

The top half of the page features a complex, abstract background of overlapping, semi-transparent blue triangles and polygons, creating a faceted, crystalline effect. The colors range from light sky blue to deep navy blue. A white diagonal line separates this patterned area from the plain white background below.

Service Guide
020-102733-02

Crimson

Crimson HD25, Crimson WU25, Crimson HD31,
Crimson WU31, Mirage HD25, Mirage WU25

CHRISTIE®

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WARRANTY

Products are warranted under Christie's standard limited warranty, the complete details of which are available by contacting your Christie dealer or Christie. In addition to the other limitations that may be specified in Christie's standard limited warranty and, to the extent relevant or applicable to your product, the warranty does not cover:

- a. Problems or damage occurring during shipment, in either direction.
- b. Problems or damage caused by combination of a product with non-Christie equipment, such as distribution systems, cameras, DVD players, etc., or use of a product with any non-Christie interface device.
- c. Problems or damage caused by misuse, improper power source, accident, fire, flood, lightning, earthquake, or other natural disaster.
- d. Problems or damage caused by improper installation/alignment, or by equipment modification, if by other than Christie service personnel or a Christie authorized repair service provider.
- e. Use of third party product enclosures for environmental protection during outside use must be approved by Christie.
- f. Problems or damage caused by use of a product on a motion platform or other movable device where such product has not been designed, modified or approved by Christie for such use.
- g. Except where the product is designed for outdoor use, problems or damage caused by use of the product outdoors unless such product is protected from precipitation or other adverse weather or environmental conditions and the ambient temperature is within the recommended ambient temperature set forth in the specifications for such product.
- h. Defects caused by normal wear and tear or otherwise due to normal aging of a product.

The warranty does not apply to any product where the serial number has been removed or obliterated. The warranty also does not apply to any product sold by a reseller to an end user outside of the country where the reseller is located unless (i) Christie has an office in the country where the end user is located or (ii) the required international warranty fee has been paid.

The warranty does not obligate Christie to provide any on site warranty service at the product site location.

PREVENTATIVE MAINTENANCE

Preventative maintenance is an important part of the continued and proper operation of your product. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty.


REGULATORY

The product 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 product is operated in a commercial environment. The product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of the product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

CAN ICES-3 (A) / NMB-3 (A)

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ENVIRONMENTAL

The product is designed and manufactured with high-quality materials and components that can be recycled and reused. This symbol  means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from regular waste. Please dispose of the product appropriately and according to local regulations. In the European Union, there are separate collection systems for used electrical and electronic products. Please help us to conserve the environment we live in!

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Introduction

This manual is intended for professionally trained operators of Christie high-brightness projection systems.



The illustrations in this document are for representation only and may not depict your projector model exactly.

Only Christie qualified technicians who are knowledgeable about the hazards associated with high-voltage, ultraviolet exposure, and the high temperatures generated by the projector are authorized to assemble, install, and service the projector.

For complete Crimson product documentation and technical support, go to www.christiedigital.com.

Model name

- Crimson HD25
- Crimson WU25
- Crimson HD31
- Crimson WU31
- Mirage HD25
- Mirage WU25

Site requirements

To safely install and operate the projector, the installation location must have restricted access for authorized personnel only and meet these minimum requirements.

Physical operating environment

Provides specifications for the operating environment.

- Crimson and Mirage HD25/WU25: Ambient temperature (operating) 5 to 40°C (41 to 104°F) up to 457.2 m (1500 ft)
- Crimson HD31/WU31: Ambient temperature (operating) 5 to 40°C (41 to 104°F) up to 304.8 m (1000 ft)
- Humidity (non-condensing) 10 to 80%
- Operating altitude: 3,000 m (10,000 ft) maximum at 5 to 25°C (41 to 77°F) ambient

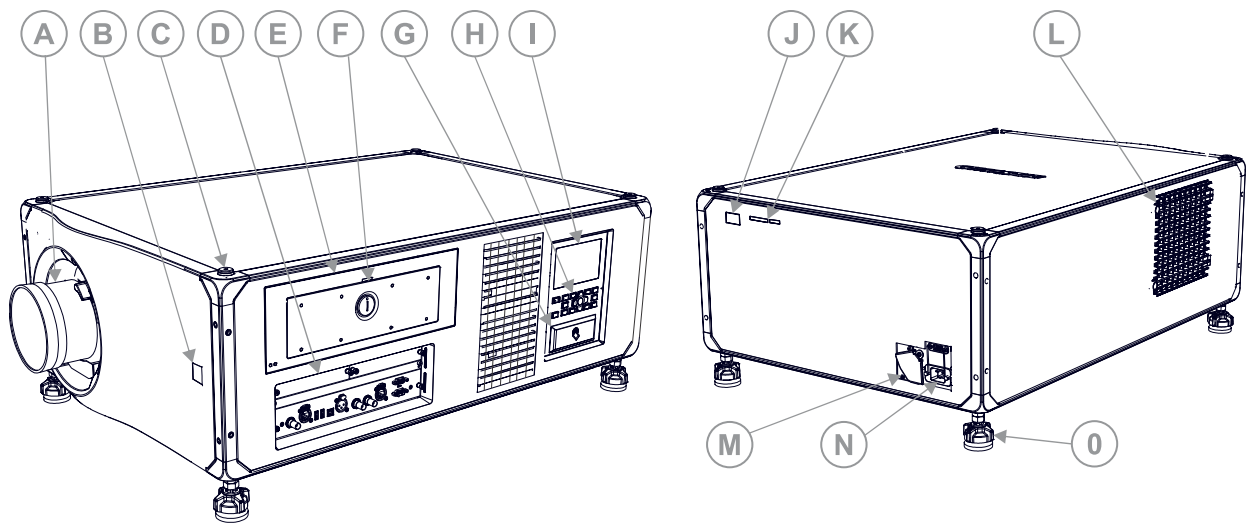
Power connection

The projector uses an innovative dual AC inlet power system that offers two power modes.

To operate at full brightness, power the projector using AC Input 1 if the appropriate high power source is available. To operate in limited power mode, power the projector using standard lower power sources using AC Input 2. A different power cord is provided for each power source. A 20 A rated wall breaker is required at the installation when using Input 1. A 15 A rated wall breaker is required at the installation when using Input 2.

Projector components

Identify the main components of the projector.



ID	Component	Description
A	Projection lens	A variety of lenses can be used with the projector. Available lenses are listed in the <i>Crimson and Mirage Specifications Guide (P/N: 020-102724-XX)</i> .
B	Front IR	Receives transmissions from the IR remote.
C	Mounting and rigging holes.	M12 x 1.75 holes for projector feet installation and offer mounting and rigging points. Four holes located on the top, and four located on the bottom.
D	Communication and input panel	Connects media sources to either the ports on the option cards or the IMXB.
E	Service compartment	Access to fold mirror, optical zoom/focus, and DMD convergence adjustments.
F	Tool box	Provides tools for Christie qualified technicians.
G	Christie TAP	Enables Android devices to communicate with the projector using near field communication.
H	Keypad interface	Controls the projector.

ID	Component	Description
I	Display panel	Displays the projector menus and status.
J	Rear IR	Receives transmissions from the IR remote.
K	LED and shutter LED status indicator	Indicates power status and shutter status.
L	Air Filter door	Provides access to the air filter.
M	AC Input 2: limited power	For use in limited power mode.
N	AC Input 1: full power	For use in full power mode.
O	Adjustable feet	Raise or lower these feet when positioning the projector to make sure it is level on all sides so the displayed image appears rectangular without any keystone.

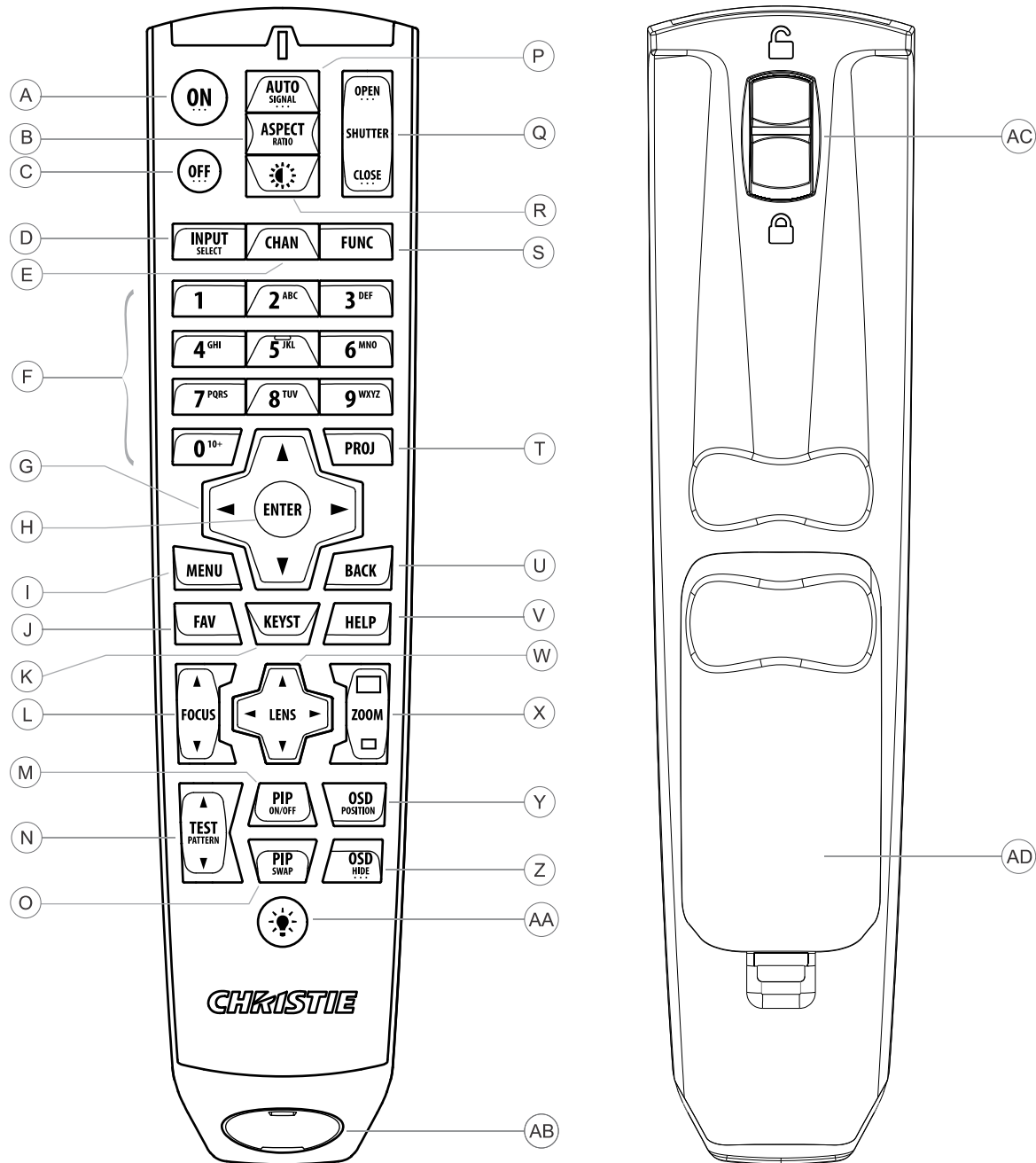
IR remote keypad

The IR remote keypad controls the projector by way of wireless communications from a battery-powered infrared (IR) transmitter.

To use the IR remote, direct the keypad toward the projector’s front or rear IR sensor and press a function key. One of the two IR sensors on the projector detect the signal and relay the commands for internal processing. The remote also offers a connector for wired connections to the projector.



Only use the wired connection to the projectors for setup and service.



Button	Description
A	Powers on the projector light source.
B	Opens the aspect ratio dialog.
C	Turns off the light source and puts the projector in standby.
D	Selects an active or inactive input on any slot.
E	Not supported.

Button	Description
F	Enter a number, such as menu, item index or value.
G	Use the arrows to navigate within a menu or to adjust settings.
H	Selects a highlighted menu item and changes or accepts a value.
I	Toggles the menus on/off.
J	Not supported.
K	Opens the keystone dialog.
L	Adjusts the lens focus.
M	Not supported.
N	Displays a test pattern.
O	Not supported.
P	Optimizes the image automatically.
Q	Opens or closes the shutter.
R	Not supported.
S	Initiates a custom action when a number is selected.
T	Selects a projector in multi-projector installations.
U	Returns to the previous menu level or exits menus if at the top level.
V	Displays context-sensitive help.
W	Arrows adjust the lens offset.
X	Adjust the lens zoom.
Y	Opens the on-screen display position menu.
Z	Shows or hides the on-screen display menus.
AA	Turns the remote backlight on.
AB	Male 3-pin XLR connector for wired option.
AC	Lock/unlock the keypad.
AD	Battery door.

Product documentation

For installation, setup, and user information, see the product documentation available on the Christie Digital Systems USA Inc. website. Read all instructions before using or servicing this product.

Crimson HD25, Crimson WU25, Crimson HD31, Crimson WU31

1. Access the documentation from the Christie website:
 - Go to this URL: bit.ly/2nOpICa.
 - Scan the QR code using a QR code reader app on a smartphone or tablet.



2. On the product page, select the model and switch to the **Downloads** tab.

Mirage HD25, Mirage WU25

1. Access the documentation from the Christie website:
 - Go to this URL: bit.ly/2C6H4HZ.
 - Scan the QR code using a QR code reader app on a smartphone or tablet.



2. On the product page, select the model and switch to the **Downloads** tab.

Related documentation

Additional information on the projector is available in the following documents.

- *Crimson and Mirage Installation and Setup Guide (P/N: 020-102647-XX)*
- *Crimson and Mirage User Guide (P/N: 020-102649-XX)*
- *Crimson and Mirage Product Safety Guide (P/N: 020-102648-XX)*
- *Crimson and Mirage Specifications Guide (P/N: 020-102724-XX)*
- *Crimson and Mirage Serial Commands Guide (P/N: 020-102660-XX)*
- *Crimson and Mirage Status System Guide (P/N: 020-102661-XX)*

Service guidelines

Review safety guidelines and information required for replacing modules.

Ordering parts

When ordering replacement parts, quote the part numbers of the items required. Quote the projector model number, serial number, and date of manufacture, as indicated on the license label.

Not all parts are available separately. In addition, some parts stocked as inventory are available only until the current supply lasts.



All part numbers are subject to change.

Replacing modules

To ensure you have the correct module and the projector module is replaced correctly, check module markings, parts lists, and the relevant disassembly and replacement procedures.

Components must be replaced with exact equivalents or Christie approved replacement parts. Failure to do so may result in unsafe operation.

Interconnections and line drawings

The interconnect diagram illustrates the path of electrical connections between modules. Manufacturer's part numbers are included. Part numbers are subject to change.

Line drawings provide projector dimensions and sizes for installation.

To download the latest interconnect diagram or line drawings, visit www.christiedigital.com.

Servicing live equipment

Only Christie accredited technicians who are knowledgeable about the hazards associated with hazardous voltage, ultraviolet exposure, and high temperatures are authorized to assemble, install, and service Christie equipment.

To make sure you remain safe when servicing energized (live) Christie equipment:

- Locate the main AC power shut off prior to servicing the equipment. This will allow you to turn the power off quickly in an emergency.
- Disconnect the projector from the communication and management network so it cannot receive commands to turn the light source on, open the shutter, and move the lens.
- Familiarize yourself with all potential safety hazards prior to servicing the equipment. This includes, but is not limited to, the location and accessibility of hazardous voltages.

- Read and understand all written procedures prior to commencing a service procedure.
- Understand and follow all local safety codes and requirements when servicing energized (live) equipment.
- Perform equipment service in a location free of obstructions and other hazards. For example, you must have an unobstructed view of the area being serviced.

Wear personal protective equipment (PPE) clothing appropriate to the service you are performing. This includes, but is not limited to, protective (electrically insulated) footwear, safety glasses, and gloves rated for the working voltage of the equipment you are servicing.

Safety and warning guidelines

Read all safety and warning guidelines before installing or operating the projector.

This projector is intended for use in a non-cinema environment.

This projector must be operated in an environment that meets the operating range specification. Use only the attachments and/or accessories recommended by Christie. Use of others may result in the risk of fire, shock, or personal injury.



Warning! If not avoided, the following could result in death or serious injury.

- This product must be operated in an environment that meets the operating range as specified in this document.
- FIRE HAZARD! Keep hands, clothes, and all combustible material away from the concentrated light beam of the projector.
- Keep fingers and other body parts away from the moving parts in the product. Tie back long hair, and remove jewelry and loose clothing before manually adjusting the product.
- FIRE AND SHOCK HAZARD! Use only the attachments, accessories, tools, and replacement parts specified by Christie.
- Do not operate the product without a lens installed.
- Always use a lens plug when installing or moving the product. This prevents contaminants from entering the product.
- UV EXPOSURE! Protective UV safety glasses with side shields and Christie approved protective safety clothing must be worn when performing optical adjustments or servicing the product.
- FIRE AND SHOCK HAZARD! Use only the attachments, accessories, tools, and replacement parts specified by Christie.



Caution! If not avoided, the following could result in minor or moderate injury.

- SHOCK HAZARD! Disconnect the product from AC before installing, moving, servicing, cleaning, removing components, or opening any enclosure.
- Christie products must be installed and serviced by Christie qualified technicians.
- TRIP OR FIRE HAZARD! Position all cables where they cannot contact hot surfaces, be pulled, be tripped over, or damaged by persons walking on or objects rolling over the cables.



Notice. If not avoided, the following could result in property damage.

- SHOCK HAZARD! All harnessing must be properly routed and secured as originally installed, especially in high voltage areas.
- FIRE HAZARD! Do not use a power cord, harness, or cable that appears damaged.

Light intensity hazard distance

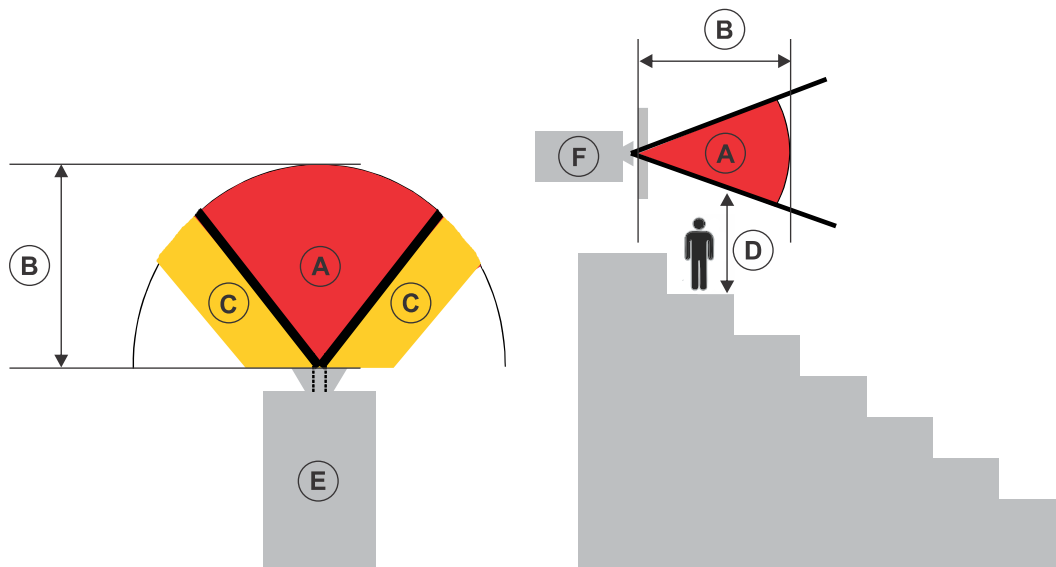
This projector has been classified as Risk Group 3 as per the IEC 62471-5:2015 standard due to possible hazardous optical and thermal radiation being emitted.



Warning! If not avoided, the following could result in serious injury.

- PERMANENT/TEMPORARY BLINDNESS HAZARD! No direct exposure to the beam must be permitted. Class 1 Laser Product - Risk Group 3 according to IEC 60825-1:2014 and IEC 62471-5:2015.
- PERMANENT/TEMPORARY BLINDNESS HAZARD! Operators must control access to the beam within the hazard distance or install the product at the height that prevents exposure of spectators' eyes within the hazard distance. The hazard zone must be no lower than 3.0 meters above the floor and the horizontal clearance to the hazard zone must be a minimum 2.5 meters.
- EXTREME BRIGHTNESS! Do not place reflective objects in the product light path.

The following diagram and table show the zones for ocular and skin hazard distances:



- A—Hazard zone. The region of space where the projection light from the laser-illuminated projector is above emission limits for Risk Group 2. The light intensity may cause eye damage after a momentary or brief exposure (before a person can avert his or her eyes away from the light source). The light may cause skin burns to occur.
- B—Hazard distance. Operators must control access to the beam within the hazard distance or install the product preventing potential exposure of the spectators' eyes from being in the hazard distance.
- C—No access zone. Horizontal clearance of the no access zone must be a minimum of 2.5 meters.
- D—Vertical distance to hazard zone. The hazard zone must be no lower than 3.0 meters above the floor.
- E—Represents the top view of the projector.
- F—Represents the side view of the projector.

For US and international hazard distances based upon IEC 62471-5:2015, *Photobiological Safety of Lamps and Lamp Systems – Part 5: Image Projectors*.

Projection lens	Part number	Hazard distance (m)	
		Crimson/Mirage 25K	Crimson 31K
0.37:1 HD ILS	118-131106-XX	1.0	1.0
0.67:1 HD ILS	118-100110-XX	1.0	1.0
0.8-1.16:1 HD ILS	118-130105-XX	1.0	1.2
1.1:1 HD ILS	118-100117-XX	1.0	1.2
1.16-1.49:1 HD ILS	118-100111-XX	1.0	1.6
1.4-1.8:1 HD ILS	118-100112-XX	1.1	1.9
1.8-2.6:1 HD ILS	118-100113-XX	1.8	2.7
2.6-4.1:1 HD ILS	118-100114-XX	2.3	4.5
4.1-6.9:1 HD ILS	118-100115-XX	6.3	7.6
6.9-10.4:1 HD ILS	118-100116-XX	12.6	11.2

For Installations in the United States

The following must be in place for laser-illuminated projector installations in the United States:

- Any human access to the hazard zone, if applicable, must be restricted by barriers to enforce the no access zone.
- Permanent show installations containing Risk Group 3 laser-illuminated projectors must meet the following conditions:
 - Installed by Christie or by Christie-authorized and trained installers.
Refer to the Laser Illuminated Projector - Class 1 Risk Group 3 Installation training (Course code: CF-LIPI-01) on the <http://www.christieuniversity.com> site.
 - Performed according to instructions provided by Christie.
 - Ensure the projection system is securely mounted or immobilized to prevent unintended movement or misalignment of the projections.
- A copy of the FDA variance approval letter must be with the operator or other responsible individual.
FDA variances can be found in the online training course—Laser Illuminated Projection - Class 1 Risk Group 3 Installation.
- Temporary show installations containing Risk Group 3 laser-illuminated projectors may be installed by Christie or sold or leased only to valid laser light show variance holders (laser light show manufacturers) for image projection applications. Such manufacturers may currently hold a valid variance for production of Class IIIb and IV laser light shows and/or for incorporation of the Risk Group 3 laser-illuminated projectors into their shows. This requirement applies also to dealers and distributors of these laser-illuminated projectors.
- For temporary installations, the FDA variance holder must maintain complete records of all show itineraries with dates, locations, operator name, and contact information clearly and completely identified.
- The Christie Laser Projection System Installation Checklist must be fully completed after the installation and sent to lasercompliance@christiedigital.com. A copy can remain on-site. This checklist can be found as a separate document in the accessory box with the manual.



- Certain US states have additional laser regulatory requirements. Go to www.christiedigital.com for additional regulatory requirements.


Product labels

Learn about the labels that may be used on the product. Labels on your product may be yellow or black and white.

General hazards

Hazard warnings also apply to accessories once they are installed in a Christie product that is connected to power.

Fire and Shock Hazard	
 	<p>To prevent fire or shock hazards, do not expose this product to rain or moisture.</p> <p>Do not alter the power plug, overload the power outlet, or use it with extension cords.</p> <p>Do not remove the product enclosure.</p> <p>Only Christie qualified technicians are authorized to service the product.</p>

Electrical Hazard	
	<p>Risk of electric shock.</p> <p>Do not remove the product enclosure.</p> <p>Only Christie qualified technicians are authorized to service the product.</p>



General hazard.



Electric shock hazard. To avoid personal injury, disconnect all power sources before performing maintenance or service.



Electrocution hazard. To avoid personal injury, always disconnect all power sources before performing maintenance or service procedures.



Hot surface hazard. To avoid personal injury, allow the product to cool for the recommended cool down time before performing maintenance or service.



Burn hazard. To avoid personal injury, allow the product to cool for the recommended cool down time before performing maintenance or service.



Moving parts hazard. To avoid personal injury, keep hands clear and loose clothing tied back.



Fan hazard. To avoid personal injury, keep hands clear and loose clothing tied back. Always disconnect all power sources before performing maintenance or service procedures.



Voltage hazard. To avoid personal injury, always disconnect all power sources before performing maintenance or service procedures.



Cut hazard. To avoid personal injury, keep hands clear or wear protective gloves.



Not for household use.

Mandatory action



Consult the service manual.



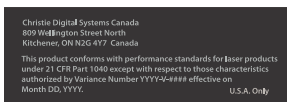
Disconnect all power sources before performing maintenance or service procedures.

Electrical labels



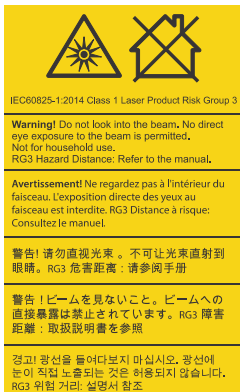
Indicates the presence of a protective earth ground.

