

DP2K-E series



Service manual

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1. SAFETY

About this chapter

Read this chapter attentively. It contains important information to prevent personal injury while servicing the DP2K-E series projector. Furthermore, it includes several cautions to prevent damage to the DP2K-E series projector. Ensure that you understand and follow all safety guidelines, safety instructions and warnings mentioned in this chapter before servicing the DP2K-E series projector. After this chapter, additional “warnings” and “cautions” are given depending on the service procedure. Read and follow these “warnings” and “cautions” as well.



WARNING: This manual is only intended for qualified service personnel.

Overview

- Safety Instructions

1.1 Safety Instructions



WARNING: Before removing/replacing any projector components, disconnect the power to the unit mains terminals.

Safety Instructions

1. Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:
 - a) Be sure that no built-in protective devices are defective and/or have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, insulating materials, barriers, covers/shields, and isolation resistor/capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Service people who defeat safety features or fail to perform safety checks may be liable for any resulting damage.
 - b) Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) excessively wide cabinet ventilation slots, and (2) an improperly fitted and/or incorrectly secured cover panels.
 - c) Leakage Current Hot Check. With the instrument completely reassembled, plug the AC line cord directly into a 220 V AC outlet (Do not use an isolation transformer during this test). Use a leakage current tester or a metering system that is designed to comply with the new IEC, ANSI and UL standards. With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screwheads, metallic overlays, control shafts, etc.). especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 3,5 mA. Reverse the instrument power cord plug in the outlet and repeat test. ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING ACCESSORIES.

AC Leakage Test

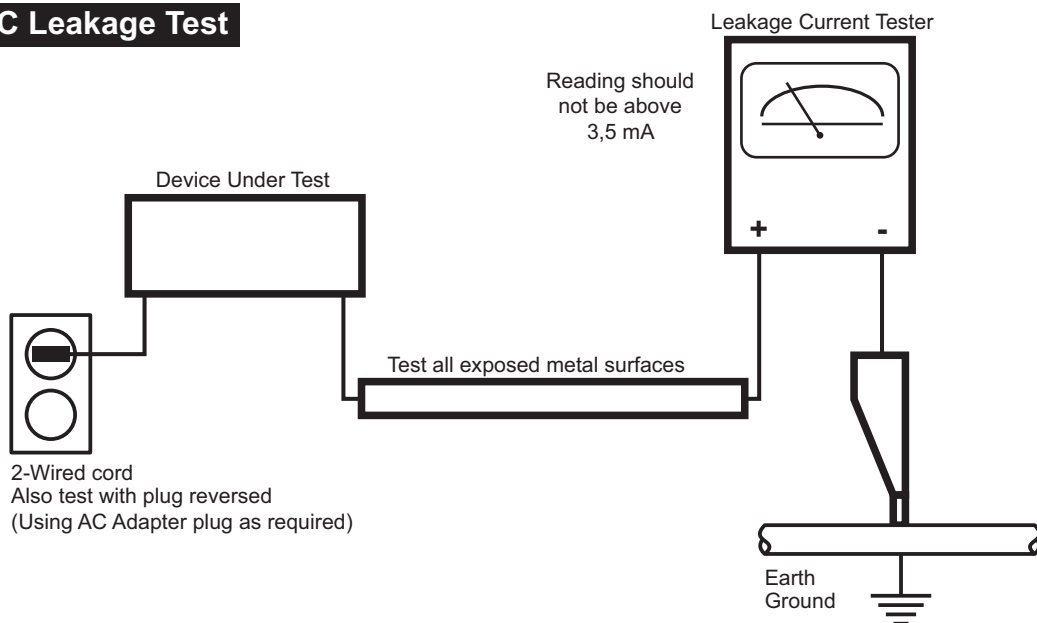


Image 1-1

- d) Ultraviolet Radiation exposure - Warning: This lamp can cause serious skin burn and eye inflammation from shortwave ultraviolet radiation if not operated in enclosed fixtures. DO NOT operate this lamp in a fixture with a missing or broken lens cover.
 - e) Ozone: Operating lamp generates ozone gas which is harmful to the respiratory system. Therefore the lamp should be operated in adequately ventilated equipment.
2. Read and comply with all caution and safety-related notes on or inside the projector cabinet or on the projector chassis, or on the picture tube.
 3. Design Alteration Warning - Do not alter or add to the mechanical or electrical design of this apparatus. Design alterations and additions, including, but not limited to, circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this apparatus and create a hazard to the user. Any design alterations or additions may void the manufacturer's warranty and may make you, the servicer responsible for personal injury or property damage resulting therefrom.

4. Lamp explosion Protection Warning – The lamp in this projector operates with a high internal pressure and there is a slight risk that the lamp may explode, particularly if it is used beyond its rated life. Do not remove, install, or otherwise handle the lamp in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while lamps are handled. Keep the lamp away from your body. For continued explosion protection, replace the lamp only with one of the same type number. Always replace the lamp before the rated life time.
5. Hot Chassis Warning - This projector chassis has two ground systems: the primary ground system is formed by the negative voltage of the rectified mains (power) and is only used as a reference in primary circuits; the secondary ground system is connected to earth ground via the earth conductor in the mains (power) lead. Separation between primary and secondary circuits is performed by the safety isolation transformers. Components bridging these transformers are also safety components and must never be defeated or altered. All user-accessible conductive parts must be connected to earth ground, or are kept at SELV (Safety Extra Low Voltage).
6. Observe original lead dress. Always inspect in all areas for pinched, out-of-face, or frayed wiring. Do not change spacing between components, and between components and the printed-circuit board. Check AC power cord for damage. Take extra care to assure correct lead dress in the following areas:
 - a) near sharp edges
 - b) near thermally hot parts - be sure that leads and components do not touch thermally hot parts
 - c) the AC supply
 - d) high voltage
7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.
8. PRODUCT SAFETY NOTICE - Many electrical and mechanical parts have special safety-related characteristics some of which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part in BARCO service data parts list might create shock, fire, and/or other hazards. Product Safety is under review continuously and new instructions are issued whenever appropriate. For the latest information, always consult the appropriate current BARCO service literature.
9. Do not spray chemical on or near this instrument or any of its assemblies.
10. Electrostatically Sensitive (ES) Devices Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity:
 - a) Immediately before handling any semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Wear a commercially available high impedance discharging wrist strap device.
 - b) After removing an electrical assembly equipped with ES devices, place the assembly on a static dissipative surface such as a 3M No 8210 table mat, to prevent electrostatic charge buildup or exposure of the assembly.
 - c) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
 - d) Do not remove a replacement ES device from its protective package until immediately before you are ready to install it (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminium foil or comparable conductive material).
 - e) Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed. CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
 - f) Minimize bodily motions when handling unpacked replacement ES devices (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

2. GENERAL

About this chapter

This chapter contains some general information on projector level such as the location of the main components, projector status, spare parts list, etc.

Overview

- Convention projector orientation
- Location of the main components of the projector
- Projector Status
- Projector block diagram
- Spare parts for DP2K-E series

2.1 Convention projector orientation

Convention

This manual refers to the left side of the projector as the side at your left hand when standing behind the projector and looking at the projection screen in front of the projector.

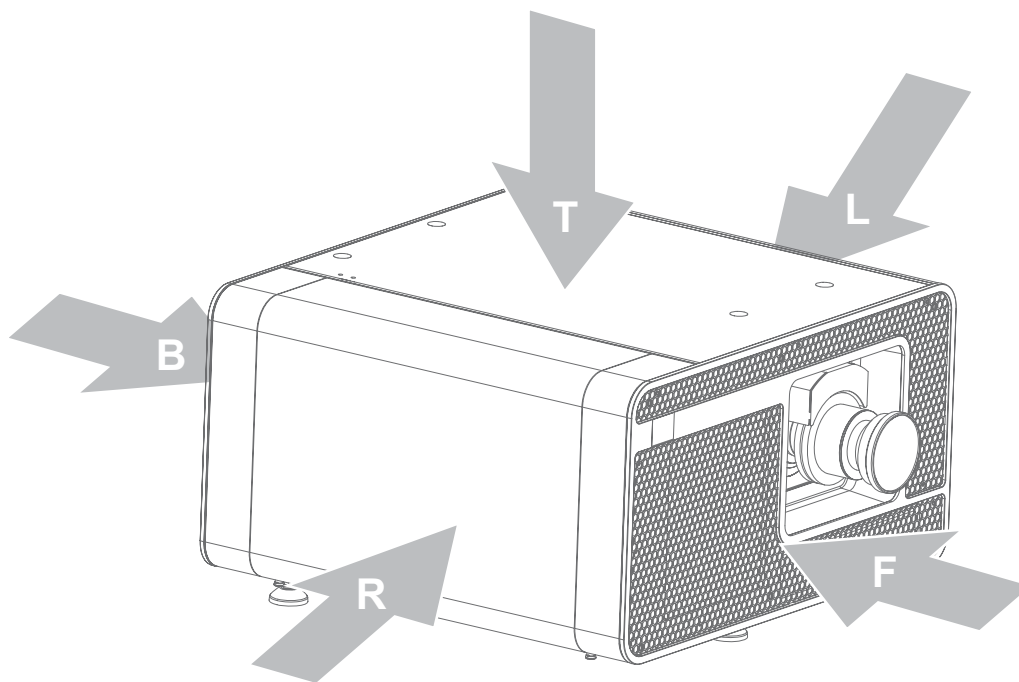


Image 2-1

- T Top of the projector.
- L Left side of the projector (Light Processor side).
- F Front of the projector.
- R Right side of the projector (Lamp side & Input side).
- B Back side of the projector.

2.2 Location of the main components of the projector

Housing and air inlet filters

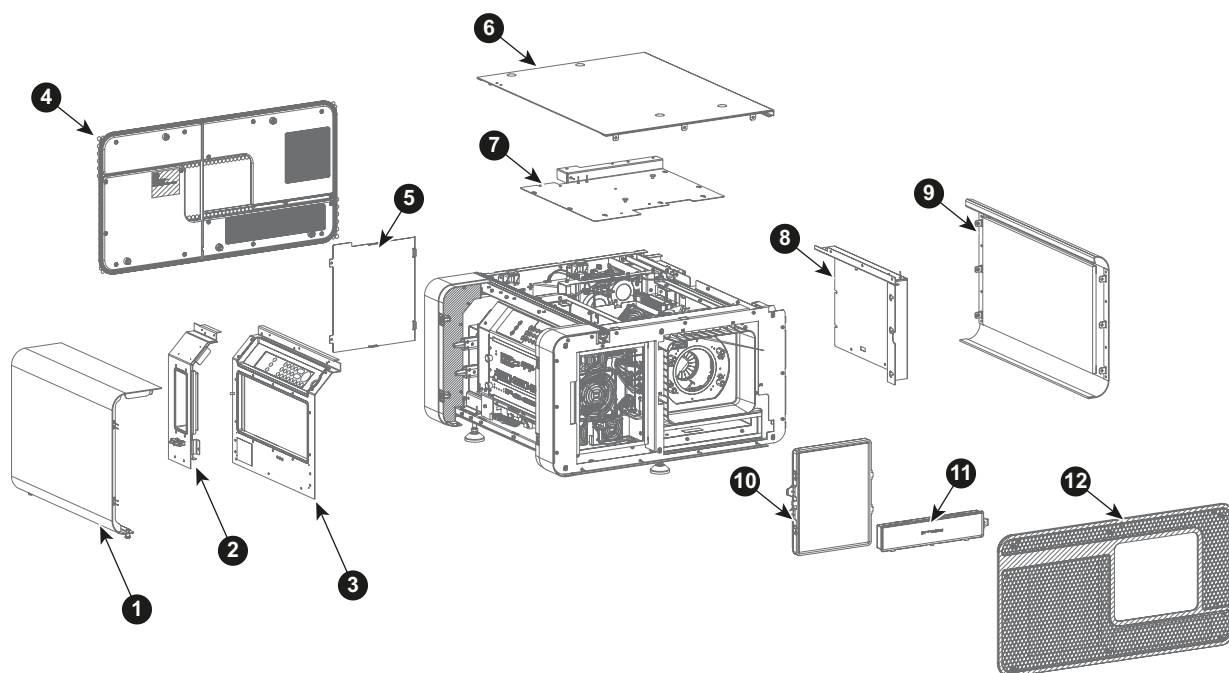


Image 2-2

- 1 Card cage door
- 2 ON/OFF cover
- 3 Card cage cover
- 4 Back (rear) cover
- 5 Mains input cover
- 6 Top cover
- 7 Top cover plate, light processor compartment
- 8 Left side cover plate, light processor compartment
- 9 Left side cover
- 10 Large dust filter
- 11 Small dust filter
- 12 Front cover

