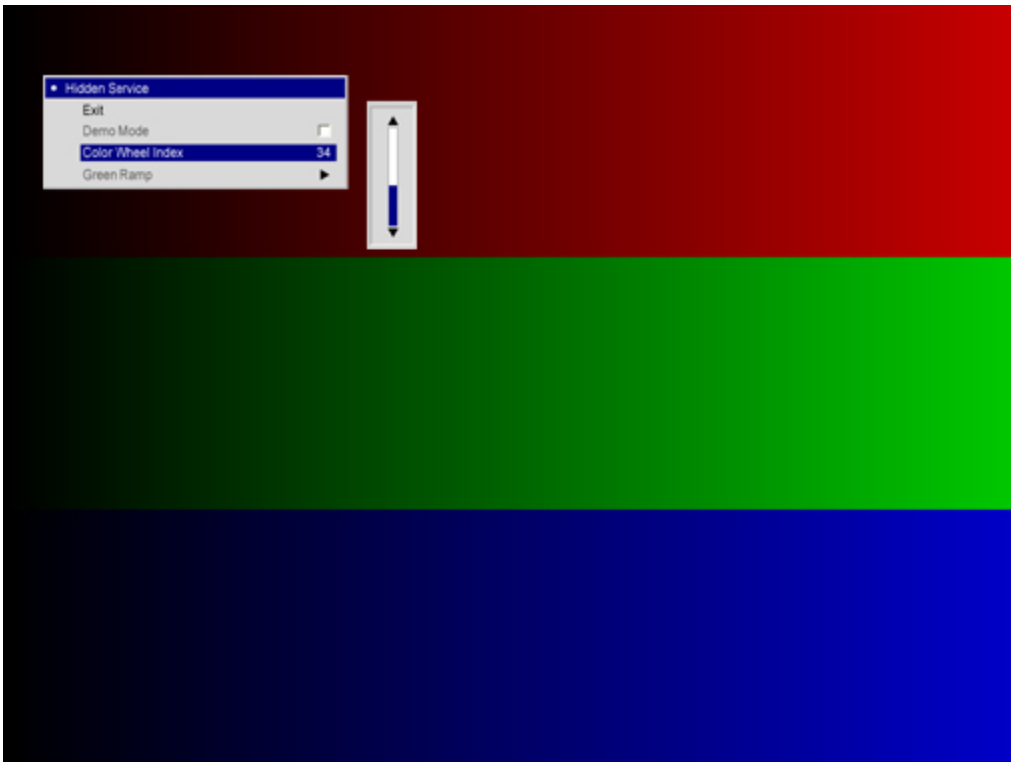
If the Hidden Service menu does not appear, repeat step c. You may need to do this several times.

Below is an illustration showing the sequence of keys to press on the remote.

5 On the Hidden Service menu, select Color Wheel Index.

The color wheel index slider bar appears to the right of the menu. Both appear on top of the color ramp screen.





6 Use the Up and Down keys on the remote control to adjust the color uniformity on the color ramp screen.

7 When you finish, press the Menu button to close the Hidden Service menu and accept the changes.

NOTE As long as the projector remains powered up, you do not need to re-enter the password to open the Hidden Service menu.

Controller ECA

The controller ECA mounts to the top of the metal chassis above the optical engine and power supply. It fastens to the chassis with seven screws and connects to the DMD ECA through a direct connector on the bottom of the controller.

A new controller ECA includes a new I/O shield over the input and output ports.

WARNING Be sure to take proper ESD precautions while working near the controller ECA. It can be easily damaged by static electricity. ECAs damaged by static electricity require replacement.

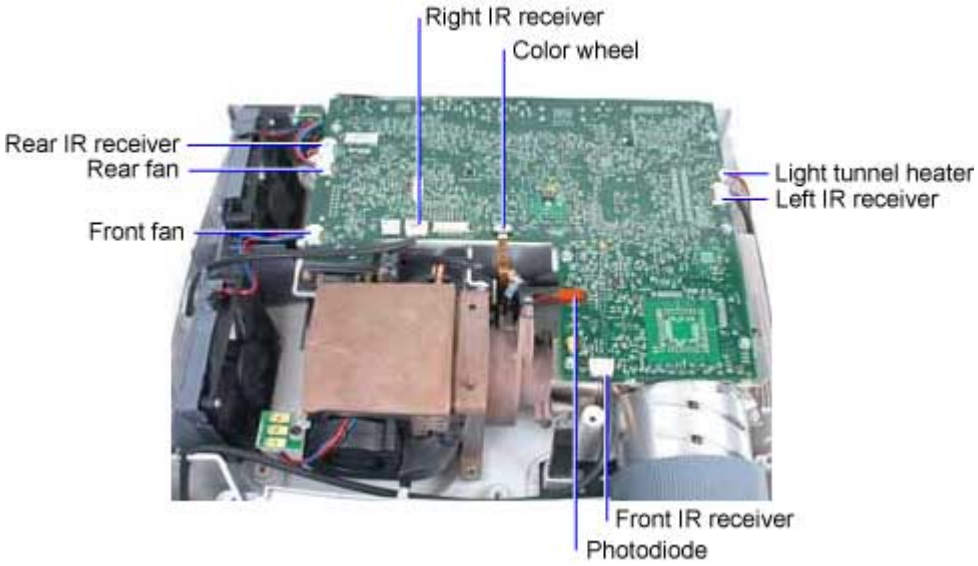
1. Remove the following items:

   Outer handle (page 37)

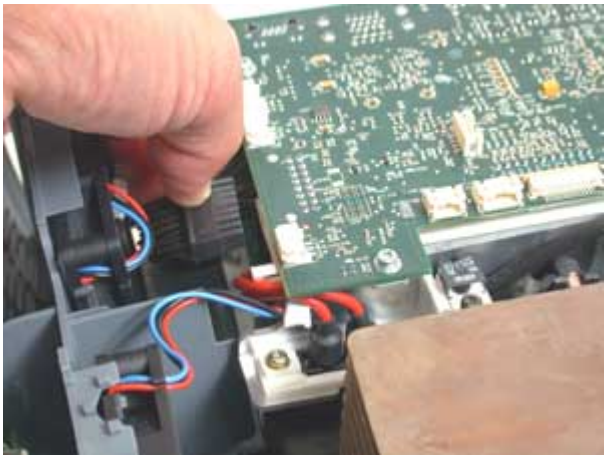
   Rear bezel (page 42)

   Top case (page 47)

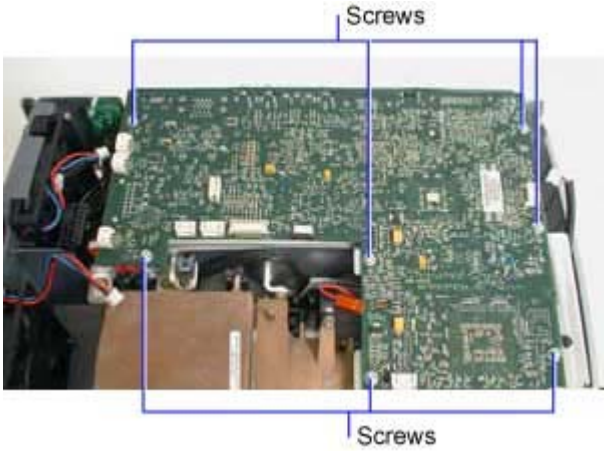
2. Unplug the two fan cables, the front, rear and two side IR receiver cables, the photodiode cable, the color wheel ribbon cable, and the light tunnel heater cable from the controller ECA.



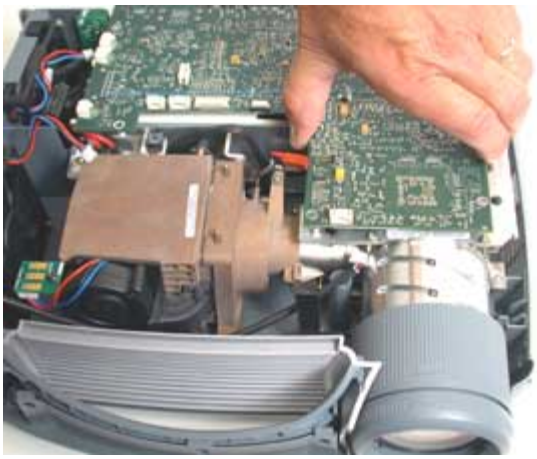
3 Unplug the controller/power supply cable from the controller ECA. Squeeze the latch on the bottom of the connector to release it.



4 Remove the seven M3x8 Torx screws that fasten the controller ECA to the chassis.



5 Lift the controller ECA over the optical engine to release the DMD/controller connector.

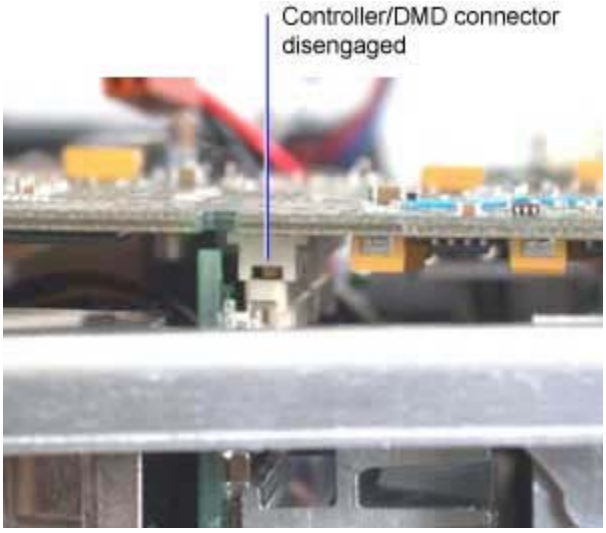


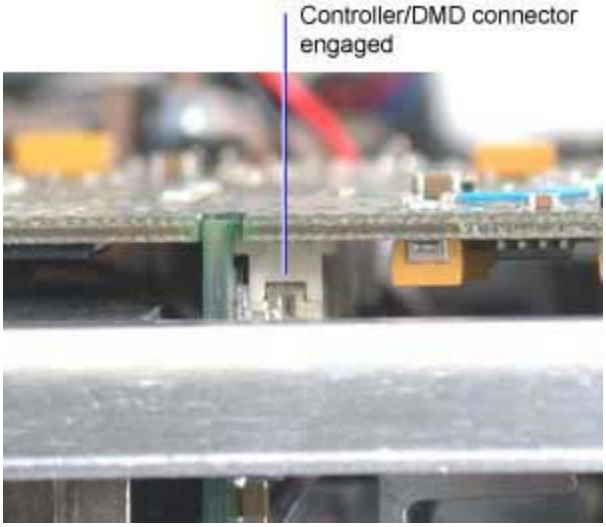
6 Lift the controller out of the projector.

WARNING Make sure to store the controller ECA in a static-safe container.

Assembly Notes

- Align the controller/DMD connector, then press the controller down firmly. You will feel the connector halves engage.





- Use a T-10 driver to install the seven M3x8 Torx screws. Torque the screws to 6 in-lbs (.68 Nm).
- Plug in the controller/power supply cable. **Make sure the cable is clear of the fan blades.** Secure cables around the fans in their retainers to prevent cable damage or fan blade blockage.
- Plug in the two fan cables, the front, rear and two side IR receiver cables, the photodiode cable, the color wheel ribbon cable, and the light tunnel heater cable. See page 67 if you need help with the color wheel ribbon cable.

Optical Engine

The optical engine fastens to the bottom case. The body of the engine fastens to the optical engine mounting bracket, while the light tunnel fastens directly to the bottom case near the lamp house. The engine comprises all parts in the light path including the:

- DMD - produces the image by reflecting wanted pixels through the projection lens and discarding unwanted pixels by reflecting them to a "dump light" area inside the engine.
- DMD driver board - formats the image signal for interpretation by the DMD
- Color wheel - provides colors for the DMD to use in image production
- Light tunnel - conducts focused light from the lamp module to the DMD
- Light tunnel heater - maintains a stable light tunnel temperature, preventing unwanted expansion and contraction that degrades the image
- Photodiode - reads color wheel rotation to maintain proper synchronization with the DMD and allow accurate image color reproduction
- Projection lens - focuses or changes the size of the image produced by the DMD

1. Remove the following items:

   Lamp door and lamp module (page 35)

   Outer handle (page 37)

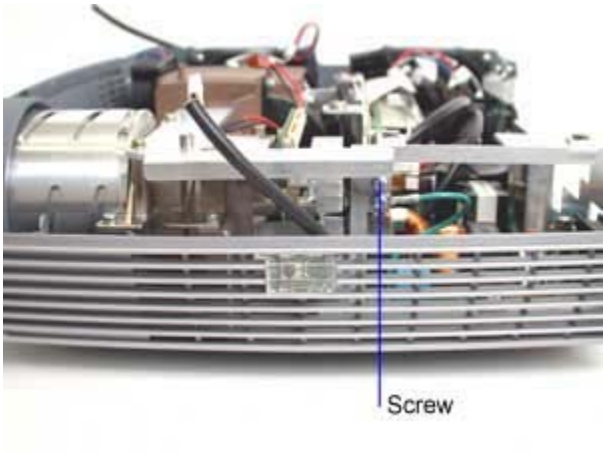
   Rear bezel (page 42)

   Top case (page 47)

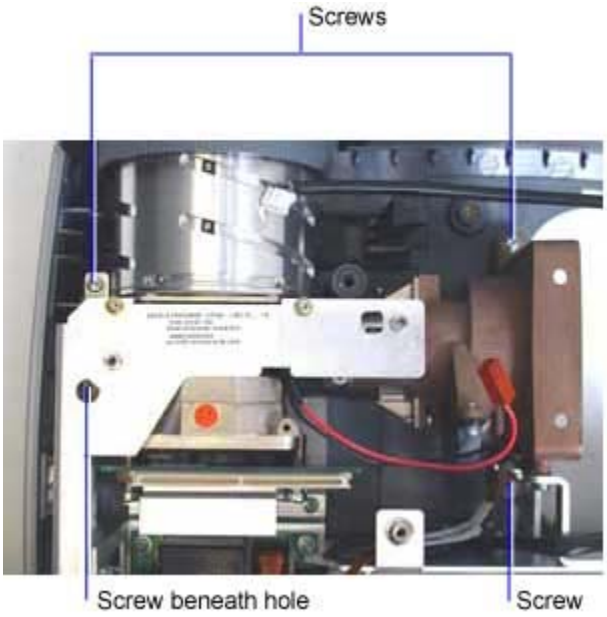
   Inner handle and front vent (page 31)

   Controller ECA (page 14)

2. Remove the M3x8 Torx screw that fastens the optical engine to the chassis.



3 Remove the four M3x8 Torx screws that fasten the optical engine to the mounting bracket.



4 Grasp the engine around the projection lens barrel. Then lift the engine up out of the case.

5 Place the engine on a static-free surface or in an ESD-protected container.

Assembly Note

- Make sure the engine aligns with the holes in the mounting bracket. Torque all five of the M3x8 Torx screws to 6 in/lbs (.68 Nm).

Fan Assembly

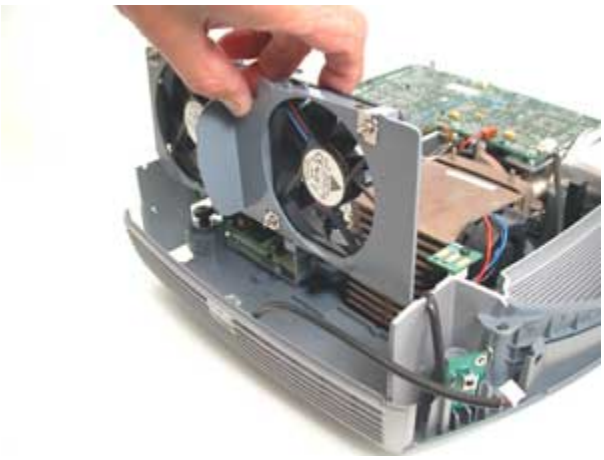
The fan assembly is comprised of two fans and the fan bracket. The two fans provide all the cooling air necessary for the projector.