Laser labels



FDA laser variance (US projectors only)

This product conforms with performance standards for laser products under 21 CFR Part 1040 except with respect to those characteristics authorized by Variance Number 2016-V-1838 effective on June 20, 2017.



Indicates a light hazard. Do not look directly into the lens. The extreme high brightness can cause permanent eye damage. Class 1 Laser Product - Risk Group 3 according to IEC 60825-1: 2014 and IEC 62471-5:2015

Service setups

Understand the special internal hardware and software adjustments and related details that may require the attention of a qualified service technician, whether done periodically or after a specific module replacement.

Turning on the projector

When the projector AC power supply is plugged in, the power is on.




Warning! If not avoided, the following could result in death or serious injury.

- **SHOCK HAZARD!** Do not attempt operation if the AC supply is not within the specified voltage and current, as specified on the license label.

1. Plug the projector in to AC power.


The projector automatically powers on to standby mode when plugged in. The display panel functionality becomes available.

2. To turn the light source on using the projector keypad, press and hold the power  button until you hear a beep.

To turn on the light source using the remote, press and hold the **ON** button until you hear a beep.

Turning off the projector

When powering off in preparation for inspection or maintenance, always disconnect from AC.

1. To turn the light source off using the projector keypad, press and hold the  button until you hear a beep.

To turn off the light source using the remote, press and hold the **OFF** button until you hear a beep.

When powering off the projector, allow the projector to complete its cool down cycle. Do not immediately unplug the projector if this can be avoided.

2. To turn off power to the projector, disconnect from AC power.

Adjusting offset

Adjust the offset to align the image on the screen. Always adjust offset before adjusting boresight.



For the best optical performance and minimal keystone, use offsets instead of aiming at the center of the image, in off-axis installations. Avoid extreme tilts or offsets. Corner vignettes on a white test pattern indicate extreme offset that should be avoided using mechanical alignment.

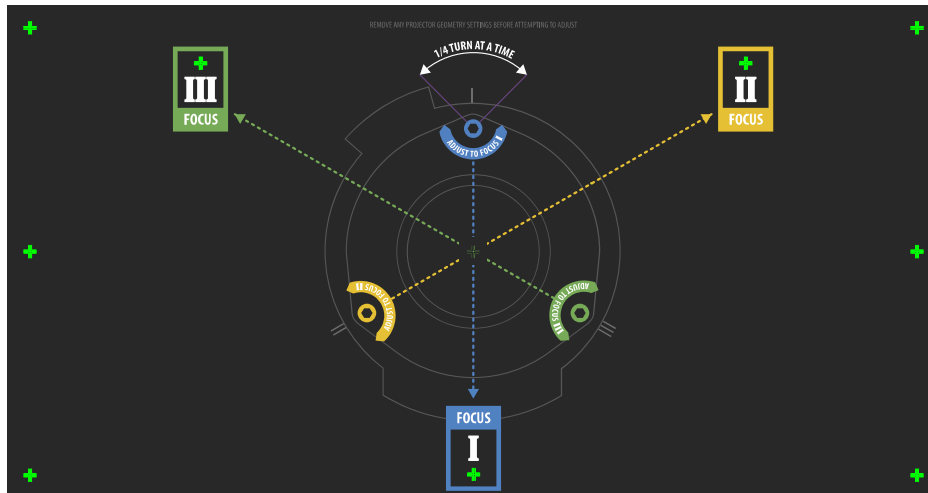
1. Project an image with the primary lens.
2. Select a framing test pattern.

3. Select **LENS OFFSET**.
4. Use the arrows to adjust the offset to display a square image on the screen, with minimal projector aiming error.
5. To exit to the home page, select **Back**.

Aligning the boresight

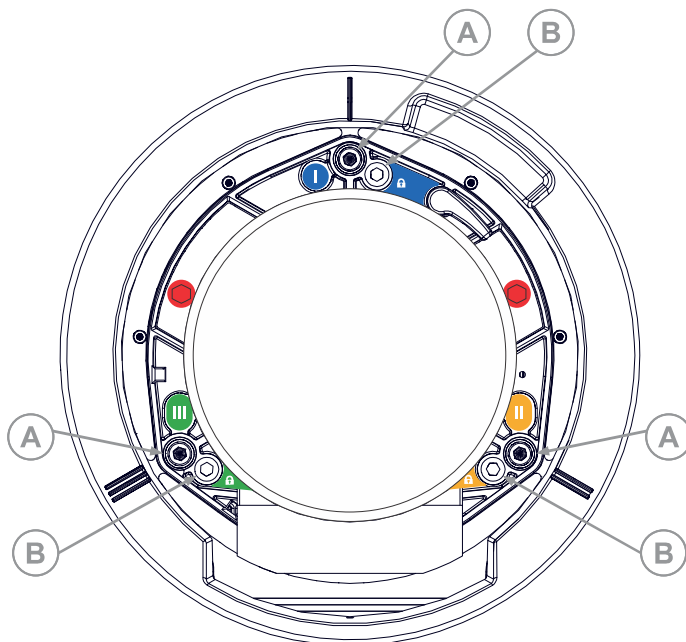
The boresight adjustment balances the tilt of the lens mount to compensate for screen-to-projector tilt.

1. Display the boresight test pattern.
 - a) On the remote keypad, press **Test**.
On the built-in keypad, press the soft key that displays Test on the display panel
 - b) To cycle to Boresight, press the **Up Arrow** key.
 - c) Press **Enter**.

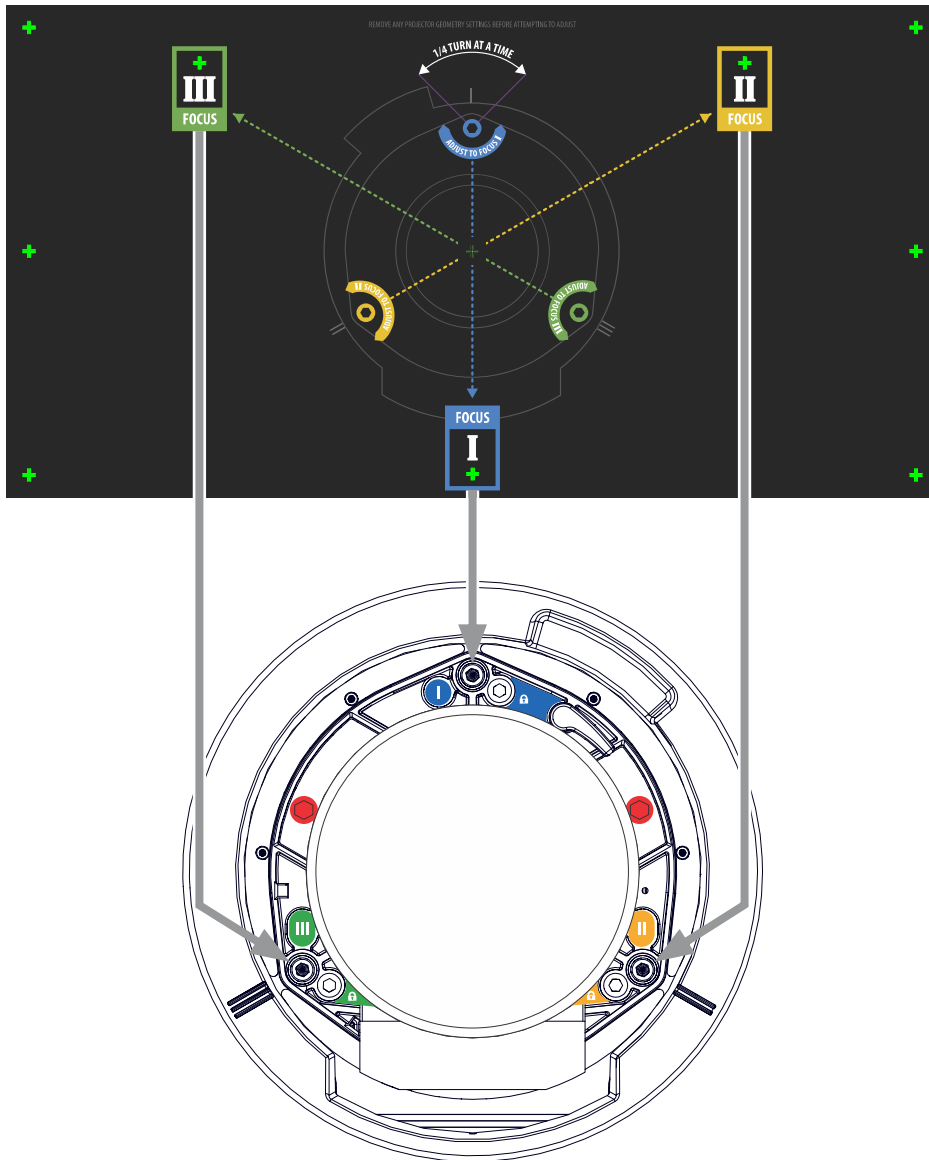


2. Focus the image on cross-hair image **I**.
3. Evaluate the focus on cross-hair image **II** and **III**.
 - If all three images are in focus, no further action is required.
 - If boresight is required, continue to step 4.

The adjustment screws (A) on the lens mount affects the corresponding cross-hairs on the test pattern.



4. To loosen the three setscrews (B) on the lens mount, use a 5 mm hex driver. The setscrews must be backed out several turns to avoid contact with the inner lens mount plate.
5. To fine tune the focus of cross-hair pattern **I**, adjust the appropriate adjustment screw (A) until the cross-hair image is in focus with minimal flare.



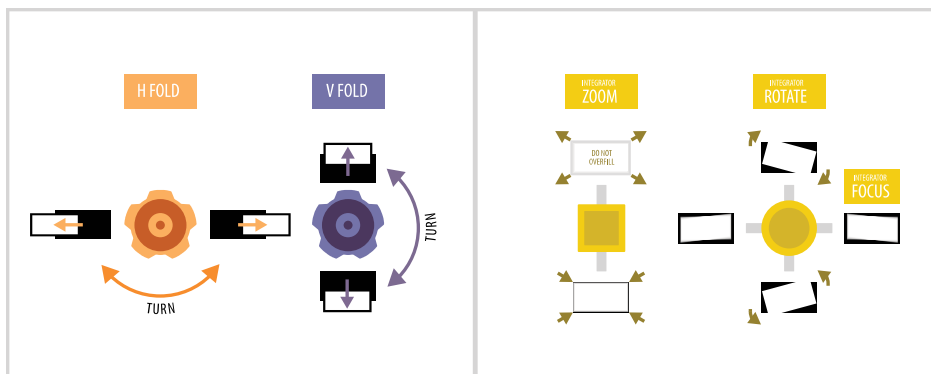
6. To fine tune cross-hair pattern **II**, adjust the appropriate adjustment screw until the cross-hair image is in focus with minimal flare.
7. To fine tune cross-hair pattern **III**, adjust the appropriate adjustment screw until the cross-hair image is in focus with minimal flare.
8. Repeat step 5 to 7 as required until all three cross-hair patterns are in equal sharp focus.
 - If the boresight is acceptable, proceed with step 11.
 - If the boresight does not appear to be converging to an acceptable level of image quality, or if the lens does not focus over the correct range of throw distances, proceed with step 9.
9. To approximately recover the original factory boresight, position the three setscrews flush with the front face of the lens mount plate and in contact with the inner lens mount plate. This may require adjusting both setscrews and adjustment screws.

10. If further action is required, repeat steps 2 to 9.
11. Lock the setscrews, and re-check the boresight quality.
Tighten the setscrews to 2.1 Nm (18 in-lb) to ensure they do not shift.

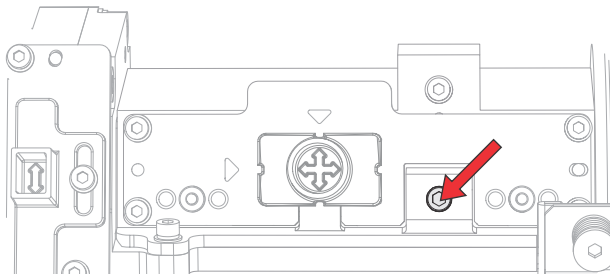
Optimizing the Integrator Focus and Zoom

Extreme misalignment of projection optics can cause permanent damage to critical optical components. Only Christie qualified technicians can perform internal optical adjustments.

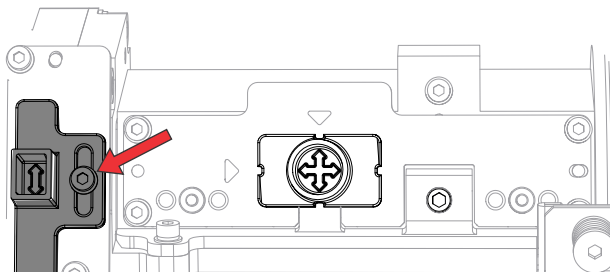
1. From the Test Pattern menu, select the **Integrator Rod** test pattern.
The Integrator Rod test pattern includes guided information for integrator zoom and focus adjustments.



2. Set the projector brightness level to approximately 50% to 60%.
3. Retrieve the 3 mm hex driver located inside the toolbox.
4. To open the Service door on the side of the projector, loosen the two captive screws.
5. Loosen the Rotate and Focus lockscrew located next to the adjustment slider.

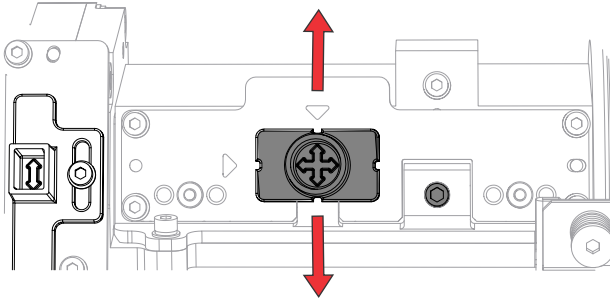


6. Loosen the integrator magnification Zoom lockscrew located next to the adjustment slider.

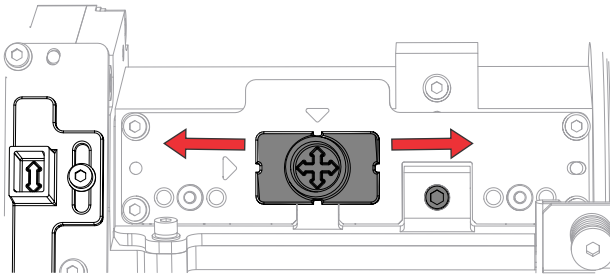


7. Move both adjustments to the nominal position before optimizing.

8. To focus the integrator rod, adjust the slider vertically to rotate the image temporarily exposing the top and bottom edges.

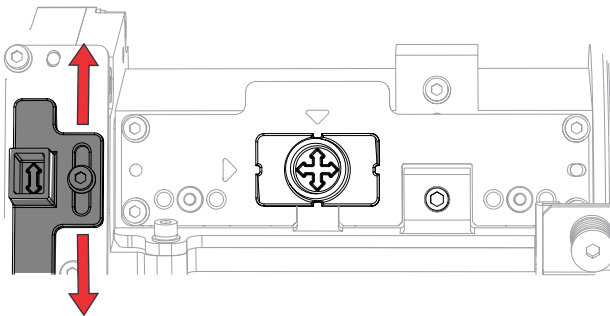


9. Adjust the slider horizontally to sharpen the top and bottom edges.



10. To rotate the focused image back to fill the shadows, adjust the slider vertically.

11. To optimize the DMD brightness, adjust the integrator magnification lens using the Zoom slider.



12. Adjust the Zoom slider vertically until shadows are not visible on the projected image.

13. Check the image quality.

If shadows still appear in the projected image after adjusting the integrator zoom, repeat steps 6 to 11.

14. Tighten the Zoom lockscrew.

15. Tighten the Rotate and Focus lockscrew.

Adjusting the fold mirror

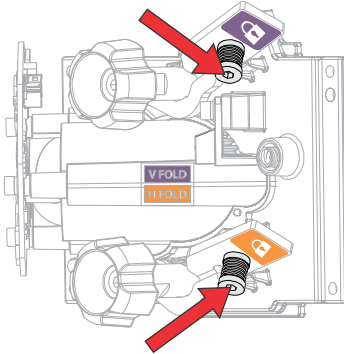
Fold mirror adjustment must be completed by trained personnel.



Notice. If not avoided, the following could result in property damage.

- Misalignment of the fold mirror may cause permanent damage to the product.

1. Set the projector to minimum power.
2. From the Test Pattern menu, select the **Integrator Rod** test pattern.
3. Open the Service door on the side of the projector.
4. Unlock the fold mirror screws to unlock the adjustment knobs.



5. To make horizontal adjustments, use the orange knob labeled Horizontal.
6. To make vertical adjustments, use the purple knob labeled Vertical.
7. To continue to refine the fold mirror adjustment, repeat the horizontal and vertical adjustments.
8. Lock the fold mirror screw to lock the adjustment knobs.
9. Once satisfied with the alignment, increase the projector power.

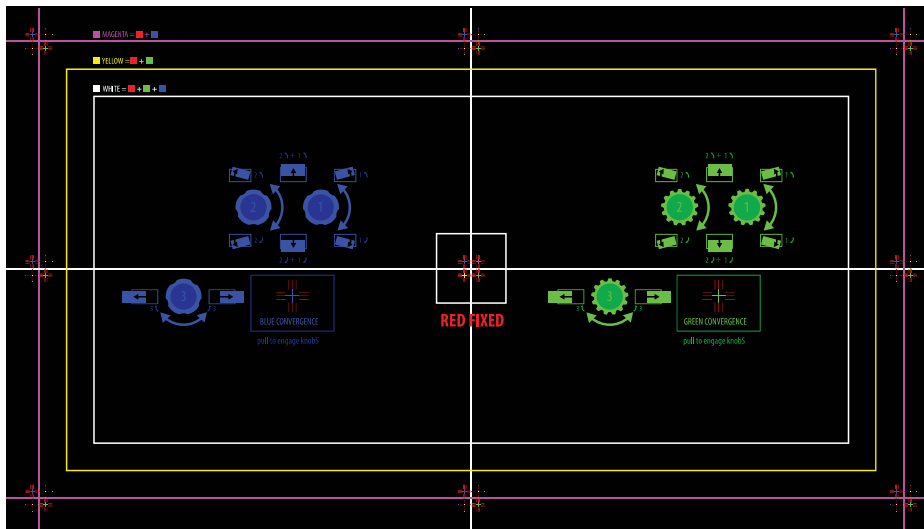
Adjusting DMD convergence

A convergence problem occurs when one or more projected colors (red, green, and blue) appears misaligned when examined with a convergence test pattern.

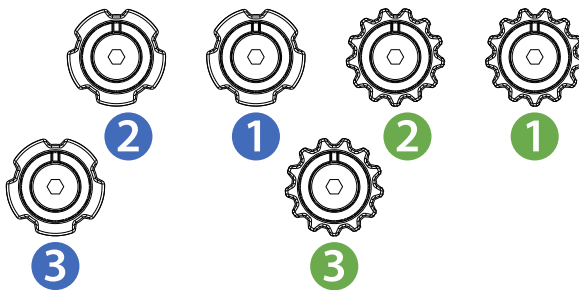
The three colors should overlap to form pure white lines throughout the image and one or more poorly converged individual colors may appear adjacent to some or all of the lines.

When adjusting the convergence, you are adjusting blue and green to red.

1. From the Test Pattern menu, select the **Convergence** test pattern.



2. Open the Service door on the side of the projector.
3. To adjust the convergence knobs, use the 3 mm tool included with the projector.
If adjusting by hand without using the tool, pull out the convergence adjustment knobs to engage them.



4. Use the Convergence test pattern to assist with adjusting the horizontal and vertical lines. Vertical convergence and rotation is done by adjusting two knobs. Christie recommends rotating a single knob a maximum of a quarter rotation before adjusting the second knob a quarter rotation. For example, if using one hand, turn the left knob a quarter rotation and then the right knob a quarter rotation, and so on. Adjusting a single knob for vertical or rotational adjustment to an extreme before adjusting the second knob may result in the convergence mechanism binding.
5. When complete, push in all the convergence adjustment knobs to disengage the knobs.

Replacing or refilling the coolant

Follow these instructions for filling the liquid cooling module and handling the coolant.



Caution! If not avoided, the following could result in minor or moderate injury.

- Use protective eye wear and gloves. Follow workplace guidelines for using personal protective equipment when installing, cleaning, and servicing the product.



Notice. If not avoided, the following could result in property damage.

- Do not attempt to fill the coolant reservoir when it is installed in the projector chassis.
 - Fill the coolant to the recommended level only. Do not fill above the maximum level line shown on the reservoir unit.
1. Remove the liquid cooling module.
 - *Light engine liquid cooling module* (on page 61)
 - *Laser liquid cooling module* (on page 63)
 2. Ensure the liquid cooling module is placed on a flat surface.
 3. Open the top cap on the reservoir fill port.
 4. Pour the required coolant (Propylene Glycol 740—P/N: 003-005179-XX) into the fill port. Fill only to the recommended level as indicated on the fill port.
 5. Replace and tighten the cap on the reservoir fill port.
 6. Use a soft cloth to wipe away any coolant that drips outside the reservoir.
 7. Re-install the liquid cooling module.

Maintenance and cleaning

Maintain the cleanliness of all internal components during any service procedure. All of the projector optics must remain free of contaminants to perform at the level specified. Even a small amount of dust or a fingerprint may degrade the image or cause a noticeable reduction of brightness.

Always power down and disconnect/disengage all power sources to the projector before servicing or cleaning the lens or before any of the projection head covers or doors are loosened and removed. If the seal is broken while the intake fans are still operating, internal components are immediately vulnerable to contamination from inbound particles.




Notice. If not avoided, the following could result in property damage.

- Avoid touching optical elements.
- Always wear clean, lint-free gloves when handling the product.

Guidelines for cleaning

Use the following guidelines when cleaning components.

Component	Preventative measures	How to clean
Illumination Optics System	Never touch or blow on exposed components. Wear gloves (supplied).	Use ionized pneumatic guns only. Keep imaging components and yourself grounded at all times.
Integrator	Never disassemble the integrator module.	Blow off particles with clean, dry de-ionized air.
Illumination system, internal lenses/prisms	Never touch or blow on interior components. Wear gloves (supplied).  Normally the internal parts should not be accessed.	Blow off particles with clean, dry de-ionized air. If necessary, wipe in a single direction with a clean high quality optical cloth.
Light engine components	Never touch or blow on components. Wear gloves (supplied).	Blow off particles with clean, dry de-ionized air. If necessary, use a Q-tip with pure isopropyl alcohol on the glass surface. Never touch the imaging panels. The green imaging panel also has glass behind it.
Light engine, DMD panels	Never touch or blow on the panels.	Blow off particles with clean, dry de-ionized air.
Projection lens	To avoid the risk of scratching the lens, only clean the lenses if	Use filtered compressed air to blow out dust and a clean lint-free cloth.

Component	Preventative measures	How to clean
	absolutely necessary. A small amount of dust on the lenses has little effect on picture quality. The projection lens should be free of dust and fingerprints. If the lenses must be cleaned, use a dry, soft cotton cloth and gently rub in a circular motion.	

Ventilation

Use the following guidelines when maintaining ventilation.

- Do not place the projector near a heat source or in an enclosure, unless proper ventilation is provided.
- Do not insert objects into the ventilation openings of the projector.
- Do not spill liquids of any kind into the projector. Should an accidental spill occur, immediately unplug the projector and have it serviced by a qualified service technician.

Cleaning the projector optics

Learn about cleaning the optical components in the projectors.

Unnecessary cleaning of optics, increases the risk of degrading delicate coatings and surfaces. Only clean optics when dust, dirt, oil, fingerprints or other marks are obvious and are causing performance problems. Maintenance of optical components requires a qualified service technician. Inspect exposed optical surfaces periodically in a clean, dust-free environment using a flashlight.

Never touch an optical surface with your bare hands. Always wear latex lab gloves.

Use the following products when cleaning the optical surfaces:

- Soft camel-hair brush
- Dust-free blower—filtered dry nitrogen blown through an anti-static nozzle.
- Dust-free lens tissue, such as Melles Griot Kodak tissues (18LAB020), Opto-wipes (18LAB022), Kim Wipes or equivalent
- Cotton swabs with wooden stems only
- Lens cleaning cloth/microfibre, such as Melles Griot (18LAB024) or equivalent

Cleaning the lens

To avoid the risk of scratching the lens, clean the lens only if absolutely required.

Removing dust from the projection lens

Remove dust from the projection lens to ensure optimum image display.

1. Brush most of the dust off with a camel-hair brush or use a dust-free blower.

2. Fold a microfiber cloth and wipe the remaining dust particles off the lens with the smooth portion of the cloth that has no folds or creases.
Do not apply finger pressure. Instead, use the tension in the folded cloth to remove the dust.
3. If significant dust remains on the lens surface, dampen a clean microfiber cloth with lens cleaning solution and wipe gently until clean.

Removing fingerprints, smudge, or oil from the projection lens

Remove fingerprints, smudges, or oil from the projection lens to ensure optimum image display.

Clean the lens only if absolutely required.

1. Brush most of the dust off with a camelhair brush or use a dust-free blower.
2. Wrap a lens tissue around a swab and soak it in lens cleaning solution.
The tissue should be damp but not dripping. Do not use a cleaning solvent that contains ammonia. Avoid lens contact with Xylene and Ether.
3. Gently wipe the surface using a figure eight motion.
4. Repeat until the blemish is removed.

Parts and module replacement

When ordering replacement parts, provide the following information found on the product license label:

- Projector Model
- Projector Serial Number
- Manufacture Date

Maintenance prerequisites

Before servicing the projector, perform the following tasks.