Main internal components

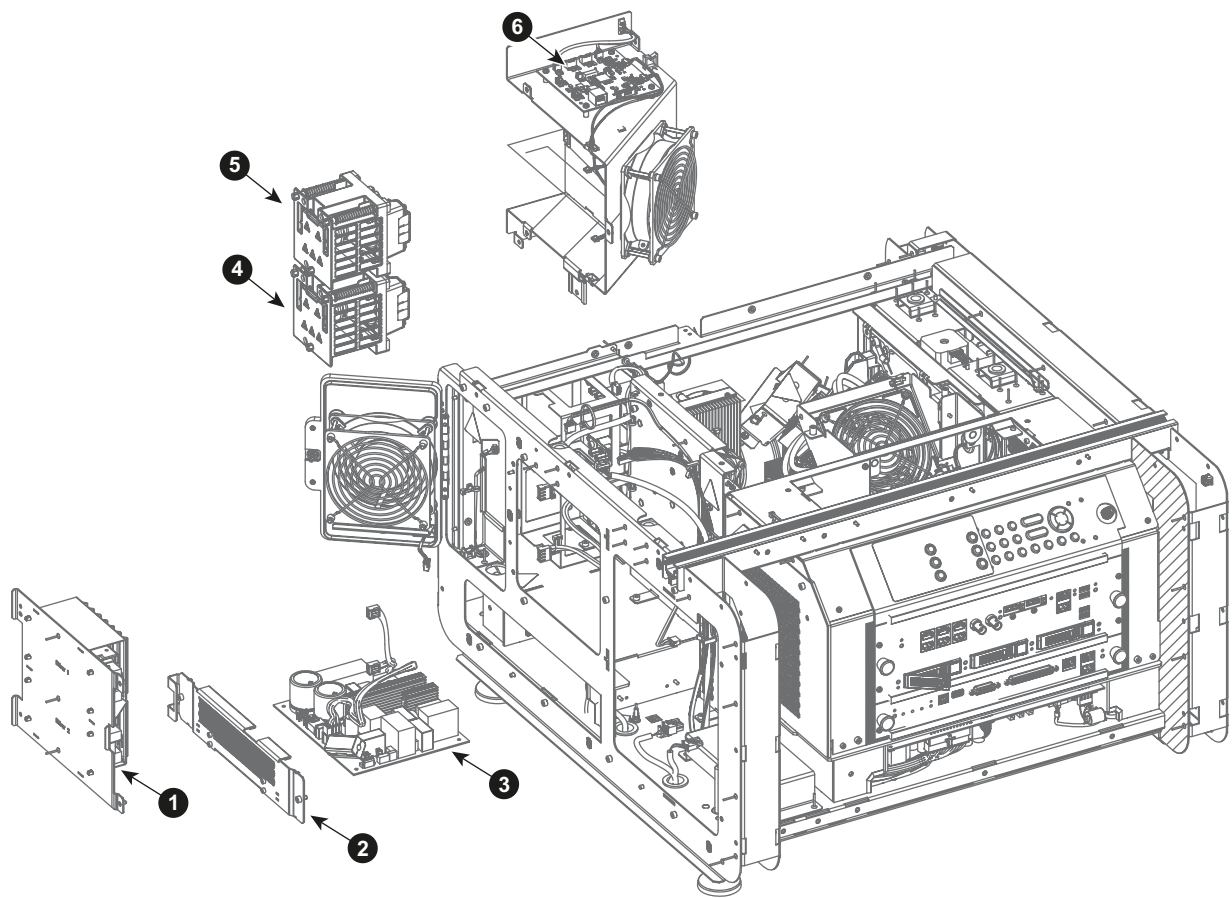


Image 2-3

- 1 Lamp driver module
- 2 Lamp Power Supply (LPS) cover
- 3 Lamp Power Supply (LPS)
- 4 Lamp Module 2
- 5 Lamp Module 1

6 Lamp control board

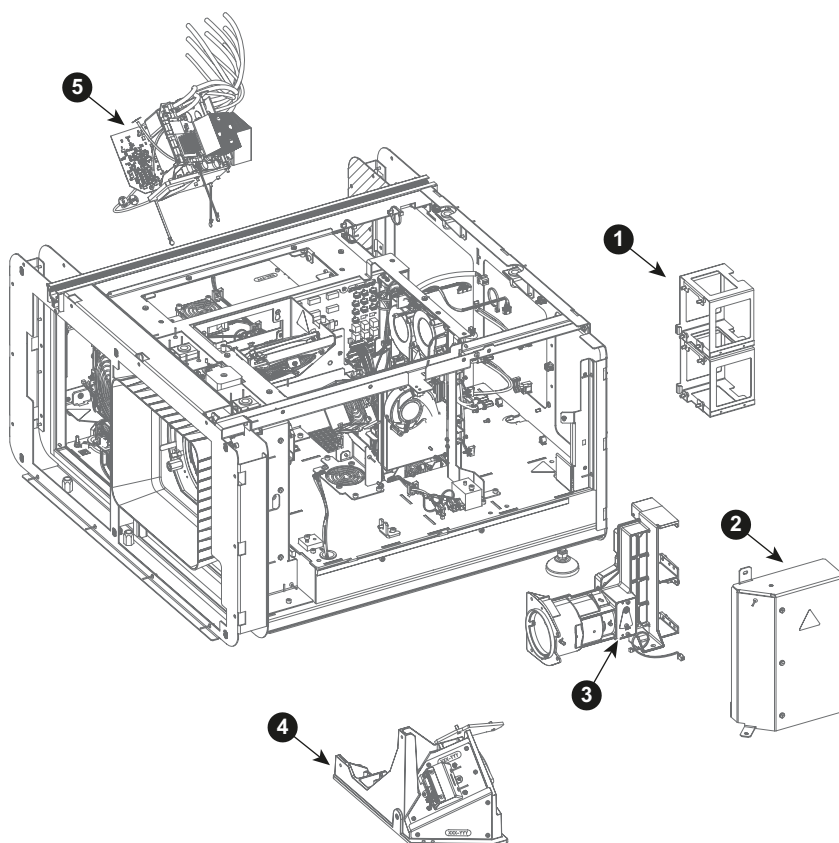


Image 2-4

- 1 Lamp module brackets
- 2 Lamp compartment security cover
- 3 Light pipe
- 4 Light pipe corner block
- 5 Light processor

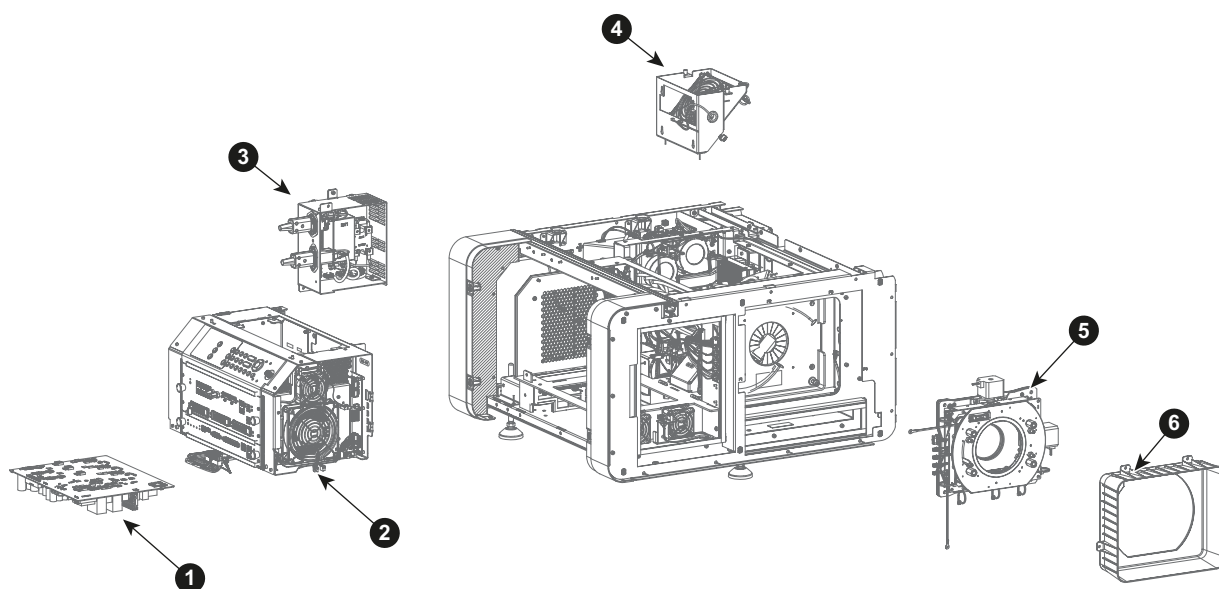


Image 2-5

- 1 SMPS
- 2 Card Cage
- 3 Mains input module
- 4 Top engine fan assembly
- 5 Lens holder
- 6 Lens holder cover

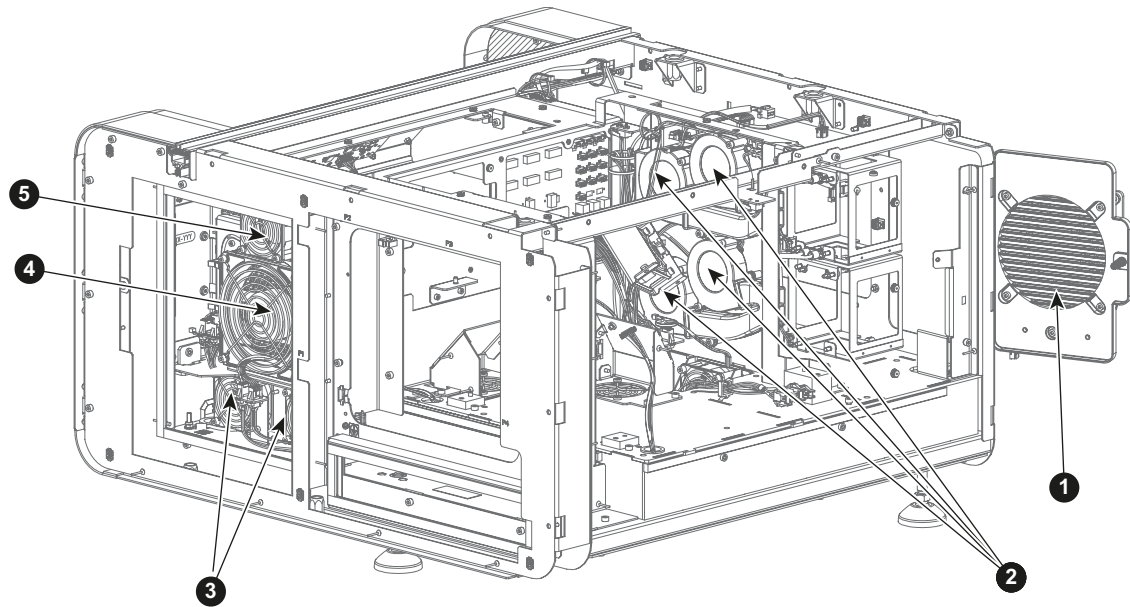


Image 2-6

- 1 Outlet fan assembly
- 2 Lamp cooling fans (4 of)
- 3 SMPS fans (2 of)
- 4 Large Card Cage fan
- 5 Small card cage fan

2.3 Projector Status

About the projector Status Light

The projector Status Light is located at the rear end of the projector. The projector Status Light is a real time indicator of the projector condition.

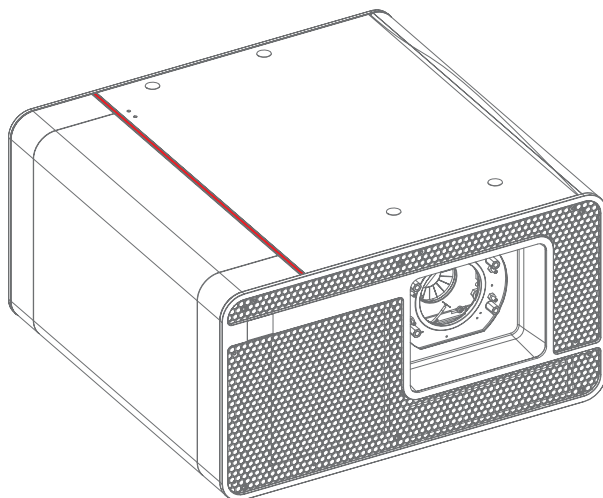


Image 2-7

Status overview

Depending on the condition of the projector the status light may have 4 colors: Green, Yellow, Red or Blue. Each color represent a different state:

Blinking Green	Projector is booting up. (Fully booted up when Test Pattern button is green as well)
Green	Projector is running normally.
Yellow	Projector is running with warnings. Event can go on but a technical intervention will be necessary in the near future to prevent a complete stop of the projector.
Red	Projector is in error state. Problem could prevent normal operation. Solve the problem before continuing with the projector.
Blue	Projector runs in notification state. Maintenance action required. Lamp run time is exceeded. New lamp must be installed.

Standby mode

In Standby mode the lamp of the projector is switched OFF but all the electronics of the projector remain fully operational. The projector is ready to ignite the lamp and project the image. The status light is not different between Standby mode and Lamp ON mode (fully operational).

Sleep mode

If the projector is in **Sleep** mode then the **status light flashes** every ten seconds. The color of the flash depends on the state of the projector. In other words, the color of the flash will be green in normal state (no warnings, no errors, no notifications).

In Sleep mode the total power consumption of the projector is less than 15W. No fans are turning and the Lamp Power Supply (LPS) is switched OFF completely. Only the following functionalities of the projector remains active:

- Cinema Controller
- Local Keypad
- Router and external switch fully functional
- USB IN port type "B" (Virtual comport RS232)
- USB OUT port type "A" (To power handheld devices [500mA MAX]. No other functionality supported)
- GPIO port on the Cinema Controller

Pressing the Sleep button in Standby mode for 3 seconds puts the projector in Sleep mode. In case the projector is processing the after cooling cycle then the projector goes in Sleep mode after finishing the after cooling cycle.

Pressing the Sleep button in Sleep mode for 3 seconds will awake the projector. The status light will blink for a few seconds (booting up all inactive boards) and then lights up continuously.

Enter or leave Sleep mode can also be done via 2 dedicated projector command (USB/Ethernet), or via two predefined Macros (not editable) with GPIO of the Cinema Controller (not the GPIO of the ICMP), or via the Communicator.



The projector always boots up in the same mode (E.g. Standby or Sleep) as it was switched OFF.
The Sleep button is disabled if the lamp is ignited.