1. Remove the following items:

   Outer handle (page 37)

   Rear bezel (page 42)

   Top case (page 47)
2. Unplug the left IR receiver cable from connector J508 and the fan cables from connectors J506 and J517 on the controller ECA.
3. Lift the fan bracket from the bottom case.



Assembly Notes

- Make sure bottom and sides of the fan bracket engage the slots in the bottom case and the front vent. The fan bracket fits into the bottom case only one way.
- Plug the cable from the fan nearest the lamp into connector J506 on the controller ECA. The cable from the fan nearest the power supply plugs into connector J517 on the controller ECA.
- Plug the cable from the left IR receiver into connector J508 on the controller ECA.
- When you install the fan bracket in the projector, make sure that all cables are clear of the fan blades. Secure cables around the fans in their retainers to prevent cable damage or fan blade blockage.

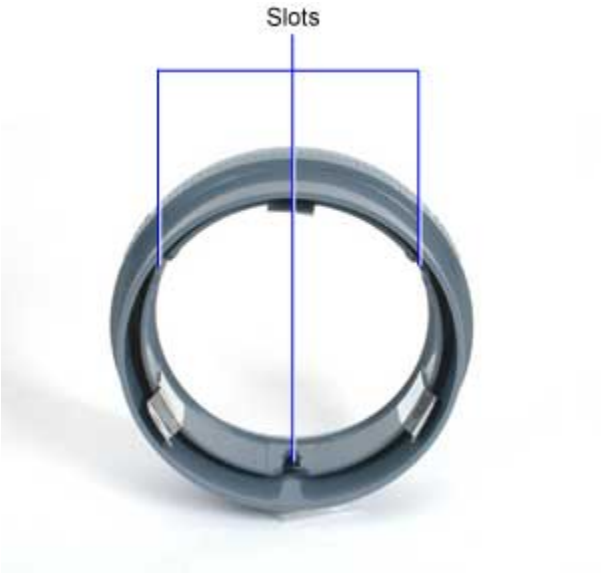
Focus and Zoom Rings

The focus ring fits around the front of the projection lens. The zoom ring is behind the focus ring. The lens cap snaps onto the focus ring.

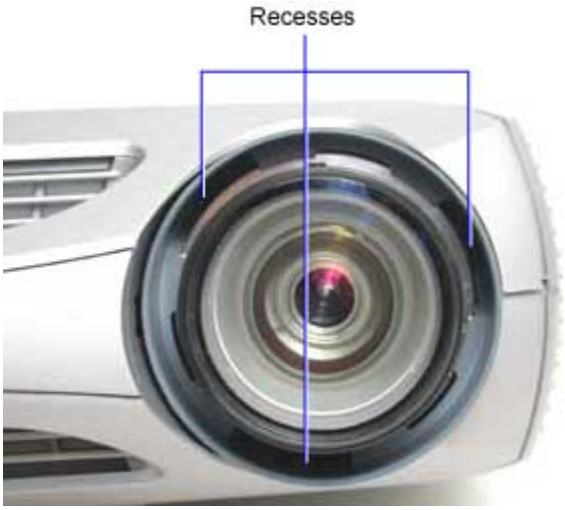
Both the focus ring and the zoom ring snap into place on the lens barrel. They can be replaced without removing any other projector parts.

Three retainer slots inside the zoom ring engage alignment pins on the outside of the lens. Three retainer tabs on the zoom ring engage holes on the lens barrel.

1. Place the projector right side up on a soft work surface.
2. Grasp the focus ring and pull it off of the lens barrel. The retainer slots disengage the pins on the lens.



3. Stand the projector on its rear side and insert a small flat blade screwdriver into one of the zoom ring recesses. Gently pry the retainer tab away from the lens. The tab releases the engagement hole on the lens barrel.

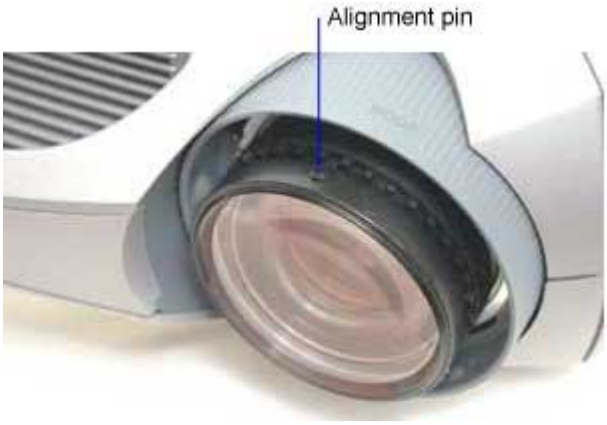


4 Gently pull forward on the zoom ring and repeat step 3 for the other two retainer tabs.

5 When you release all 3 retainer tabs, grasp the zoom ring and pull it off of the lens barrel.

Assembly Notes

- Align the three tabs on the zoom ring with the three holes on the lens barrel. Push the ring onto the lens barrel. The lens barrel should fit snugly against the collar inside the zoom ring. Rotate the zoom ring to ensure that the tabs properly engage the holes.
- Align the three slots on the focus ring with the three alignment pins on the end of the lens barrel. Press the focus ring into place. Rotate the focus ring to ensure that the slots properly engage the alignment pins.



- Place the lens cap over the focus ring.

Front IR Receiver and cable

The front IR receiver and cable is located behind the front IR lens in the inner handle. It consists of the IR ECA and a cable that connects to the controller ECA. The receiver works with others at the rear and both sides of the projector to provide omni-directional reception of commands from the remote control.

1. Remove the following items:

   Outer handle (page 37)

   Rear bezel (page 42)

   Top case (page 47)

2. Unplug the front IR receiver cable it from J500 on the controller ECA.
3. Slide the front IR receiver upward and out of the alignment slots in the inner handle.

Assembly Notes

- Route the cable to the left of the front IR receiver ECA and through the saddle at the top of the inner handle.

- Make sure that the front IR receiver ECA properly engages the alignment slots in the inner handle.
- Connect the cable to J500 on the controller ECA.

Handle

The handle is comprised of the curved plastic handle and a vent. It provides rigidity to the front of the projector.

1. Remove the following items:

   Outer handle (page 37)

   Rear bezel (page 42)

   Top case (page 47)

   Front IR receiver (page 30)

2. Lift the handle from the side of the projector opposite the lens. Swing the handle upward slightly then lift it from the bottom case.

Assembly Notes

- Position the front vent in the slots in the bottom case. Make sure that it fits properly and that the side of the fan bracket rests in the vertical slot along the back of the vent.

I/O EMI Shield

The I/O EMI shield fits over the I/O connectors on the rear of the controller ECA. It fastens to the controller with eight jack screws.

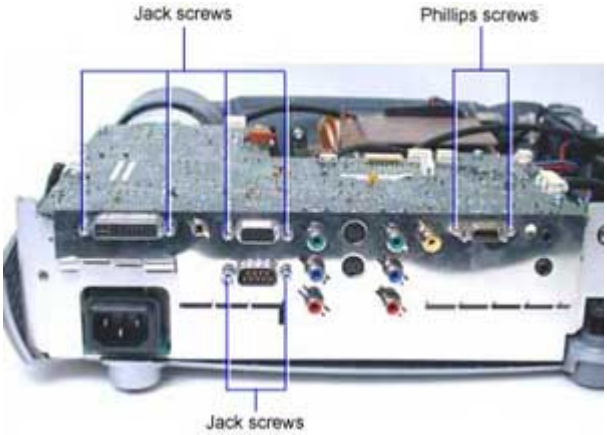
1. Remove the following items:

   Outer handle (page 37)

   Rear bezel (page 42)

   Top case (page 47)

2. Remove the six 4-40 jack screws and the two Phillips screws that fasten the EMI shield to connectors on the controller ECA.



3. Carefully pull the I/O EMI shield off of the connectors. Take care not to bend the shield or the fingers as you work the shield off.

Assembly Notes

- Make sure the fingers on the shield contact the connectors.
- Torque the jackscrews to 2 in-lbs (.226 Nm).
- Lightly snug the Phillips screws. Don't over tighten them.

Keypad

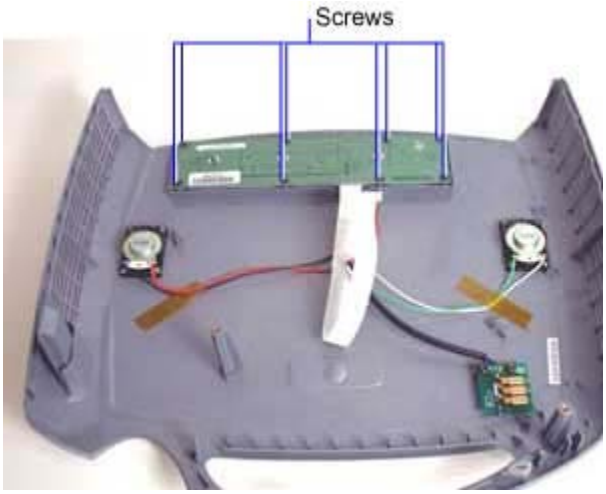
The keypad fastens to the inside of the top case. The keypad consists of the keypad ECA, the rubber key set. Both parts are available separately.

1. Remove the following items:

   Rear bezel (page 42)

   Outer handle (page 37)

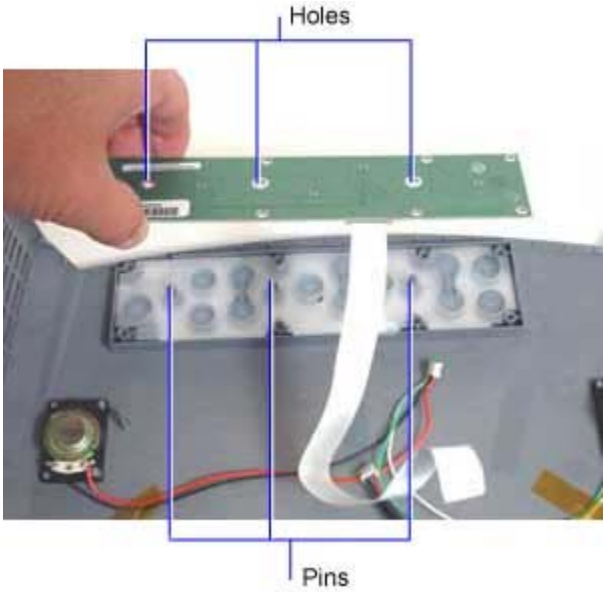
   Top case (page 47)
2. Place the top case face down on a soft work surface.
3. Remove the eight M3x6 Plastite Torx screws that fasten the keypad to the top case. Then lift the keypad ECA out of the recess in the top case.



4. Gently lift the rubberized key set out of the top case.

Assembly Notes

- The keypad ECA and the key set fit only one way in the top case. Make sure that the alignment holes in the keypad ECA fit over the pins in the top case.



- Make sure that the collar on each key fits flush against its hole in the top case.
- Torque the eight M3x6 Plastite Torx screws to 4 in.-lbs. (.452 Nm).

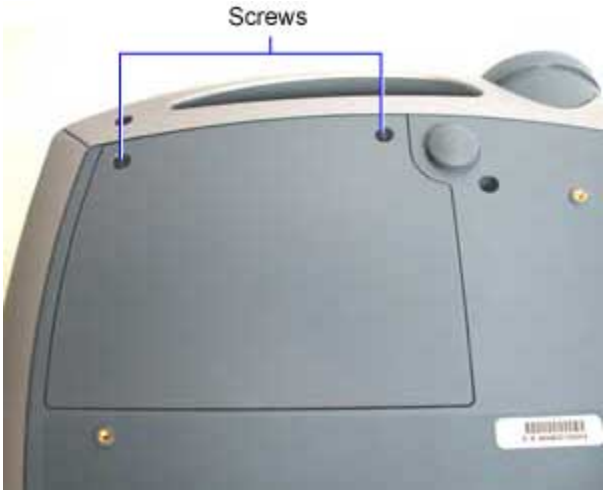
Lamp Door and Lamp Module

The lamp door fits over the lamp cavity in the projector. It includes a tab that closes the interlock switch when the door is shut.

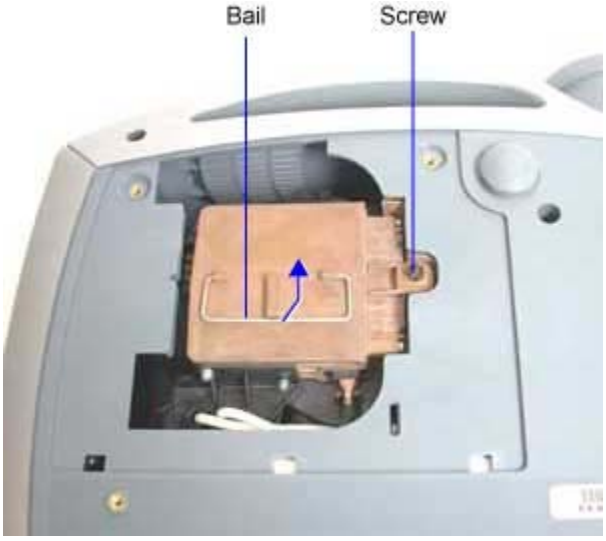
The lamp module consists of a metal housing and enclosed reflector assembly and arc tube. A blower on the side of the lamp module provides cooling air to the arc tube and reflector inside of the housing.

CAUTION The lamp module gets very hot during operation. Allow the lamp to cool for 30 minutes before handling it. The lamp module gets very hot during operation. Allow the lamp to cool for 30 minutes before handling it.

1. Place the projector upside down on a soft work surface.
2. To remove the lamp door, loosen the two captive screws that secure it to the projector.



3. To remove the lamp, loosen the captive screw that secures it in the projector, swing the bail on the top of the lamp module up from its storage position, and then pull the module out of the projector.



Assembly Notes

- The lamp must be seated properly to fully ignite. Make sure the two alignment pins on the lamp module engage the holes inside the lamp cavity.
- Make sure the bail on the lamp module is folded down in storage position. It snaps into position.

NOTE If the lamp door does not fit flush in the door opening, it is probably because the bail is not completely folded down.

- You must replace the lamp door for the projector to operate.
- If you installed a new lamp module, follow the directions below to **reset the lamp timer**.

  a Power up the projector.

  b Hold down the two Brightness buttons on the projector keypad for 10 seconds.

  c After you reset the lamp timer, read the timer value to make sure it was reset. Navigate to the About screen from the Main Menu, then view the Lamp Hour value. It should show 0 hours.

Outer Handle

The outer handle covers the front of the projector and helps to secure the top case to the bottom case. Pins on the handle fit into holes through tabs on the top and bottom cases. When the pins engage the holes, the top and bottom cases lock together at the front of the projector and hold the outer handle in place.

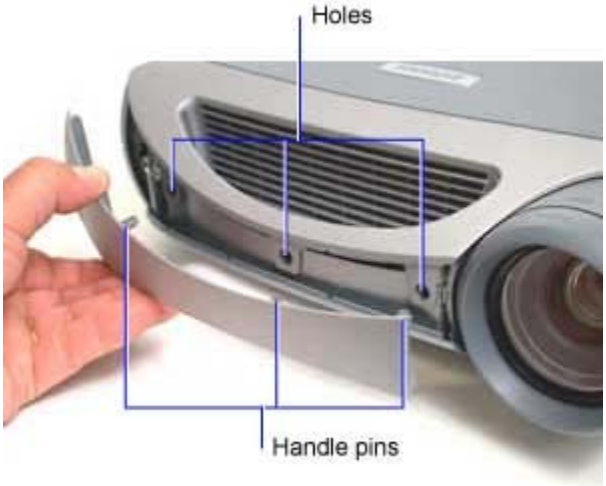
The outer handle contains the **front IR lens**. The lens snaps into the recess in the outer handle. A new outer handle does not include a front IR lens.