- Always *power down and disengage all power sources* (on page 18) to the projector prior to servicing.
- Follow all *service safety guidelines* (on page 13).
- For detailed breakdown of serviceable modules, see *Index of parts and modules* (on page 31).
- When re-connecting harnesses, see the interconnect drawings on www.christiedigital.com.

Tools required for service

Before servicing the projector, ensure the following tools are available.

- Long and stubby neck magnetic-tip ball drivers—2.5 mm, 3 mm, and 5 mm (provided in projector toolbox)
- #2 Phillips™ screwdriver
- 1.5 mm and 2.0 mm hex screwdriver
- Slotted screw driver
- Side cutters and cable ties
- Needle nose pliers
- 19 mm wrench
- Magnetiser
- Electrostatic protective strap and pad
- Disposable lint-free gloves (included with optical components)
- Cloth wipes

Index of parts and modules

The following table lists the parts and modules for Crimson.

Description	Part number
Light engine	
Light engine HD	Crimson/Mirage 25: 003-107494-XX Crimson 31: 003-109609-XX
Light engine WU	Crimson/Mirage 25: 003-107766-XX Crimson 31: 003-109616-XX
Power supply and electronics	
Power supply LV 500W	003-107582-XX
Power supply 3KW	003-107583-XX
ACIDM	003-121553-XX
Line filter and inline harness	003-006423-XX
Light module 25K	003-121562-XX
Light driver module 25K	003-121564-XX
Light module 31K	003-121830-XX
Light driver module 31K	003-121832-XX
Printed circuit boards	
Housekeeping board (HKBC)	003-113675-XX
IR sensor board 1.2	003-112635-XX
Dual temperature sensor module (DTSM)	003-111269-XX
Convenience light board (CLB)	003-005261-XX
Backpane 3.0 board (C4LBP)	003-112433-XX
Image processing board (WIP) 3.0	003-112431-XX
IMXB board	003-112351-XX
Status LED board	003-112245-XX
Fan control board (CFCB)	Crimson/Mirage 25: 003-006159-XX Crimson 31: 003-006937-XX
Color sensor board (CSB)	003-113367-XX
Light driver board	Crimson/Mirage 25: 003-121564-XX Crimson 31: 003-121832-XX
Ventilation and cooling	
Light engine radiator intake individual fan (1-4)	Crimson/Mirage 25: 003-121612-XX Crimson 31: 003-121829-XX
Light engine radiator intake fan pack (1-4)	Crimson/Mirage 25: 003-00061620XX

Description	Part number
	Crimson 31: 003-006932-XX
Laser system cooling fan pack (includes fans 5-10)	003-107557-XX
Laser system cooling fans 5-10	003-121615-XX
Light engine exhaust fans 11-12	003-121610-XX
Phosphor wheel fan 16 Card cage fan 25-26	003-006002-XX
Rear exhaust fan 3 pack (includes fans 17-19)	Crimson/Mirage 25: 003-107562-XX
Rear exhaust fan (used for fans 17-19)	Crimson/Mirage 25: 003-121618-XX
Rear exhaust fan 5 pack (includes fans 13, 14, 17-19)	Crimson 31: 003-109582-XX
Rear exhaust fan (used for fans 13, 14, 17-19)	Crimson 31: 003-121828-XX
Light engine exhaust fan 24	003-121614-XX
Light engine radiator	003-121608-XX
Light engine radiator	003-121608-XX
Liquid cooling module	003-121607-XX
Laser module cooling module	003-121565-XX
Propylene Glycol 740 coolant	003-005179-XX
Laser module fan	003-005960-XX
Harnesses	
Main and limited IN/ACIDM harness	Crimson/Mirage 25: 003-006422-XX Crimson 31: 003-006933-XX
Fans harnesses	Crimson/Mirage 25: 003-006474-XX Crimson 31: 003-006935-XX
Harness to housekeeping board (HKBC)	003-006424-XX
Power supplies harness	003-006425-XX
Harness to backpane board (C4LBP)	Crimson/Mirage 25: 003-006473-XX Crimson 31: 003-006934-XX
Light engine mini SAS harness	003-006161-XX
Convenience light board (CLB) harness	003-006160-XX
Auto optical switch harness	003-111558-XX
Covers and feet	
Top/bottom cover	003-107563-XX
Front cover	003-107564-XX
Intake right-side cover	003-107567-XX
Electronics left-side cover	003-107568-XX

Description	Part number
Rear cover	Crimson/Mirage 25: 003-107565-XX Crimson 31: 003-109568-XX
Light engine cover	Crimson/Mirage 25: 003-006158-XX Crimson 31: 003-006931-XX
Feet	003-006113-XX
Optics	
Integrator rod HD	003-107574-XX
Integrator rod WUXGA	003-107579-XX
Front IOS	003-107572-XX
Fold mirror adjustment	003-107577-XX
L1 adjustment knob	003-006420-XX
Integrator knob	003-006421-XX
Fold mirror	003-001979-XX
Color sensor	003-113367-XX
Lenses	
0.73SX+/0.67 HD ILS	118-100110-XX
1.25-1.6SX+/1.16-1.49 HD ILS	118-100111-XX
1.5-2.0SX+/1.4-1.8 HD ILS	118-100112-XX
2.0-2.8SX+/1.8-2.6 HD ILS	118-100113-XX
2.8-4.5SX+/2.6-4.1 HD ILS	118-100114-XX
4.5-7.5SX+/4.1-6.9 HD ILS	118-100115-XX
7.5-11.2SX+/6.9-10.4 HD ILS	118-100116-XX
1.2SX+/1.1 HD ILS	118-100117-XX
0.80-1.16:1 HD ILS	118-130105-XX
0.37:1 HD ILS	118-131106-XX
Lens mount components	
Lens mount ILS	003-107581-XX
Offset motor	003-005247-XX
Miscellaneous	
User interface	003-107560-XX 003-109117-XX
Remote control	003-120918-XX
Air clean filter	003-006157-XX
EMI filter	003-000311-03

Description	Part number
Precision 1 rigging frame	165-101103-XX
Retro-fit rigging frame kit	003-006427-XX
Shutter	003-107847-XX
1/4 turn screws	003-006170-XX
HBMIC input card	144-116109-XX
Terra SDVoE input card (TSIC)	144-132107-XX

Lens mount components

The lens mount provides a means of securing a projection lens to the projector. Components include the lens boot, lens mount barrel, and the lens mount offset.

Lens efficiency ratings

The following table lists the available lenses for Crimson and their associated transmission efficiency. Lens transmission efficiency affects the brightness of the projected image.

Lens	Part number	Efficiency rating
0.37:1 HD	118-131106-XX	77%
0.73:1 SX+/0.67:1 HD fixed	118-100110-XX	92%
0.8-1.16:1 HD	118-130105-XX	85%
1.2:1 SX+/1.1:1 HD fixed	118-100117-XX	88%
1.25-1.6:1 SX+/1.16-1.49:1 HD zoom	118-100111-XX	94%
1.5-2.0:1 SX+/1.4-1.8:1 HD zoom	118-100112-XX	91%
2.0-2.8:1 SX+/1.8-2.6:1 HD zoom	118-100113-XX	100%
2.8-4.5:1 SX+/2.6-4.1:1 HD zoom	118-100114-XX	93%
4.5-7.3:1SX/4.1-6.9:1 HD zoom	118-100115-XX	99%
7.5-11.2:1 SX+/6.9-10.4:1 HD zoom	118-100116-XX	100%

Installing a projection lens

The projection lens, shipped separately from the projector, must be installed prior to setting up the projector.



Notice. If not avoided, the following could result in property damage.

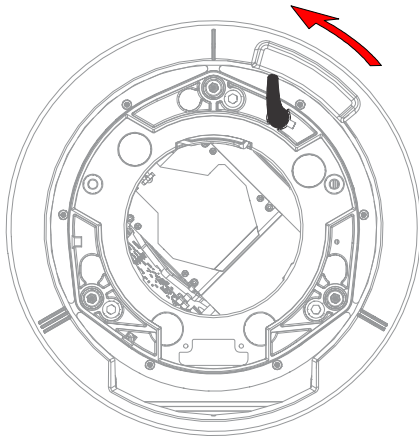
- Always use a lens plug when installing or moving the product. This prevents contaminants from entering the product.
- Do not insert the lens into the product at an angle. This can damage the lens and the optical components inside the product.
- Always place the lens cap onto the lens when moving the projector to avoid scratching the lens.
- Remove the lens cap before turning the product on to avoid damaging the lens.

The projector includes a motorized lens mount that allows automated lens control and adjustment: vertical and horizontal offsets, zoom, and focus. The projection lens is shipped separately from the projector. Use the lens cap when transporting the lens to avoid scratching and damaging the lens, which could affect your displayed image.

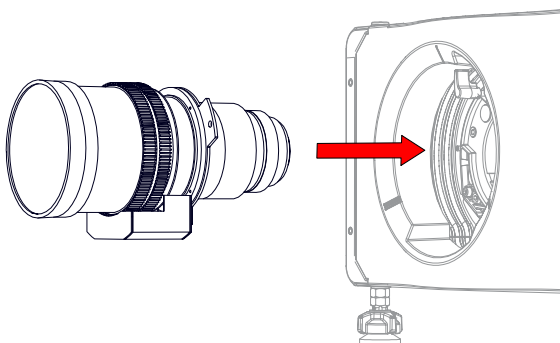
- **Zoom and Focus**—Two internal lens motors allow for quick motorized adjustment of zoom and focus. Adjust zoom to fit the displayed image on the screen and adjust focus to improve the clarity of the image.
- **Lens Offset**—The motorized lens mount allows vertical and horizontal offset of the displayed image.
- **Shutter**—Sets the screen to absolute black, when in the closed state.

Do not adjust motorized lenses by hand without first setting them for manual operation; otherwise, the zoom and focus motors may be damaged.

1. Ensure the lens cap is on the lens.
2. Rotate the lens clamp to the open position.



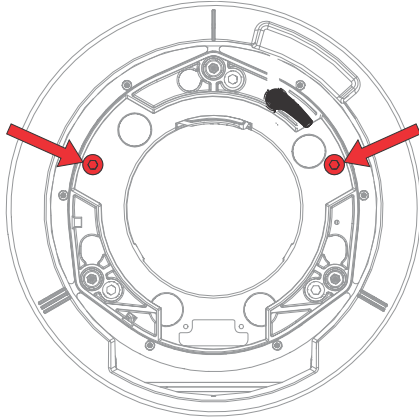
3. Align the lens interface plate with the lens mount and align the lens electrical connector with the mating connector on the lens mount.
4. Fully insert the assembly straight into the lens mount opening without turning and press with your hand as shown.



5. To lock the lens assembly in place, while holding the lens flat against the lens mount, push the lens clamp down.
6. Remove the front lens cap.

7. For added stability and safety such as motion applications, or if the projector is hoisted or installed in an overhead position, use a 5mm hex driver to fasten the security screws provided with the lens mount or hand tighten the lens retaining screws attached to the lens.

Christie recommends doing this for all lenses.



Calibrating the lens motor

Ensure the lens motor is calibrated before using the projector.

If the lens motors are not calibrated properly, implications may include:

- Incorrect reporting of the lens motor position.
- Inability to use the full range of the lens motors.
- Lens motors traveling outside of the pre-defined keep-out area.
- Damage to the projector.

Calibrate the lens motors when any of the following conditions are met:

- After a lens change.
- After the projector is moved and/or jostled.
- After any manual adjustment is made to the zoom or focus.

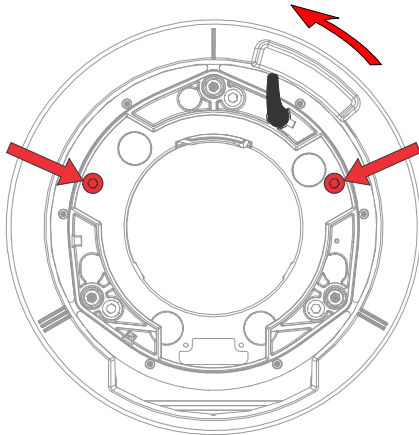
To calibrate the lens:

1. Select **MENU** > **Configuration** > **Lens Settings** > **Lens Calibration**.
2. Select **Enter**.

Removing the lens

Complete the following procedure to remove the lens.

1. Remove and retain the two security screws (for installation) from the lens mount.

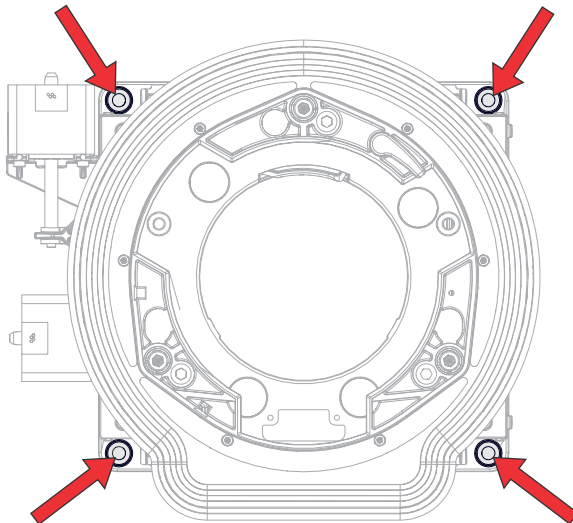


2. Rotate the lens clamp counter-clockwise to the open position.
3. Pull the lens straight out of the lens mount.

Replacing the lens mount

The lens mount, located at the front of the projector is an assembly of mechanical and electrical components that securely holds and positions the projection lens.

1. Remove the top cover (on page 42).
2. Remove the front cover (on page 41).
3. Disconnect the lens mount harness connector J88 from the HKBC board.
4. Release the lens mount harness from all the cable clips.
5. Remove the four screws and washers from the corners of the lens mount.



6. Remove the lens mount.
The horizontal and vertical adjustment have posts that the motors sit on; they look like manual slotted adjustment screws. They are not adjustment screws. Adjusting these screws will damage the lens mount.

7. Replace the lens mount.
8. To re-install, follow these steps in reverse order.
When re-installing the screws from step 5, make sure the washers are also re-installed.

Filtration

Filters help to prevent dust, smoke, fog, and other foreign materials from entering the projector.

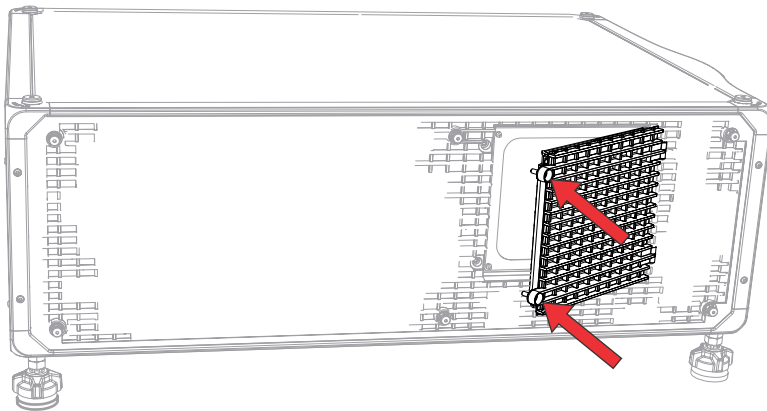


Notice. If not avoided, the following could result in property damage.

- Do not operate the product without the filter installed.
- Do not operate the product with an incorrectly installed filter.
- Do not reuse an old air filter.

Replacing the air filter

The air filter is located on the air intake side cover.



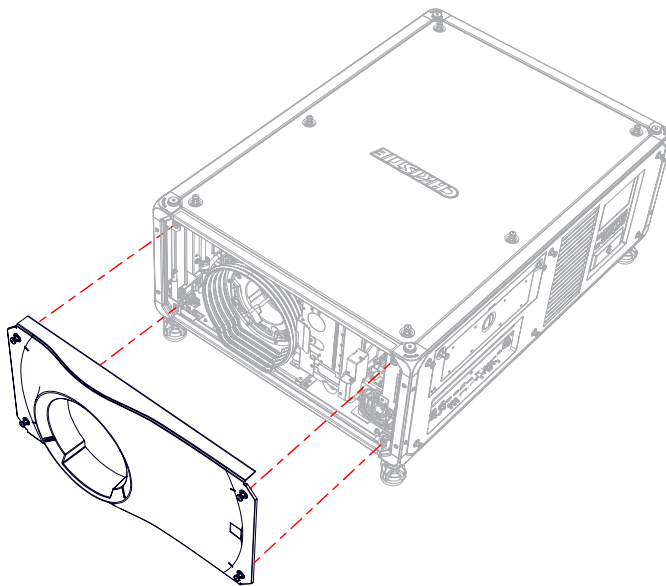
1. To open the air filter door, loosen the two captive screws.
2. Replace the used air filter with a new one.
The airflow indicator on the new filter must point into projector.
3. Close the air filter door.
4. Tighten the two screws.

Projector covers

Learn how to remove the covers of the projector.

Removing the front cover

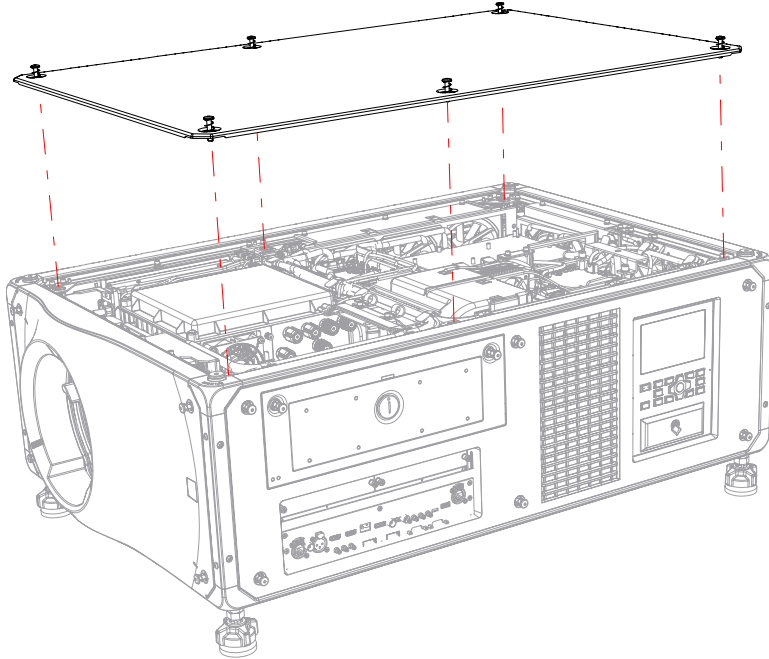
The front cover provides access to the lens assembly and front sensors.



1. Loosen the four screws securing the front cover.
2. Remove the front cover.
3. Replace the front cover, if required.
4. To re-install, repeat these steps in reverse order.

Removing the top cover

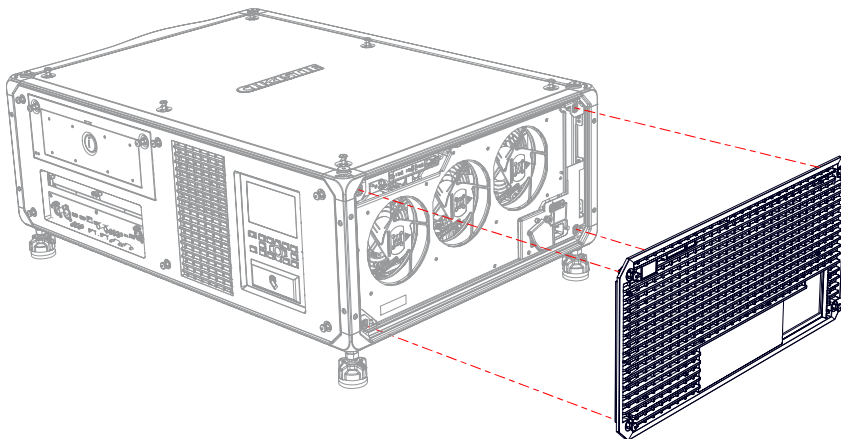
The top cover provides access to the light engine, electronics, and various other internal components.



1. Loosen the six captive screws securing the top cover.
2. Remove the top cover.
3. Replace top cover, if required.
4. To re-install, repeat these steps in reverse order.

Removing the rear cover

The rear cover provides access to the power supplies, AC input/line filter, and rear exhaust fans.

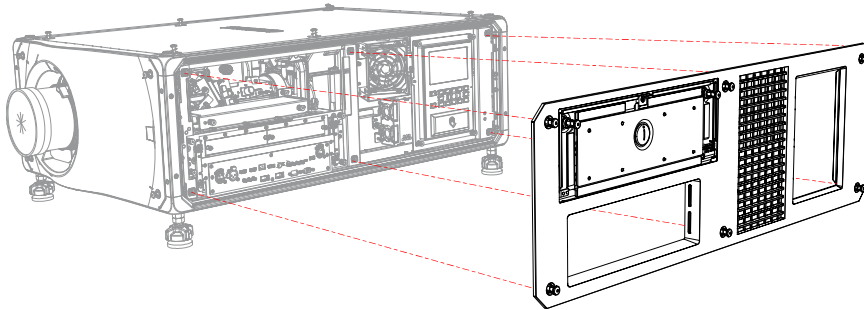


1. Loosen the four captive screws securing the rear cover.

2. Remove the rear cover.
3. Replace the rear cover, if required.
4. Regularly clean the steel mesh shield when servicing the rear cover.
5. To re-install, repeat these steps in reverse order.

Removing the electronics-side cover

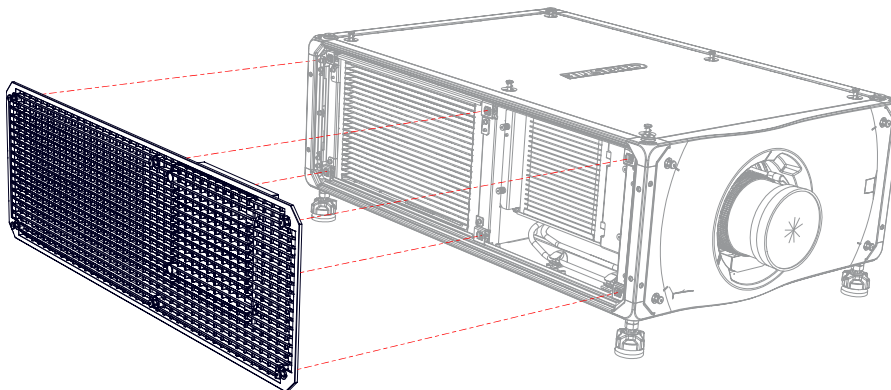
The electronics-side cover provides access to side panel display and card cage.



1. Loosen the six captive screws securing the electronics-side cover.
2. Remove the electronics-side cover.
3. Replace the electronics-side cover, if required.
4. To re-install, repeat these steps in reverse order.

Removing the air intake-side cover

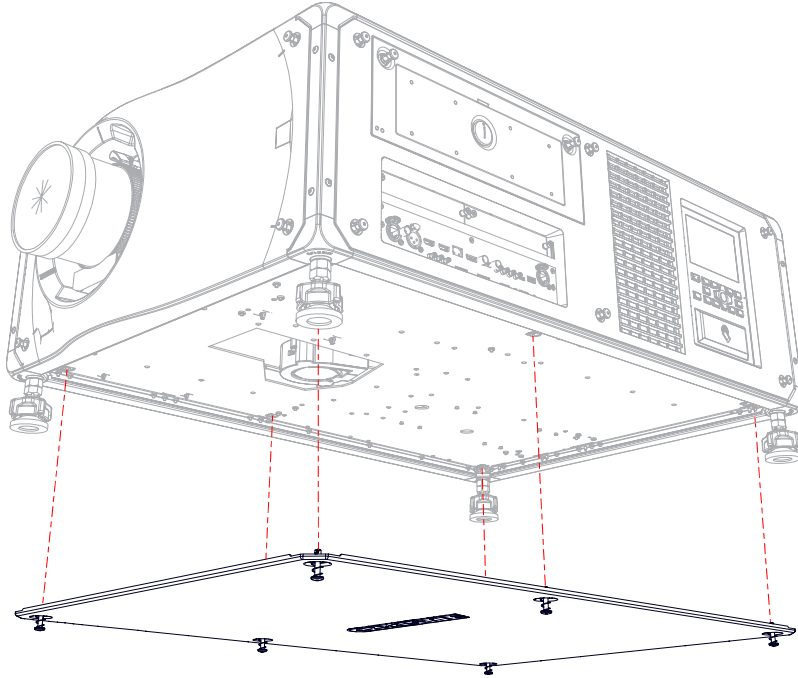
The air intake-side cover provides access to the radiator.



1. Loosen the six captive screws securing the air intake-side cover.
2. Remove the air intake-side cover.
3. Replace the air intake-side cover, if required.
4. To re-install, repeat these steps in reverse order.