2.4 Projector block diagram

Internal wiring diagram

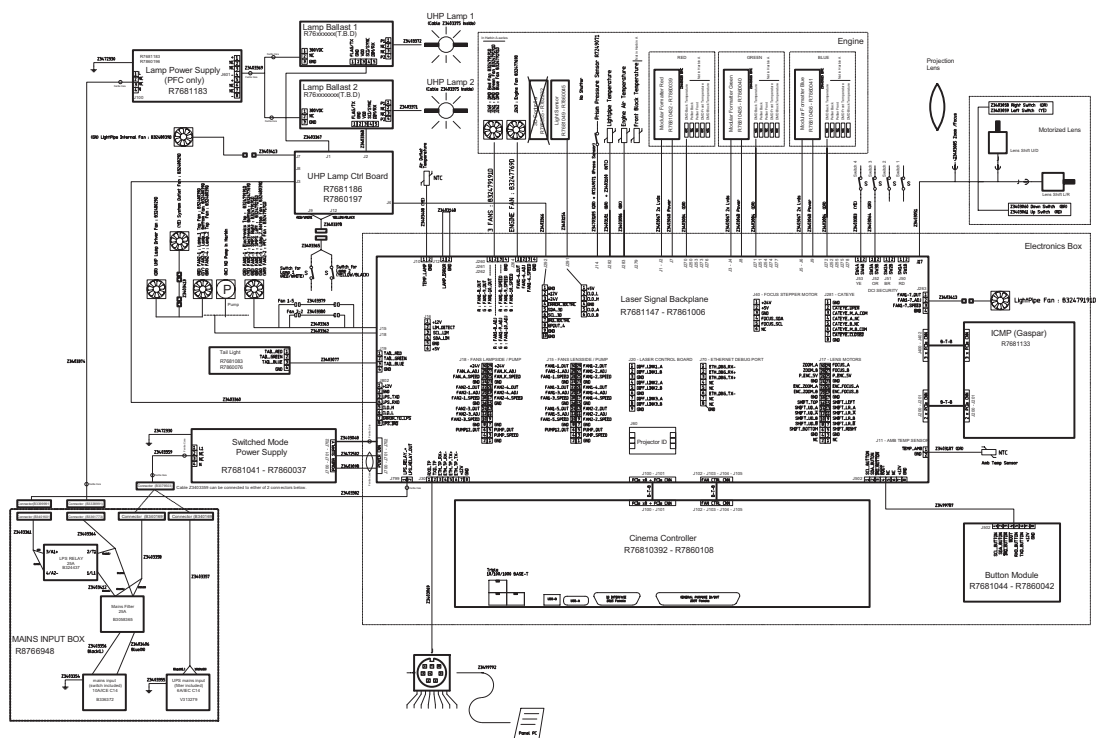


Image 2-8

2.5 Spare parts for DP2K-E series

Up to date information regarding spare parts for DP2K-E series

Barco continuously improves its service procedures for the customer. Managing spare parts is one of the key processes. The spare parts list is subject to change. No spare parts list is included in this manual to ensure that no spare parts are ordered based upon outdated information. Up to date information regarding spare parts, and much more, is available on Barco's web site <http://www.barco.com>. Go to *myBarco log in* and enter your credentials. Select your market and product and click on the product page on *Technical support*. The *Spare parts* tab becomes available.

3. PREVENTATIVE MAINTENANCE ACTIONS

Maintenance program

The maintenance program is subdivided in time frames. The maintenance actions described in this chapter can be done by a trained projectionist. Note that there are also annually and 4 yearly maintenance actions (not included in this manual) which must be done by certified service personnel who are familiar with potential hazards of the product and all product safety checks. Contact your service partner for more information about maintenance services.

Overview

- 1 month maintenance actions
- 3 month maintenance actions
- Lamp change maintenance actions
- 1 year maintenance actions
- 4 year maintenance actions

3.1 1 month maintenance actions

MAINTENANCE TYPE A (perform every month)



The 1 month maintenance actions, listed below, may be performed by a trained projectionist who is familiar with potential hazards associated with the product.

No.	Maintenance action	Remarks
1	<p>Check both dust filters and foam filters of the projector for dust and grease.</p> <p>Grease on the filter and foam can build up after several months in an environment contaminated with greasy air. Note that areas where popcorn is consumed are subject to greasy air.</p> <ul style="list-style-type: none"> If the filters or foams are contaminated with dust then cleaning the them with a vacuum cleaner should be sufficient. If the filters or foams feel greasy then they must be washed. <p>Take into account that the time needed to dry the dust filters and foams may be 24 hours or more. For that reason, it is recommended to have a second set of dust filters and foams which can be used while cleaning the first set.</p>	<p>Replace damaged filters and foams immediately.</p> <p>See procedures "Vacuum cleaning of the dust filters and filter foams", page 271, and "Washing and drying the dust filters", page 272.</p> <p>To speed up drying, allow the filters and foams to dry at 50°C max (122°F max) in a well ventilated room.</p>
2	<p>Check the surface of the lens output side for dust (it is not necessary to remove the lens from the projector to do this). Clean only if necessary.</p>	<p>Clean the equipment if dust is clearly visible upon the surface of the lens output side.</p> <p>Note: if the lens was removed from the projector, a manual "Lens Home & Return" action must be executed to calibrate the position of the lens in relation to the Lens Holder. This way the references of the existing 'lens files' remain valid. See user guide of the Communicator software.</p>
3	<p>Check the porthole (both sides) for dust.</p>	<p>Clean the porthole if dust is clearly visible upon the surface. Use a clean dry micro-fiber cloth suitable for cleaning optics.</p>

3.2 3 month maintenance actions

MAINTENANCE TYPE B (perform every three months)



The 3 month maintenance actions, listed below, may be performed by a trained projectionist who is familiar with potential hazards associated with the product.

No.	Maintenance action	Remarks
1	Clean the back air outlet vents of the lamp modules and Lamp Power Supply (LPS).	Dust the vents using a vacuum cleaner with brush attachment.
2	Clean the housing of your projector.	Remove excess dust on and around the projector covers. See cleaning instructions in this manual.
3	Verify the internal clock of the ICMP with real time clock. Correct if needed.	ICMP version 1.2.1 is required. Communicator version 5.0 is required. See user guide of Communicator for detailed instructions.
4	Check the lamp module compartment and lamp fan for dust.	Clean if necessary. Use a vacuum cleaner with brush attachment to remove dust.

3.3 Lamp change maintenance actions

Maintenance actions at every lamp change



The maintenance actions, listed below, which are required at every lamp change may be performed by a trained projectionist who is familiar with potential hazards associated with the lamp.

No.	Maintenance action	Remarks
1	Visual inspection of the lamp anode and igniter connectors of the lamp module.	Replace the lamp module in case of degradation, damage, etc.
2	Visual inspection of the lamp anode and cables of the lamp module.	Replace the lamp module in case of degradation, damage, etc.

3.4 1 year maintenance actions

MAINTENANCE TYPE C (perform every year)



The 1 year maintenance actions, listed below, may **ONLY** be performed by certified service personnel who are familiar with potential hazards of the product and all product safety checks.

No.	Component	Maintenance action	Remarks
1	Dust in general	Remove all dust on the Lamp module compartment.	Use a vacuum cleaner with brush attachment to remove dust.
2	Dust in general	Check the mask and the integrator entry for burn damage, degradation, cracks, etc. Remove the Lamp Modules and look at the mask and integrator entry.	Replace the Light Pipe in case of burn damage, degradation, cracks, etc. See service manual chapter "Light Pipe", page 135.
3	Dust in general	Check the prism exit side for dust, discoloration, damage, degradation, cracks, etc.	Only clean the prism exit side in case dust is clearly visible upon the surface of prism. See service manual chapter "Cleaning the Prism exit side", page 123. Replace the complete Light Processor Unit in case of degradation, cracks, etc. See service manual chapter "Light Processor replacement process", page 116.
4	Dust in general	Check the porthole (both sides) for dust.	Only clean the porthole in case dust is clearly visible upon the surface. Use an optical cloth.
5	Dust in general	Clean the projector exterior (housing).	Report on cleanliness of booth!
6	Dust in general	Check the condition (hot state) of the Light Pipe and prism by looking for artifacts in the projected full white and full black patterns.	If artifacts are visible, diagnose the Integration Rod. If diagnosis shows that artifacts are caused by Integration Rod, replace the Light Pipe. See service manual chapter "Light Pipe", page 135. If the prism is the cause of artifacts, replace the Light Processor Unit. See service manual chapter "Light Processor replacement process", page 116.
7	Diagnostics	Check actual diagnostics/self tests after 1 hour play with black image. See user guide of the Communicator software.	Note any irregularities and follow up. Take the necessary measurements if required.
8	Diagnostics	Check and save TI and projector log/history files. See user guide of the Communicator software.	Note any irregularities and follow up.
9	Diagnostics	Verify projector date and time and correct if required.	See Communicator software.
10	Software version	Check for the latest version of Barco and TI software. See user guide of the Communicator software. The latest software version can be downloaded from the secured Barco web site.	Upgrade the projector software with the latest version. See user guide of the projector toolset.
11	Info-T's	Check if all Info-T's are implemented. Note that the Info-T's are listed on the secured Barco web site.	If not, implement all Info-T's and update the projector service docket.
12	Lamp Module	Check the Lamp for dust, degradation, cracks, etc.	Only clean the lamp if dust is clearly visible upon the surface of the reflector. Take the Lamp Module to another room and use compressed air to blow away the dust from the lamp. See service manual chapter "Projector cleaning", page 291.
13	Lens holder	Check the Lens Holder shift functionality (up/down & left/right).	Use the local keypad or the Communicator software to shift.
14	Lens holder	Check the positional integrity of motorized adjustments by switching Macro's.	Verify correct alignment on screen between flat and scope.

3. Preventative maintenance actions

No.	Component	Maintenance action	Remarks
15	Lens holder	Check the focus uniformity.	Adjust the Lens Holder (Scheimpflug) ONLY if needed. See service manual chapter "Scheimpflug", page 213.
16	Lens	Check the optic surfaces of the lens input and output for dust.	<p>Only clean the input and/or output side in case dust is clearly visible upon the surfaces. Use an optical cloth. See service manual chapter "Cleaning the lens", page 195.</p> <p>Note: if the lens was removed from the projector, a manual "Lens Home & Return" action must be executed to calibrate the position of the lens in relation to the Lens Holder. This way the references of the existing 'lens files' remain valid. See user guide of the Communicator software.</p>
17	Lens	Check the lens Zoom & Focus motors.	Use the local keypad and the Communicator software to Zoom and to Focus.
18	Convergence	Check convergence.	See chapter "Convergence", page 175.
19	Electronic boards	Check the general condition of the electronic boards in the Card Cage: Status LED's, dust, connections, etc.	Blow out dust.
20	Security	Check the Tamper Switch Activation Report and Security Logs for security infringements.	Report if intruded.
21	Color calibration	Measure the color coordinates of the projected image and calibrated if necessary.	See user guide of the Communicator software.
22	Documentation	Check if the projector manuals are present and up-to-date.	Download current manual version from https://My.Barco.com .
23	Documentation	Update projector service docket.	List all maintenance actions and remarks.

3.5 4 year maintenance actions

MAINTENANCE TYPE D (perform every four years)



The 4 year maintenance actions, listed below, may **ONLY** be performed by certified service personnel who are familiar with potential hazards of the product and all product safety checks.

No.	Maintenance action	Remarks
1	Check all fans: vibrations, noise, speed, etc. (speeds: via diagnostics)	Replace if needed.

4. TROUBLESHOOTING

About this chapter

This chapter enumerates all possible error codes which can appear on the Touch Panel display of the cinema projector or in the projector log files. Note that some codes have a warning and an error state. Some only have an error state, others have only a warning state. In case of a “warning” the projector remains to operate. Nevertheless, it is recommended to solve the problem which causing the “warning” as soon as possible otherwise, the “warning” state may turn into an “error” state which will switch off the projector consequently.

The codes are placed in ascending order to make it easier to look up the code and find an appropriate solution.

Overview

- Troubleshooting checklist
- Log files

4.1 Troubleshooting checklist

Code 5003: "light sensor - no communication" (Error)

Situation	Solution
No communication with the Light Sensor Module (CLO).	<ol style="list-style-type: none"> Reboot the projector: <ol style="list-style-type: none"> Turn off the Lamp and cool down the Lamp for at least 1 minute if hot. Switch off the power of the unit and wait for at least 15 seconds. Switch on the power of the unit and respect normal startup procedure. Check if the wire is connected with the CLO module (reference 1 of image 4-1) and with the Signal Backplane (reference 10 of image 4-1). Note: To access the Signal Backplane the top cover plate of the Light Processor compartment has to be removed. Removing the top cover plate will lead to an authorization request upon startup. If the problem remains, replace the CLO module. See service manual chapter "Replacing the Light Sensor module (CLO)", page 164.