1. Insert a small flat blade screwdriver behind the edge of the outer handle near the lens.

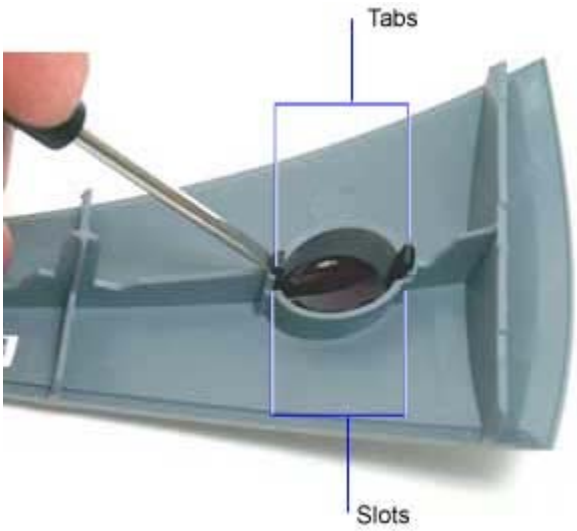
2. Gently pry the edge of the outer handle away from the projector.

CAUTION Don't pry against the focus ring or lens.

3. Pull the handle away from the projector. The pins on the handle disengage from the holes on the front of the projector.



4 Remove the front IR lens and save it for use with the replacement outer handle. Press on one of the tabs on the lens to disengage it from its slot on the outer handle.



Assembly Notes

- Align the two tabs on the front IR lens with the slots on the outer handle. Press the lens into place to secure it.

- Position the outer handle against the front of the projector so that the pins align with the holes in the top and bottom case tabs. Then press the outer handle into place against the front of the projector.

Power Supply

The power supply fastens to the chassis. It converts 100-240 VAC supply voltage to various low voltage DC levels required internally by the projector. The power supply interfaces with the ballast through the **lamp control cable** to control lamp strike and operation, and through the **power supply/ballast cable** to provide DC power. The power supply also interfaces with the controller ECA through the **power supply/controller ECA cable** to provide DC power and exchange control signals.

1. Remove the following items:

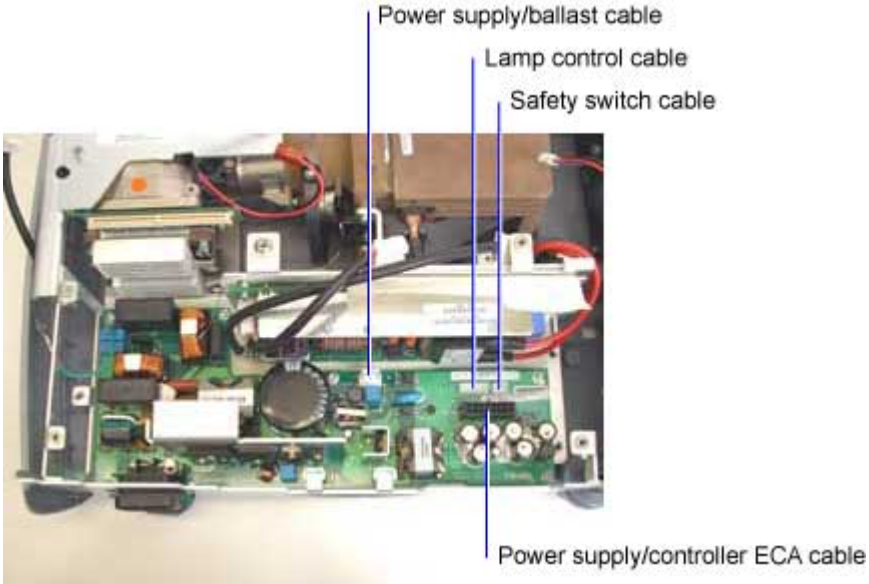
   Outer handle (page 37)

   Rear bezel (page 42)

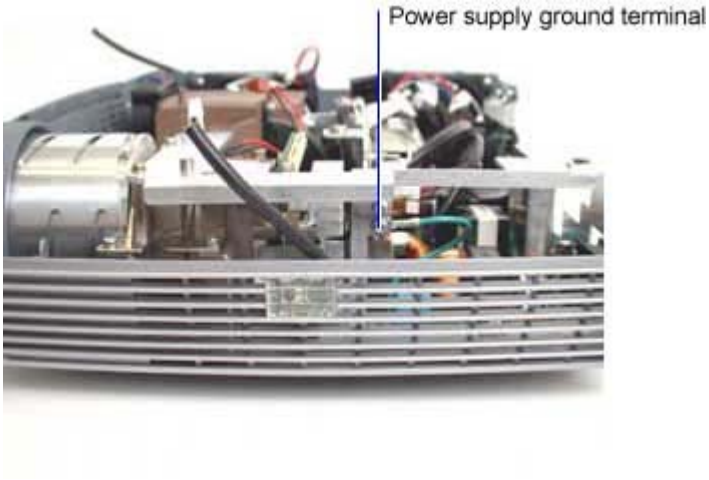
   Top case (page 47)

   Controller ECA (page 14)

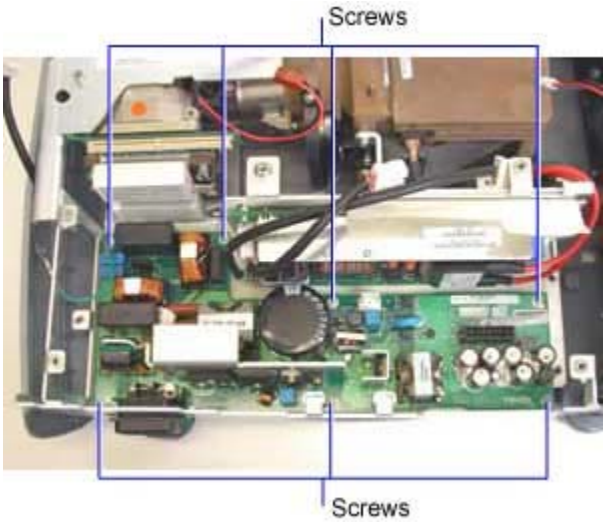
2. Unplug the safety switch cable from J3 on the power supply. Then unplug the power supply/controller ECA cable from P1, the ballast/power supply cable from J1 and the lamp control cable from J4 on the power supply. Squeeze the latches on the power supply/controller ECA cable and the power supply/ballast cable connectors to release them.



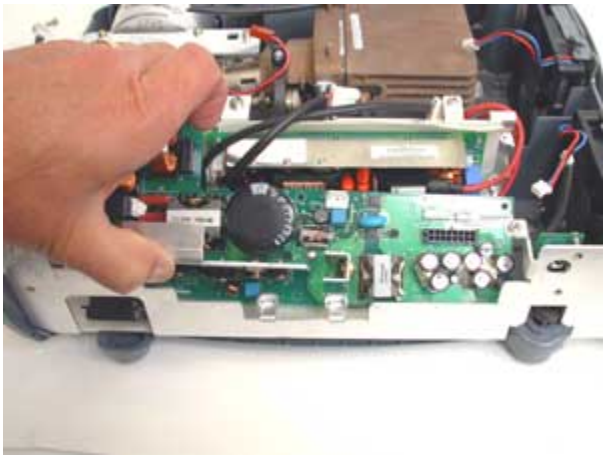
3 Remove the M3x8 Torx screw that fastens the ground terminal to the side of the chassis.



4 Use a Torx T-10 screwdriver to remove the seven M3x8 screws that fasten the power supply to the chassis.

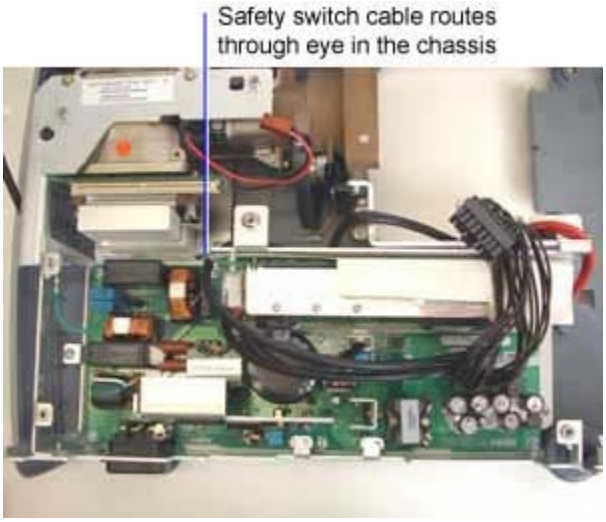


5 Lift the forward side of the power supply to allow the AC line connector to pass through the hole in the chassis. Then lift the power supply away from the chassis.



Assembly Notes

- Insert the power supply into the chassis with the forward side up to allow the AC line connector to pass through the hole in the chassis.
- Torque the six M3x8 Torx screws to 6 in-lbs (.68 Nm).
- Connect the ground terminal to the chassis. Torque the M3x8 Torx screw to 6 in-lbs (.68 Nm).
- Connect the safety switch cable to J3 on the power supply. Then connect the power supply/controller ECA cable to P1, the ballast/power supply cable to J1 and the lamp control cable to J4 on the power supply.
- Make sure that you route the safety switch cable through the eye at the front left side of the chassis.



Rear IR Receiver

The **rear IR receiver** fastens to the chassis. It includes the cable that connects to the controller ECA.

NOTE To replace the rear IR lens, see Rear Bezel on page 42 for information.

1. Remove the following items:

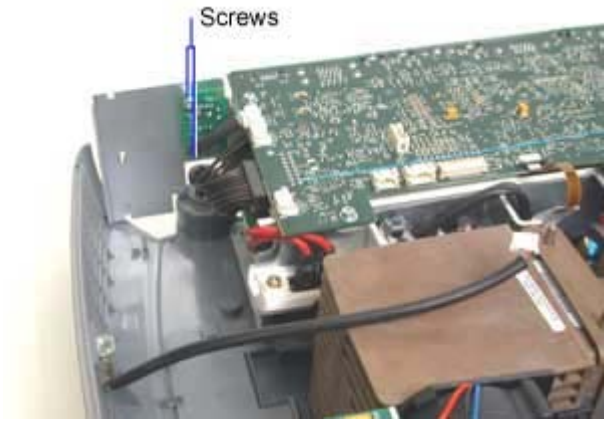
   Outer handle (page 37)

   Rear bezel (page 42)

   Top case (page 47)

   Fan assembly (page 26)

2. Unplug the rear IR receiver cable from J518 on the controller ECA.
3. Remove the two M3x8 Torx screws that fasten the rear IR receiver to the chassis.



Assembly Notes

- Route the cable to the inside of the rear IR receiver ECA.

- Make sure that the rear IR receiver aligns with the hole in the chassis.
- Torque the two M3x8 Torx screws to 6 in/lbs (.68 Nm).
- Connect the cable to J518 on the controller ECA.

Rear Bezel

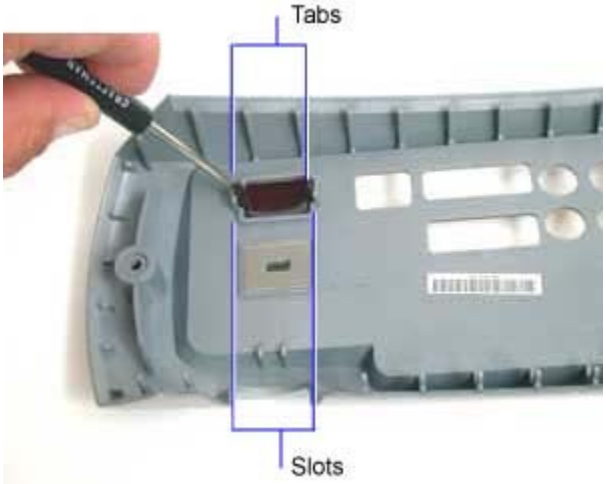
The **rear bezel** fastens to the rear of the projector and surrounds the I/O ports. The **I/O panel label** adheres to the outside of the rear bezel. The **rear IR lens** fastens to the inside of the rear bezel.

If you replace the rear bezel, you need a replacement I/O panel label. You cannot remove the label from the rear bezel. A new rear bezel does not include a rear IR lens or security plate.

1. Remove the two M3x8 Torx screws from the rear bezel.

2. Pull the rear bezel away from the projector.

3. To replace the rear IR lens, press on one of the tabs on the lens to disengage it from the rear bezel.



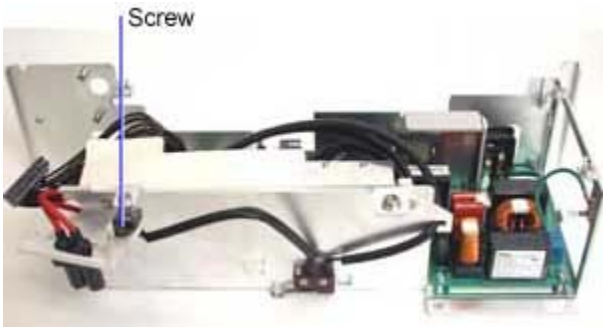
Assembly Notes

- When you install a new rear bezel, affix the new I/O panel label to the outside of the bezel.
- Torque the two M3x8 Torx screws to 6 in/lbs (.68 Nm)

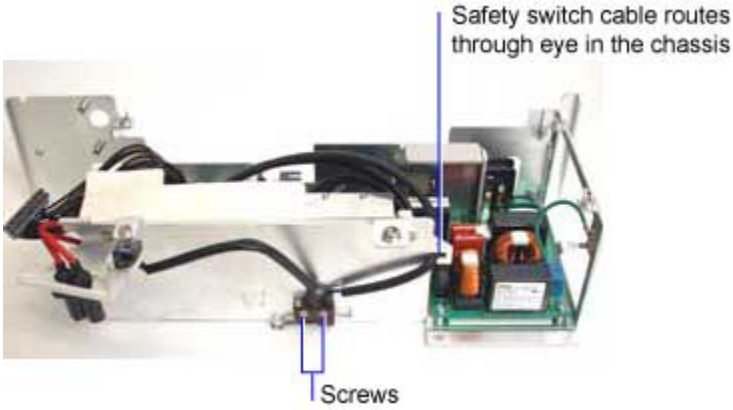
Safety Switch

The **safety switch** interrupts power output from the power supply when the lamp door is removed from the projector. It is located on the front side of the chassis in the lamp housing. A thermal switch mounted near the safety switch monitors temperature in the projector lamp housing and cancels power supply output if the temperature rises too high. The thermal switch and safety switch share a common cable to the power supply. A new safety switch includes a thermal switch.

1. To access the safety switch, remove the chassis (page 11).
2. Unplug the safety switch cable from J3 on the power supply. Then remove the M3x6 Torx Plastite screw that fastens the thermal switch to the lamp connector retainer.