Removing the bottom cover

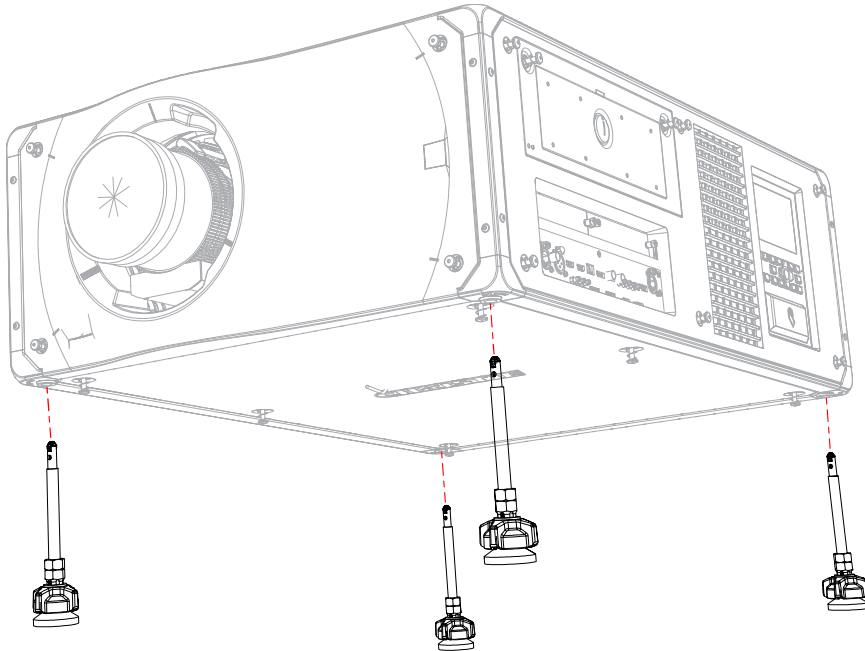
The bottom cover provides access to the blower fan under the light engine.



1. Flip the projector onto its side.
2. Loosen the six captive screws securing the bottom cover.
3. Remove the bottom cover.
4. Replace the bottom cover, if required.
5. To re-install, repeat these steps in reverse order.

Removing a projector's foot

The adjustable feet can be raised or lowered when positioning the projector to make sure it is level on all sides so the displayed image appears rectangular without any keystone.



1. Ensure the projector is in a secure position.
Christie does not recommend having the projector overhang when replacing the feet, unless the projector is securely positioned.
2. Loosen the lock nut on the affected foot.
3. Uninstall the foot.
4. Replace the foot, if required.
5. To re-install, follow these steps in reverse order.

Ventilation and cooling

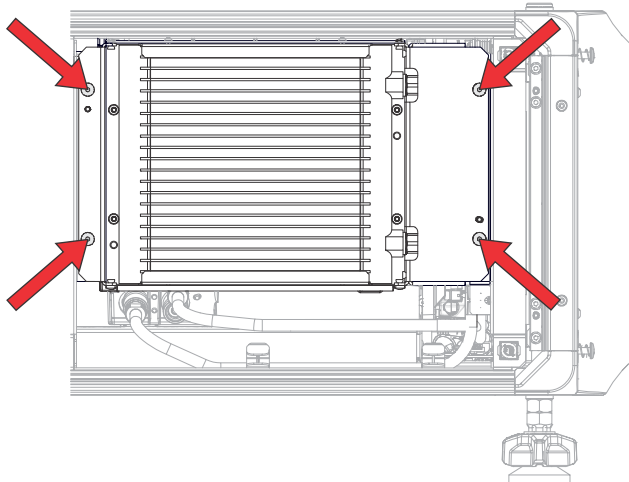
Vents and louvers provide ventilation, both for intake and exhaust, keeping the projector components within their operating temperature specifications.

When replacing fans, ensure you confirm the fan direction for airflow. The correct orientation of the fan also ensures that the fan harness reaches the connector.

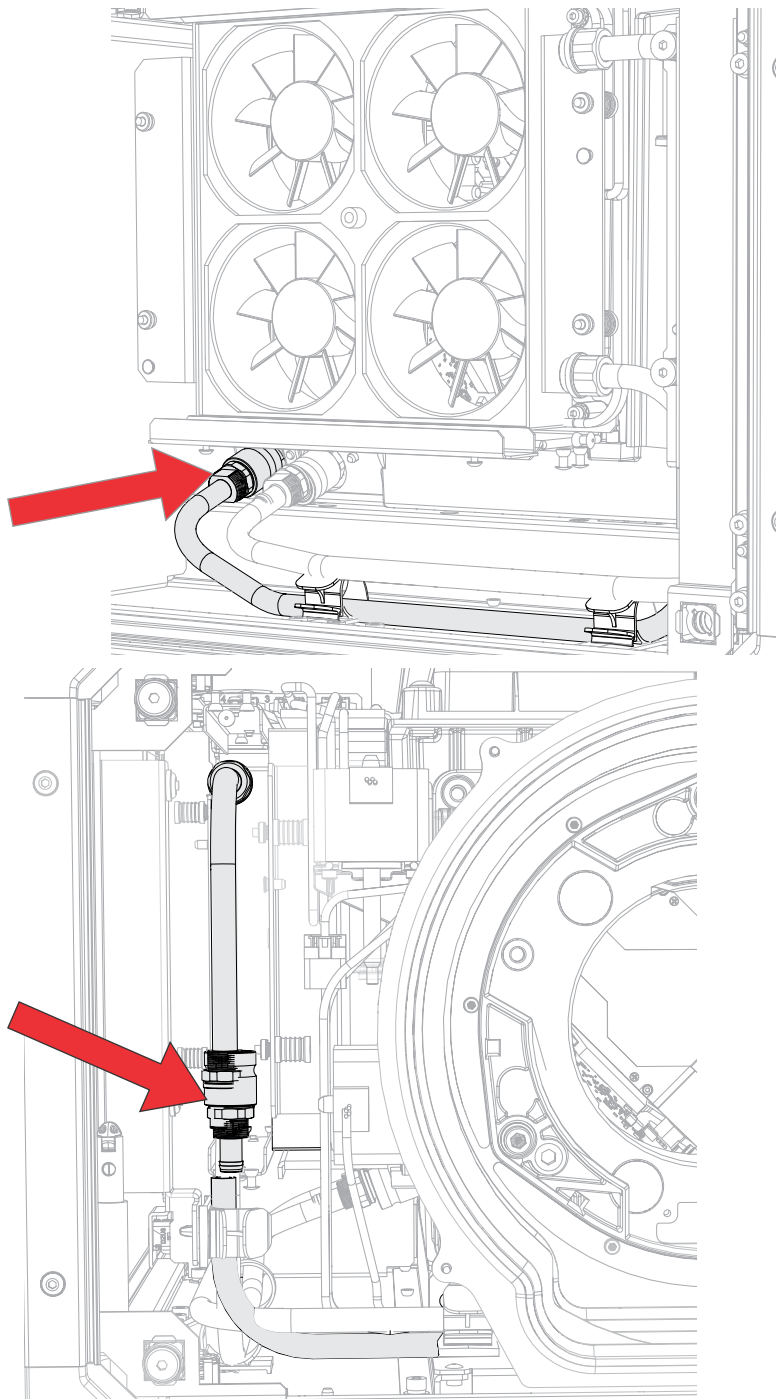
Replacing the light engine intake fans (#1, 2, 3, 4)

The light engine intake fans draw air into the projector for the light engine.

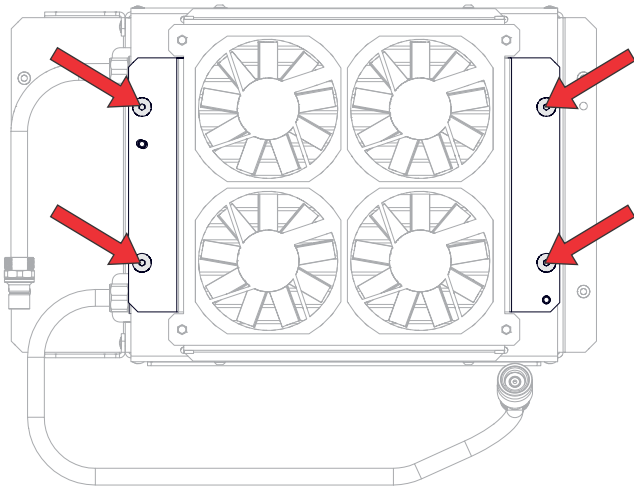
1. Remove the top cover (on page 42).
2. Remove the intake side cover (on page 43).
3. Disconnect the four fan harness connectors located above the light engine radiator assembly.
4. Loosen the four captive screws securing the light engine radiator assembly.



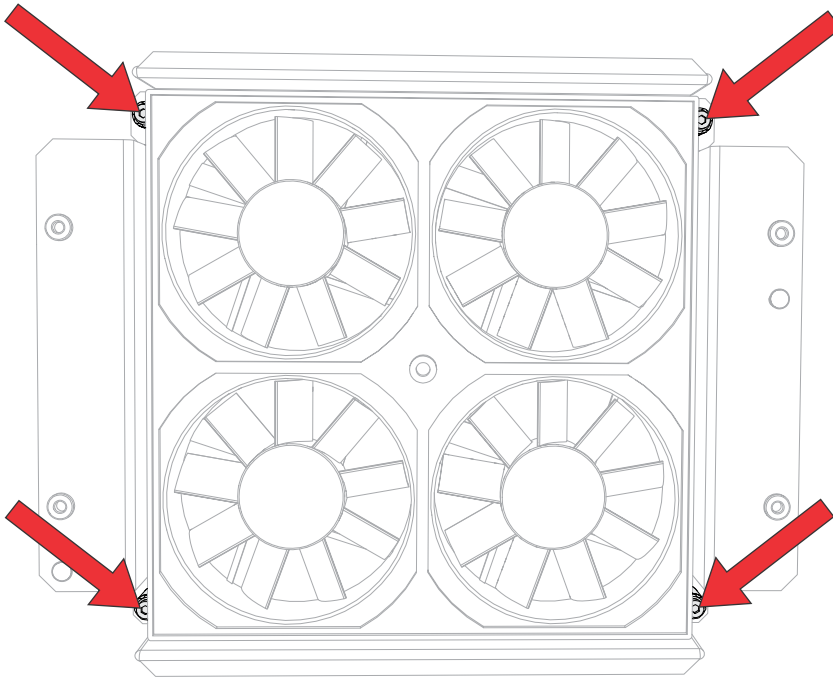
5. Pull out the light engine radiator assembly.
6. Disconnect the two in-line hose connections going to the radiator and remove from clips.
Hose disconnect locations:



7. Place the light engine radiator assembly on a flat surface.
8. Loosen the four captive screws securing the fan pack to the radiator.



9. Remove the four screws securing the fan pack to the bracket.

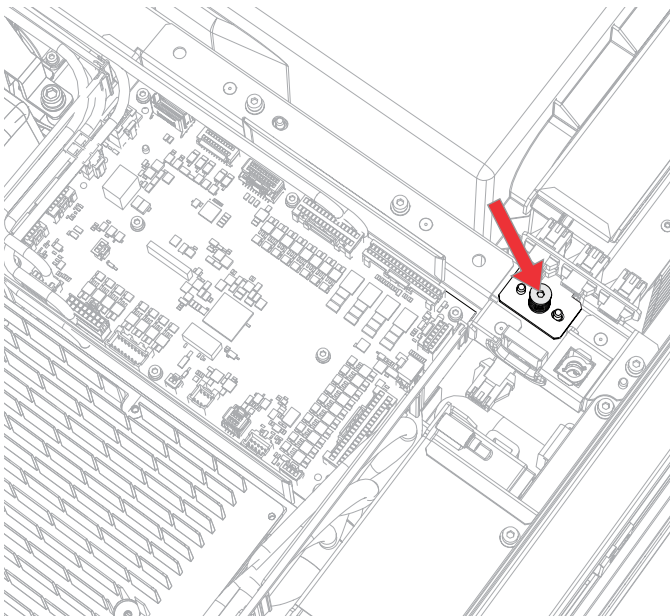


10. To replace an individual fan.
- Pull up the rubber boot from the fan bracket.
Make note of the harness routing.
 - Remove the affected fan from the rubber boot and replace.
11. To re-install, follow these steps in reverse order.
Make sure to align the arrow on the fan with the arrow on the rubber boot.

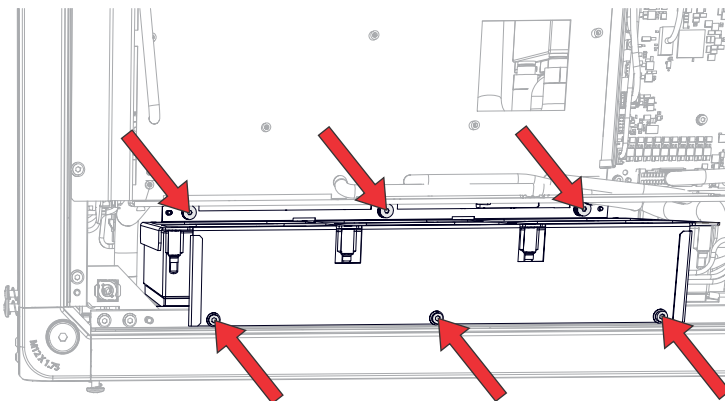
Replacing the laser radiator exhaust fans (#5, 6, 7, 8, 9, 10)

The laser radiator exhaust fans draw hot air out of the laser radiator.

1. Remove the top cover (on page 42).
2. Remove the intake side cover (on page 43).
3. Disconnect the J103 harness from the housekeeping (HKBC) board.
4. Disconnect the four harnesses from the light engine intake fans.
The four harnesses to remove: Fan 1, Fan 2, Fan 3, Fan 4.
5. Loosen the captive screw securing the harness bracket.



6. Remove three screws (shown in step 6) from the top of the laser radiator exhaust fans pack.
7. Using a 3 mm extra-long screwdriver, loosen the three captive screws from the bottom of the laser radiator exhaust fans pack.



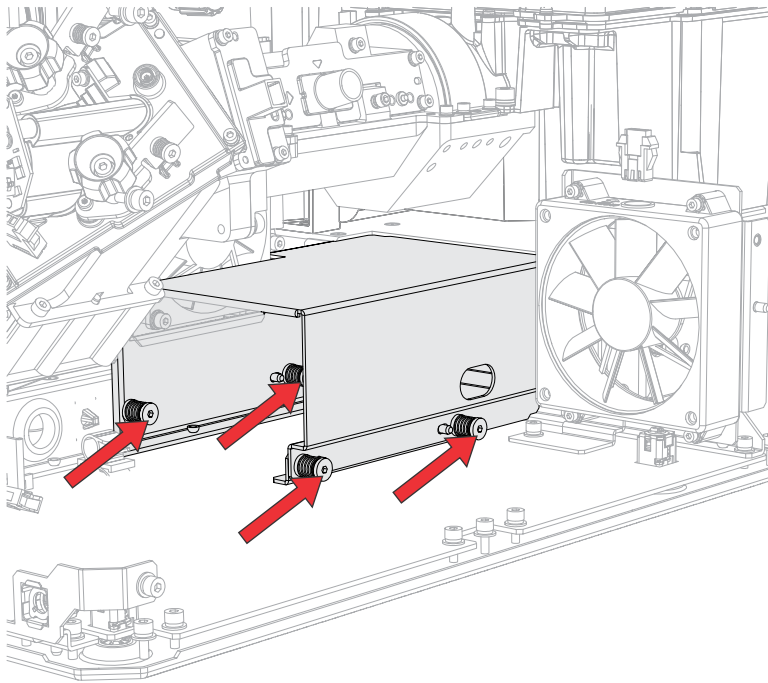
8. To replace an individual fan.

- a) Remove the eight screws securing the fan grill bracket.
 - b) Remove the affected fan from the rubber boot and replace.
Make note of the harness routing.
9. To re-install, follow these steps in reverse order.
Make sure to align the arrow on the fan with the arrow on the rubber boot.

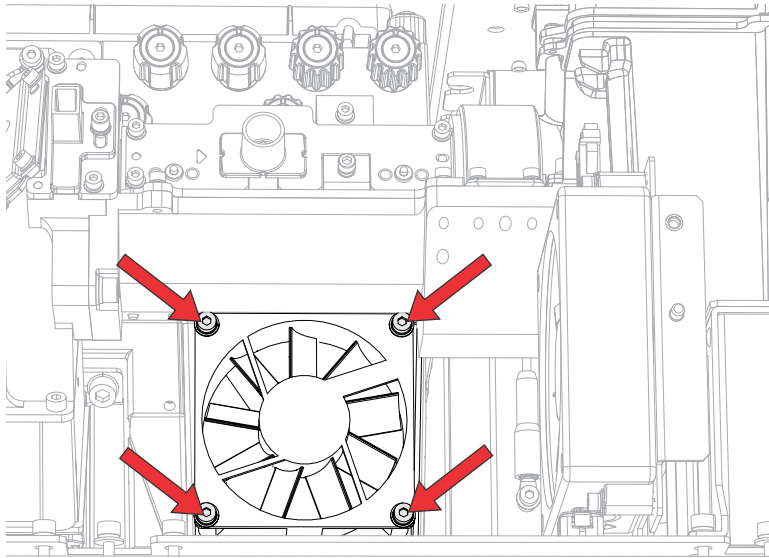
Replacing light engine exhaust fan (#11)

The light engine exhaust fan draws hot air out of the light engine.

1. Remove the electronics-side cover (on page 43).
2. Remove the card cage (on page 66).
3. Disconnect the fan 11 inline harness.
4. Loosen four captive screws to remove the bracket.



5. Remove the four screws securing the fan to the light engine and remove it.

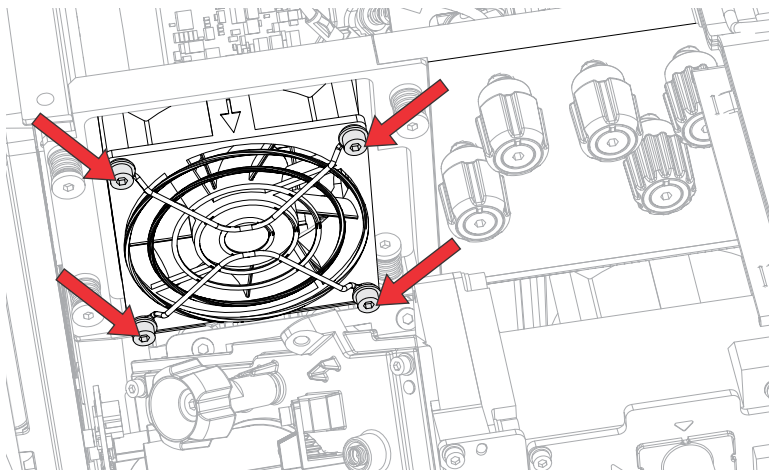


6. Replace the fan.
7. To re-install, follow these steps in reverse order.

Replacing the light engine exhaust fan (#12)

The light engine exhaust fan draws hot air out of the light engine.

1. Remove the top cover (on page 42).
2. Remove the light engine cover (on page 79).
3. Disconnect the Fan 12 harness and remove the harness from the clips.
4. Loosen the four captive screws securing the fan bracket and pull it up to remove it.
5. Remove the four screws securing the fan to the light engine and remove it.

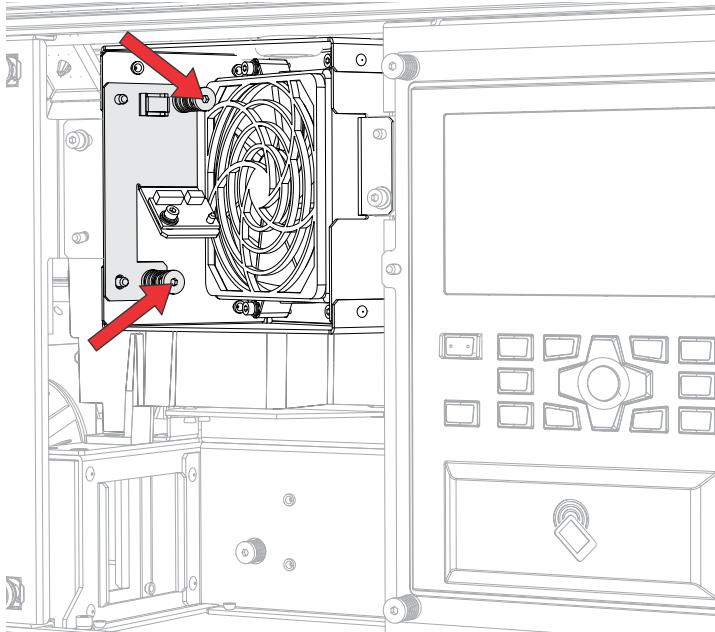


6. Replace the fan, if required.
7. To re-install, repeat these steps in reverse order.

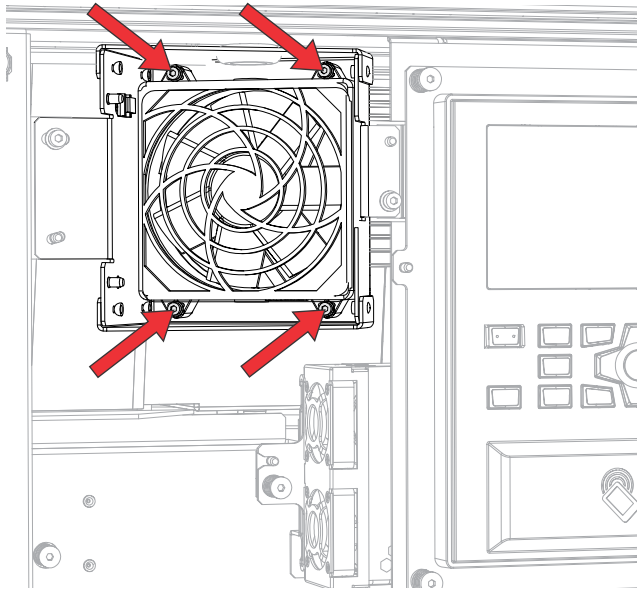
Replacing the user interface intake fan (#16)

The user interface intake fan draws air into the projector for the side panel display.

1. Remove the top cover (on page 42).
2. Remove the electronics-side cover (on page 43).
3. Disconnect the dual temperature sensor module (DTSM) harness and remove the harness from the clip.
4. Loosen the two captive screws securing the DTSM bracket.



5. Remove the DTSM bracket.
6. Remove the four screws securing the side panel display intake fan and remove it.



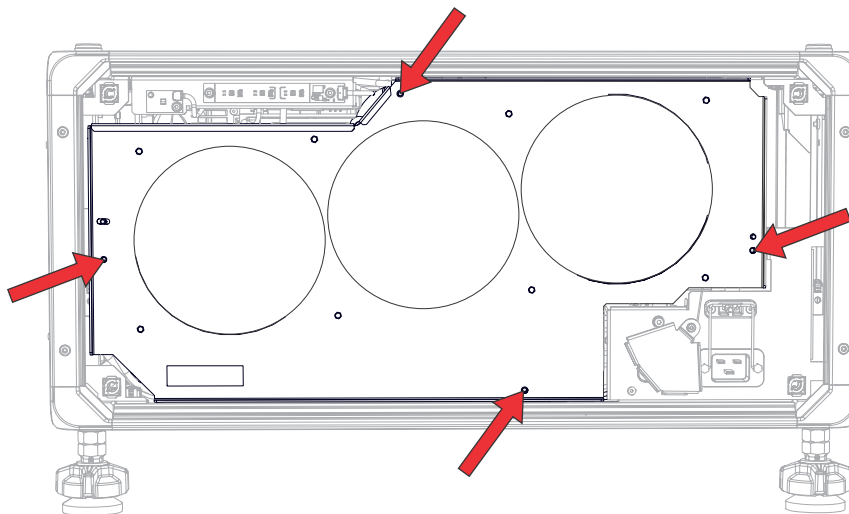
7. Replace the fan, if required.
8. To re-install, repeat these steps in reverse order.

Replacing the rear exhaust fans (#17, 18, 19) for Crimson/Mirage 25

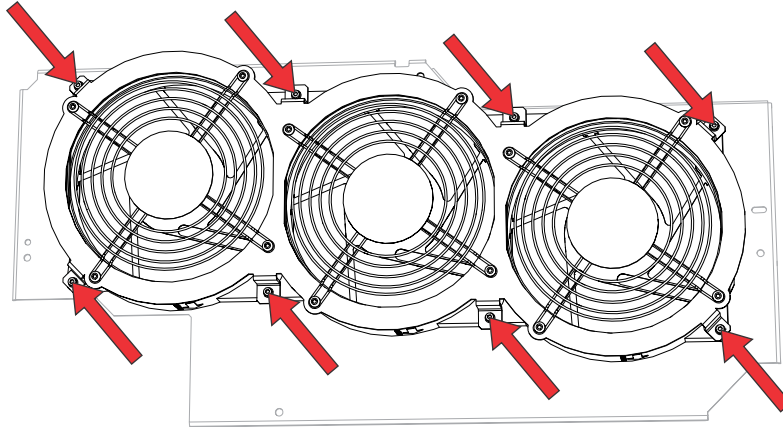
The rear exhaust fans draw hot air out of the projector.

Applies to: Crimson HD25, Crimson WU25, Mirage HD25, Mirage WU25

1. Remove the rear cover (on page 42).
2. Disconnect the three exhaust fan in-line harness connectors.
3. Remove the four screws securing the rear exhaust fan bracket.



4. Pull out the fan assembly.
5. To replace an individual fan.
 - a) Remove the eight screws securing the fan grill bracket.



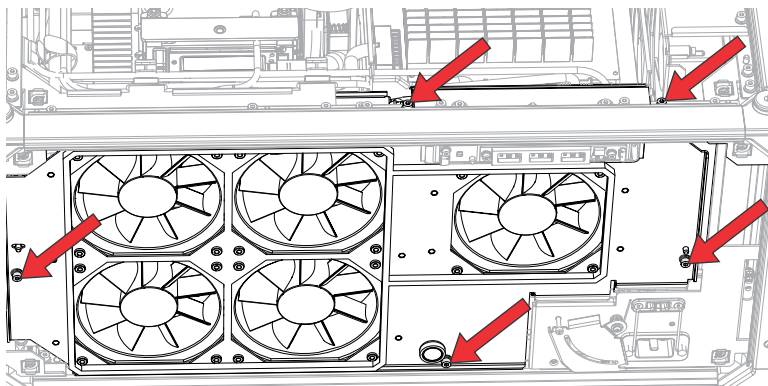
- b) Cut the tie-wrap holding the harnesses.
 - c) Remove the affected fan from the rubber boot and replace.
6. To re-install, repeat these steps in reverse order.
Make sure to align the arrow on the fan with the arrow on the rubber boot.