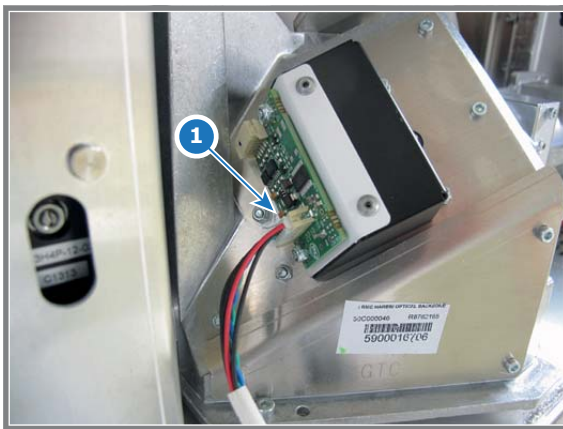


Image 4-1

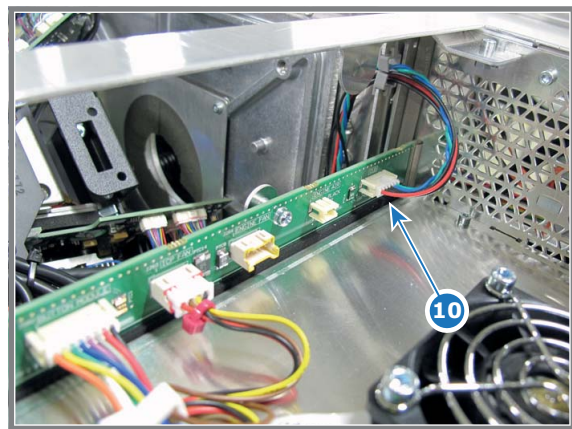
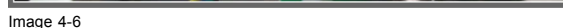
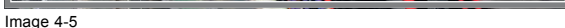


Image 4-2

Code 5005: "lamp power supplies - communication failed" (Error)

Situation	Solution
LPS communication cable disconnected from the J3 port of the ULCB unit.	Check if the LPS communication cable (reference 3 of image 4-3) is connected with the J3 port of the ULCB unit.
LPS communication cable disconnected from the Signal Backplane.	Check if the LPS communication cable (reference 6 of image 4-5) is connected with the Signal Backplane.
Lamp Ballast communication cable disconnected from the J1 and J2 port of the ULCB unit.	Check if the Lamp Ballast communication cable (reference 4 and 5 of image 4-4) is connected with the J1 and J2 port of the ULCB unit.
Lamp Ballast communication cable disconnected from the CN2 port of the Lamp Ballast unit.	Check if the Lamp Ballast communication cable (reference 7 of image 4-6) is connected with the CN2 port of the Lamp Ballast unit.
Malfunction of the Lamp Ballast module.	Replace the Lamp Ballast module. See service manual chapter "Lamp Power Supply (LPS)", page 85.
Malfunction Barco Cinema Controller board.	Replace the malfunction Barco Cinema Controller board. See service manual chapter "Replacement of the Cinema Controller", page 238.
Malfunction PFC module	Replace PFC Module (reference 8 of image 4-7).



Code 5020: “system - read projector identification failed” (Error)

Situation	Solution
Cinema Controller failure.	Reseat/replace the Cinema Controller board.
Projector ID card not well inserted in SIM slot.	Check if the Projector ID card is well inserted in the SIM card socket on the Signal Backplane (reference 8 of image 4-8). To access the SIM card socket the ICMP has to first be removed.
Corrupt or invalid Projector ID card.	Contact Barco for further actions.

4. Troubleshooting

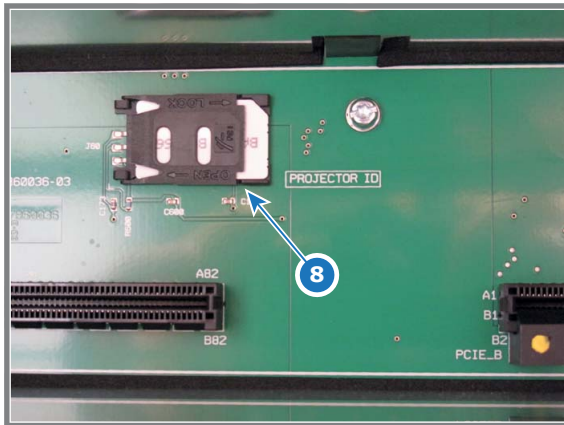


Image 4-8

Code 5053: “engine fan - speed low ” (Warning)

Situation	Solution
Blocked fan of the Light Processor compartment.	Unblock the fan. Ensure that the fan can turn freely (reference 1 image 4-9).
Damaged wire of the fan of the Light Processor compartment.	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one (reference 5 image 4-10).
Fan end of life.	Replace the fan. See service manual chapter "Replacement of the fan of the Light Processor compartment ", page 124.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

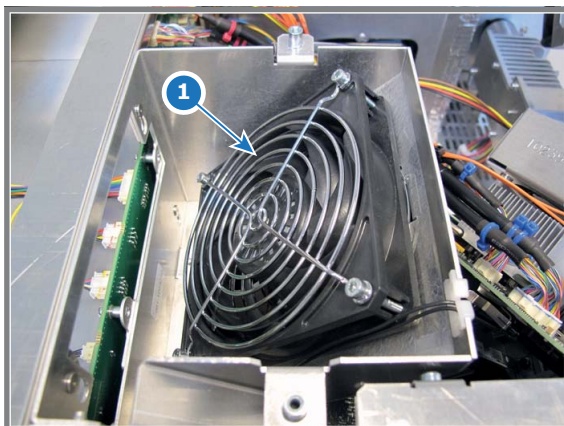


Image 4-9

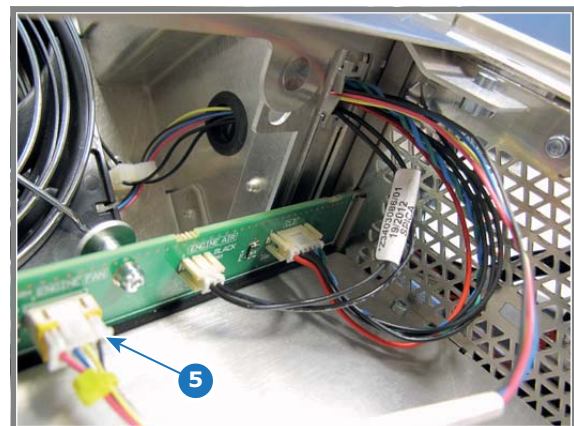


Image 4-10

Code 5103: “smcps fan 1 (left side) - speed low” (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely (reference 3 of image 4-11).
Damaged wire.	Remove the large dust filter from the projector and check if the wire of the left fan of the SMPS compartment is not damaged. Repair if possible, otherwise replace with new one. Note: SMPS fan 1 is the fan which wire is marked with a brown cable tie (reference 1 of image 4-12). SMPS fan 2 is the fan which wire is marked with a red cable tie (reference 2 of image 4-12).
Fan end of life.	Replace both fans of the SMPS compartment. See service manual chapter "Replacing the fans of the SMPS compartment", page 83. Note: If one fan of the SMPS compartment is end of life the other fan will probably also (nearly) end of live. For that, it's better to replace both fans at once.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

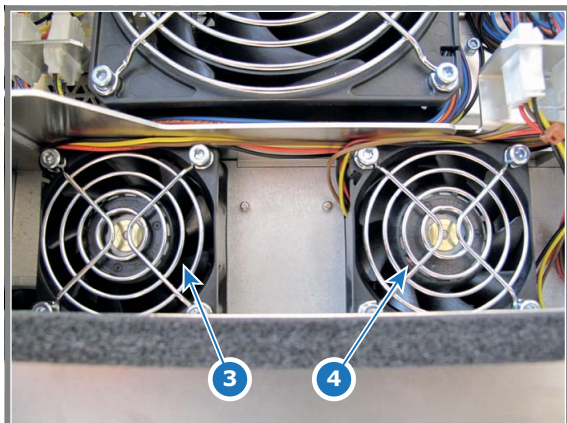


Image 4-11

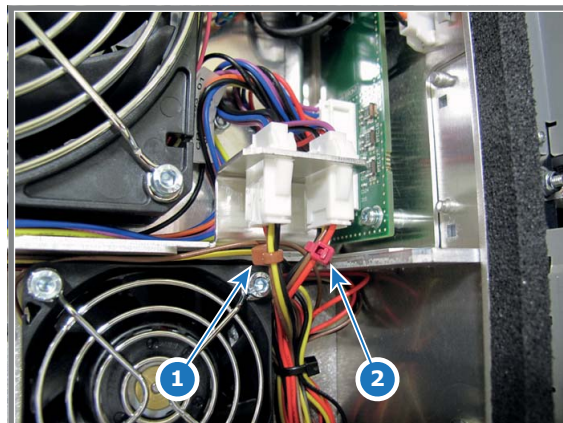


Image 4-12

Code 5113: “smps fan 2 (right side) - speed low” (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely (reference 4 of image 4-13).
Damaged wire.	Remove the large dust filter from the projector and check if the wire of the left fan of the SMPS compartment is not damaged. Repair if possible, otherwise replace with new one. Note: SMPS fan 1 is the fan which wire is marked with a brown cable tie (reference 1 of image 4-14). SMPS fan 2 is the fan which wire is marked with a red cable tie (reference 2 of image 4-14).
Fan end of life.	Replace both fans of the SMPS compartment. See service manual chapter "Replacing the fans of the SMPS compartment", page 83 Note: If one fan of the SMPS compartment is end of life the other fan will probably also (nearly) end of life. For that, it's better to replace both fans at once.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

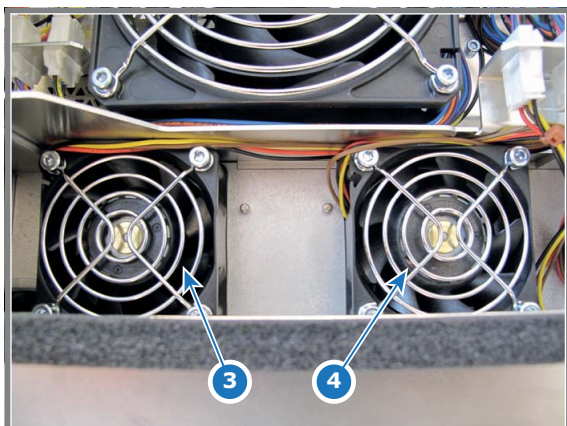


Image 4-13

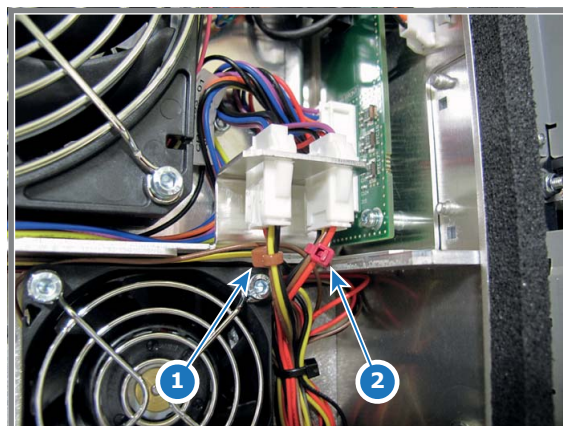


Image 4-14

Code 5143: “electronics fan 1 (top side) - speed low” (Warning)

Situation	Solution
Blocked fan.	Remove the large dust filter from the projector and check if the small fan can turn freely (reference 1 of image 4-15).
Damaged wire.	Remove the large dust filter from the projector and check if the wire of the Card Cage small fan is damaged. Repair if possible, otherwise replace with new one. Note: Electronics fan 1 (Card Cage small fan) is the fan which wire is marked with a yellow cable tie (reference 3 of image 4-16). Electronics fan 2 (Card Cage large fan) is the fan which wire is marked with a orange cable tie (reference 4 of image 4-16).

4. Troubleshooting

Situation	Solution
Fan end of life.	Replace the Card Cage small fan. See service manual chapter "Replacement of the Card Cage small fan", page 239.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

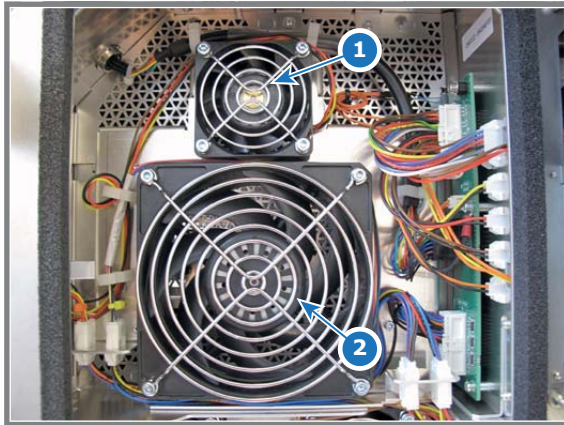


Image 4-15

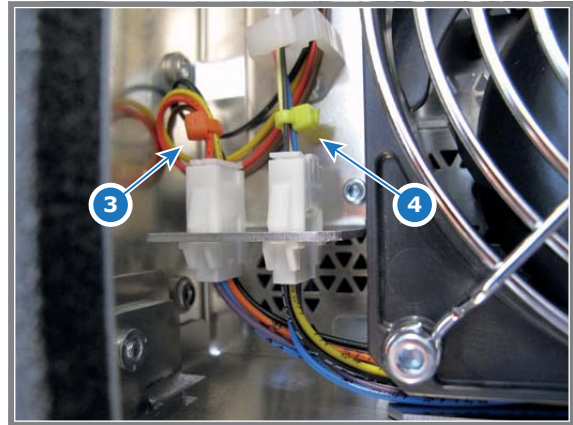


Image 4-16

Code 5153: "electronics fan 2 (bottom side) - speed low" (Warning)

Situation	Solution
Blocked fan.	Remove the large dust filter from the projector and check if the large fan can turn freely (reference 2 of image 4-17).
Damaged wire.	Remove the large dust filter from the projector and check if the wire of the Card Cage large fan is damaged. Repair if possible, otherwise replace with new one. Note: Electronics fan 1 (Card Cage small fan) is the fan which wire is marked with a yellow cable tie (reference 3 of image 4-18). Electronics fan 2 (Card Cage large fan) is the fan which wire is marked with an orange cable tie (reference 4 of image 4-18).
Fan end of life.	Replace the Card Cage large fan. See service manual chapter "Replacement of the Card Cage large fan", page 240.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