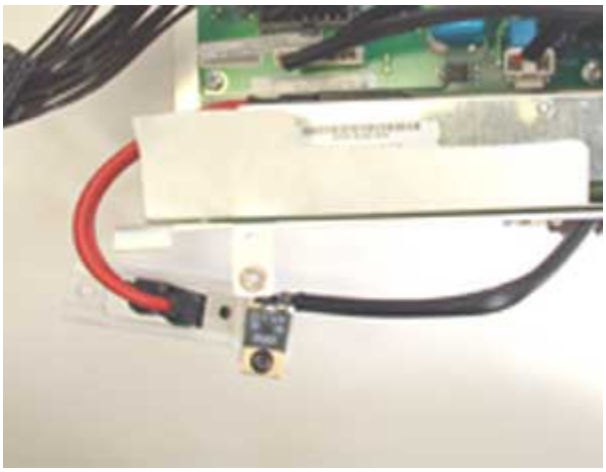
3. Remove the two M2x8 Torx screws that fasten the safety switch to the chassis. Then remove the safety switch cable from the eye on the chassis.



4. Remove the safety switch from the chassis.

Assembly Notes

- To install the safety switch, orient it so that the lever actuator faces away from the mounting tab on the chassis. The curved portion of the lever actuator fits into the slot in the bottom case near the lamp cavity. A tab on the lamp door fits through the slot to close the safety switch when the lamp door is in place.
- Torque the two M2x8 Torx screws to 6 in/lbs. (.68 Nm).
- Orient the thermal switch on lamp connector retainer so that the screw hole on the switch aligns with the hole in the retainer. The white lettering on the switch should face up.



- Torque the M3x6 Torx Plastite screw to 3 in/lbs (.34 Nm).
- After you install the safety switch, route the cable through the eye on the chassis. Connect the cable to J3 on the power supply.

Top Case

The **top case** covers the top half of the half of the projector. Once you remove the top case, you have access to FRUs inside the projector. When you replace the top case, you need to adhere a new **nameplate** to the top case. Once you remove the top case, you also have access to the **elevator button**.

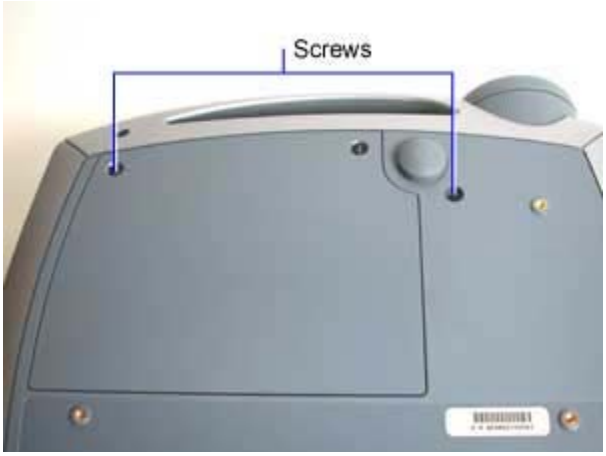
A new top case contains two speakers. You cannot remove the speakers from the top case.

1. Remove the following items:

   Rear bezel (page 42)

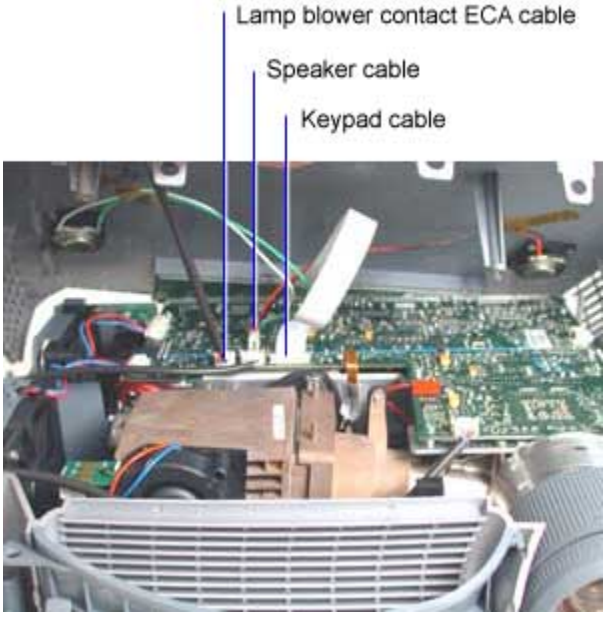
   Outer handle (page 37)

2. Place the projector right side up on the bench, and then remove the two black M3x8 Torx screws from the bottom case.

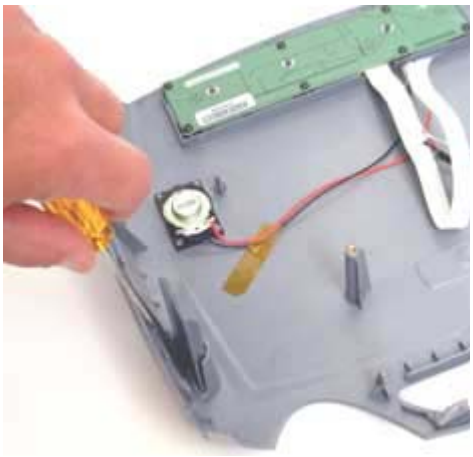


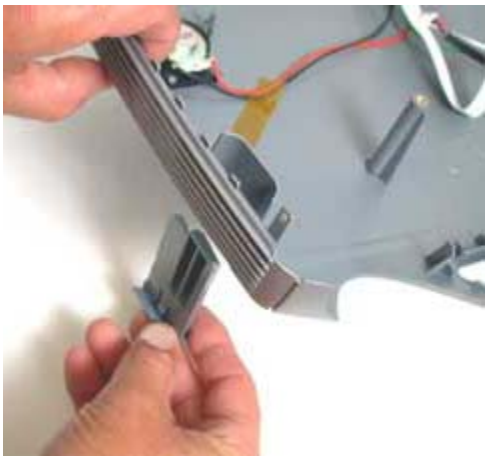
3. Slowly lift the top case away from the projector. Avoid stress on the cables that run between the top case and controller ECA.

4 Unplug the lamp blower contact ECA cable and the speaker cable from their connectors on the controller ECA. Then disconnect the keypad cable from the ZIF connector on the controller ECA.



5 If you are going to replace the top case with a new one, remove the **elevator button**. To do this, use a small flat blade screwdriver to depress the retainer tab on the side of the elevator button. Then slide the button out of the top case.





Assembly Notes

- If you're replacing the top case with a new one, install the elevator button.
- Adhere a new nameplate to the top case in the recess near the handle.
- Connect the keypad lamp blower contact ECA cable, the speaker cable and the keypad cable.
- Make sure that the top case fits flush over the bottom case.
- Torque the two black M3x8 Torx screws to 6 in.-lbs. (.678 Nm).

Troubleshooting

You use the Troubleshooting section to diagnose problems with the projector. In this section, you will find troubleshooting flowcharts for a variety of symptoms. Each flowchart leads you through a series of steps that will ultimately result in a solution. The solutions begin with the most simple and progress to the most complex.

What do you want help solving?

Power problems, including lamp issues, partial power up, shutdown and no power (page 50)

Image problems, including no image, bad color, dim image and other picture distortions (page 58)

Keypad problems (page 59)

Remote problems (page 60)

Audio problems (page 61)

Power and Start-up Problems

The SP7205 communicates its power status via an LED located on the keypad. When this status LED is green, you know that the projector is working properly. When the status LED is solid red or flashing red, you know there are lamp, power or startup problems. The frequency with which the status indicator blinks red indicates one of several error codes. These error codes provide crucial information about projector malfunctions.

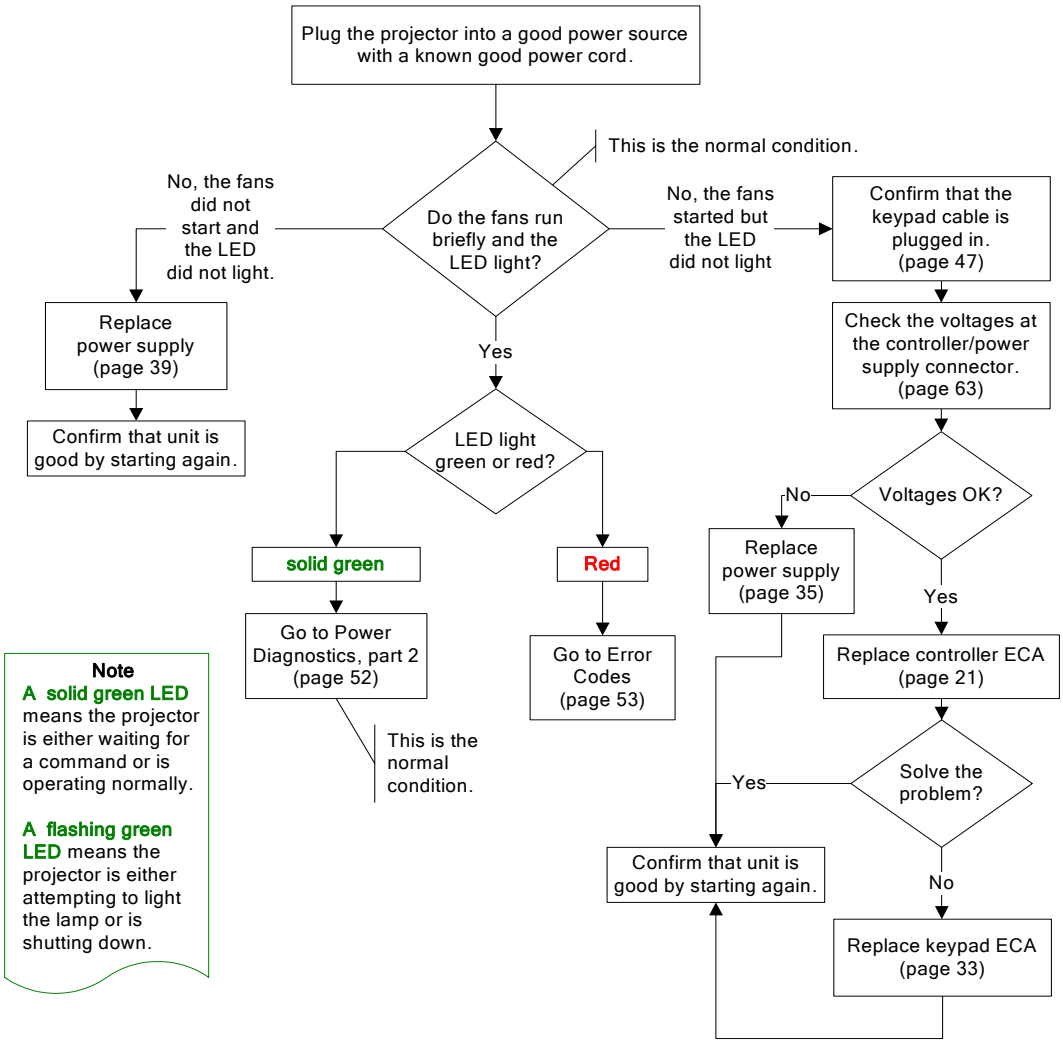
Go to **Power Diagnostics, Part 1** on page 51.

Below is a table that shows the meaning the various LED states.

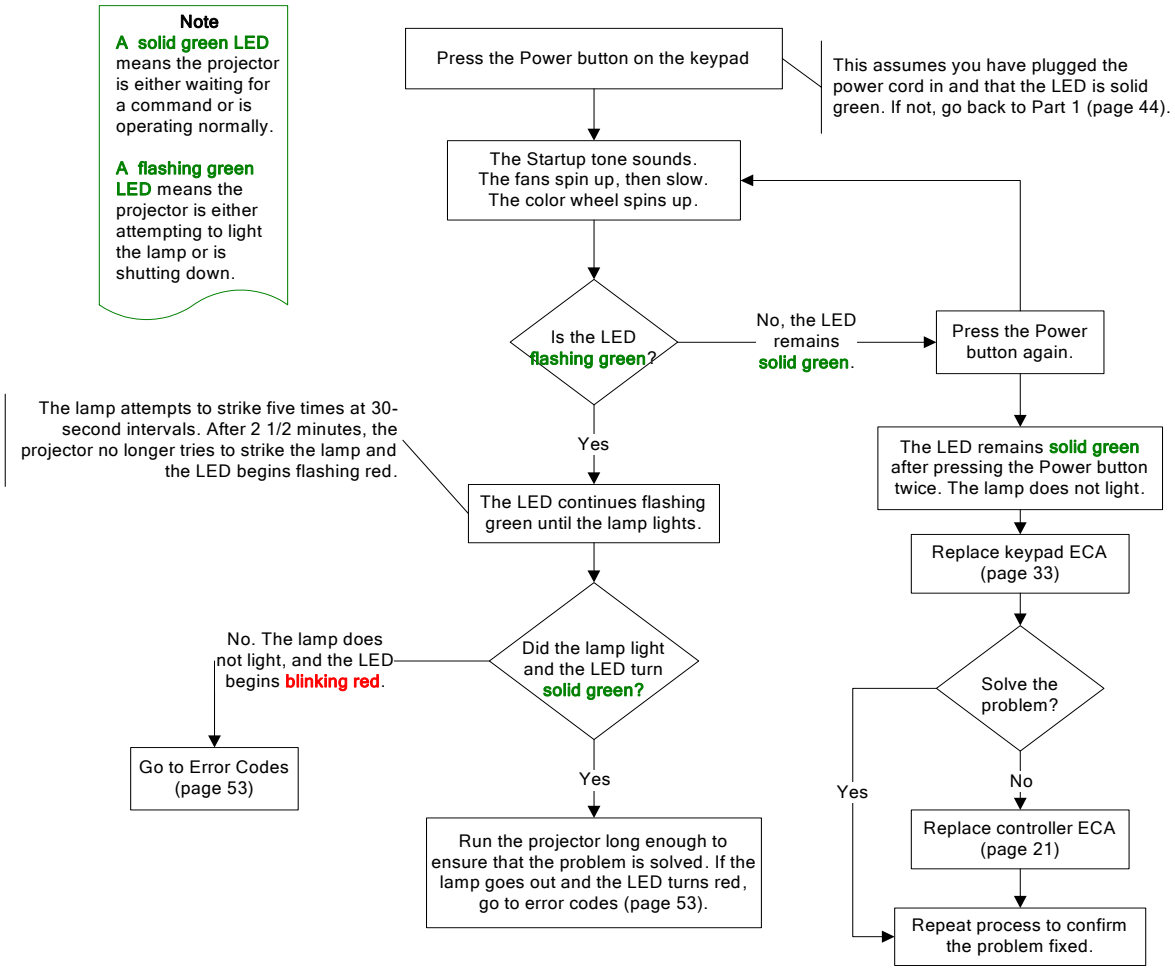
NOTE We **strongly** suggest that you follow the entire power diagnosis sequence (page 51).