Replacing the rear exhaust fans (#13, 14, 17, 18, 19) for Crimson HD31/WU31

The rear exhaust fans draw hot air out of the projector.

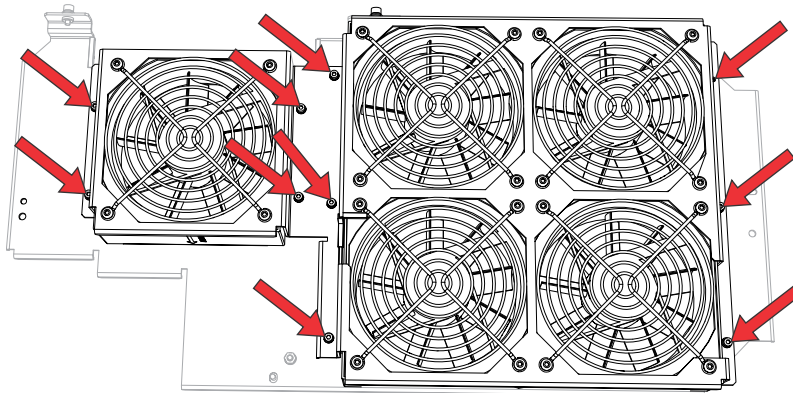
Applies to: Crimson HD31, Crimson WU31

1. Remove the top cover (on page 42).
2. Remove the rear cover (on page 42).
3. Disconnect the five exhaust fan in-line harness connectors.
4. Remove the five screws securing the rear exhaust fan assembly.



5. Pull out the rear exhaust fan assembly.

6. To replace an individual fan.
 - a) Remove the 10 screws securing the fan grill bracket.

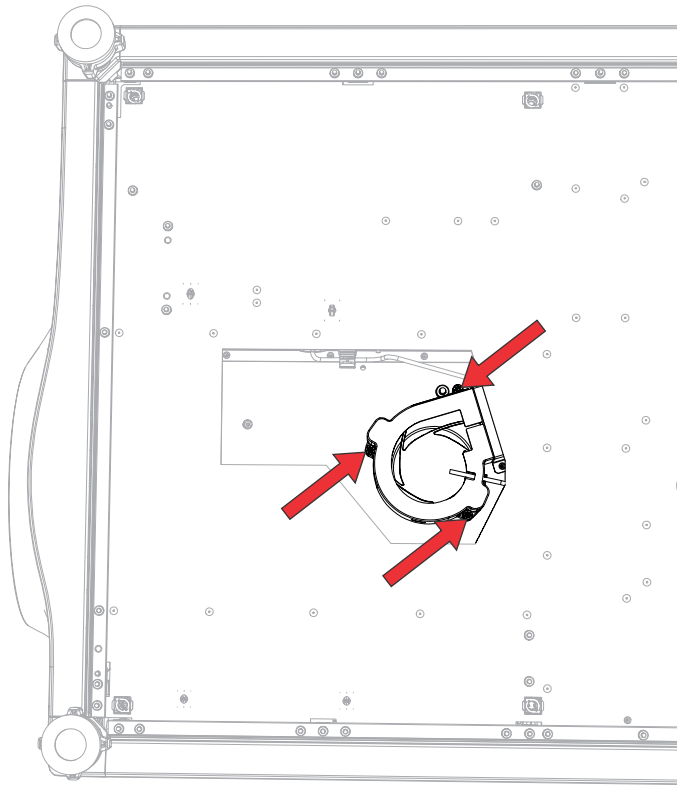


- b) Remove the affected fan from the rubber boot and replace.
7. To re-install, repeat these steps in reverse order.
Make sure to align the arrow on the fan with the arrow on the rubber boot.

Replacing the light engine exhaust fan (#24)

The light engine exhaust fan draws hot air from the light engine.

1. *Remove the electronics-side cover* (on page 43).
2. To remove the card cage, loosen the four captive screws and pull out the card cage.
Do not remove the card cage harness cover or disconnect the harnesses. The card cage slides out to provide enough space to access the light engine exhaust fan harness (J135).
3. Disconnect the J135 harness.
4. Replace the card cage and tighten the four captive screws.
5. Replace the electronics-side cover.
6. Flip the projector onto its side.
7. *Remove the bottom cover* (on page 44).
8. Remove the three screws securing the light engine exhaust fan and remove it.

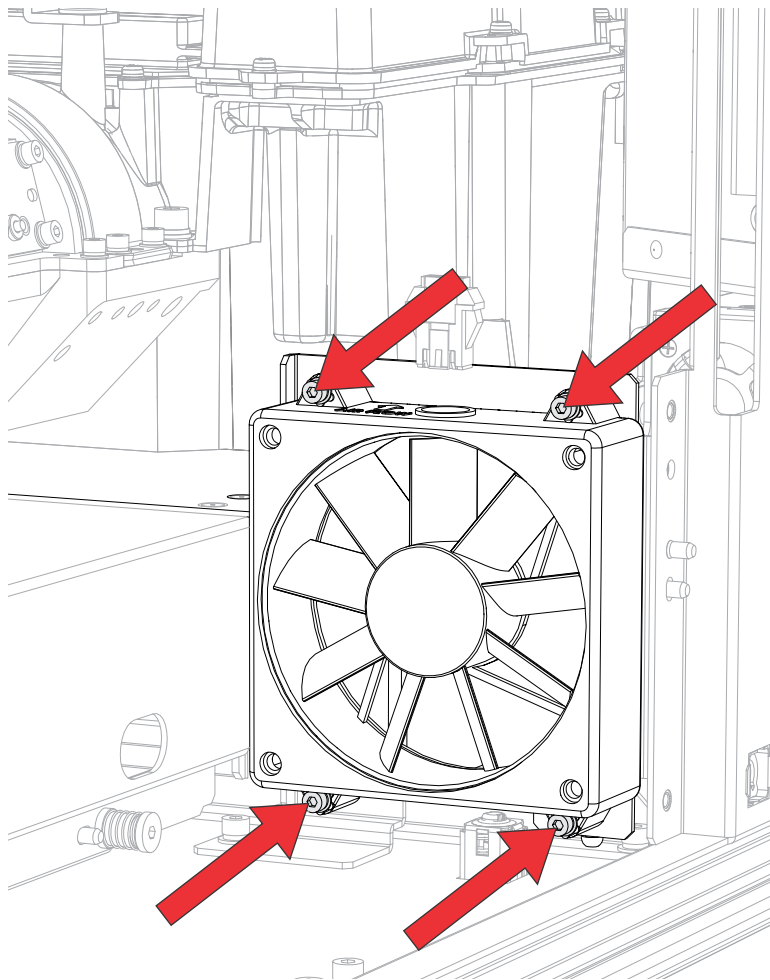


9. Remove the fan from the rubber boot.
10. Replace the fan, if required.
11. To re-install, repeat these steps in reverse order.

Replacing the card cage exhaust fan (#25)

The card cage exhaust fan draws hot air from the card cage.

1. *Remove the electronics-side cover* (on page 43).
2. *Remove the card cage* (on page 66).
3. Disconnect the Fan 25 harness.
4. Remove the four screws securing the card cage exhaust fan and remove it.

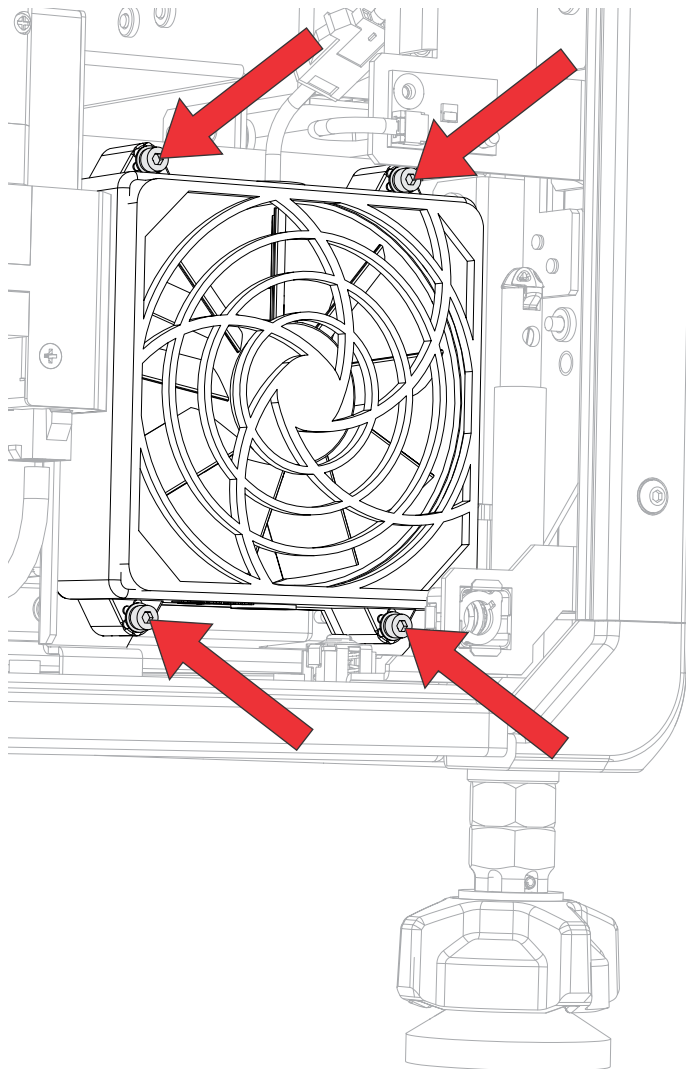


5. Replace the fan, if required.
6. To re-install, repeat these steps in reverse order.

Replacing the card cage intake fan (#26)

The card cage intake fan #26 draws air into the projector for the card cage.

1. Remove the front cover (on page 41).
2. Disconnect the fan 26 harness.
3. Remove the four screws securing the fan to the plate.

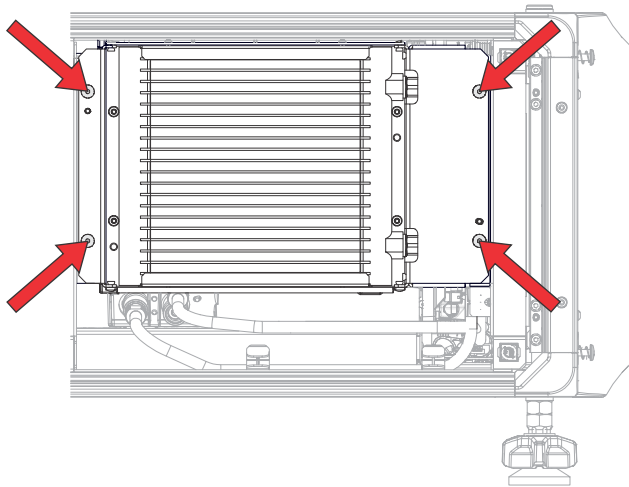


4. Replace the fan, if required.
5. To re-install, repeat these steps in reverse order.

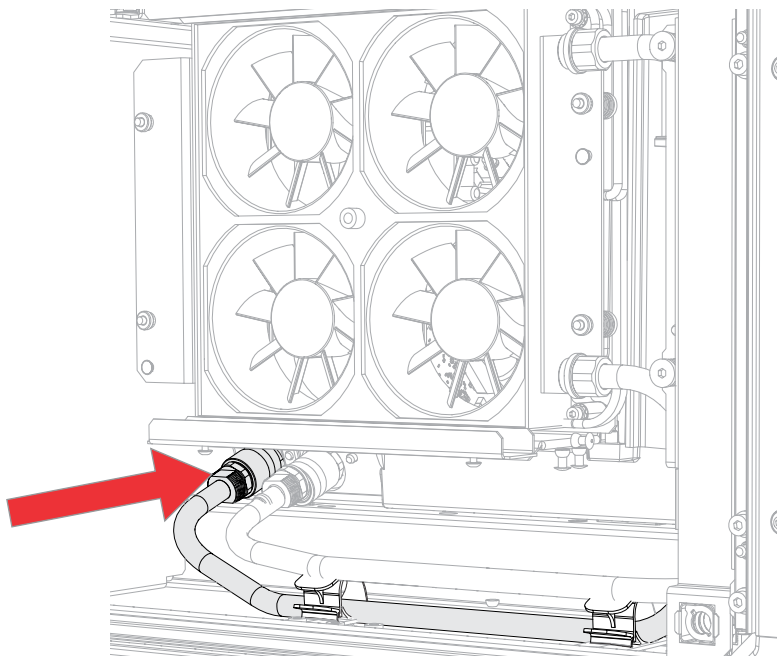
Replacing the light engine radiator

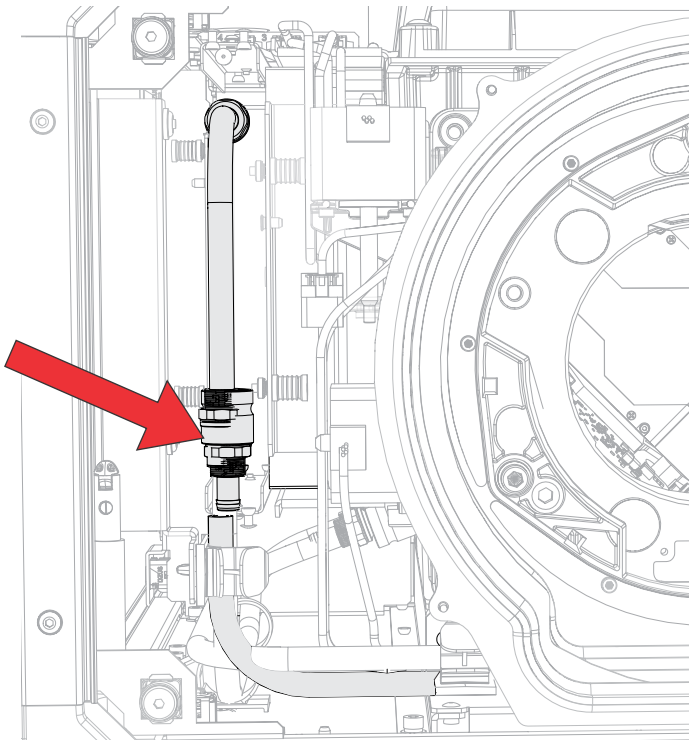
The light engine radiator provides the system cooling to the liquid in the liquid cooling module (LCM) and light engine.

1. *Remove the top cover* (on page 42).
2. *Remove the intake side cover* (on page 43).
3. Disconnect the four fan harness connectors located above the light engine radiator assembly.
4. Loosen the four captive screws securing the light engine radiator assembly.

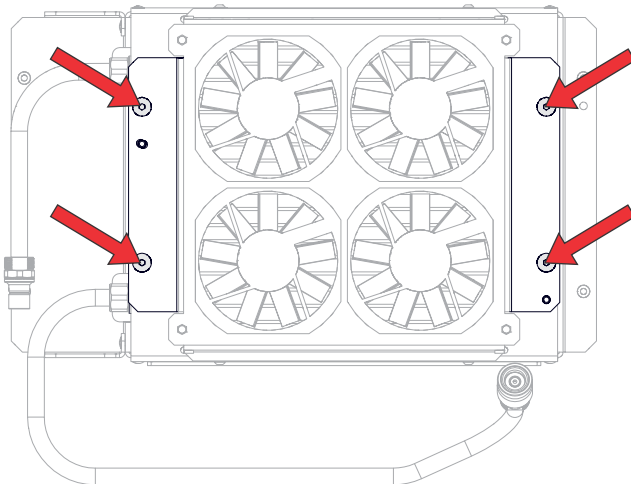


5. Pull out the light engine radiator assembly.
6. Disconnect the two inline hose connections going to the radiator and remove from clips.
Hose disconnect locations:



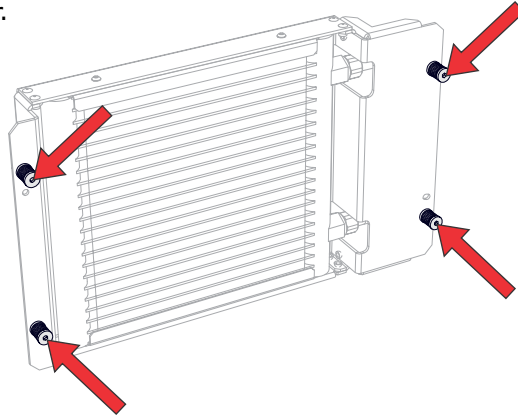


7. Place the light engine radiator assembly on a flat surface.
8. Loosen the four captive screws securing the fan pack to the radiator.



9. Remove the fan pack.
10. Remove the four screws securing the radiator to the bracket.

Upon re-install, orient the radiator in the bracket so the hoses are in the same position as the old radiator.



11. Remove the radiator from the bracket and replace.
12. To re-install, repeat these steps in reverse order.

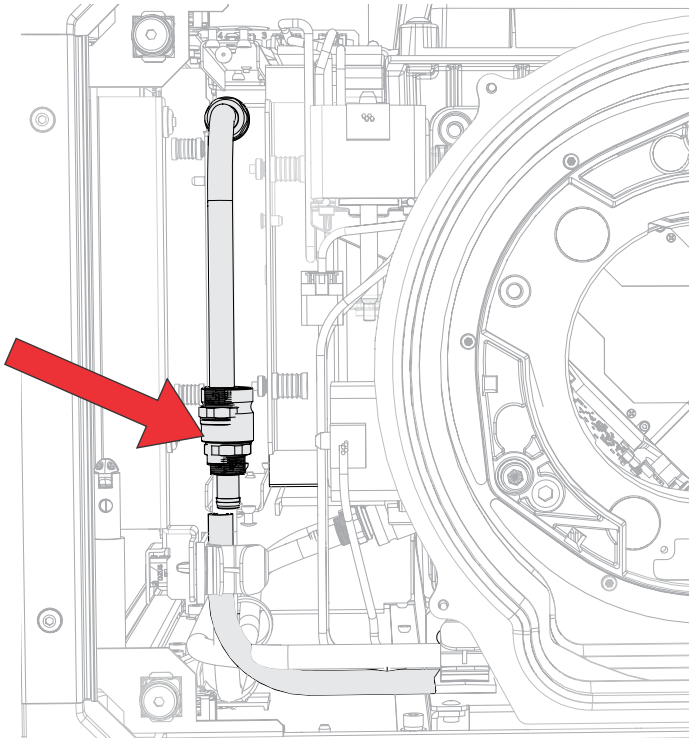
Removing the light engine liquid cooling module

Before replacing or refilling the coolant, the light engine liquid cooling module (LCM) must be removed from the projector.

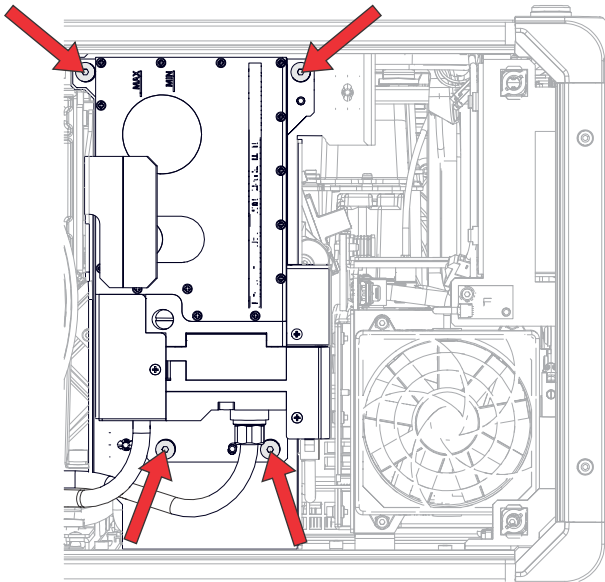


Warning! If not avoided, the following could result in death or serious injury.

- SHOCK HAZARD! Disconnect the product from AC before installing, moving, servicing, cleaning, removing components, or opening any enclosure.
1. *Remove the top cover* (on page 42).
 2. *Remove the front cover* (on page 41).
 3. Disconnect the pump harness.



4. Remove the light engine LCM hoses from the clips.
5. Loosen the four captive screws securing the light engine LCM and remove from the projector.



6. Set the light engine LCM on a flat surface.
7. *Replace or refill the coolant (on page 25).*
8. To re-install, repeat these steps in reverse order.

Replacing the laser liquid cooling module

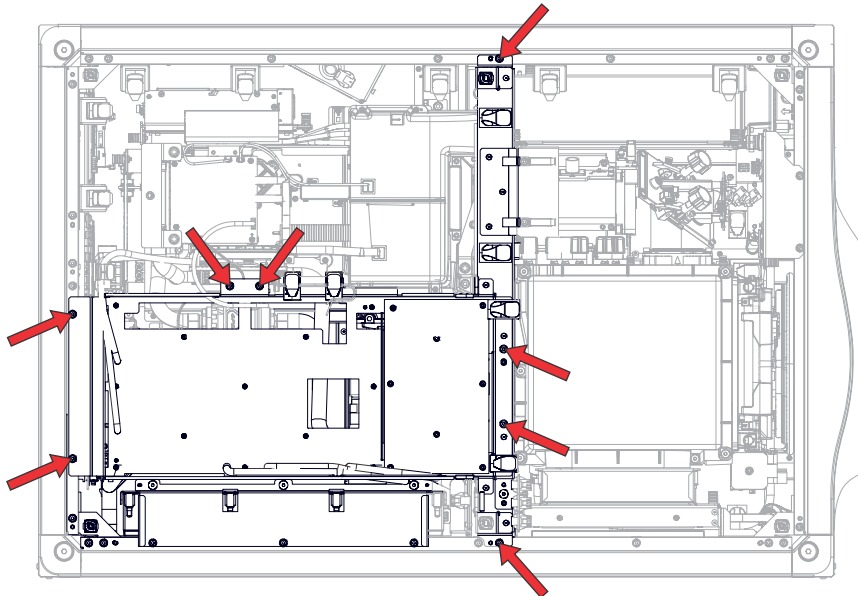
Before replacing or refilling the coolant, the laser liquid cooling module (LCM) must be removed from the projector.



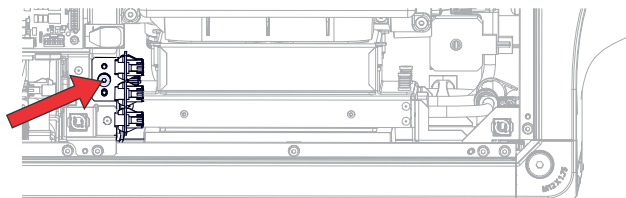
Warning! If not avoided, the following could result in death or serious injury.

- SHOCK HAZARD! Disconnect the product from AC before installing, moving, servicing, cleaning, removing components, or opening any enclosure.

1. Remove the top cover (on page 42).
2. Remove the intake side cover (on page 43).
3. Disconnect the following harnesses:
 - Laser banks connectors J322, J323, J324, J325, and J326 located on the light driver board
 - LVPS connector J320 located on the light driver board
 - TEC connector J321 located on the light driver board
 - IR board connector J84 located on the HKBC
 - ACIDM connector J130 located on the HKBC
 - SID connector J118 located on the HKBC
 - Fan 1-10 connector J103 located on the HKBC
4. Remove eight screws securing the top electronics assembly.

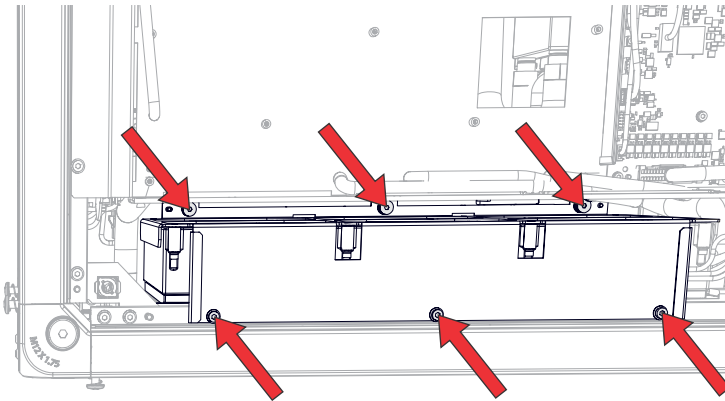


5. Loosen the one captive screw to release the fan 1-4 harness bracket.

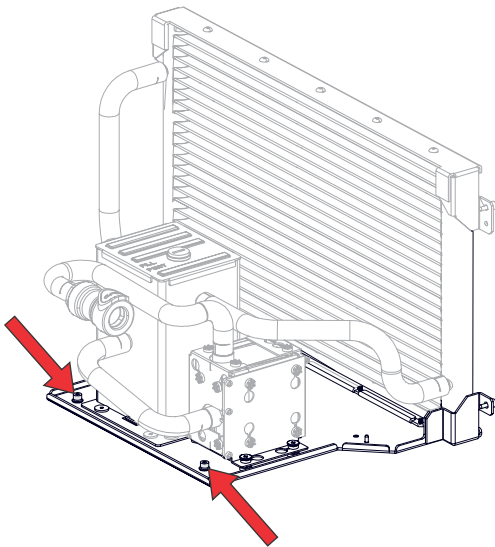


6. Pivot the light driver board and tray aside so it sits on top of the light engine cover.

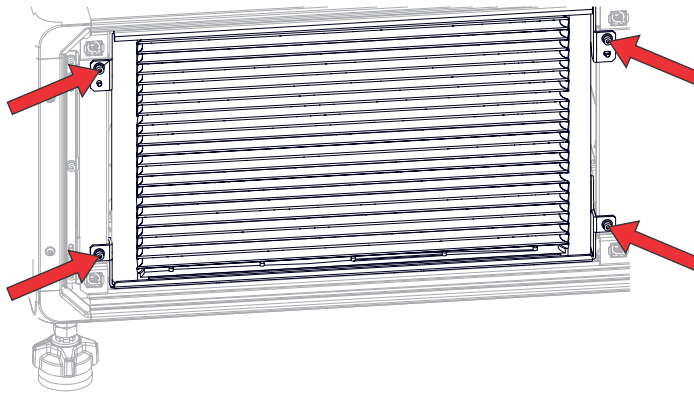
7. Remove the three screws (shown in step 8) from the top of the laser radiator exhaust fan pack.
8. Loosen the three captive screws from the bottom of the laser radiator exhaust fan pack.