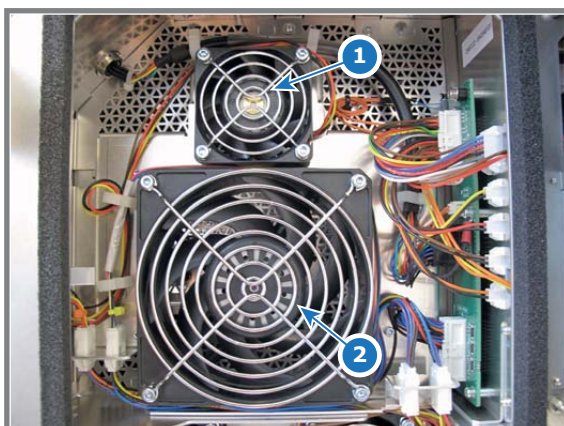


Image 4-17

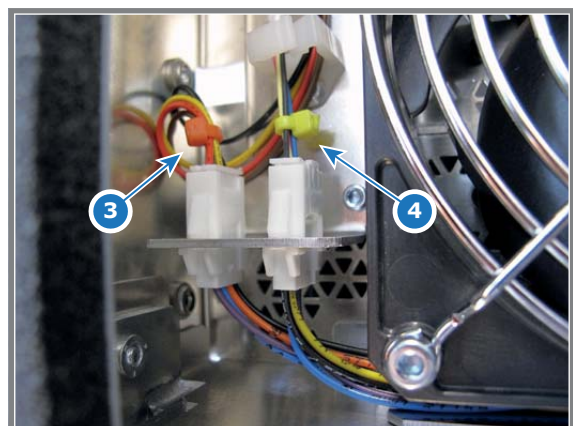


Image 4-18

Code 5180: “lamp module - not connected” (Error)

Situation	Solution
lamp module is not properly connected.	Check if the lamp module is properly installed. Make sure that the red wire of the Lamp Switch (reference 1 of image 4-19) is properly connected.

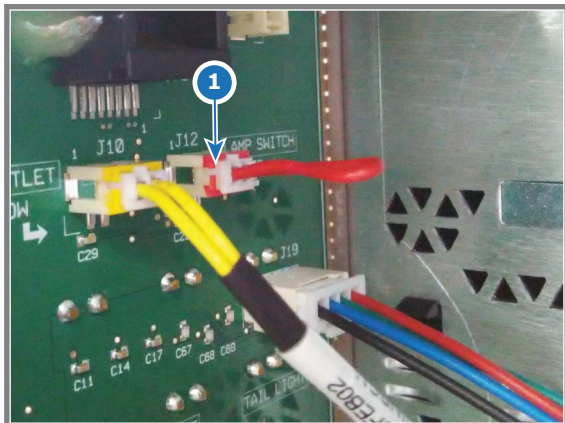


Image 4-19

Code 5191: “prism switch - warning (lens probably touches prism)” (Warning)

Situation	Solution
Lens is touching the sensor on the prism. Maximum lens shift position reached.	Shift the lens upwards and/or to the left.
Defect prism sensor.	Remove lens and reboot projector, if warning appears again then the prism sensor is defective and needs to be replaced (reference 1 of image 4-20). Caution: after replacement of the prism sensor ensure that the wire of the prism sensor is connected with the Signal Backplane! (reference 2 of image 4-21 and reference 5 of image 4-22)

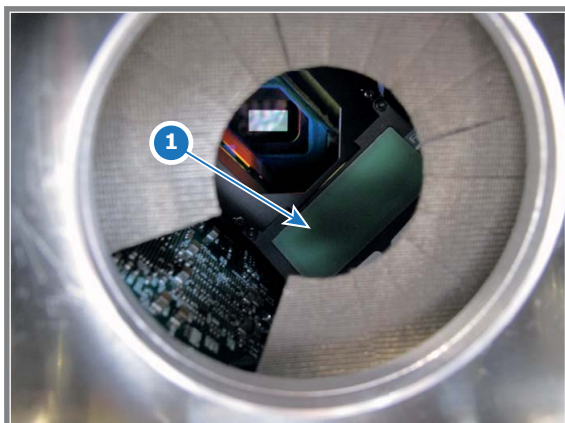


Image 4-20

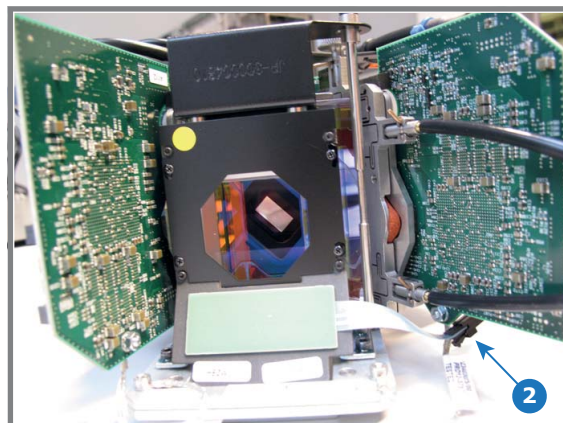


Image 4-21

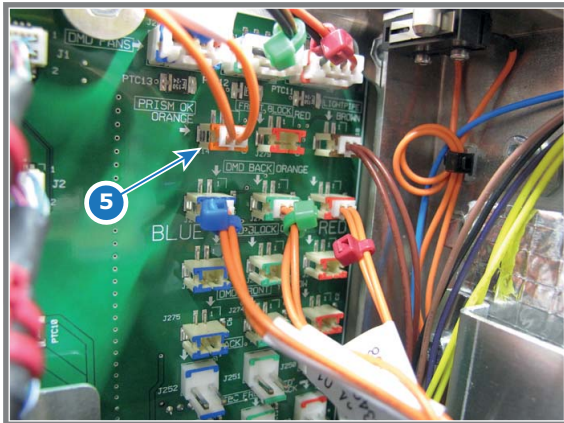


Image 4-22

Code 5230: “lens zoom position - requested target not reached” (Warning)

Situation	Solution
Manual lens installed.	Replace the manual lens with a motorized lens.
Lens not correctly installed.	Check that the lens is correctly installed. See service manual chapter "Lens installation", page 191.
The activated lens file does not correspond with the lens mounted on the projector.	Activate a lens file which does correspond with the mounted lens or mount an other lens which correspond with the lens file you want to activate.
Corrupt lens file.	<p>Delete the lens file and program correct lens type into communicator under Advanced/lens parameters and recreate a new lens file.</p> <p>Tip: Perform a “Lens Homing” before creating a new lens file. Otherwise, if the lens is removed the existing lens file becomes useless. Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that the lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom.</p>
The final lens position lays very close to the mechanical limits which disable the motorized lens position.	<p>Position the lens manually, or reposition the projector so that the lens position lays further away from the mechanical limits, or try to use another lens which range is more suitable.</p> <p>Tip: Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom. Program correct lens type into communicator under Advanced/lens parameters and recreate the lens files.</p>
Disconnected wire of the zoom and focus motors of the motorized lens.	Remove the Lens Holder cover of the projector and check if the orange wire at the left side of the Lens Holder is connected (reference 5 image 4-23)
Disconnected wire, of the lens motors, from the Signal Backplane.	Remove the large dust filter from the projector and check if the wire (reference 3 image 4-24) is inserted in the Signal Backplane.
Broken or damaged electrical socket of the Lens Holder.	Check if the electrical socket (reference 1 image 4-25) on the Lens Holder front plate is not damaged. If damaged replace the socket. See service manual chapter "Lens Holder", page 183.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.
Malfunction zoom motor of the lens.	Use the local keypad to zoom the image on the screen. If unsuccessful, replace the motorized lens or replace the motor assembly of the lens. See service procedure "Replacement of the motor assembly for 0.69" DC2K lenses (Type 'M')", page 200.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane. See service procedure "Signal Backplane replacement process", page 244.

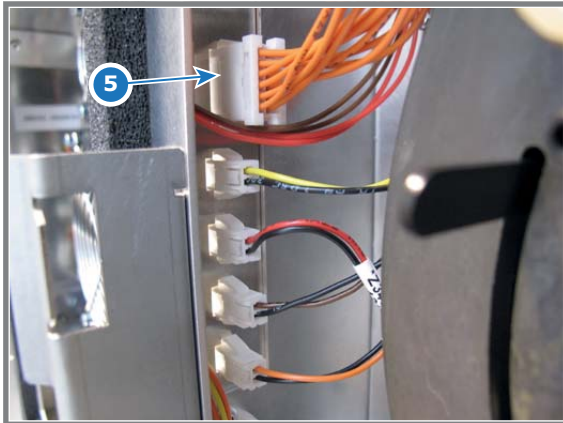


Image 4-23

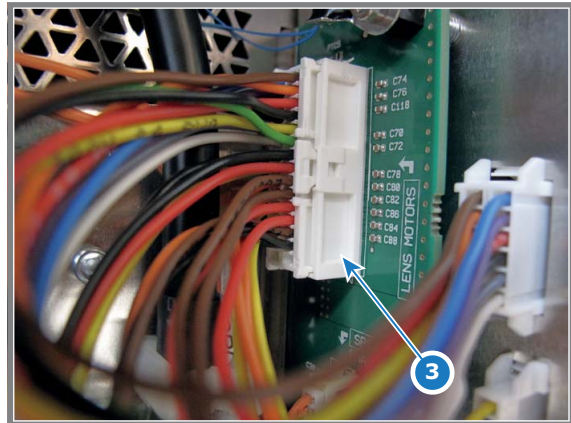


Image 4-24

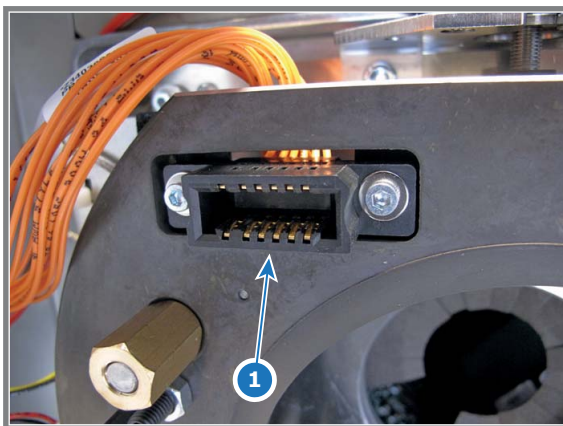


Image 4-25

Code 5231: “lens focus position - requested target not reached” (Warning)

Situation	Solution
Manual lens installed.	Replace the manual lens with a motorized lens.
Lens not correctly installed.	Check that the lens is correctly installed. See service manual chapter "Lens installation", page 191.
The activated lens file does not correspond with the lens mounted on the projector.	Activate a lens file which does correspond with the mounted lens or mount an other lens which correspond with the lens file you want to activate.
Corrupt lens file.	<p>Delete the lens file and program correct lens type into communicator under Advanced/lens parameters and recreate a new lens file.</p> <p>Tip: perform a “Lens Homing” before creating a new lens file. Otherwise, if the lens is removed the existing lens file becomes useless. Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that the lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom.</p>
The final lens position lays very close to the mechanical limits which disable the motorized lens position.	<p>Position the lens manually, or reposition the projector so that the lens position lays further away from the mechanical limits, or try to use another lens which range is more suitable.</p> <p>Tip: Setup all new lens files away from the maximum limitation of the lens zoom. It is possible that lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom. Program correct lens type into communicator under Advanced/lens parameters and recreate the lens files.</p>
Disconnected wire of the zoom and focus motors of the motorized lens.	Remove the Lens Holder cover of the projector and check if the orange wire at the left side of the Lens Holder is connected (reference 5 image 4-26)
Disconnected wire, of the lens motors, from the Signal Backplane.	Remove the large dust filter from the projector and check if the wire (reference 3 image 4-27) is inserted in the Signal Backplane.
Broken or damaged electrical socket of the Lens Holder.	Check if the electrical socket (reference 1 image 4-28) on the Lens Holder front plate is not damaged. If damaged replace the socket. See service manual chapter "Lens Holder", page 183.

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Situation	Solution
Malfunction Cinema Control board.	Replace the Cinema Control board. See service procedure "Replacement of the Cinema Controller", page 238.
Malfunction zoom motor of the lens.	Use the local keypad to zoom the image on the screen. If unsuccessful, replace the motorized lens or replace the motor assembly of the lens. See service procedure "Replacement of the motor assembly for 0.69" DC2K lenses (Type 'M')", page 200.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane. See service procedure "Signal Backplane replacement process", page 244.