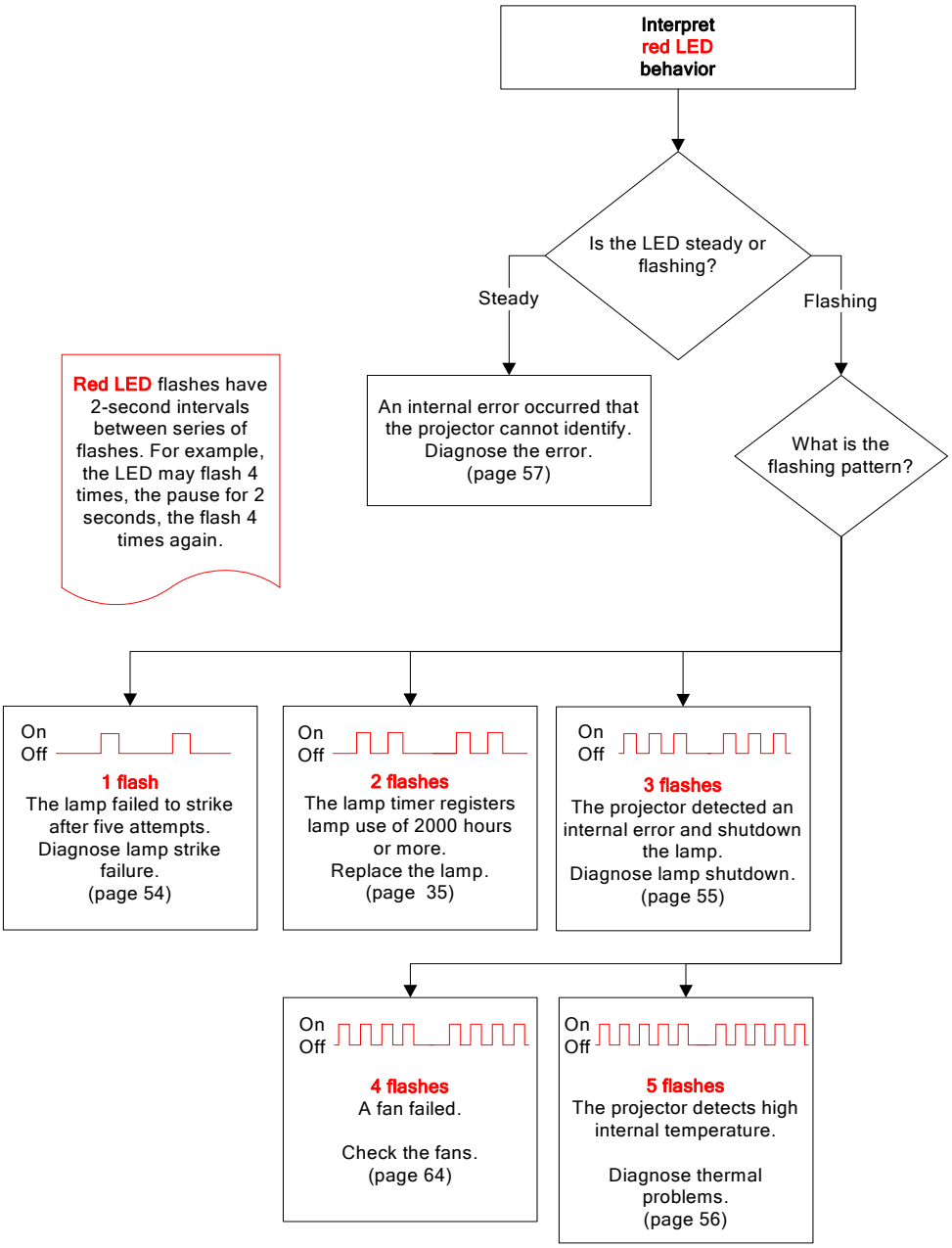
LED Status	
LED flashes green	The projector is starting up after the Power button was pressed, or the projector is shutting down after the Power button was pressed.
LED is solid green	The projector is ready to light the lamp when the Power button is pressed. Or the lamp is lit and the projector is operating properly.
LED flashes red once	The lamp will not strike after five tries (2 1/2 minutes).
LED flashes red two times	The lamp has more than 2,000 hours of use. Requires replacement. Projector shuts down.
LED flashes red three times	Lamp failure. Projector shuts down.
LED flashes red four times	One or more fans not operating. Projector shuts down.
LED flashes red five times	High temperature condition. Projector shuts down.
LED is solid red	Undiagnosed error. Projector shuts down.

Power Diagnostics, part 1

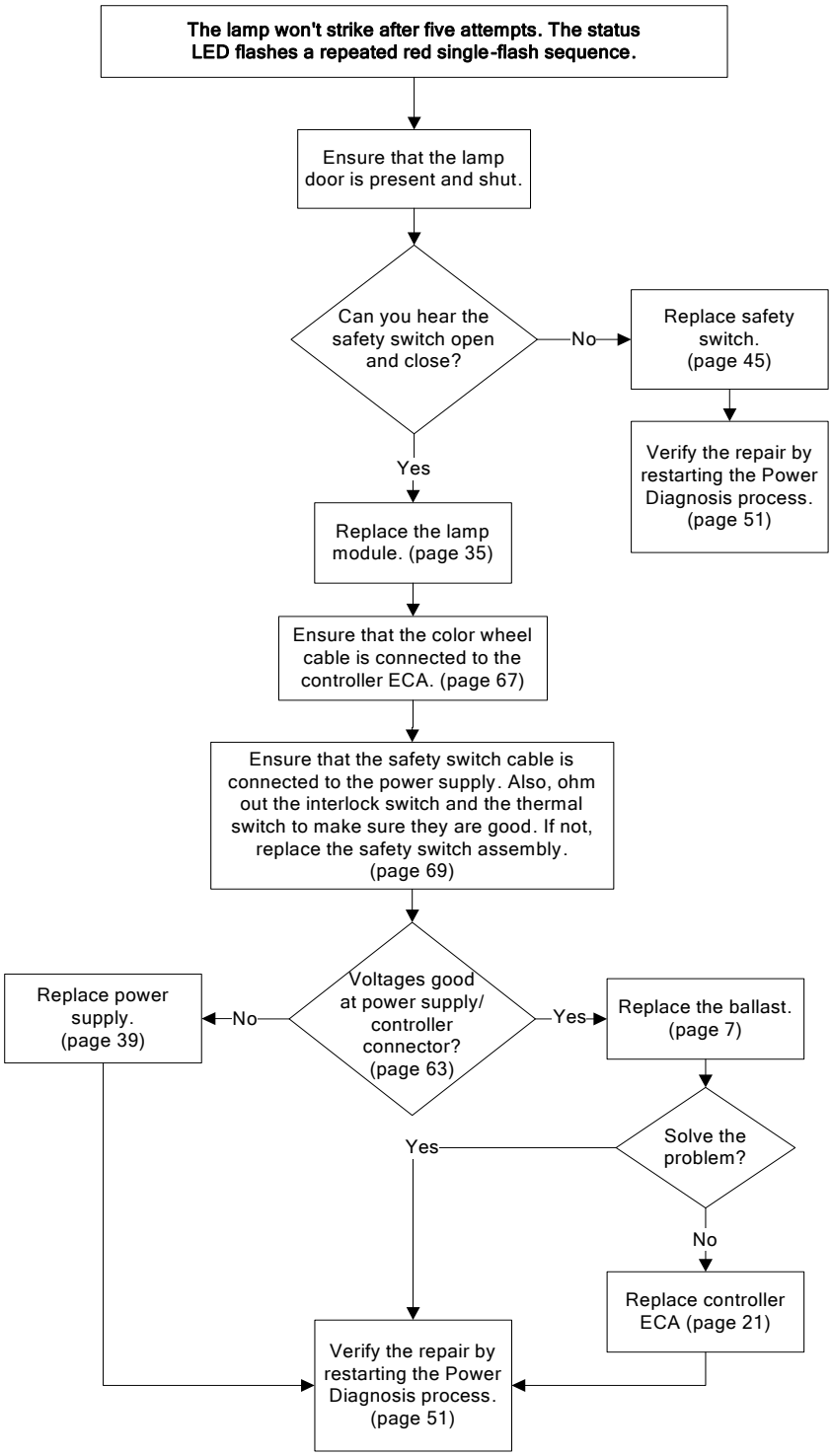


Power Diagnostics, part 2

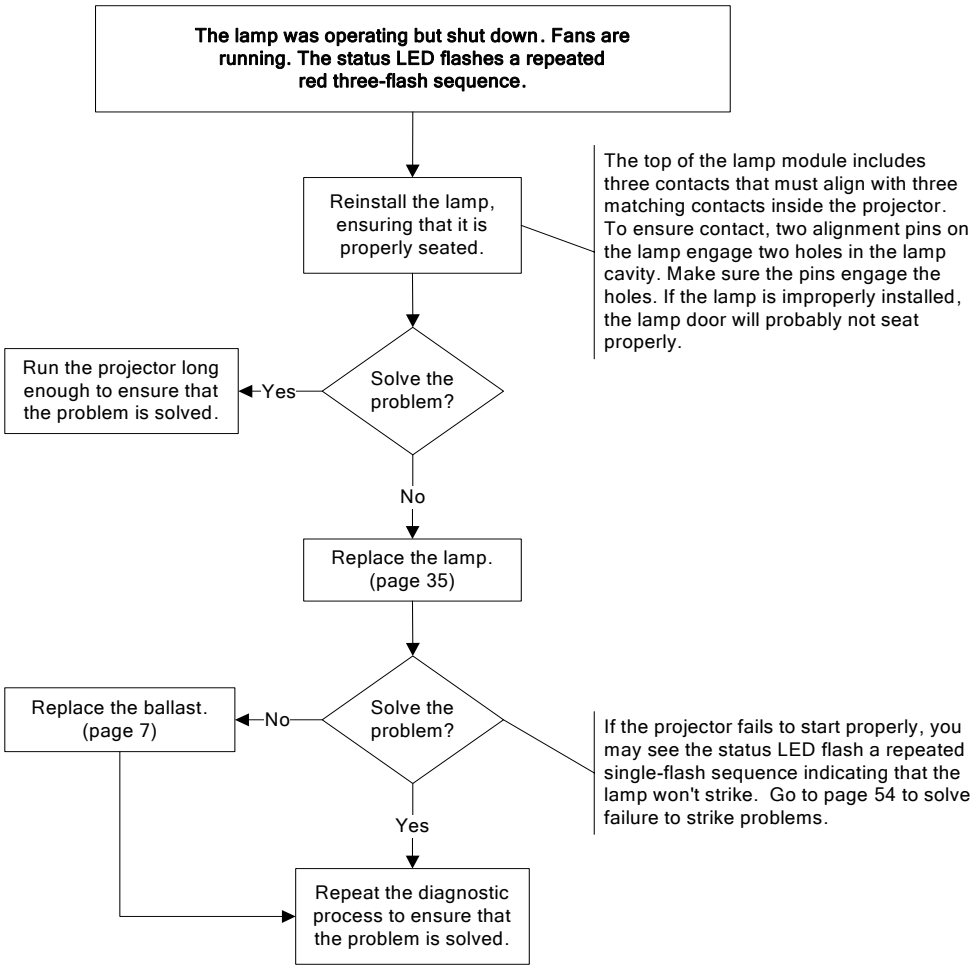



Interpret red LED behavior
Is the LED steady or flashing?
Steady
Flashing
An internal error occurred that the projector cannot identify. Diagnose the error. (page 57)
What is the flashing pattern?
Red LED flashes have 2-second intervals between series of flashes. For example, the LED may flash 4 times, the pause for 2 seconds, the flash 4 times again.
On
Off
1 flash
The lamp failed to strike after five attempts. Diagnose lamp strike failure. (page 54)
On
Off
2 flashes
The lamp timer registers lamp use of 2000 hours or more. Replace the lamp. (page 35)
On
Off
3 flashes
The projector detected an internal error and shutdown the lamp. Diagnose lamp shutdown. (page 55)
On
Off
4 flashes
A fan failed.
Check the fans. (page 64)
On
Off
5 flashes
The projector detects high internal temperature.
Diagnose thermal problems. (page 56)