9. Remove the laser radiator fan pack from the projector.
10. Disconnect the pump harness P311 from the fan controller board.
11. Remove the pump harness P311 from the plastic retaining clip.
12. Place a large cloth wipe under the two laser liquid cooling module hoses to catch any potential coolant ejected while disconnecting the hoses.
13. Disconnect the two radiator liquid cooling module hoses.
14. Remove the two screws on the bottom of the laser liquid cooling module tray.



15. Remove the four screws securing the laser liquid cooling module radiator assembly and pull it out from the projector.



16. Set the laser liquid cooling module and radiator assembly on a flat surface.
17. *Replace or refill the coolant* (on page 25).
18. To re-install, repeat these steps in reverse order.

Replacing the laser liquid cooling module radiator

The radiator provides system cooling to the laser liquid cooling module (LCM).

1. *Remove the laser liquid cooling module* (on page 63).
2. Disconnect the radiator from the laser LCM.
3. Replace the radiator.
4. To re-install, repeat these steps in reverse order.

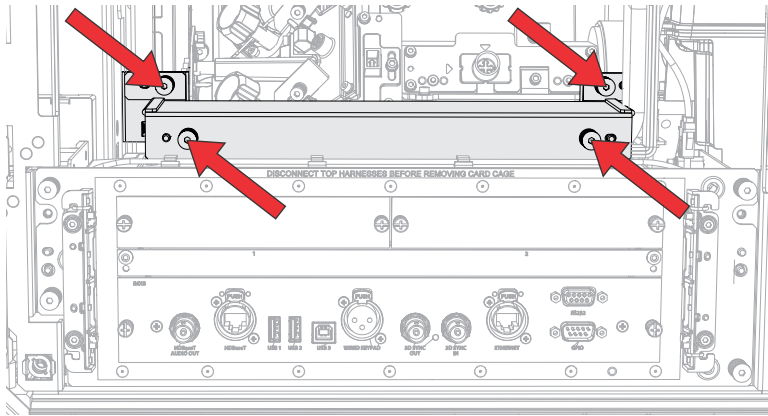
Electronics

Learn how to replace the electronic components and cards in the projector.

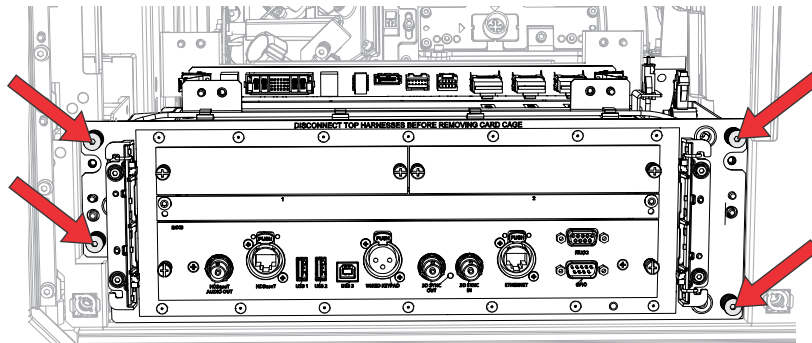
Removing the card cage

The card cage contains slots for the IMXB module and two Core4 option cards.

1. Remove the electronics-side cover (on page 43).
2. Loosen the four captive screws securing the card cage harness cover and remove it.



3. Disconnect the red, green, and blue mini-SAS harnesses on top of the card cage.
4. Disconnect the four harnesses on the top of the card cage.
The four harnesses to remove: CLB inline cable located on the top-right side of the card cage, and J5, J26 (red-colored harness), and the P3 harness bundle located on the backplane board.
5. Loosen the four captive screws from the card cage and remove it.
To avoid possible damage, place the card cage on a surface and rest it as shown to avoid damage.

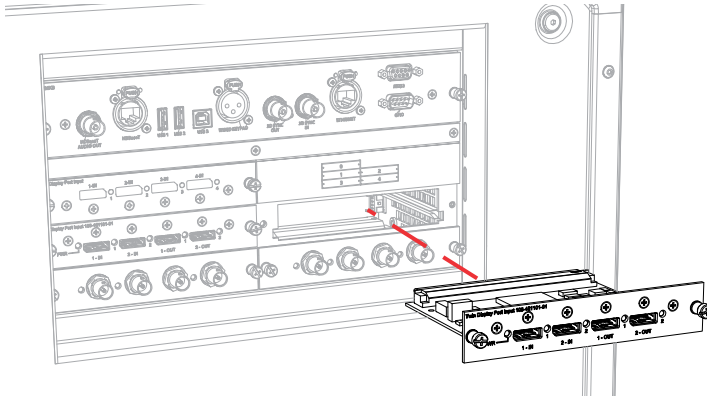


6. Replace the card cage, if required.
7. To re-install, repeat these steps in reverse order.

Replacing the option cards

The projector comes standard with a high bandwidth multiple input card (HBMIC).

1. On the option card you want to remove, loosen the two captive screws on the faceplate and pull out the option card.



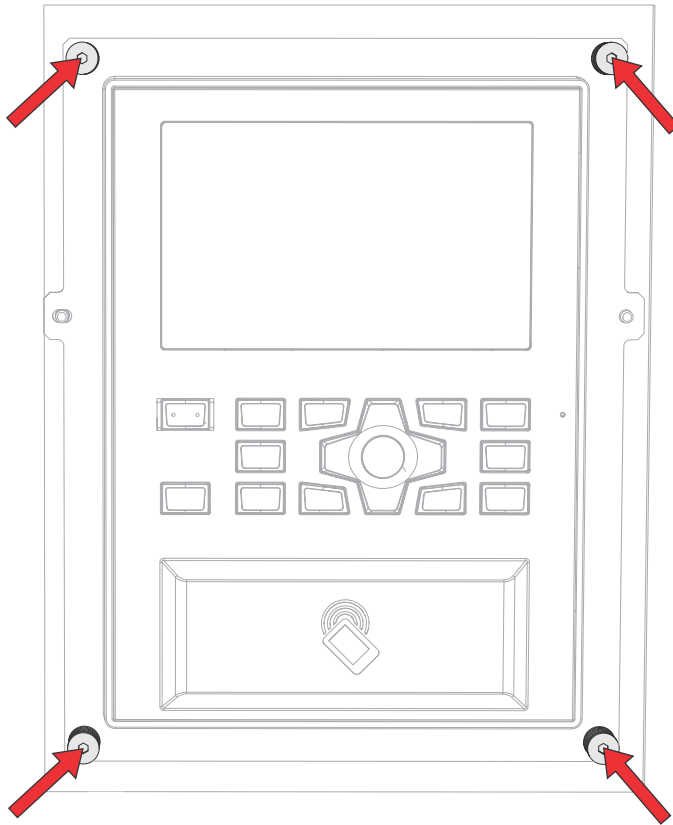
2. Replace the option card, if required.
3. To re-install, repeat these steps in reverse order.

Removing the user interface module

The user interface module mounts to the electronics side of the projector.

Using the side panel display, the user can view and control input and output activities on the projector. The near field communication (NFC) reader on the user interface module enables Android devices to communicate with the projector.

1. *Remove the electronics-side cover* (on page 43).
2. Loosen the four captive screws securing the user interface module and remove it.



3. Disconnect the J30 (system interface) and J32 (CLB interface) harnesses from the back of the user interface module.
4. Replace the user interface module, if required.
5. To re-install, repeat these steps in reverse order.
Make sure to position the user interface module on the locating pins.

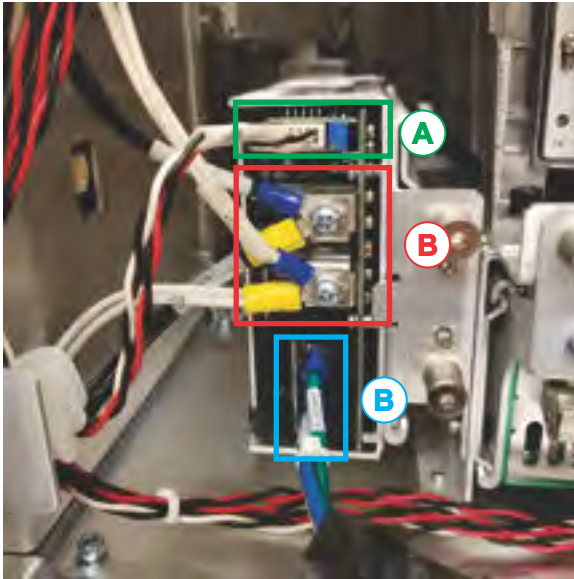
Replacing the 500W power supply

The 500W power supply module provides the required voltages for operating the electronics in the projector.

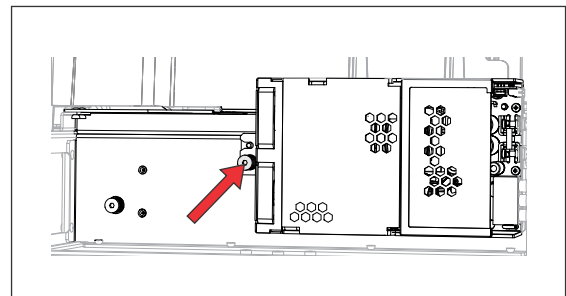
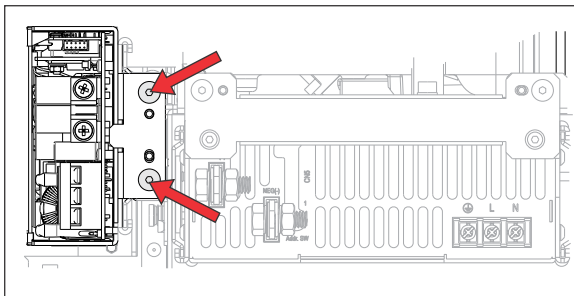
Before servicing, always carefully observe the original lead dress. Take extra precautions to secure all harnessing properly, especially in the high voltage circuitry areas. Replace any wire that appears to have damaged insulation.

1. Remove the rear cover (on page 42).
2. Remove the rear fan exhaust assembly: *Crimson/Mirage 25* (on page 53) or *Crimson 31* (on page 54).
3. Disconnect the low voltage power supply (LVPS) harness (A).
4. Disconnect the four 12V power cables (B).
5. Disconnect the power inline harness connector (C).

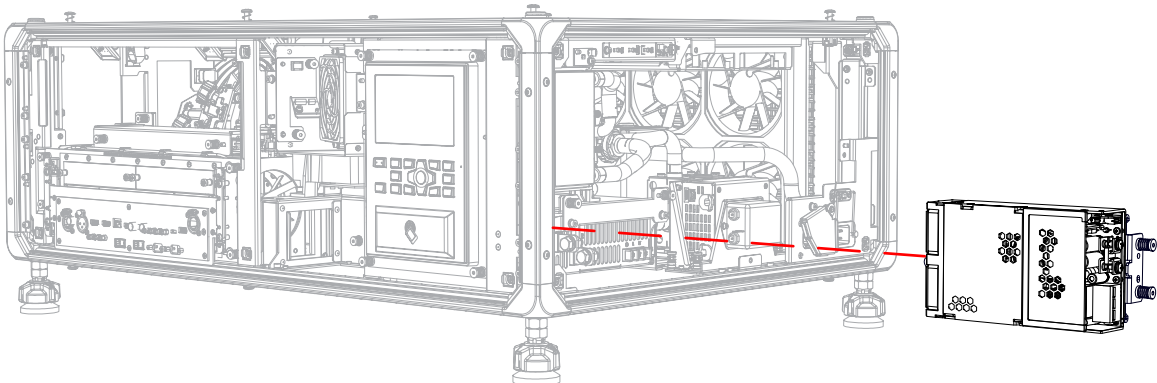
The -12V return cables connect to the top terminal and the +12V cables connect to the bottom terminal.



- Loosen the two captive screws on the back and one captive screw on the side of the power supply.



- Pull out the power supply.



- Replace the power supply, if required.
- To re-install, repeat these steps in reverse order.
Make sure the cables are routed and reconnected properly as shown in step 6.

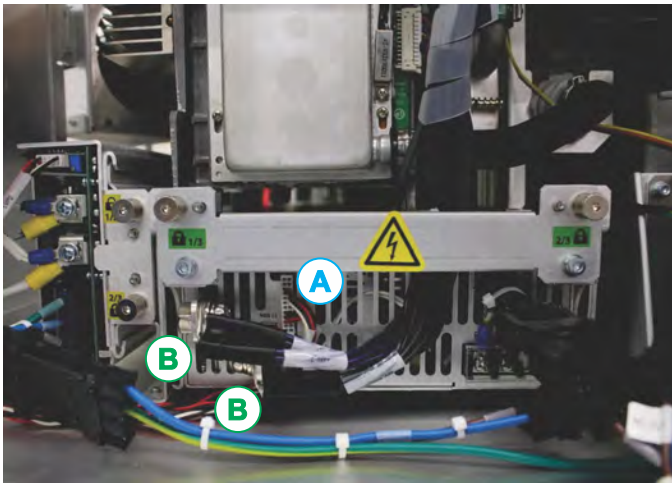
Replacing the 3kW power supply

The power supply module provides the required voltages for operating the projector in low power mode.

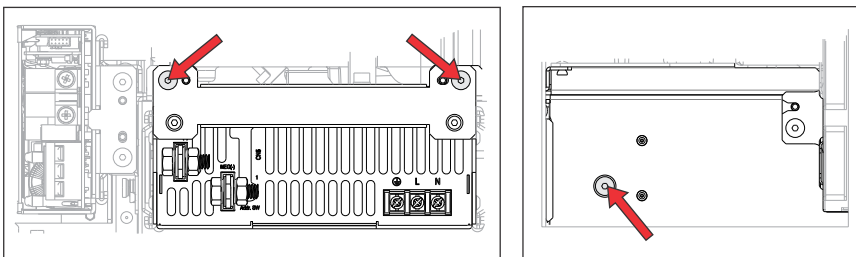
Before servicing, always carefully observe the original lead dress. Take extra precautions to secure all harnessing properly, especially in the high voltage circuitry areas. Replace any wire that appears to have damaged insulation.

1. Remove the rear cover (on page 42).
2. Remove the rear fan exhaust assembly: *Crimson/Mirage 25* (on page 53) or *Crimson 31* (on page 54).
3. Disconnect the CN2 harness (A).
4. Disconnect the four 48V power cables (B).
5. Disconnect the power inline harness connector.

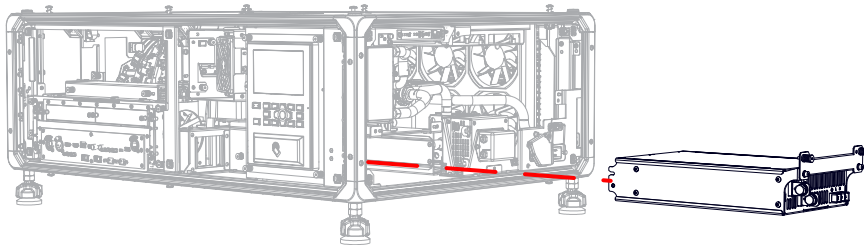
The -48V return cables connect to the bottom terminal and the +48V cables connect to the top terminal.



6. Loosen the two captive screws on the back and one captive screw on the side of the power supply.



7. Pull out the power supply.

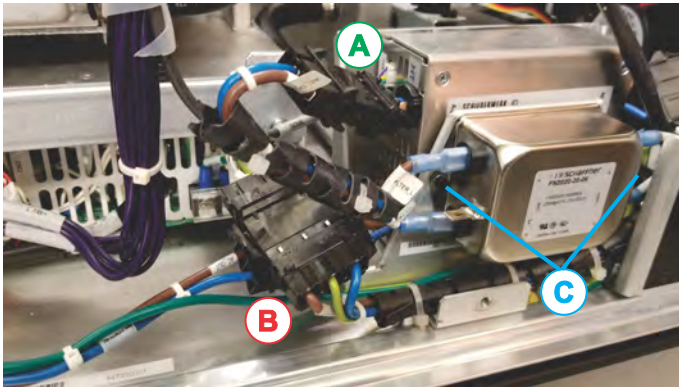


8. Replace the power supply, if required.
9. To re-install, repeat these steps in reverse order.
Make sure the cables are routed and reconnected properly as shown in step 5. Caution must be taken to prevent terminals from touching and shorting the 48V supply.

Replacing the line filter

The line filter helps the projector to meet conducted emissions standards.

1. Remove the rear cover (on page 42).
2. Remove the rear fan exhaust assembly: *Crimson/Mirage 25* (on page 53) or *Crimson 31* (on page 54).
3. Disconnect the AC OUT 2 inline harness connector (A) from the AC inlet detect module (ACIDM).
4. Disconnect the inline harness connector (B) from the 3kW power supply.
5. Remove the two screws (C) securing the line filter and remove it.



6. Replace the line filter, if required.
7. To re-install, repeat these steps in reverse order.

Replacing the AC inlet detect module (ACIDM)

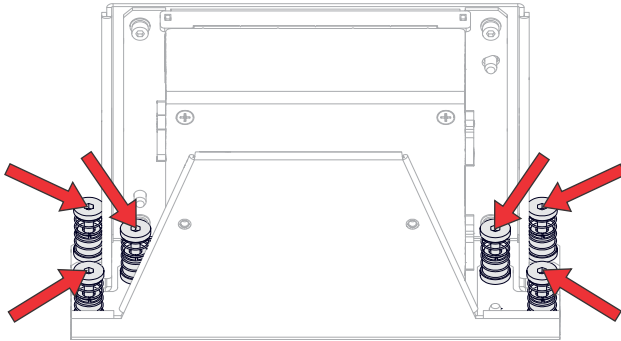
The AC inlet detect module ACIDM detects if the inlet used has limited power capabilities to signal the projector to limit the power drawn by restricting the number of laser banks used.

1. Remove the top cover (on page 42).
2. Remove the line filter (on page 71).

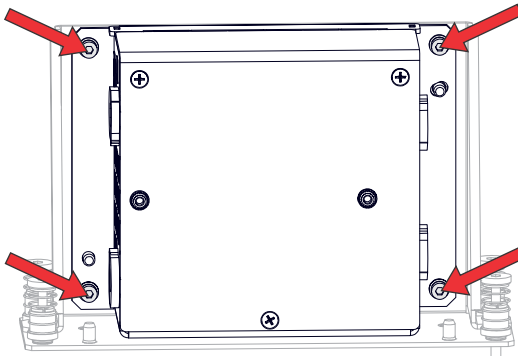
3. Disconnect the SIGNAL harness connector from the ACIDM.
4. Disconnect the inline harness connectors LIMITED AC IN, and MAIN AC IN.
5. Disconnect the inline harness connector from the 500W power supply.



6. Loosen the six captive screws securing the ACIDM assembly to the projector and remove it.



7. Remove the line filter bracket.
8. Remove the four screws securing the ACIDM to the bracket and remove it.

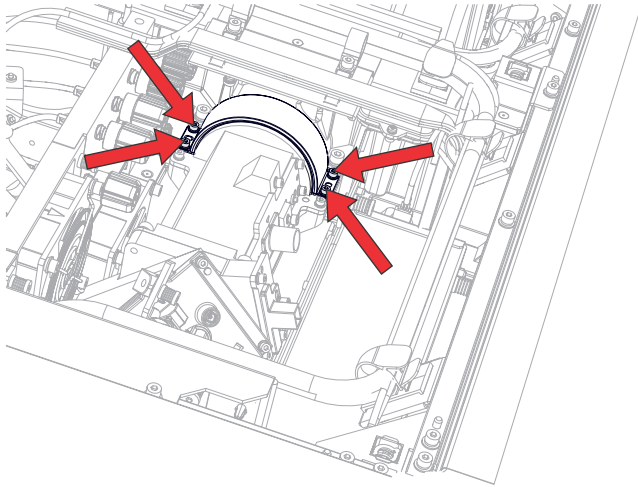


9. Replace the ACIDM, if required.
10. To re-install, repeat these steps in reverse order.

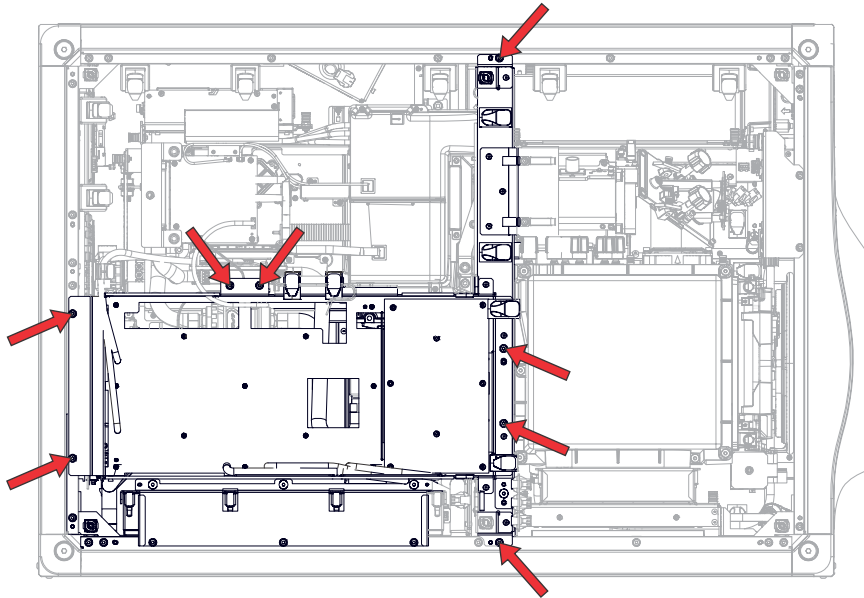
Replacing the light module

The light module provides the light source for the projector.

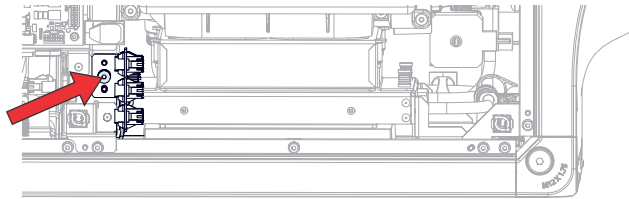
1. Remove the top cover (on page 42).
2. Remove the fan control board (CFCB) (on page 91).
3. Remove the four screws securing the integrator housing collar and remove it.



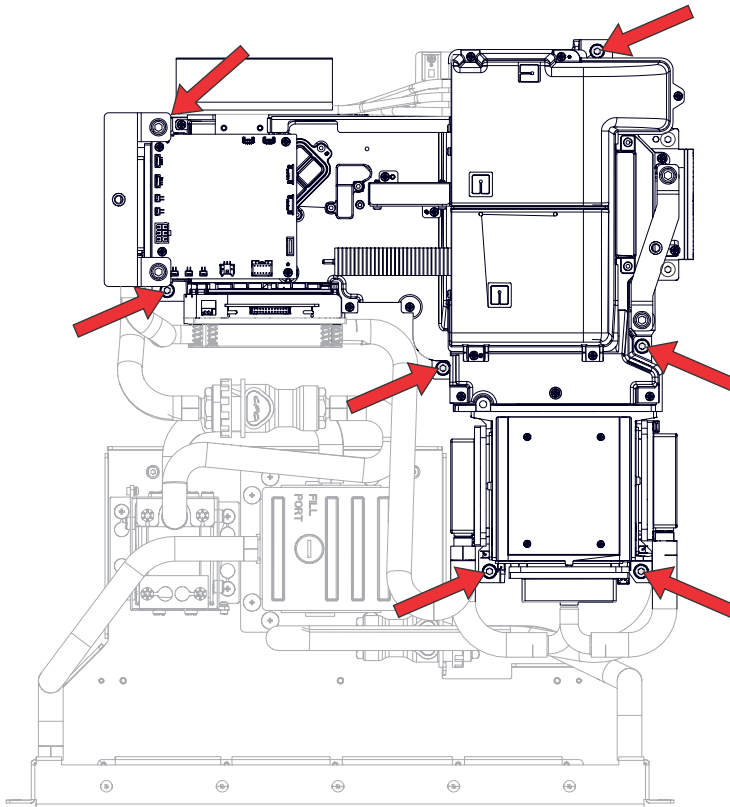
4. Disconnect the following harnesses:
 - Laser banks connectors J322, J323, J324, J325, and J326 located on the light driver board
 - LVPS connector J320 located on the light driver board
 - TEC connector J321 located on the light driver board
 - IR board connector J84 located on the HKBC
 - ACIDM connector J130 located on the HKBC
 - SID connector J118 located on the HKBC
 - Fan 1-10 connector J103 located on the HKBC
5. Remove eight screws securing the top electronics assembly.