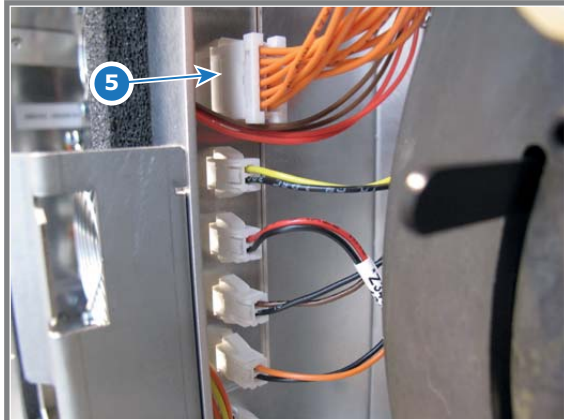


Image 4-26

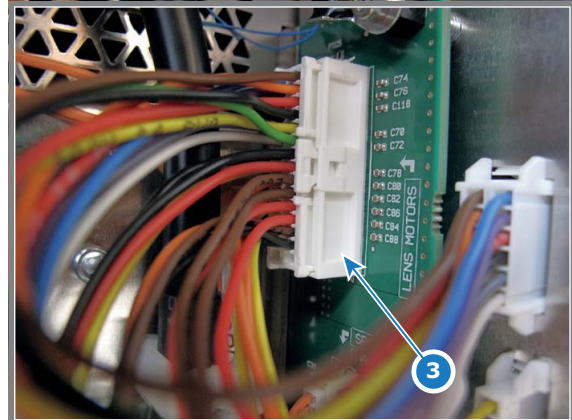


Image 4-27

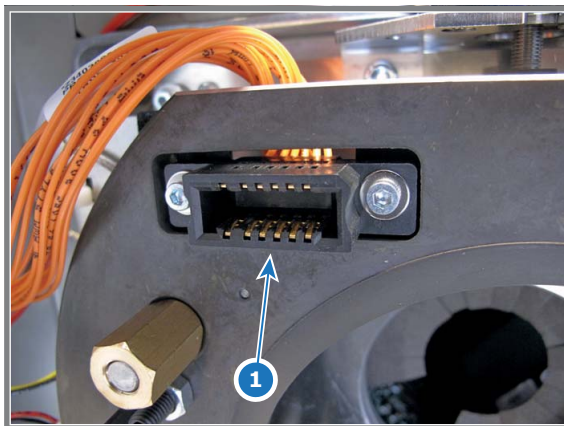


Image 4-28

Code 5232: "lens horizontal shift position - requested target not reached" (Warning)

Situation	Solution
The activated lens file does not correspond with the lens mounted on the projector.	Activate a lens file which does correspond with the mounted lens or mount an other lens which correspond with the lens file you want to activate.
Corrupt lens file.	Delete the lens file and program correct lens type into communicator under Advanced/lens parameters and recreate a new lens file. Tip: Perform a "Lens Homing" before creating a new lens file. Otherwise, if the lens is removed the existing lens file becomes useless. Setup all new lens files away from the maximum limitation of the lens zoom.
The final lens position lays very close to the mechanical limits which disable the motorized lens position.	Reposition the projector (closer to on axis) so that the lens position lays further away from the mechanical limits, or try to use another lens which range is more suitable. Tip: Setup all new lens files away from the maximum limitation of the lens shift. It is possible that lens file was originally created at the maximum shift capabilities. Program correct lens type into communicator under Advanced/lens parameters and recreate the lens files.
Disconnected wire of the Lens Holder horizontal shift motor	Remove the Lens Holder cover from the projector and check if the yellow/orange wire (reference 4 image 4-30) is connected with the horizontal shift motor which is located at the right side of the Lens Holder.

Situation	Solution
Disconnected wires of the limit switches for horizontal shift.	Remove the Lens Holder cover from the projector and check if the yellow/black and orange/black wires (reference 6 & 9 image 4-29) are connected with the sockets at the right side of the Lens Holder compartment.
Wire of the lens motors is disconnected from the Signal Backplane.	Remove the large dust filter from the projector and check if the wire (reference 3 image 4-31) is inserted in the Signal Backplane.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service procedure "Replacement of the Cinema Controller", page 238.
Malfunction horizontal shift motor of the Lens Holder.	Use the local keypad to shift the image horizontally on the screen. If unsuccessful, replace the horizontal shift motor of the Lens Holder. See service manual chapter "Replacement of the Horizontal Shift stepper motor", page 198.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 244.

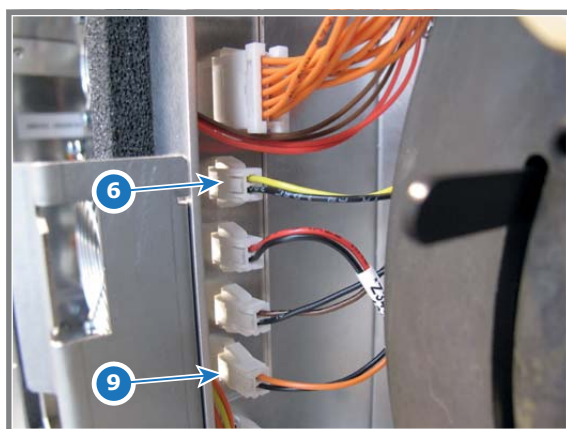


Image 4-29

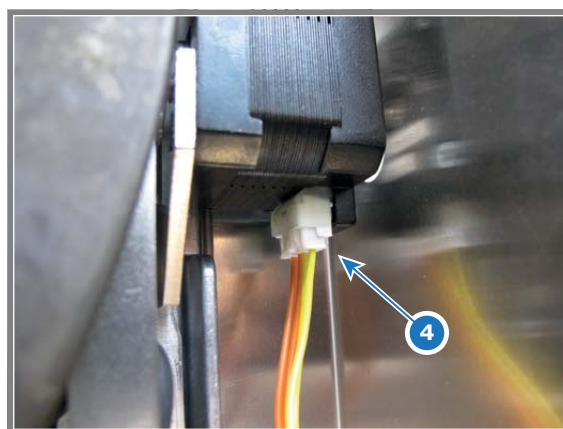


Image 4-30

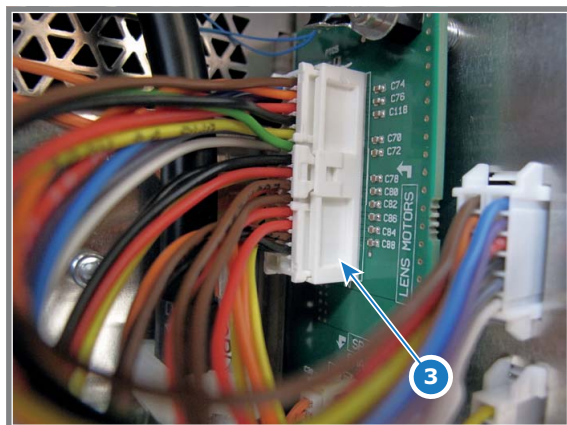


Image 4-31

Code 5233: "lens vertical shift position - requested target not reached" (Warning)

Situation	Solution
The activated lens file does not correspond with the lens mounted on the projector.	Activate a lens file which does correspond with the mounted lens or mount an other lens which correspond with the lens file you want to activate.
Corrupt lens file.	<p>Delete the lens file and program correct lens type into communicator under Advanced/lens parameters and recreate a new lens file.</p> <p>Tip: Perform a "Lens Homing" before creating a new lens file. Otherwise, if the lens is removed the existing lens file becomes useless. Setup all new lens files away from the maximum limitation of the lens zoom.</p>

4. Troubleshooting

Situation	Solution
The final lens position lays very close to the mechanical limits which disable the motorized lens position.	<p>Reposition the projector (closer to on axis) so that the lens position lays further away from the mechanical limits, or try to use another lens which range is more suitable.</p> <p>Tip: Setup all new lens files away from the maximum limitation of the lens shift. It is possible that lens file was originally created at the maximum shift capabilities. Program correct lens type into communicator under Advanced/lens parameters and recreate the lens files.</p>
Disconnected wire of the Lens Holder vertical shift motor	Remove the projector top cover and check if the brown/orange wire (reference 2 image 4-32) is connected with the vertical shift motor which is located at the top of the Lens Holder.
Disconnected wires of the limit switches for vertical shift.	Remove the Lens Holder cover from the projector and check if the red/black and brown/black wires (reference 7 & 8 image 4-33) are connected with the sockets at the right side of the Lens Holder compartment.
Wire of the lens motors is disconnected from the Signal Backplane.	Remove the large dust filter from the projector and check if the wire (reference 3 image 4-34) is inserted in the Signal Backplane.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service procedure "Replacement of the Cinema Controller", page 238.
Malfunction vertical shift motor of the Lens Holder.	Use the local keypad to shift the image horizontally on the screen. If unsuccessful, replace the horizontal shift motor of the Lens Holder. See service procedure "Replacement of the Horizontal Shift stepper motor", page 198.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane. See service procedure "Signal Backplane replacement process", page 244.

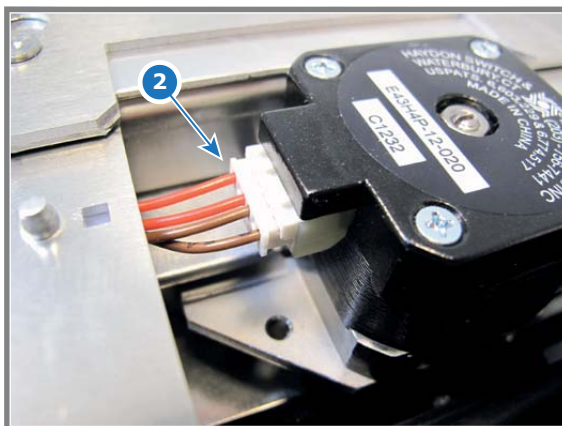


Image 4-32

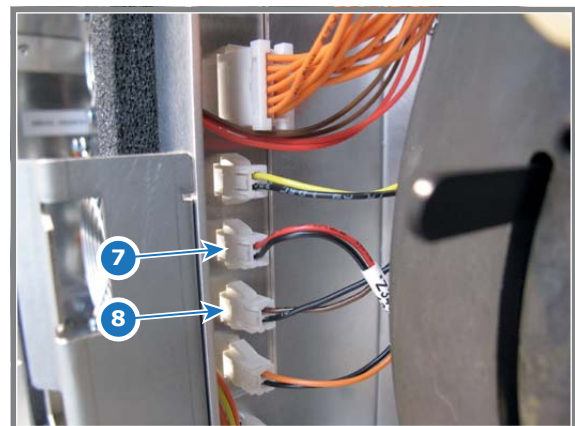


Image 4-33

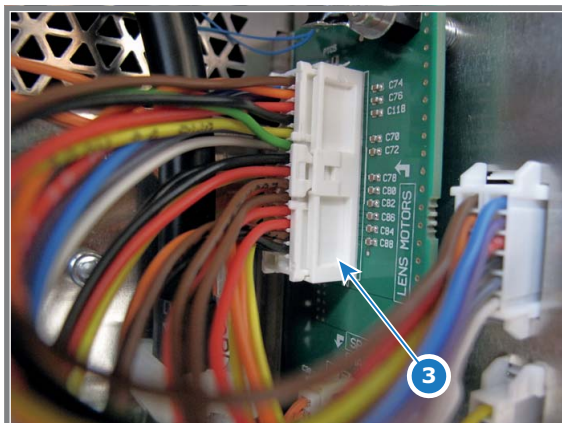


Image 4-34

Code 5253: “dmd red fan - speed low” (Warning)

Situation	Solution
Wire of the fan is disconnected.	Check if the wiring of the fan is connected with the signal backplane. See reference 3 image 4-35.
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely. The DMD fan of the Red channel is located underneath the Light Processor. See reference 13 image 4-36. Light Processor has to be removed to access the fan.
Damaged wire unit.	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Fan end of life.	Replace the fan. See service manual chapter "Replacement of the fan of the Red channel", page 127.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.
Other fans are also not spinning.	Replace the SMPS Board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.
Defect Signal Backplane	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 244.

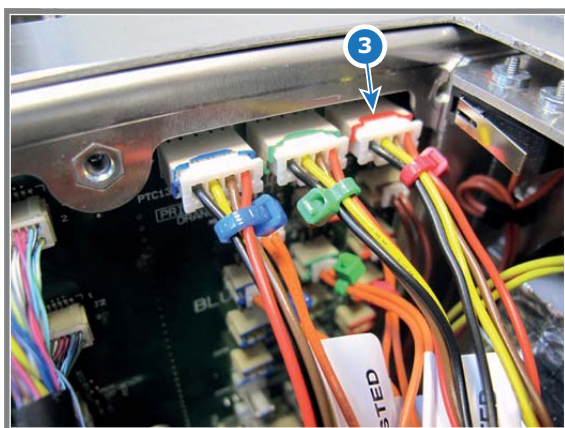


Image 4-35

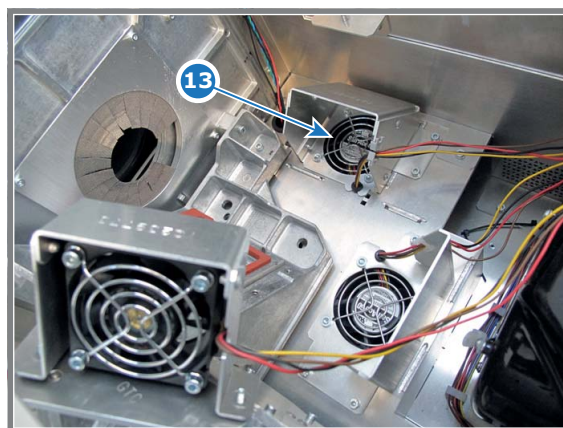


Image 4-36

Code 5263: “dmd green fan - speed low” (Warning)

Situation	Solution
Wire of the fan is disconnected.	Check if the wiring of the fan is connected with the signal backplane. See reference 2 image 4-37.
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely. The DMD fan of the Green channel is located underneath the Light Processor. See reference 12 image 4-38. Light Processor has to be removed to access the fan.
Damaged wire unit.	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Fan end of life.	Replace the fan. See service manual chapter "Replacement of the fan of the Green channel", page 129.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.
Other fans are also not spinning.	Replace the SMPS Board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.
Defect Signal Backplane	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 244.