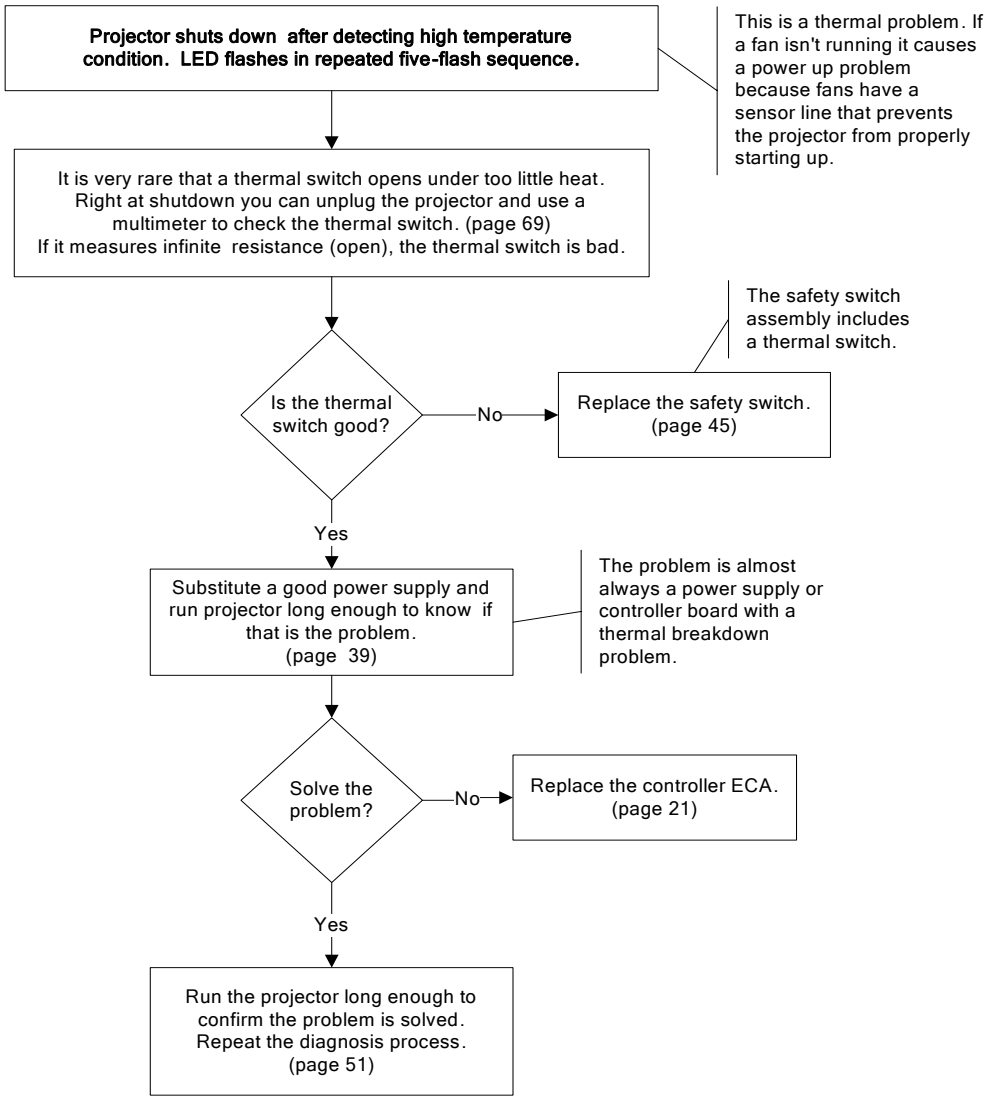
LED flashes single red



LED repeats 3 flash sequence



LED repeats 5 flash sequence



LED solid red

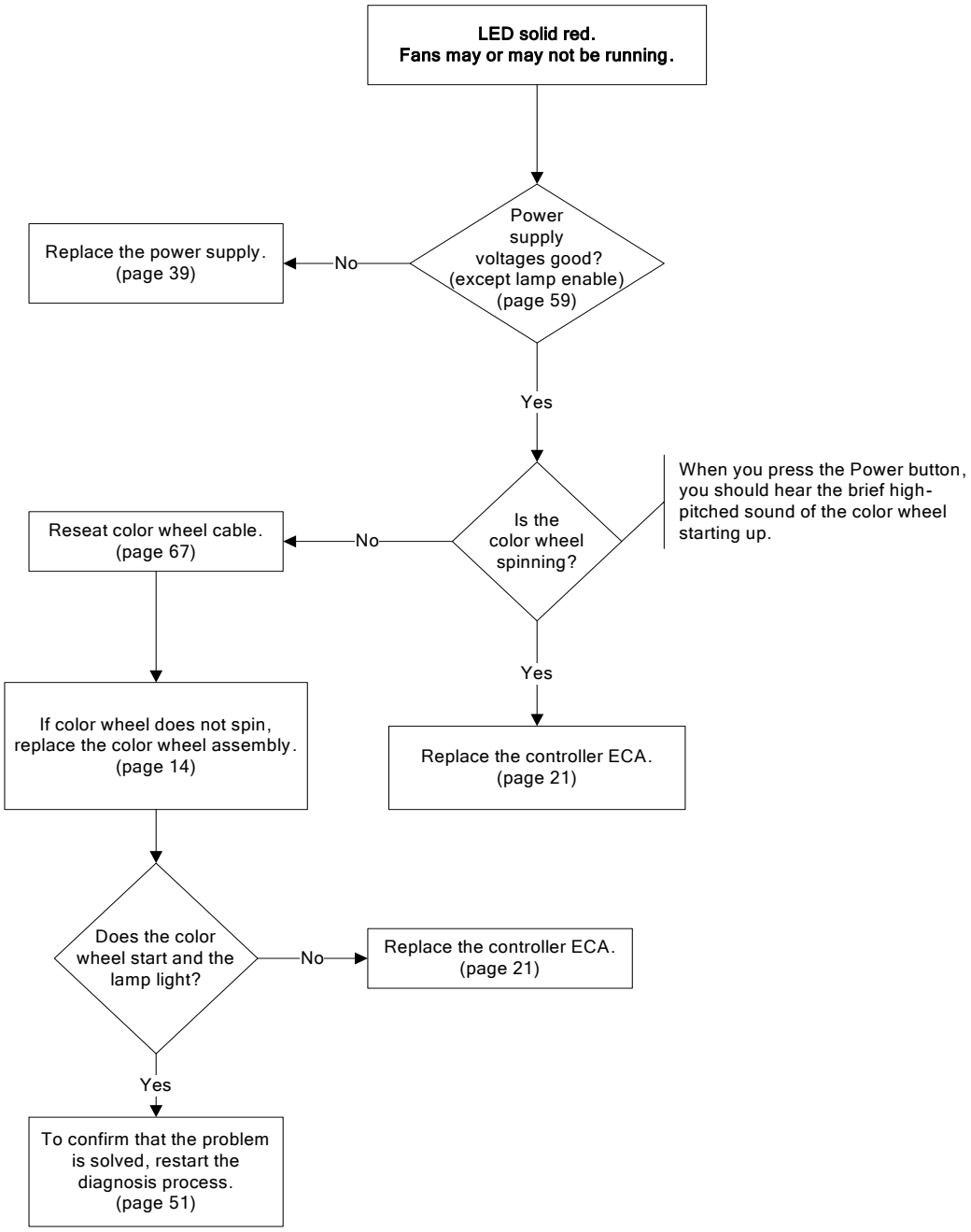
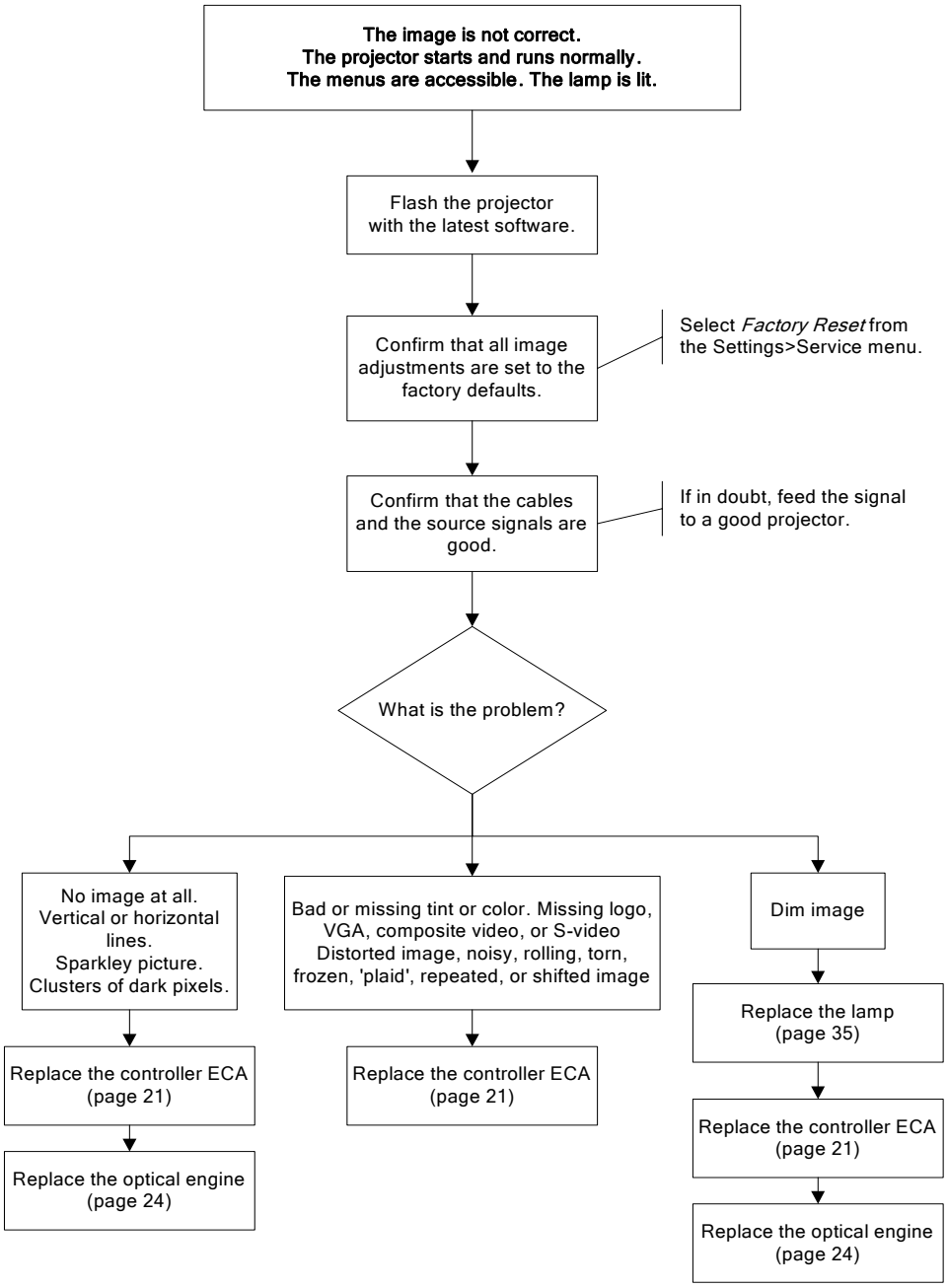
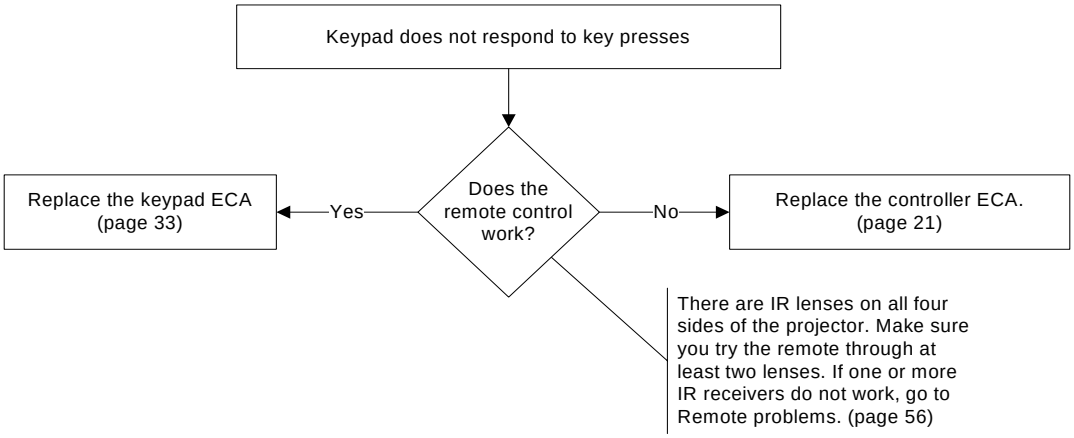