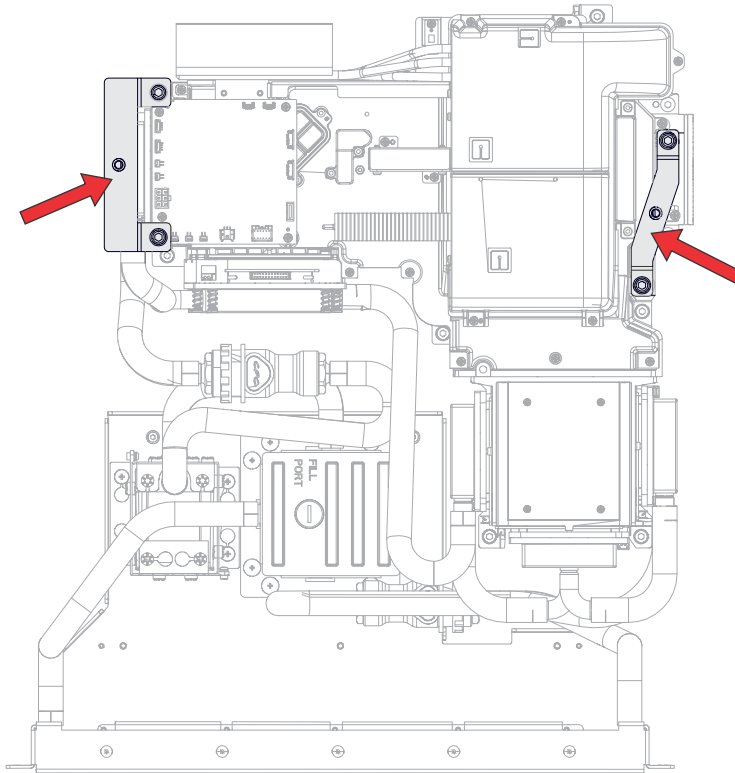
6. Loosen one captive screw to release the fan 1-4 harness bracket.



7. Pivot the light driver board and tray aside so it sits on top of the light engine cover.
8. Place large cloth wipes under the two light module liquid cooling module hoses to catch any potential coolant ejected while disconnecting the hoses.
9. Disconnect the two radiator liquid cooling module hoses.
10. Remove the seven screws securing the light module.



11. Lift the light module using the two handles.



12. Replace the light module.
13. To re-install, repeat these steps in reverse order.

Optics

Learn how to replace the light source, mirrors, and other optical components.

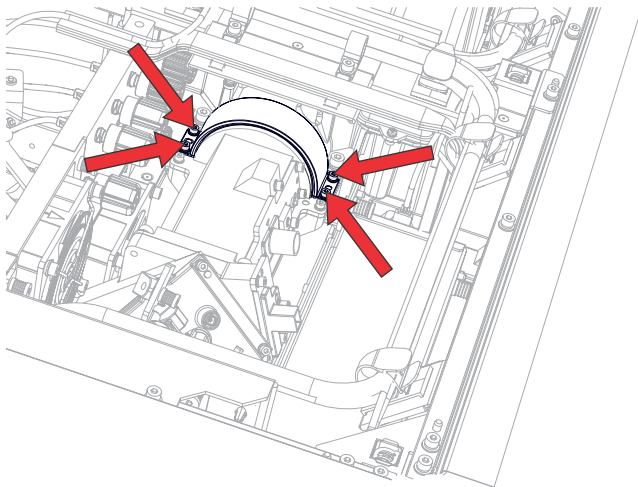
The projector must be powered off and all components must be re-installed before powering on the projector for doing any optical alignment.

Replacing the integrator rod

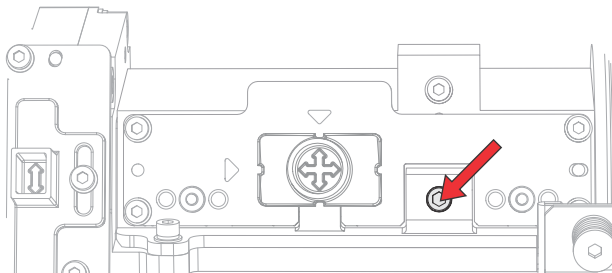
The integrator rod captures the light source and combines it into a uniform rectangular light source for the light engine.

Wear gloves when handling the integrator rod assembly.

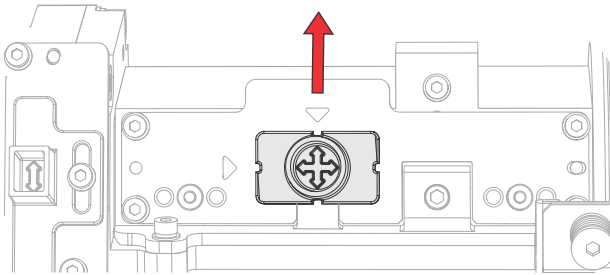
1. Remove the top cover (on page 42).
2. Remove the electronics-side cover (on page 43).
3. Remove the four screws securing the integrator housing collar and remove it.



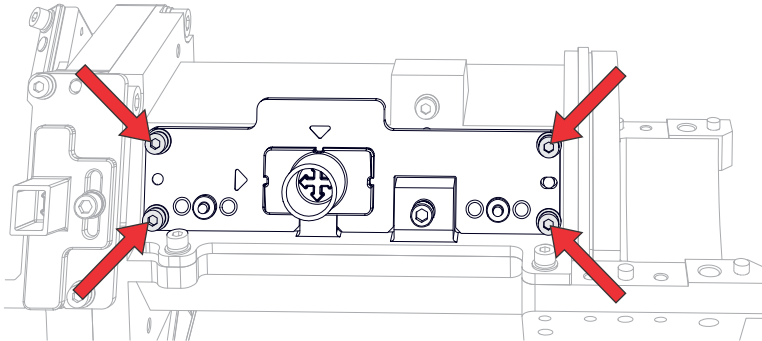
4. Loosen the integrator rotate-focus lockscrew.



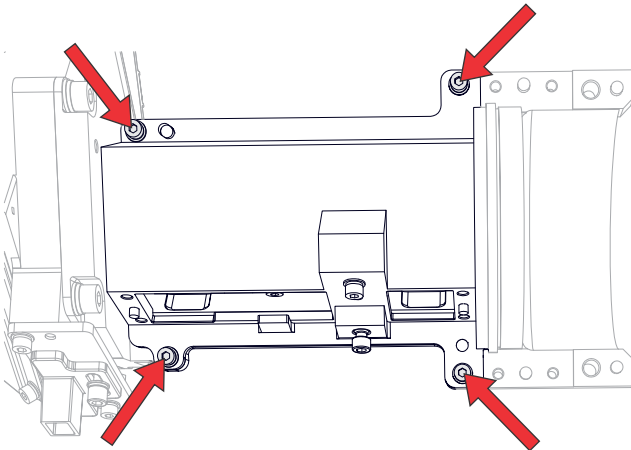
5. Align the knob with the top indicator and slide the knob upwards to its limit.



6. Remove the four screws securing the integrator plate and remove it.

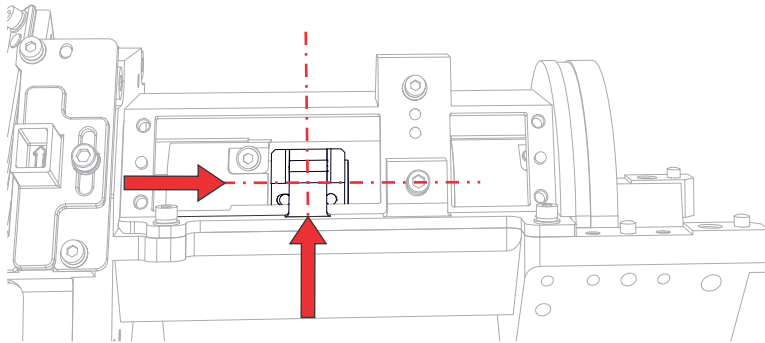


7. Remove the four screws securing the integrator top cover.



8. Remove the integrator rod assembly from the housing.
- To clear the housing, carefully lift up the integrator rod assembly and pull it towards the combiner.
 - Swing the assembly upwards and remove from the housing.
9. Replace the integrator rod.
10. To re-install the integrator rod, position the rod so that the tab on the integrator top cover is centered about the clevis on the integrator assembly and the bottom of the clevis is aligned with the top of the tab. .

This allows the integrator rotate-focus adjustment slider to engage with the rod

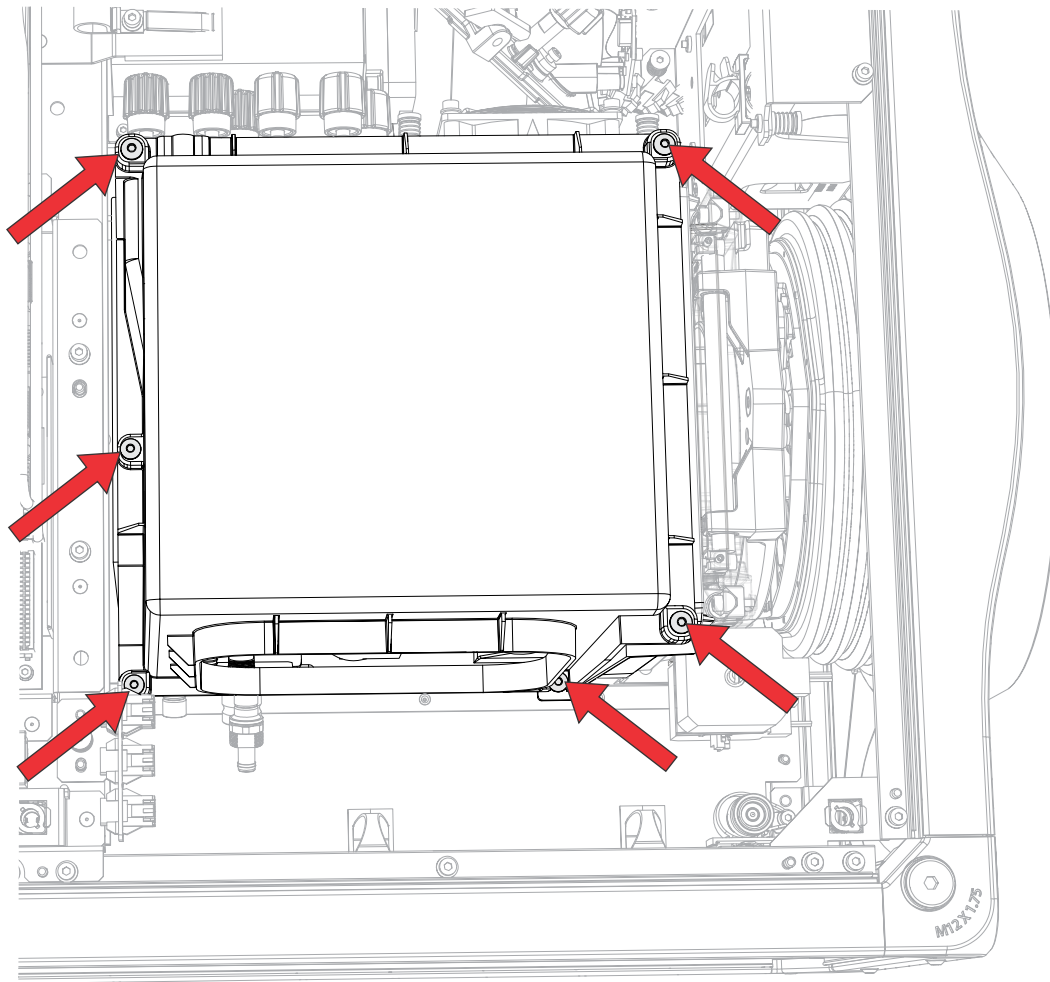


11. Once re-installed, make sure that moving the knob vertically adjusts the rod rotation and when moving the knob horizontally, the rod focus on screen changes.
12. To re-install all other components, repeat these steps in reverse order.
13. *Optimize the integrator focus and zoom.* (on page 22)
14. *Adjust the fold mirror.* (on page 23)

Replacing the light engine cover

The light engine cover protects the light engine from dust and debris.

1. *Remove the top cover* (on page 42).
2. *Remove the light engine radiator* (on page 58).
3. Remove six screws securing the light engine cover and remove it.

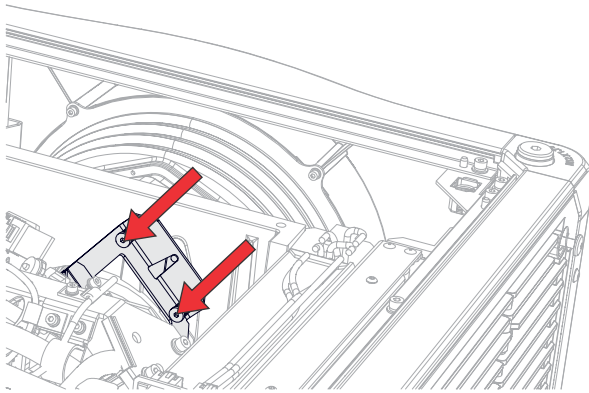


4. Replace the light engine cover.
5. To re-install, repeat these steps in reverse order.
Avoid pinched cables and harnesses by making sure the mini-SAS cables and shutter harness are aligned with the features in the top cover when re-installing the cover.

Removing the light dump

The light dump absorbs any off-state light from the light engine.

1. *Remove the top cover* (on page 42).
2. *Remove the light engine radiator* (on page 58).
3. *Remove the light engine cover* (on page 79).
4. Loosen or remove the two screws securing the light dump and remove it.
Depending on your model, the screws may be captive.



5. Replace the light dump.
6. To re-install, repeat these steps in reverse order.

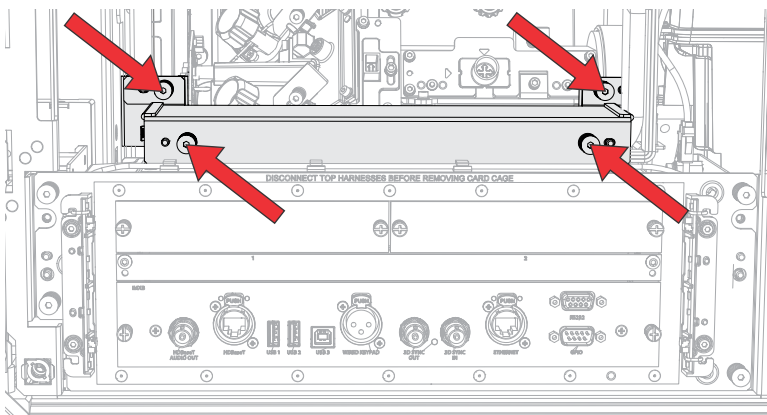
Replacing the light engine

The light engine modulates incoming light from the light source to create an image, which is projected to the screen.



The illustrations in this topic are for representation only and may not depict your projector model exactly.

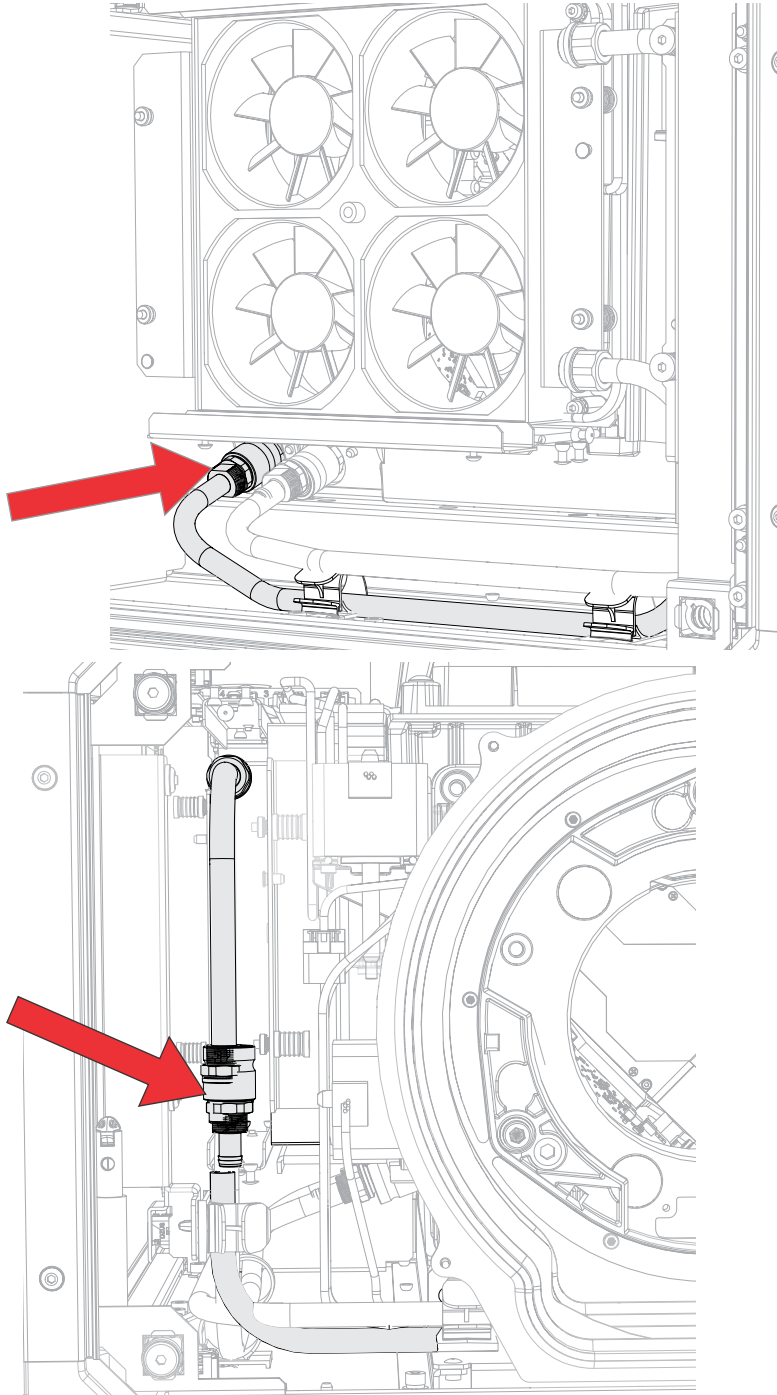
1. Remove the top cover (on page 42).
2. Remove the intake side cover (on page 43).
3. Remove the light engine intake fan assembly (on page 46).
4. Remove the light engine cover (on page 79).
5. Remove the electronics-side cover (on page 43).
6. Remove the light dump (on page 80).
7. Loosen the four captive screws securing the card cage harness cover and remove it.



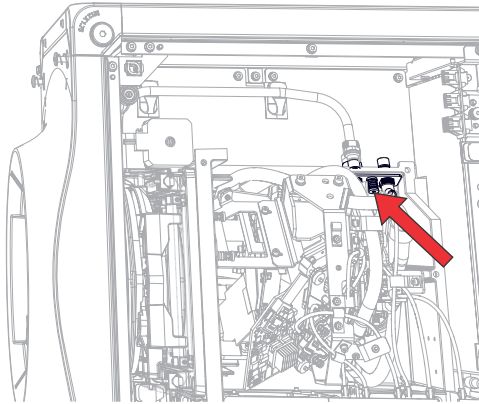
8. Disconnect the red, green, and blue mini-SAS harnesses on top of the card cage. Do not disconnect the mini-SAS harnesses from the light engine.

9. Place large cloth wipes under the two radiator liquid cooling module hoses to catch any potential coolant ejected while disconnecting the hoses.
10. Disconnect the two radiator liquid cooling module hoses.

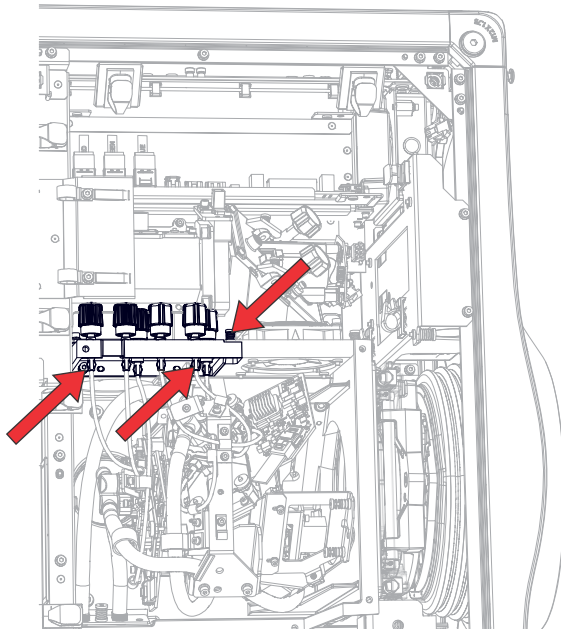
Hose disconnect locations:



11. Loosen one captive screw securing the liquid cooling module hose bracket.



12. Loosen three captive screws to remove the convergence plate.



13. Disconnect the shutter harness (J90) from the HKBC.

14. Loosen the three captive screws securing the light engine to the projector base and remove it.

15. Replace the light engine, if required.

16. To re-install, repeat these steps in reverse order.

Replacing the fold mirror

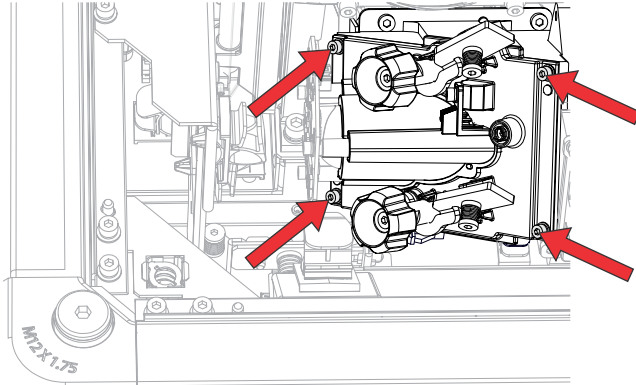
The fold mirror directs light towards the light engine.

Wear gloves when handling the fold mirror.

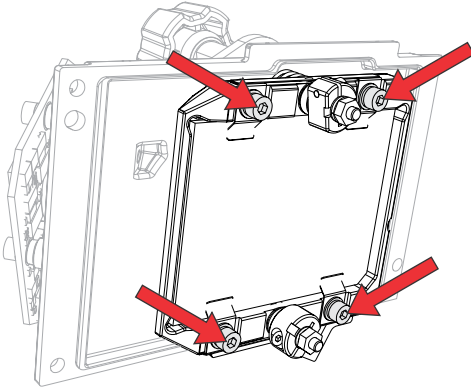
1. *Remove the top cover* (on page 42).
2. *Remove the front cover* (on page 41).
3. *Remove the liquid cooling module* (on page 61).

Move the liquid cooling module aside without disconnecting the hoses.

4. Disconnect the color sensor board harness J82.
5. Remove the four screws securing the fold mirror assembly.



6. Remove the four screws securing the fold mirror and remove it.

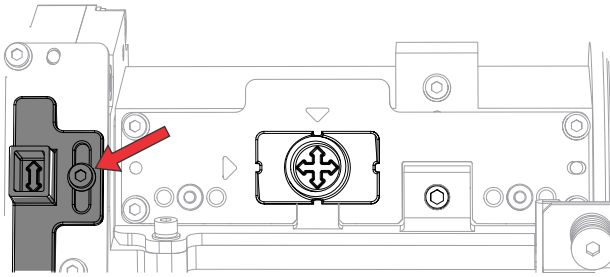


7. Replace the fold mirror, if required.
8. To re-install, repeat these steps in reverse order.
The reflective coating side must be on the side closest to the springs.
9. *Optimize the integrator focus and zoom.* (on page 22)
10. *Adjust the fold mirror.* (on page 23)

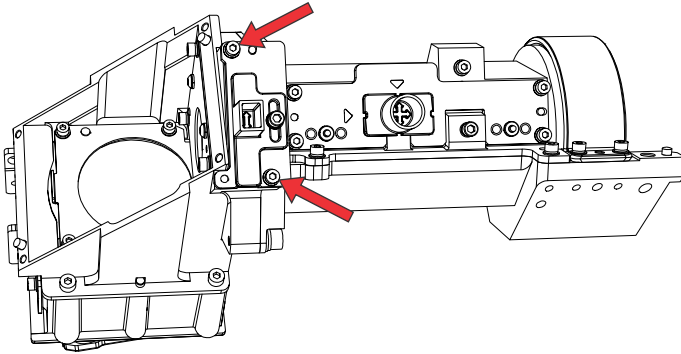
Replacing the integrator zoom adjustment knob

The knob is used to adjust the integrator zoom lens.

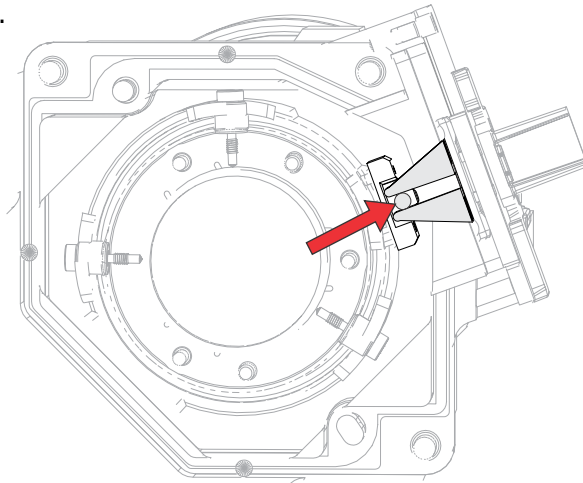
1. *Remove the fold mirror* (on page 83).
2. Loosen the adjustment knob lock screw.



3. Remove the two screws securing the adjustment knob and remove it.



4. Replace the adjustment knob.
5. Look through the fold mirror cavity and look for the lens moving as the knob moves. Ensure the adjustment knob fork engages the shoulder screw or the zoom lens will not traverse.