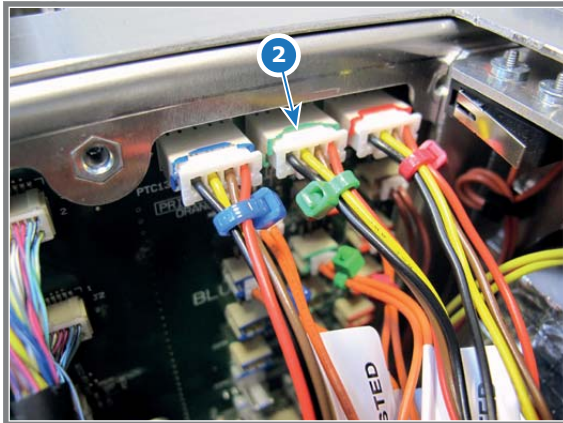


Image 4-37

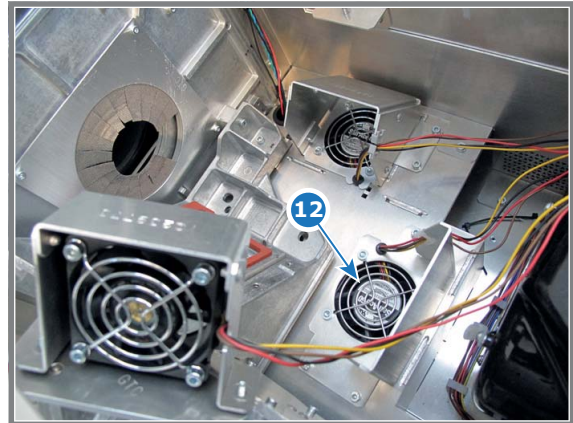


Image 4-38

Code 5273: “dmd blue fan - speed low” (Warning)

Situation	Solution
Wire of the fan is disconnected.	Check if the wiring of the fan is connected with the signal backplane. See reference 1 image 4-39.
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely. The DMD fan of the Blue channel is located above the Light Processor and Light Pipe. See reference 11 image 4-40. No need to remove the Light Processor to access the fan.
Damaged wire unit.	Check if the wire unit of the fan is not damaged. Repair if possible, otherwise replace with new one.
Fan end of life.	Replace the fan. See service manual chapter "Replacement of the fan of the Blue channel", page 131.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.
Other fans are also not spinning.	Replace the SMPS Board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.
Defect Signal Backplane	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 244.

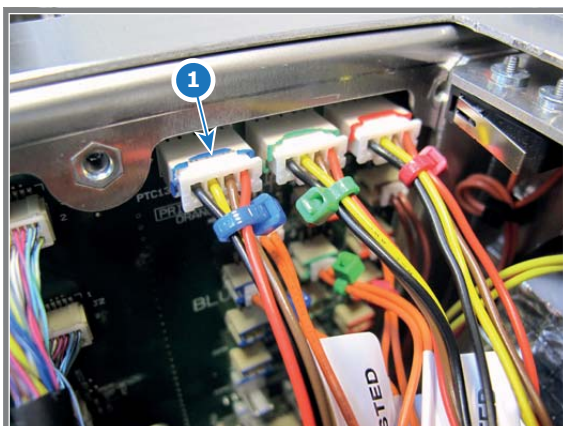


Image 4-39

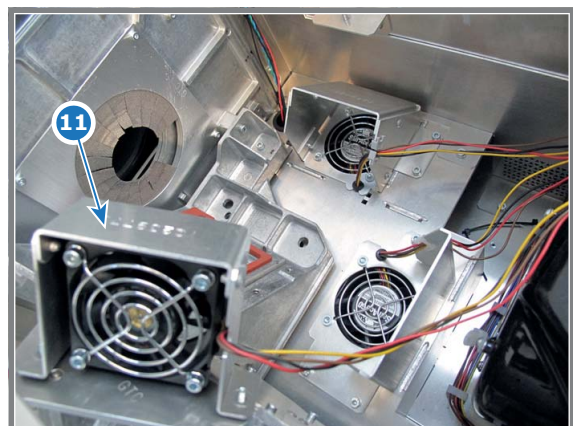


Image 4-40

Code 5280: “ambient - temperature too high” (Error)

This error code is probably preceded by the warning code: ambient - temperature high”. The same troubleshooting table can be applied.

Code 5281: “ambient - temperature high” (Warning)

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Blocked dust filter.	Clean the large dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.
Defect temperature sensor.	Replace the ambient temperature sensor (reference 12 image 4-41).
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

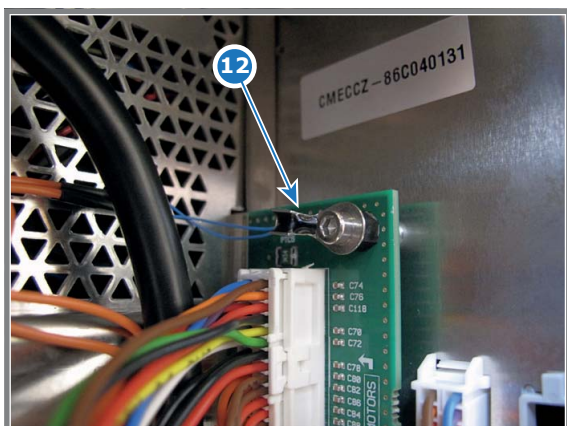


Image 4-41

Code 5284: “ambient - temperature sensor open” (Error)

Situation	Solution
Temperature sensor disconnected.	Check if wire (reference 14 image 4-42) of the ambient temperature sensor (NTC) is connected with the Signal Backplane.
Defect temperature sensor.	Replace the ambient temperature sensor (reference 12 image 4-43).
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.
Malfunction Signal Backplane.	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 244.

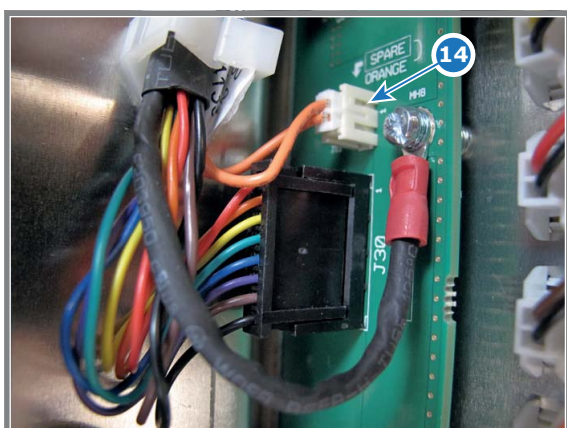


Image 4-42

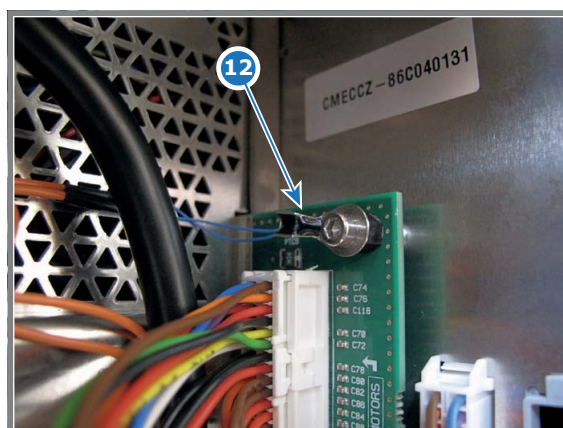


Image 4-43

Code 5285: “ambient - temperature sensor short” (Error)

Situation	Solution
Damaged wire insulation of the temperature sensor which measures the ambient temperature. When disconnecting the wire of the temperature sensor from the Signal Backplane (reference 14 image 4-42) the error code is changed to “ambient - temperature sensor open”.	<ol style="list-style-type: none"> 1. Repair the insulation of the of the temperature sensor which measures the heat sink temperature of the blue channel (reference 12 image 4-43). 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 12 image 4-43) which measures the ambient temperature. When disconnecting the wire of the temperature sensor from the Signal Backplane (reference 14 image 4-42) the error code is changed to “ambient - temperature sensor open”.	Replace the temperature sensor (reference 12 image 4-43) which measures the heat sink temperature of the blue channel.

Code 5290: “dmd blue - temperature too high” (Error)

This error code is probably preceded by the warning code 5291: “dmd blue - temperature high”. The same troubleshooting table can be applied to.

Code 5291: “dmd blue - temperature high” (Warning)

Situation	Solution
Blocked large dust filter.	Clean the large dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Defect temperature sensor.	Replace the temperature sensor (reference 16 image 4-44) which measures the heat sink temperature of the DMD of the blue channel.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.
Malfunction Light Processor.	Replace the whole Light Processor Unit. See service manual chapter "Light Processor replacement process", page 116. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

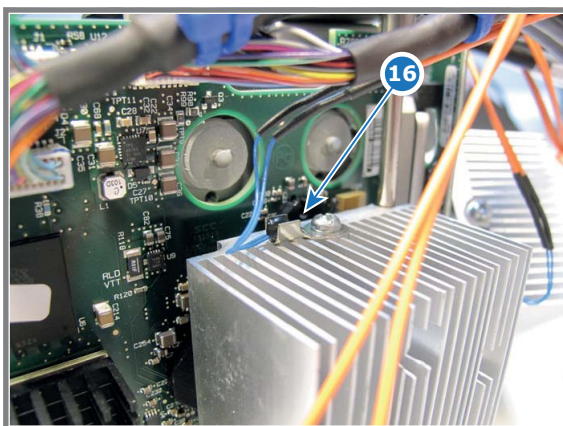


Image 4-44

Code 5293: “dmd blue - temperature low” (Warning)

Situation	Solution
The electronics of the Light Processor remains off due to a low DMD temperature.	Make sure that the ambient temperature is within specs (higher then 10°C (50°F)). Let the projector acclimate. Do not ignite the lamp, otherwise there is a risk for condensation.
Defect temperature sensor.	Replace the temperature sensor (reference 16 image 4-44) which measures the heat sink temperature of the blue channel.

Code 5294: “dmd blue - temperature sensor open” (Error)

Situation	Solution
Disconnected wire of the temperature sensor.	Check if the wire (reference 6 image 4-45) of the temperature sensor is plugged into its socket on the Signal Backplane.
Damaged wire of the temperature sensor.	<ol style="list-style-type: none"> 1. Repair the wire of the temperature sensor which measures the heat sink temperature of the blue channel (reference 16 image 4-46) . 2. If not repairable, replace the temperature sensor.
Defect temperature sensor.	Replace the temperature sensor (reference 16 image 4-46) which measures the heat sink temperature of the blue channel.

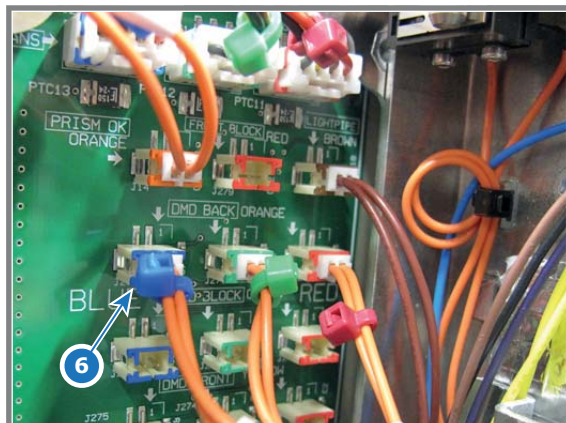


Image 4-45

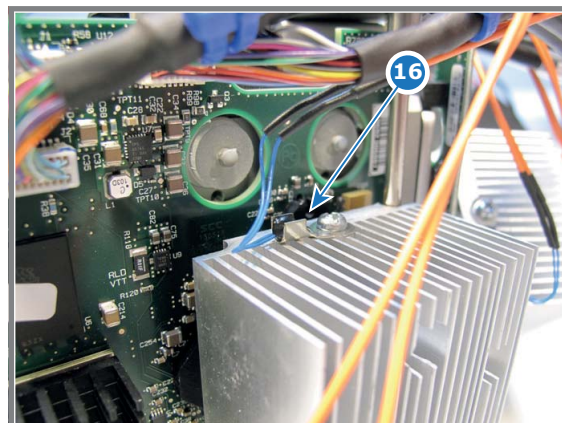


Image 4-46

Code 5295: “dmd blue - temperature sensor short” (Error)

Situation	Solution
Damaged wire insulation of the temperature sensor which measures the heat sink temperature of the blue channel. When disconnecting the wire of the temperature sensor from the Signal Backplane (reference 6 image 4-45) the error code is changed to “dmd blue - temperature sensor open”.	<ol style="list-style-type: none"> 1. Repair the insulation of the of the temperature sensor which measures the heat sink temperature of the blue channel (reference 16 image 4-46). 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 16 image 4-46) which measures the heat sink temperature of the blue channel. When disconnecting the wire unit of the temperature sensor from the Signal Backplane (reference 6 image 4-45) the error code is changed to “dmd blue - temperature sensor open”.	Replace the temperature sensor (reference 16 image 4-46) which measures the heat sink temperature of the blue channel.

Code 5300: “dmd green - temperature too high” (Error)

This error code is probably preceded by the warning code 5301: “dmd green - temperature high”. The same troubleshooting table can be applied to.

Code 5301: “dmd green - temperature high” (Error)

Situation	Solution
Blocked large dust filter.	Clean the large dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).