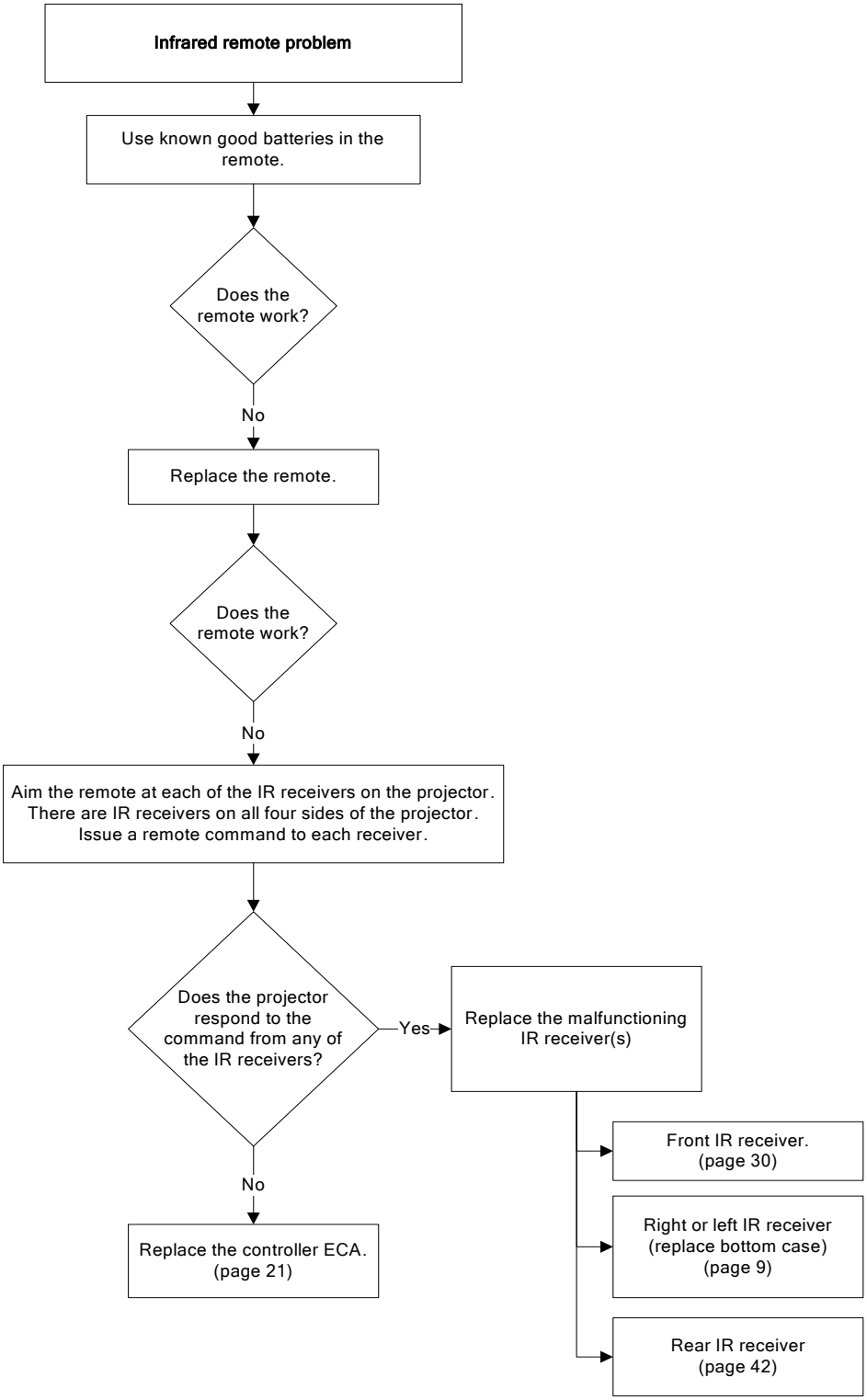
Image Problems



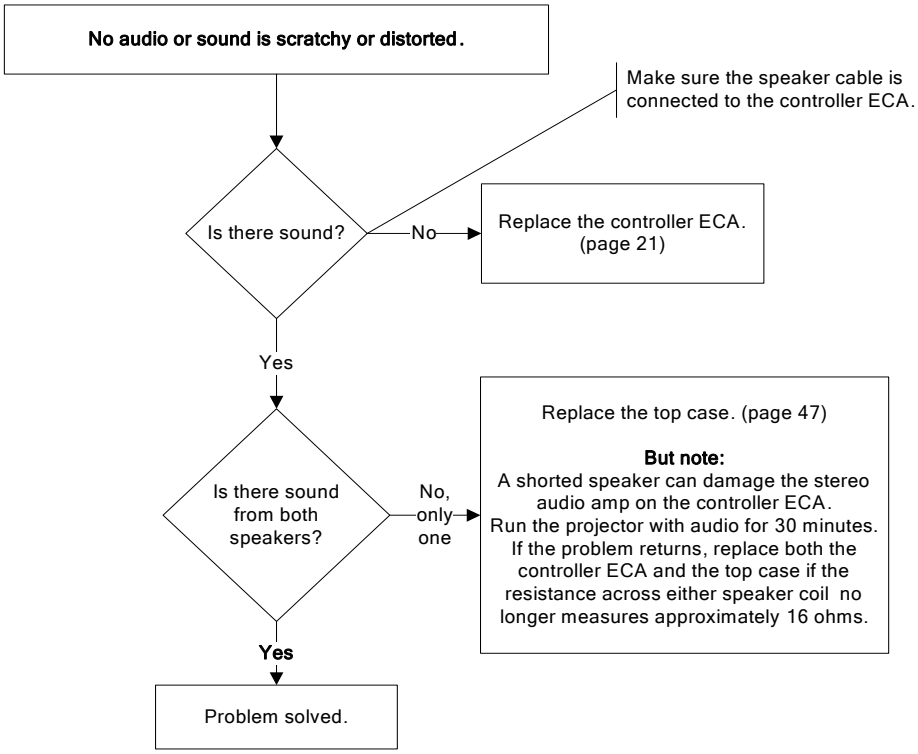
Keypad Problems



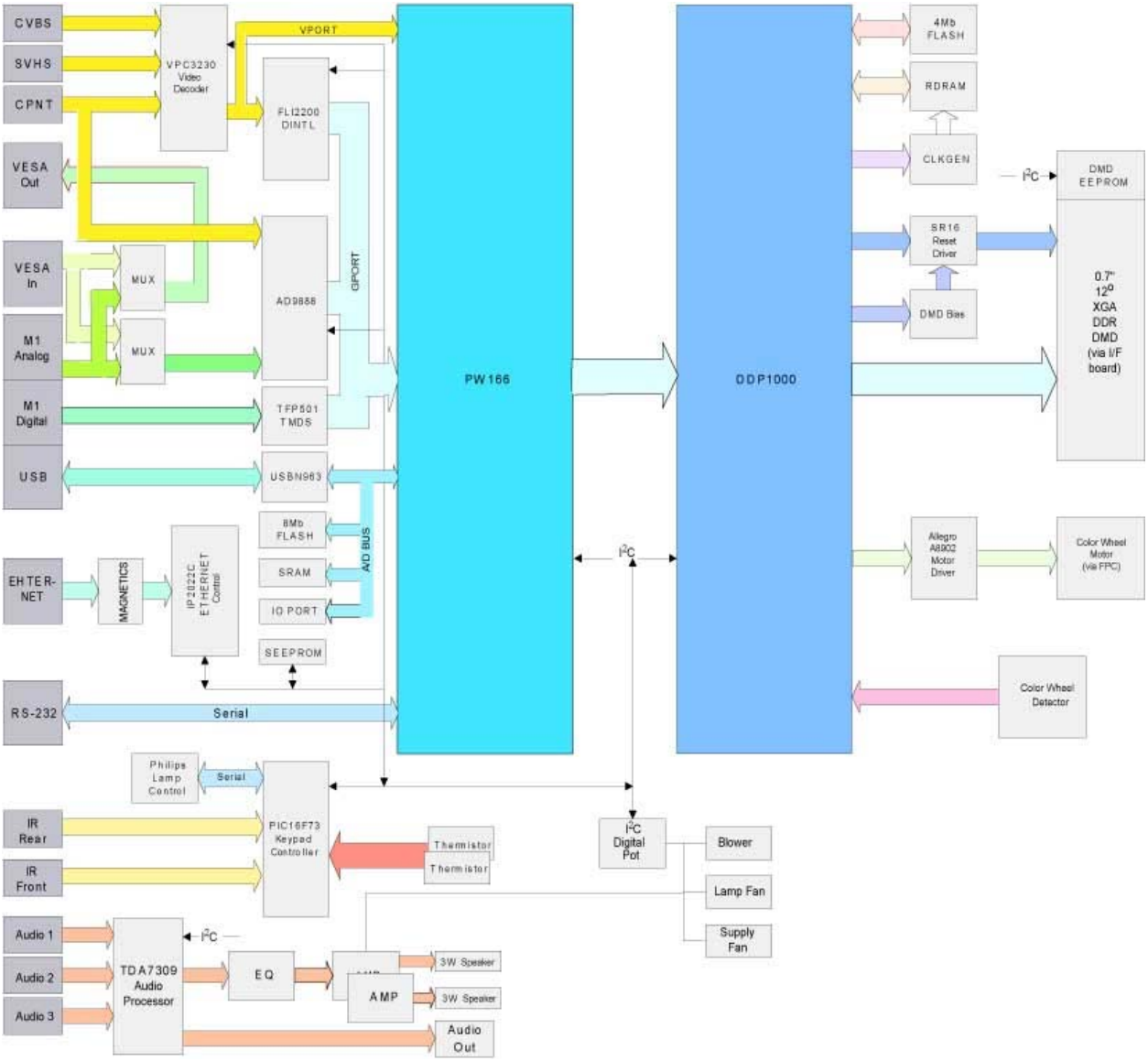
Remote Problems



Audio Problems

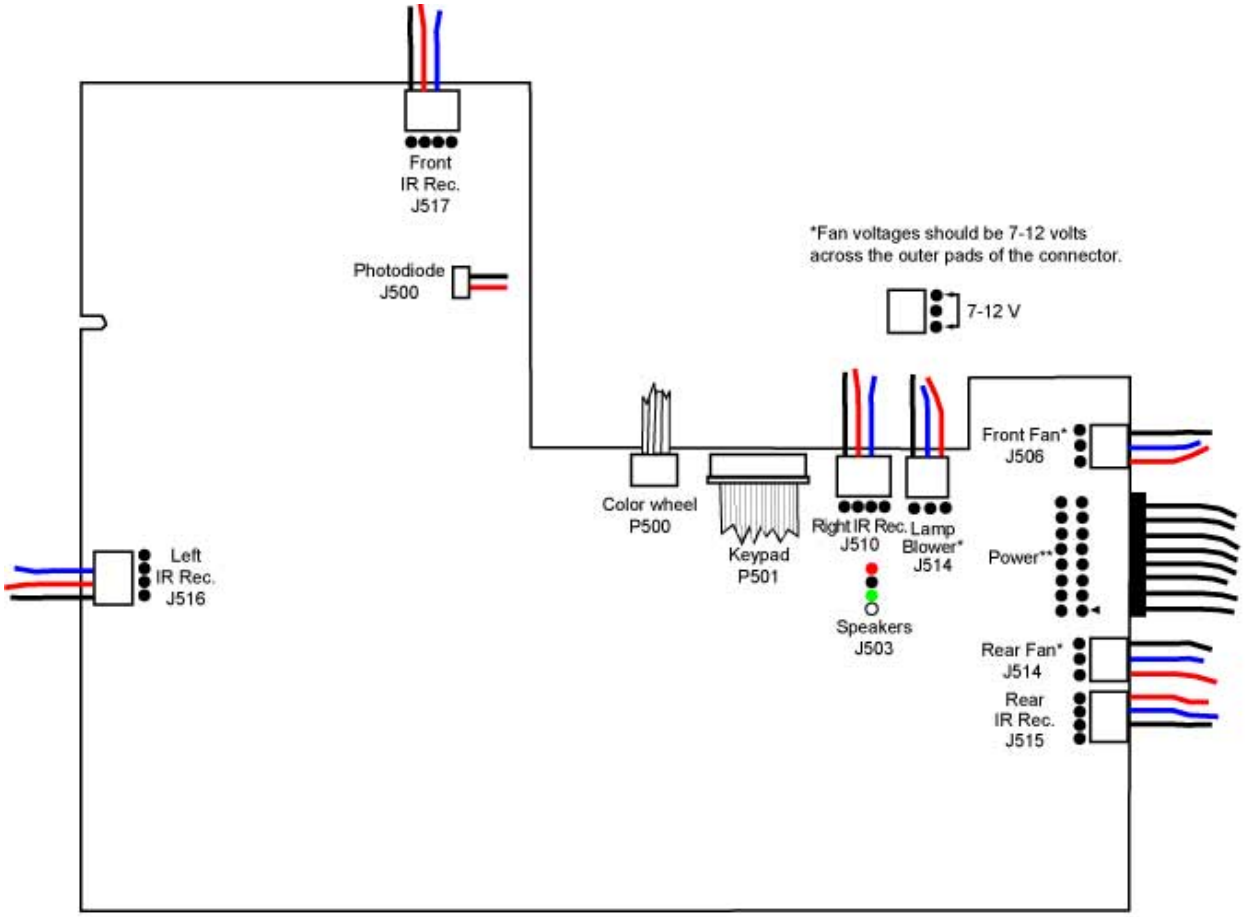


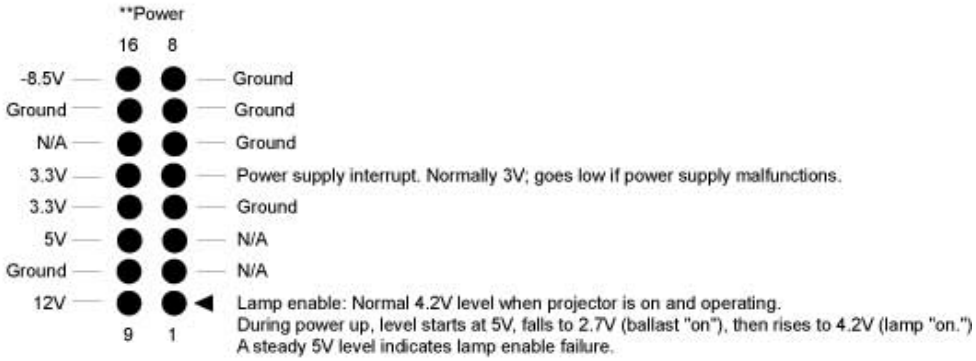
Block Diagram



Check Controller Voltages

To check voltages, you need to power up the projector with the top case removed. See page 64 for instructions on how to do this.





Power Up with Top Case Removed to Check Fans and Voltages

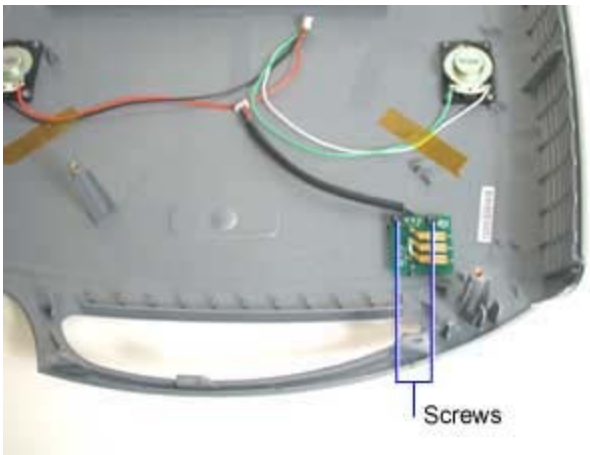
You can check the three fans and the lamp blower by removing only the top case from the projector. Once the top case is removed, you can power up the projector and check internal voltages or verify whether the fans operate.

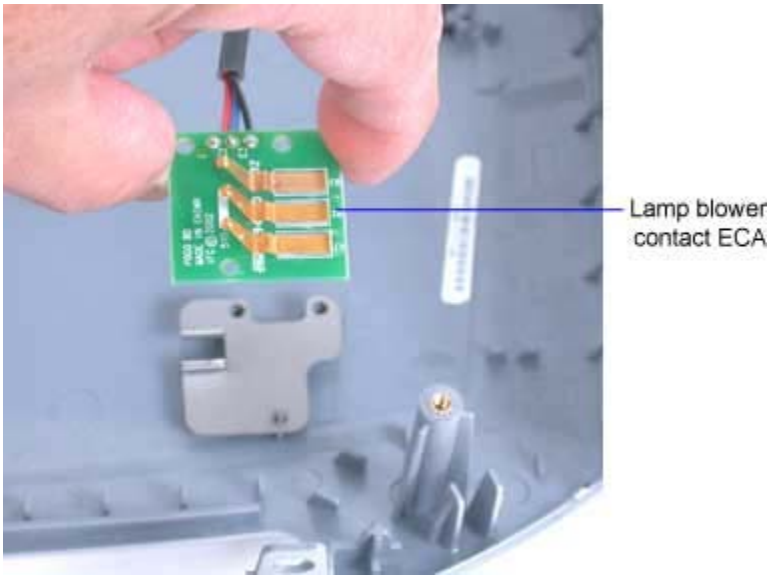
1. Remove the following items:

   Top case (page 47)

   NOTE The lamp and the lamp door must be in place to start the projector with the top case removed.

2. Remove the lamp blower contact ECA from the top case.





3 Use black vinyl or other insulating tape to temporarily attach the lamp blower contact ECA to the lamp module. The lamp blower must receive power for the projector to start. Ensure that the contacts align properly.

Lamp blower contact ECA
temporarily attached to lamp blower contacts

4 Connect the lamp blower contact ECA cable to the controller ECA at J504.

5 Use a compatible remote control to power up the projector. To do this, point the remote at any side of the projector and press Power.

If you do not have a remote, connect the keypad cable to the controller ECA and power up the projector using the keypad.

CAUTION When you start the projector, there is voltage present on the controller ECA and power supply. Be very careful where you probe and where you touch.

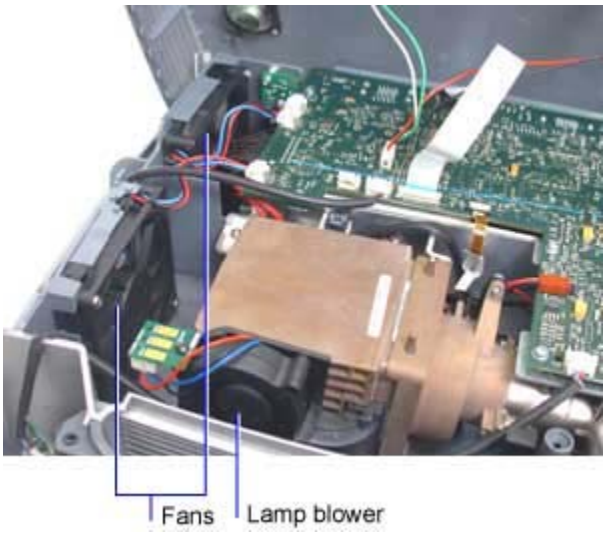
6 Do one or all of the following:

Check controller ECA voltages (page 63)

Check the thermal switch (page 69)

7 Follow the directions below to check the fans and lamp blower.

The fans and the lamp blower should all start up when you press the power button.



8 To verify that a fan or blower is bad, unplug the connector for the suspect unit, then plug in a known good fan or blower.

9 If the lamp blower fails to operate, replace the lamp module (page 35).

10 If one of the fans fails to operate, remove the fan assembly and replace the defective fan (page 26).

Check the Color Wheel and Reseat the Cable

If the color wheel cable is not properly seated in its ZIF connector, the color wheel will not start when the Power button is pressed. When the color wheel does not spin, there is no lamp enable signal, and the lamp will not strike.

Normally, you hear the brief high-pitched sound when the color wheel spins up to speed. If you don't hear the sound, or if you are not sure, you can do a visual check to confirm the color wheel operation.

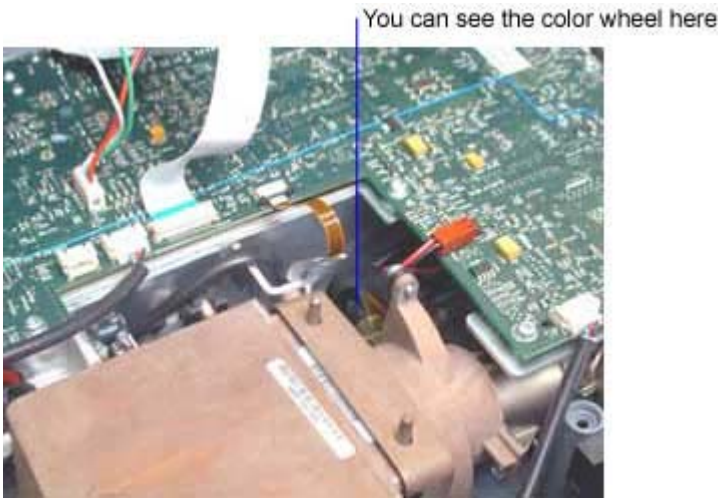
If the color wheel is not spinning, the first item to check is the color wheel cable connection and reseat it if necessary.

To check color wheel operation and reseat the cable, do the following:

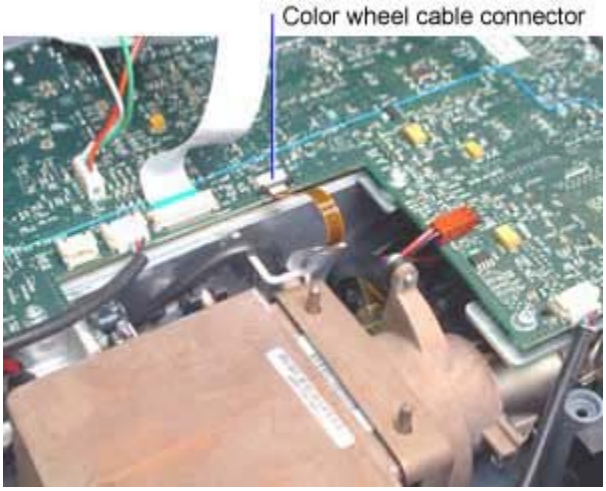
1. Power up the projector with the top off (page 64).

   NOTE The lamp and the lamp door must be in place to start the projector with the top case removed.

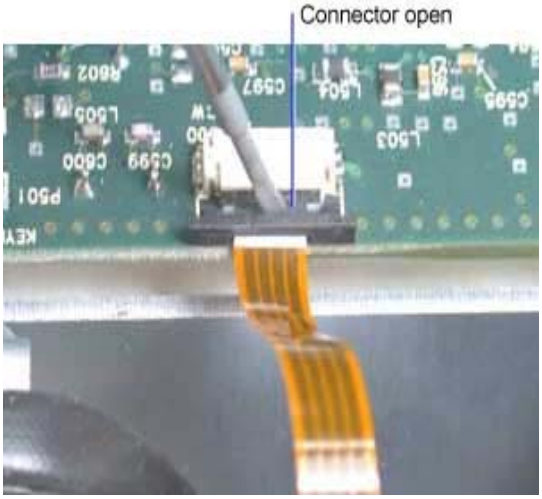
2. Examine the color wheel to see if it is spinning. The color wheel is inside the circular shroud on the optical engine.