6. To re-install, repeat these steps in reverse order.
7. *Optimize the integrator focus and zoom.* (on page 22)
8. *Adjust the fold mirror.* (on page 23)

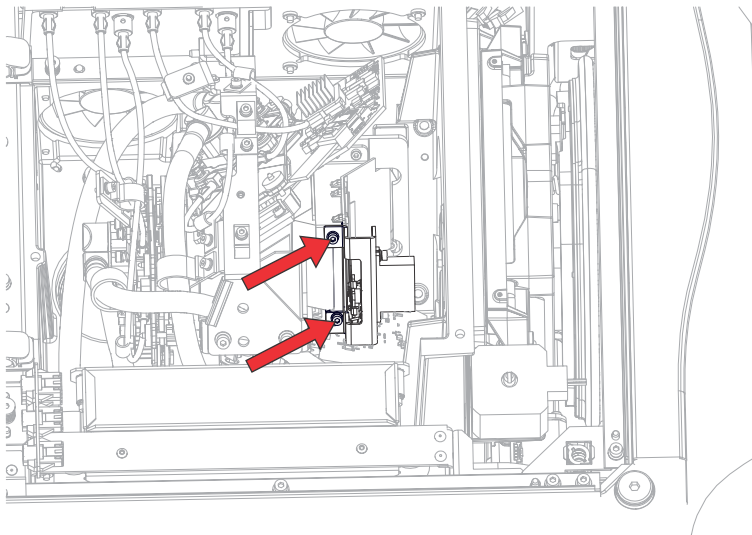
Replacing the shutter

The shutter blocks the light coming into the projector lens.



The illustrations in this topic are for representation only and may not depict your projector model exactly.

1. Remove the top cover (on page 42).
2. Remove the light engine cover (on page 79).
3. Remove the light dump (on page 80).
4. Disconnect harness connector (J90) from the HKBC board.
5. Remove the two screws securing the shutter to the light engine and remove it.



6. Replace the shutter, if required.
7. To re-install, repeat these steps in reverse order.

Printed circuit boards and sensors

Printed circuit boards (PCB) mechanically support and electrically connect the projector components. Sensors convert information such as temperature, light, and communication into electrical signals.

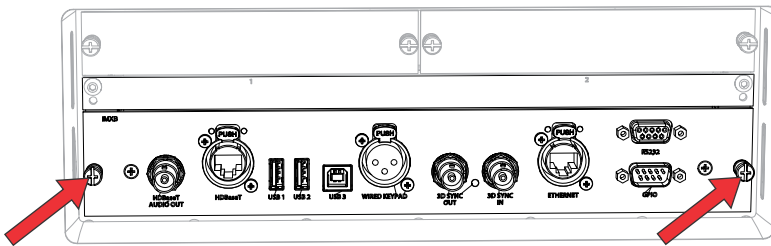


Always wear an electrostatic discharge (ESD) strap and use insulated tools when replacing circuit boards.

Replacing the IMXB board

The IMXB module acts as the communication interface between the projector and the control systems.

1. Loosen the two captive screws and pull out the IMXB board.

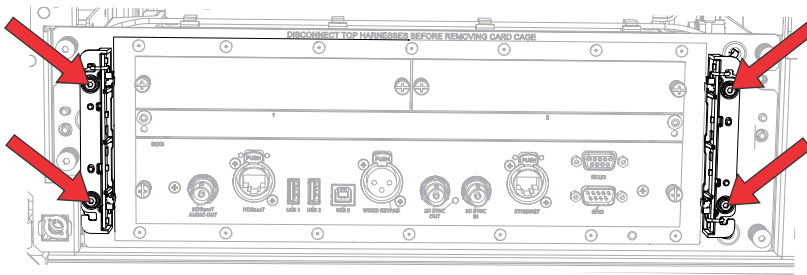


2. Replace the IMXB board, if required.
3. To re-install, repeat these steps in reverse order.

Replacing the card cage convenience light boards (CLB)

The card cage convenience light boards (CLB) provides extra illumination when needed for connecting to the card cage.

1. Remove the electronics-side cover (on page 43).
2. Disconnect the one or two inline connectors, depending on which CLB is being removed. The left CLB has one harness (J1) and the right CLB has two harnesses (J1 and J2).
3. Remove the two screws securing the CLB.



4. Remove the affected CLB with bracket.
5. Replace the CLB, if required.
6. To re-install, repeat these steps in reverse order.

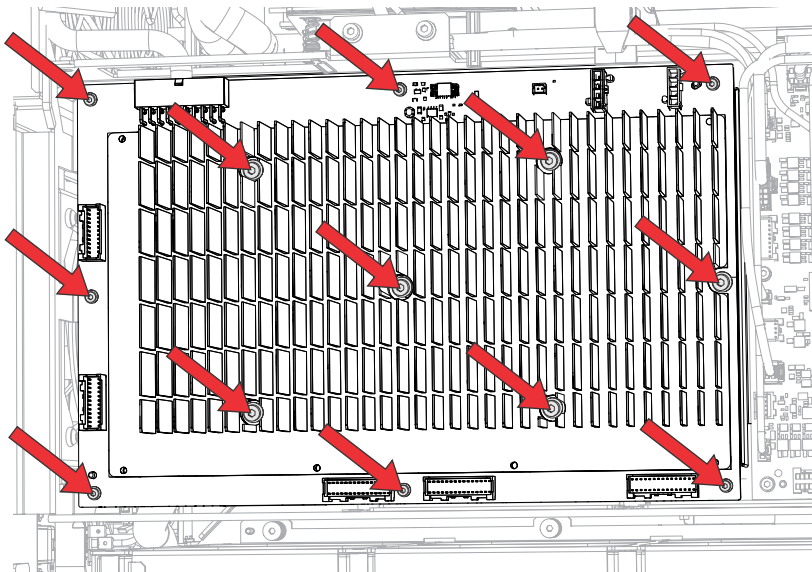
Replacing the light driver board

The laser driver board is located adjacent to the radiator fan assembly.



The illustrations in this topic are for representation only and may not depict your projector model exactly.

1. Remove the top cover (on page 42).
2. Disconnect the harnesses on the light driver board.
For Crimson/Mirage 25, remove eight harnesses: J320, P321, P322, P323, P324, P325, P326, P327.
For Crimson 31, remove nine harnesses: J320, P321, P322, P323, P324, P325, P326, P327, P333.
3. Remove the harnesses from the clips.
4. Remove the 13 screws securing the light driver board.



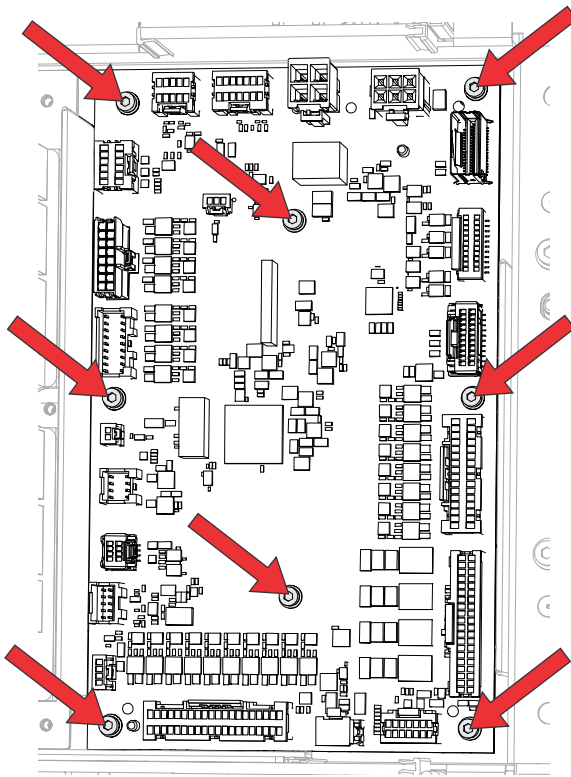
5. Pull back the harnesses and pull out the light driver board.
6. Replace the light driver board, if required.

- To re-install, repeat these steps in reverse order.

Replacing the housekeeping board (HKBC)

The housekeeping (HKBC) board acts as an interface board with the majority of the control devices feeding into it, including most of the fans, convenience light board, IR receivers, and so on.

- Remove the top cover (on page 42).
- Disconnect the 17 harnesses on the housekeeping board.
The 17 harnesses to remove: J7, J83, J84, J85, J88, J90, J101, J103, J104, J113, J115, J116, J117, J118, J130, J132, J131, J135.
- Remove the eight screws securing the HKBC board.

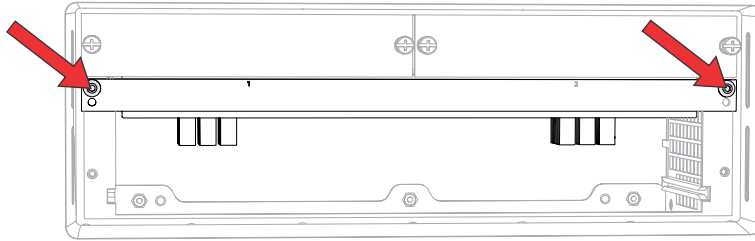


- Pull back the harnesses and pull out the board.
- Replace the board, if required.
- To re-install, repeat these steps in reverse order.

Replacing the image processing board (WIP)

The image processing board (WIP) board provides the signal processing of the inputs going into the projector.

- Remove the IMXB board (on page 87).
- Remove the two screws securing the WIP board and remove it.

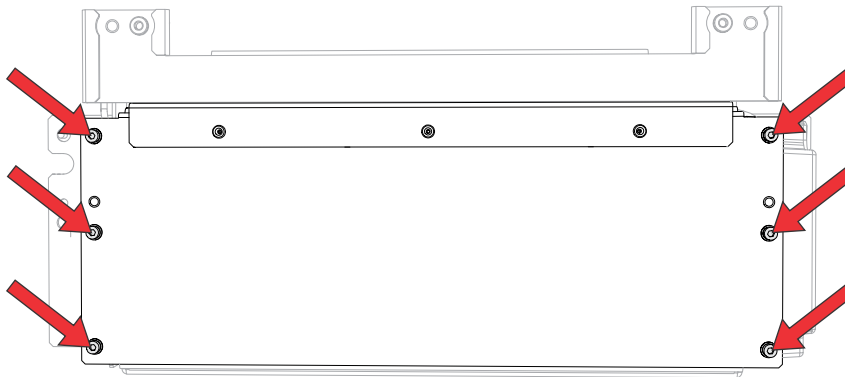


3. Replace the WIP board, if required.
4. To re-install, repeat these steps in reverse order.

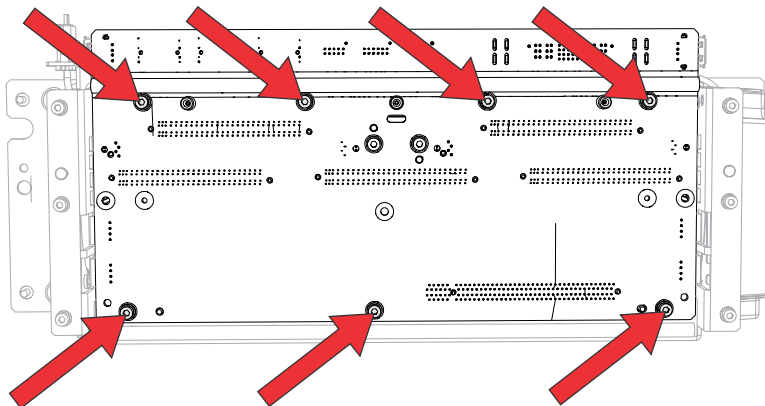
Replacing the backplane board (C4LBP)

The backplane board (C4LBP) provides the main interconnection between the input modules and the image processing board (the WIP).

1. Remove the card cage (on page 66).
2. Remove the IMXB board (on page 87).
3. Remove all option cards (on page 67).
4. Remove the image processing board (WIP) (on page 89).
5. Remove the six screws securing the card cage rear cover and remove the cover.



6. Remove the seven screws securing the board to the card cage housing and remove the board.

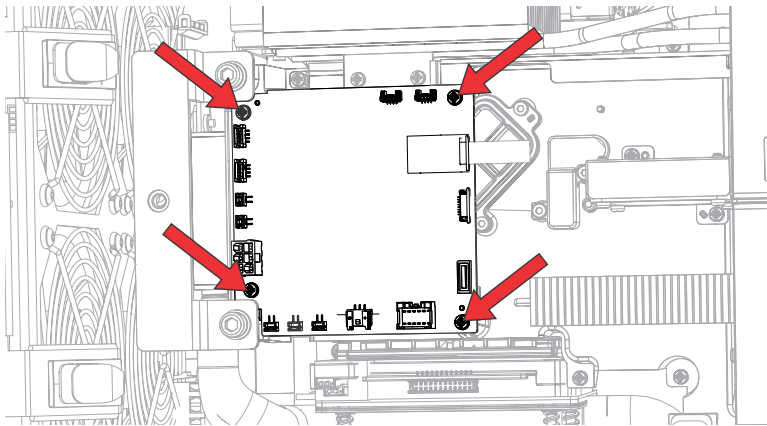


7. Replace the backplane board, if required.
8. To re-install, repeat these steps in reverse order.

Replacing the fan control board (CFCB)

The fan control board (CFCB) is located on top of the light module.

1. *Remove the top cover* (on page 42).
2. Disconnect the 14 harnesses on the fan control board.
The 14 harnesses to remove: J301, J300, P302, P304, P308, P309, P312, P313, P314, P315, P316, P317, P318.
3. Remove the four screws securing the fan control board.



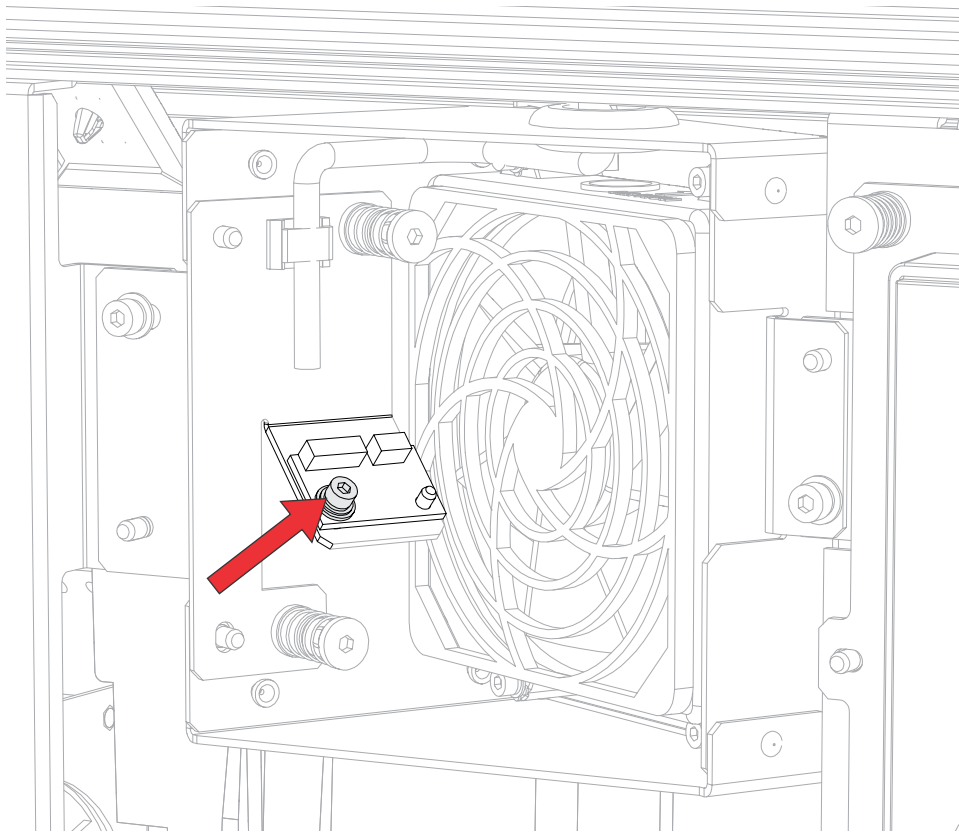
4. Pull back the harnesses and pull out the board.
5. Replace the board, if required.
6. To re-install, repeat these steps in reverse order.

Replacing the dual temperature sensor module (DTSM)

The dual temperature sensor module (DTSM) monitors the ambient air temperature going into the projector.

1. *Remove the electronics-side cover* (on page 43).
2. Disconnect the J82 harnesses.
3. Remove the single screw securing the DTSM board.

Do not lose the plastic washer under the DTSM board, which is located between the board and the metal bracket (it acts as a thermal insulator). When re-installing the DTSM board, make sure that this plastic washer goes back in the same place. There is also one under the metal washer under the screw.

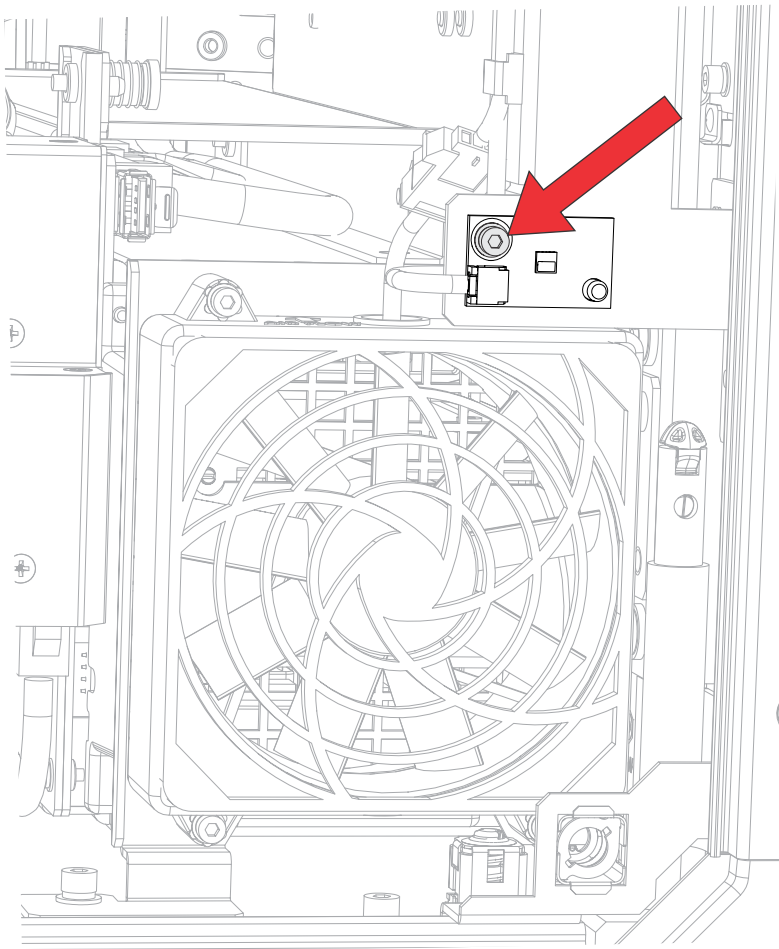


4. Pull back the harness and pull up the board off the post.
5. Replace the board, if required.
6. To re-install, repeat these steps in reverse order.

Replacing the front IR sensor board (front IRB)

The front IR sensor board (front IRB) receives command codes from the IR remote to control the projector operation.

1. Remove the front cover (on page 41).
2. Disconnect the front IR harness (J108).
3. Remove the single screw securing the front IR sensor board to the bracket.



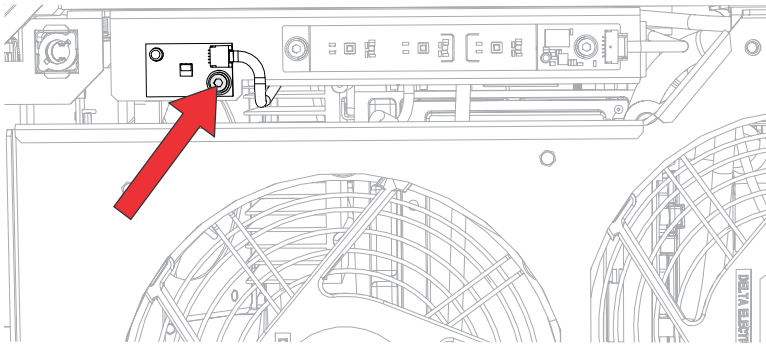
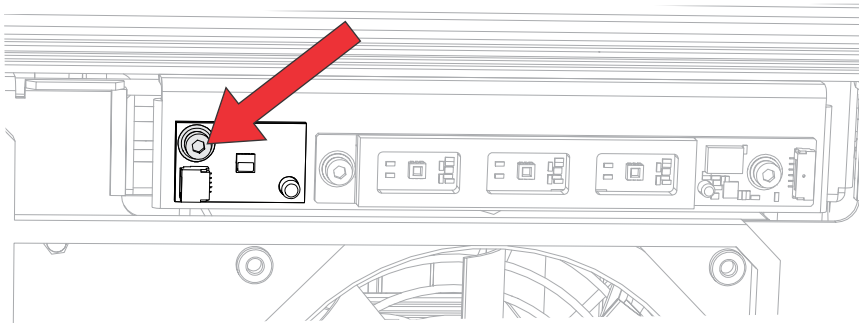
4. Pull up the board off the post.
5. Replace the board, if required.
6. To re-install, repeat these steps in reverse order.

Replacing the rear IR sensor board (rear IRB)

The rear IR sensor board (rear IRB) receives command codes from the IR remote to control the projector operation.

1. *Remove the rear cover* (on page 42).
2. Disconnect the rear IR harness (P108).
3. Remove the screw securing the rear IR sensor board to the bracket.

Crimson/Mirage 25:

**Crimson 31:**

4. Pull up the board off of the pin.
5. Replace the board, if required.
6. To re-install, repeat these steps in reverse order.

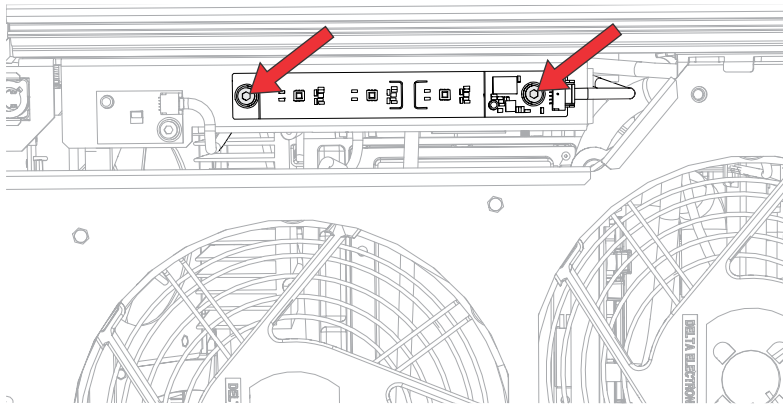
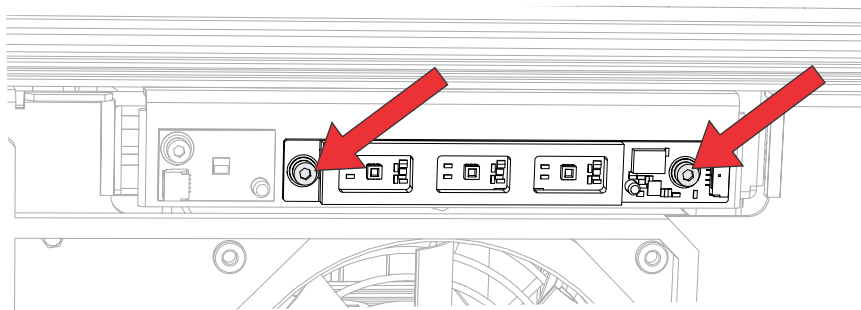
Replacing the status LED board (SLB)

The status LED board (SLB) provides a visual about the operational state of the projector.

1. Remove the rear cover (on page 42).
2. Disconnect the harness (J1(SLB)).
3. Remove the two screws securing the board.

Two metal washers are behind the SLB. Ensure they do not fall into the projector when the screws are removed. They should be replaced behind the new SLB upon re-install. Newer units may not have these washers.

Crimson/Mirage 25:

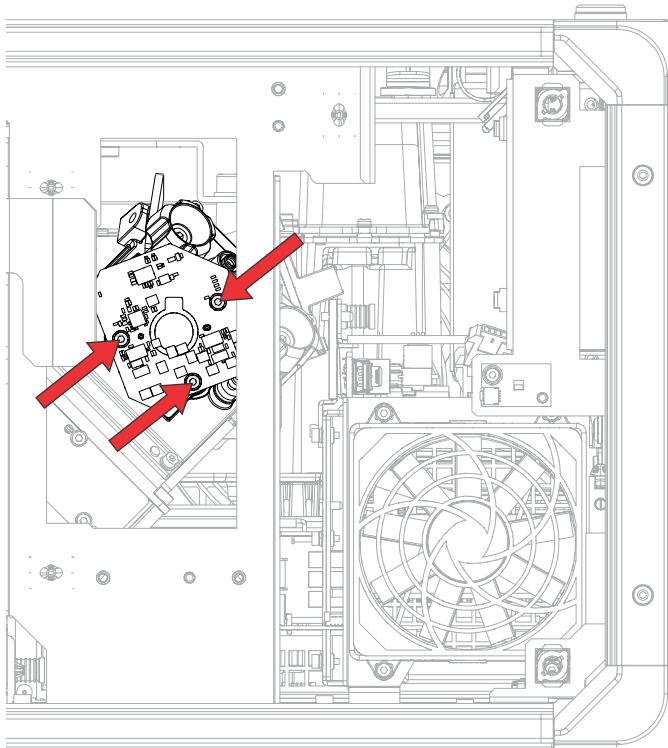
**Crimson 31:**

4. Pull up the board off the post.
5. Replace the board, if required.
6. To re-install, repeat these steps in reverse order.

Replacing the color sensor board (CSB)

The color sensor board (CSB) measures the color of the light being generated by the optics. It is used in a feedback loop to ensure that the output color of the image is stable as the lasers age.

1. *Remove the top cover* (on page 42).
2. *Remove the front cover* (on page 41).
3. *Remove the liquid cooling module* (on page 61).
Move the liquid cooling module aside without disconnecting the hoses.
4. Disconnect the color sensor board harness J82.
5. Remove the three screws securing the CSB and remove it.



6. Replace the CSB, if required.
7. To re-install, repeat these steps in reverse order.

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