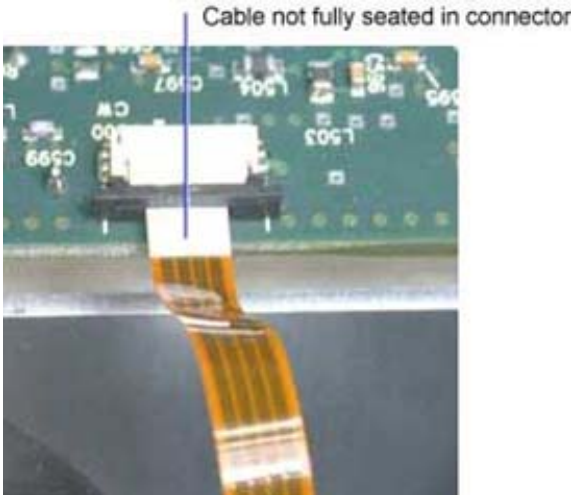


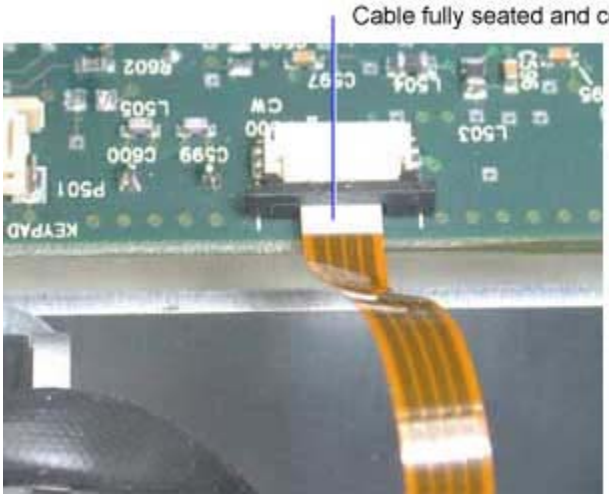
3 If the color wheel is not spinning, check and reseat the color wheel cable connection.



To reseat the cable, open the ZIF connector, and pull the cable out. Re-insert the cable fully, and then close the ZIF connector.



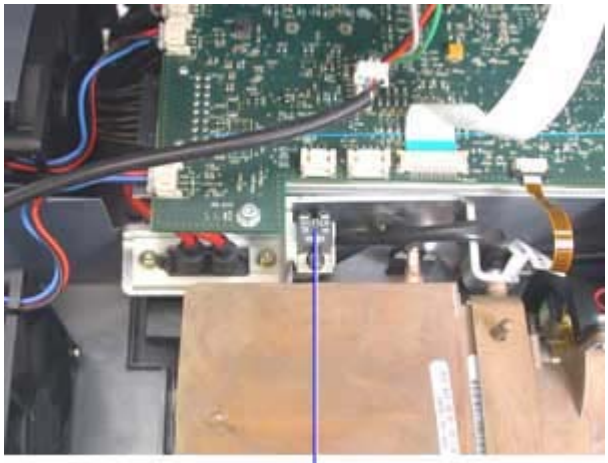




Check the Thermal Switch

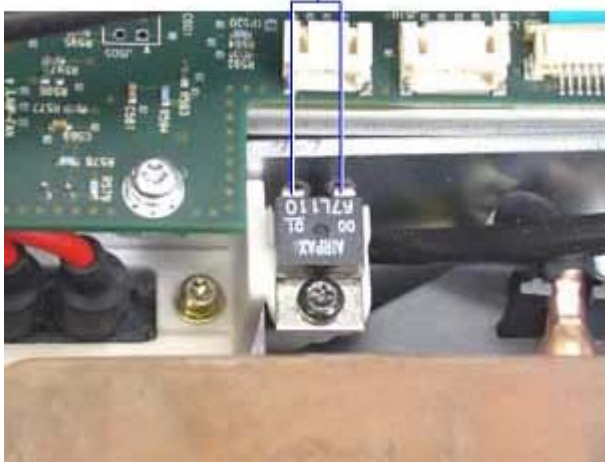
The thermal switch is designed to open when the temperature inside the projector gets too high. When the switch opens, the power supply shuts down, turning the projector off.

When the projector shuts down after operating for a few minutes or when the lamp fails to strike after repeated attempts at startup, you need to check the thermal switch operation. First, power up the projector with the top off (page 64). Let the projector run until it shuts down. Measure the resistance at the switch. If the resistance is **infinity** (Ω), replace the safety switch assembly, which includes the thermal switch.



Thermal switch

Measure resistance here

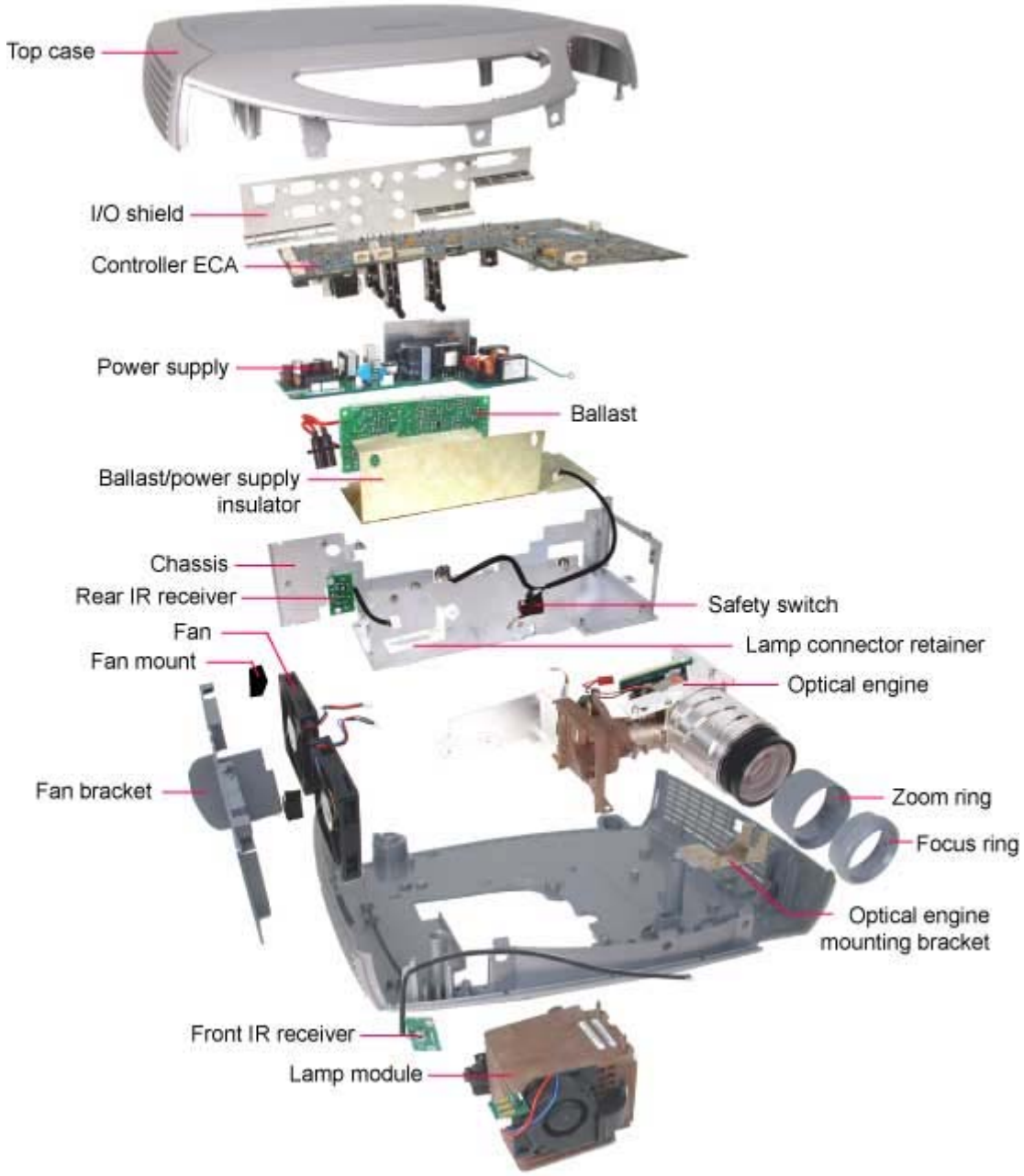


Go to remove and replace the safety switch assembly on page 45.

Parts Lists

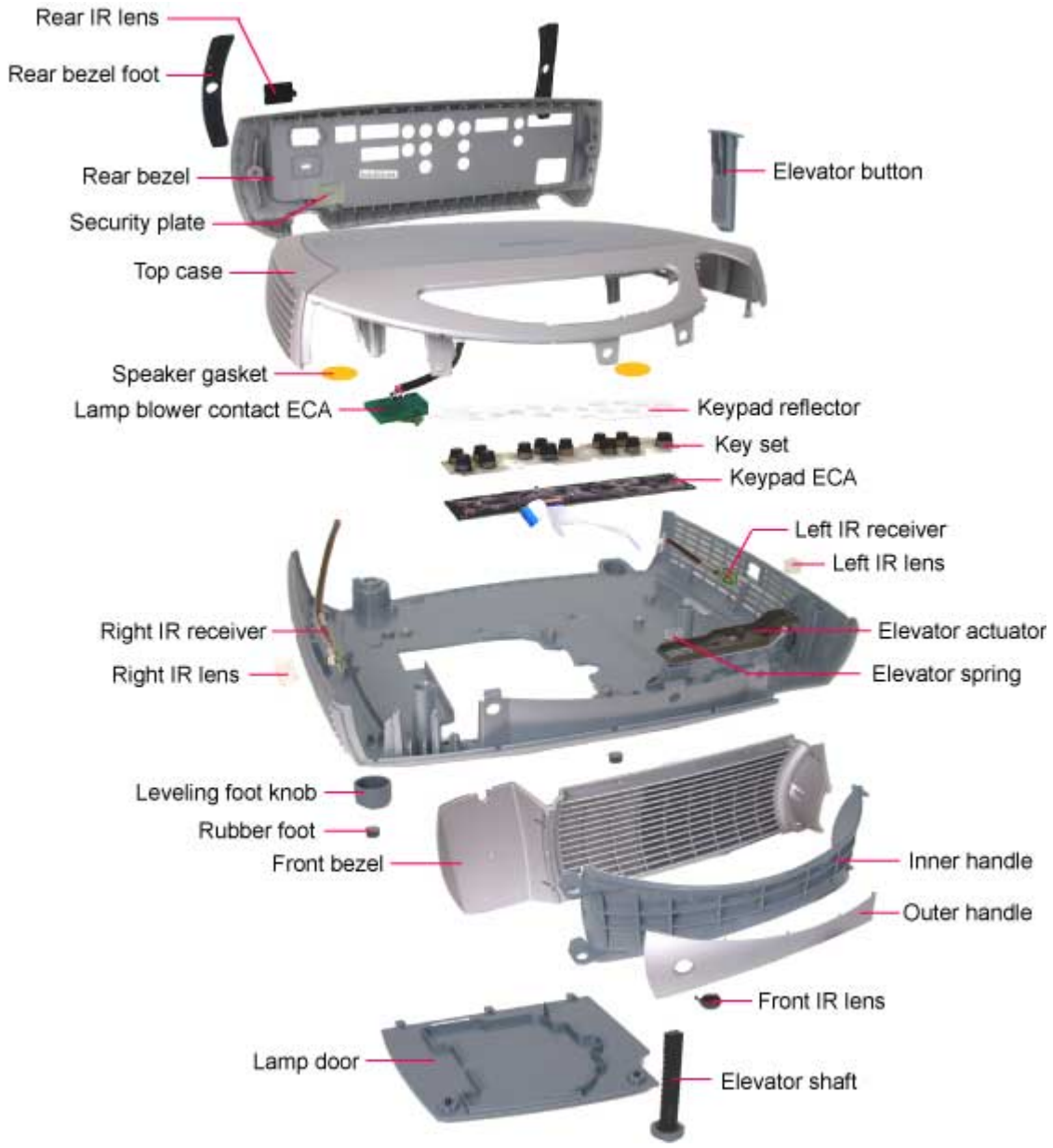
Component Parts Exploded View

NOTE The exploded view below shows the available parts for the SP7200. The parts in the SP7205 look identical; however, not every part is available as an FRU. Be sure to check the parts list to confirm a specific part is available.



Case Parts Exploded View

NOTE The exploded view below shows the available parts for the SP7200. The parts in the SP7205 look identical; however, not every part is available as an FRU. Be sure to check the parts list to confirm a specific part is available.



Replaceable parts

The part name on the parts list often differs from the name we use in this service guide. When you order a part, you must know its official name, so we list these names in the right-hand column.

Part Name	Part Number	Parts pricing list part name
Nameplate	020-1591-xx	Label top, InFocus
IO Panel Label	020-1599-xx	Label, I/O panel, Nighthawk
Certification Label	020-2058-xx	Label, Cert., SP-7205, Malasia
Power Supply/Ballast Cable	211-0149-xx	Cable assy, ballast
Power Supply/Controller ECA Cable	211-0185-xx	Cable, DC output
Lamp Control Cable	211-0186-xx	Cable, lamp sync
Color wheel cable	211-0268-xx	Cable, CW hub detect
I/O EMI Shield	330-0885-xx	Shield, I/O
Elevator Button	340-0986-xx	Button, elevator
IR Lens, Front	340-0989-xx	Window, IR front
IR Lens, Rear	340-0990-xx	Window, IR rear
Chassis	505-1236-xx	S/A, system chassis
Lamp Door	505-1380-xx	S/A elastomer keypad
Outer Handle	505-1473-xx	S/A, handle, outer
Focus Ring	505-1474-xx	S/A, focus ring
Fan Assembly	505-1479-xx	S/A, fans/bracket
Handle	505-1481-xx	S/A, handle
Bottom Case	505-1486-xx	S/A, enclosure, lower
Rear Bezel	505-1487-xx	S/A, enclosure, rear
Top Case	505-1810-xx	S/A, enclosure, upper
Zoom Ring	505-1820-xx	S/A, zoom ring
Lens Cap	505-1822-xx	S/A, lens cap
Power Supply	510-1615-xx	ECA, power supply, Raven
Controller ECA	510-1916-xx	ECA, controller w/IO shield
Ballast	520-0102-xx	Ballast, 250W, Raven/Nighthawk
Color wheel assembly	525-0122-xx	S/A, C/W, NHII, Service
Safety Switch	526-0123-xx	S/A , cable, interlock switch
Keypad ECA	526-0124-xx	S/A, keypad
IR Receiver, Rear	526-0134-xx	Cable, rear IR
IR Receiver, Front	526-0136-xx	Cable, front IR
Optical Engine	535-0023-xx	SP-7205 CS packaged engine kit
Fastener Kit	802-0031-xx	Fastener kit, LP650
Lamp Module	SP-LAMP-006	Replacement lamp, LP-0650, DP6500X, SP7200

Fastener Kit Contents

Fastener	Quantity	Fastens
#4-40 Jack Screws	10	I/O shield to controller ECA
M3x8 Torx T-10 Plastite	10	Keypad to top case
M3x8 Torx T-10	23	Power supply, controller ECA, chassis
M2x8 Torx T-10	5	Safety switch to chassis
M4x10 Torx T-10 Conepoint	3	Top and bottom cases
M3x10 Torx T-10	10	Lamp connector retainer to chassis
M3x8 Torx T-10, black	10	Rear bezel
M3x8 Torx T-10 Plastite	5	Leveling foot knob to leveling foot shaft
M4x10 slotted black	2	Lamp door to bottom case
Leveling foot shaft, M8x29	5	