4. Troubleshooting

Situation	Solution
Malfunction air extraction system.	Check the condition of the air extraction system. The air extraction system must be capable of removing minimum 4 m³/min (140 CFM) per installed DP2K-E series digital projector. Note: limit the amount of extraction to a maximum of 5m³/min (180 CFM). Excessive air extraction can dramatically speed-up contamination of the projector air inlet filters, hence requiring more regular filter cleaning interventions.
Defect temperature sensor.	Replace the temperature sensor (reference 17 image 4-47) which measures the heat sink temperature of the DMD of the green channel.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.
Malfunction Light Processor.	Replace the whole Light Processor Unit. See service manual chapter "Light Processor replacement process", page 116. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

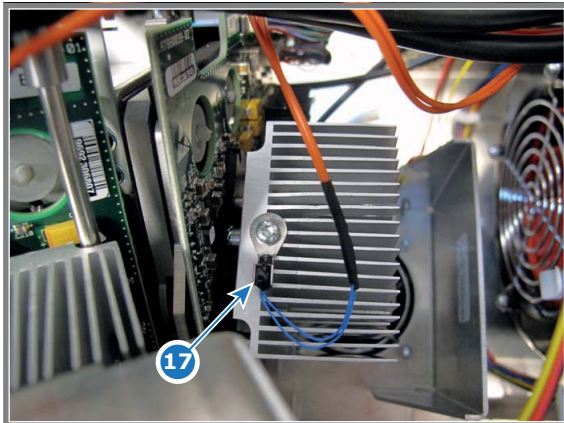


Image 4-47

Code 5303: “dmd green - temperature low” (Warning)

Situation	Solution
The electronics of the Light Processor remains off due to a low DMD temperature.	Make sure that the ambient temperature is within specs (higher then 10°C (50°F)). Let the projector acclimate. Do not ignite the lamp, otherwise there is a risk for condensation.
Defect temperature sensor.	Replace the temperature sensor (reference 17 image 4-47) which measures the heat sink temperature of the blue channel.

Code 5304: “dmd green - temperature sensor open” (Error)

Situation	Solution
Disconnected wire of the temperature sensor.	Check if the wire (reference 7 image 4-48) of the temperature sensor is plugged into its socket on the Signal Backplane.
Damaged wire of the temperature sensor.	<ol style="list-style-type: none">1. Repair the wire of the temperature sensor which measures the heat sink temperature of the green channel (reference 17 image 4-49) .2. If not repairable, replace the temperature sensor.
Defect temperature sensor.	Replace the temperature sensor (reference 17 image 4-49) which measures the heat sink temperature of the green channel.

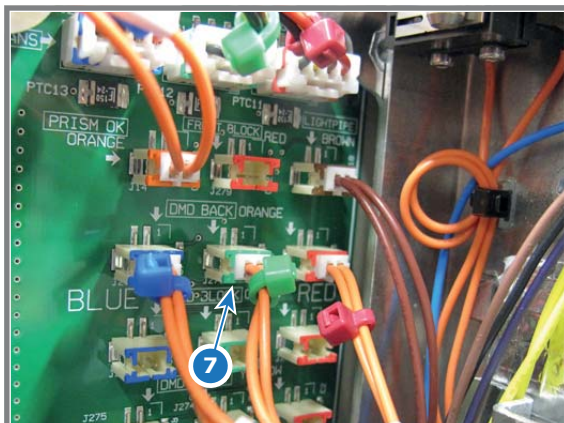


Image 4-48

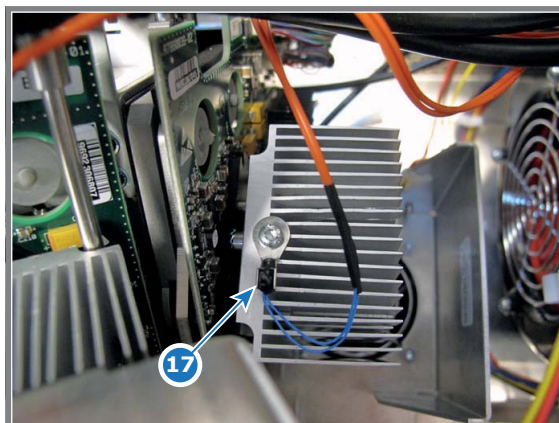


Image 4-49

Code 5305: “dmd green - temperature sensor short” (Error)

Situation	Solution
Damaged wire insulation of the temperature sensor which measures the heat sink temperature of the green channel. When disconnecting the wire of the temperature sensor from the Signal Backplane (reference 7 image 4-48) the error code is changed to “dmd green - temperature sensor open”.	<ol style="list-style-type: none"> 1. Repair the insulation of the of the temperature sensor which measures the heat sink temperature of the green channel (reference 17 image 4-49) . 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 17 image 4-49) which measures the heat sink temperature of the green channel. When disconnecting the wire unit of the temperature sensor from the Signal Backplane (reference 7 image 4-48) the error code is changed to “dmd green - temperature sensor open”.	Replace the temperature sensor (reference 17 image 4-49) which measures the heat sink temperature of the green channel.

Code 5310: “lamp - temperature too high” (Error)

This error code is probably preceded by the warning code 5311: “lamp - temperature high”. The same troubleshooting table can be applied.

Code 5311: “lamp - temperature high” (Warning)

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Blocked large dust filter.	Clean the large dust filter or replace with new one. See service manual chapter “Dust Filters and Filter Foams”, page 269.
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter “Dust Filters and Filter Foams”, page 269.
Malfunction air extraction system.	<p>Check the condition of the air extraction system. The air extraction system must be capable of removing minimum 4 m³/min (140 CFM) per installed DP2K-E series digital projector.</p> <p>Note: limit the amount of extraction to a maximum of 5m³/min (180 CFM). Excessive air extraction can dramatically speed up contamination of the projector air inlet filters, hence requiring more regular filter cleaning interventions.</p>
Malfunction system outlet fan.	Check the speed and voltage of the system outlet fan. See User Guide Communicator. Replace any malfunctioning fan.

4. Troubleshooting

Code 5314: "lamp - temperature sensor open" (Error)

Situation	Solution
Disconnected wire of the temperature sensor	Check if the wire (reference 9 of image 4-50) of the temperature sensor is properly plugged into its socket on the Signal Backplane.
Defect temperature sensor.	Replace the temperature sensor (reference 19 of image 4-51) which measures the heat sink temperature of the green channel.

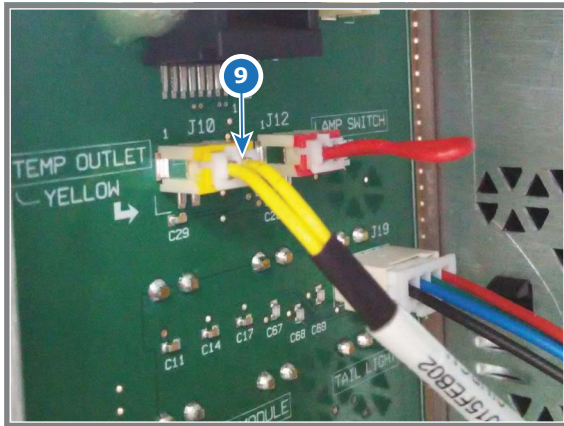


Image 4-50

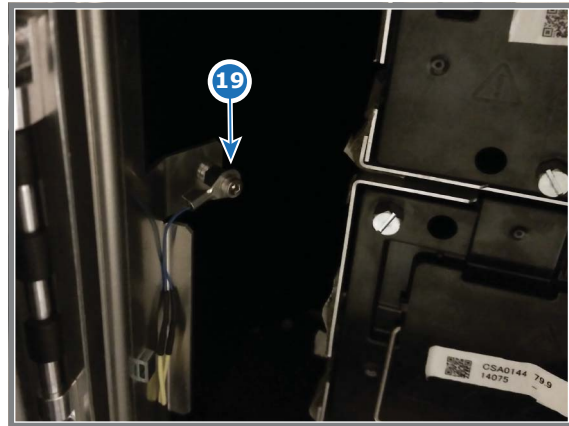


Image 4-51

Code 5315: "lamp - temperature sensor short " (Error)

Situation	Solution
Damaged insulation of the temperature sensor wires (reference 19 of image 4-51).	<ol style="list-style-type: none"> 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 19 of image 4-51), which measures the temperature in the channel of the air outlet of the lamp module. When disconnecting the wire unit of the temperature sensor from the Signal Backplane (reference 9 of image 4-50), the error code is changed to "lamp - temperature sensor open".	Replace the temperature sensor.

Code 5320: "fcb - force lps/lamp off" (Error)

Situation	Solution
The Cinema Control board forces to switch off the Lamp Power Supply due to an Error. This can be due to an over temperature or lamp module not connected.	<ol style="list-style-type: none"> 1. Ensure that all temperatures are within range (Light Processor, lamp module, ambient, etc. See projector log files) 2. Check if the lamp module is properly installed. Make sure that both fixation screws at the base of the lamp module are fastened. 3. Check the Fan warnings/errors in the log files and solve them. 4. Look for other errors in the log files and try to solve them.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

Code 5340: "dmd red - temperature too high" (Error)

This error code is probably preceded by the warning code 5341: "dmd red - temperature high". The same troubleshooting table can be applied.

Code 5341: "dmd red - temperature high" (Warning)

Situation	Solution
Blocked large dust filter.	Clean the large dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.

Situation	Solution
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Malfunction air extraction system.	Check the condition of the air extraction system. The air extraction system must be capable of removing minimum 4 m³/min (140 CFM) per installed DP2K-E series digital projector. Note: limit the amount of extraction to a maximum of 5m³/min (180 CFM). Excessive air extraction can dramatically speed-up contamination of the projector air inlet filters, hence requiring more regular filter cleaning interventions.
Defect temperature sensor.	Replace the temperature sensor (reference 18 image 4-52) which measures the heat sink temperature of the DMD of the red channel.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.
Malfunction Light Processor.	Replace the whole Light Processor Unit. See service manual chapter "Light Processor replacement process", page 116. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

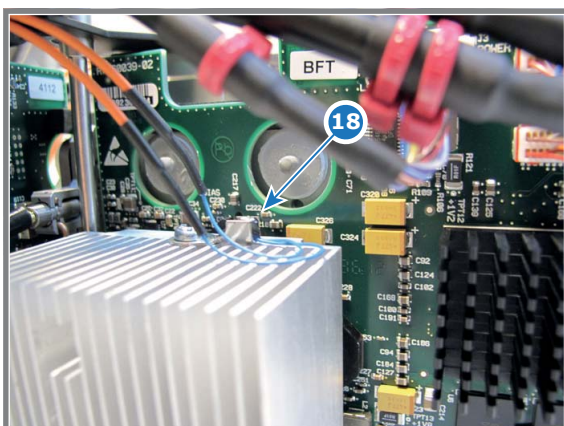


Image 4-52

Code 5343: "dmd red - temperature low" (Warning)

Situation	Solution
The electronics of the Light Processor remains off due to a low DMD temperature.	Make sure that the ambient temperature is within specs (higher then 10°C (50°F)). Let the projector acclimate. Do not ignite the lamp, otherwise there is a risk for condensation.
Defect temperature sensor.	Replace the temperature sensor (reference 18 image 4-52) which measures the heat sink temperature of the red channel.

Code 5344: "dmd red - temperature sensor open" (Error)

Situation	Solution
Disconnected wire of the temperature sensor.	Check if the wire (reference 8 image 4-53) of the temperature sensor is plugged into its socket on the Signal Backplane.
Damaged wire of the temperature sensor.	<ol style="list-style-type: none"> 1. Repair the wire of the temperature sensor which measures the heat sink temperature of the red channel (reference 18 image 4-54) . 2. If not repairable, replace the temperature sensor.
Defect temperature sensor.	Replace the temperature sensor (reference 18 image 4-54) which measures the heat sink temperature of the red channel.

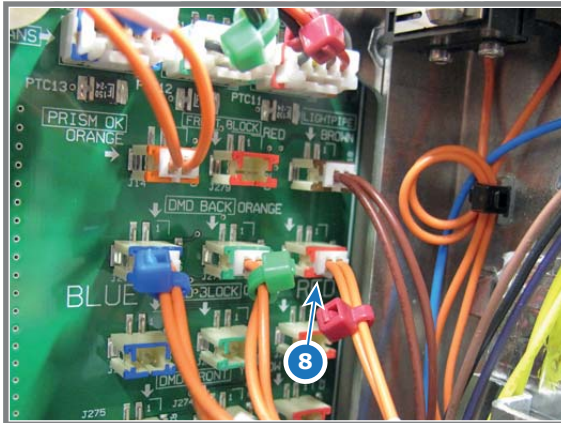


Image 4-53

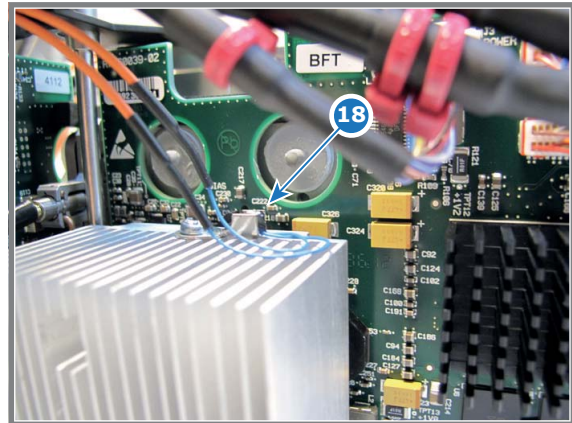


Image 4-54

Code 5345: "dmd red - temperature sensor short" (Error)

Situation	Solution
Damaged wire insulation of the temperature sensor which measures the heat sink temperature of the red channel. When disconnecting the wire of the temperature sensor from the Signal Backplane (reference 8 image 4-53) the error code is changed to "dmd red - temperature sensor open".	<ol style="list-style-type: none"> 1. Repair the insulation of the of the temperature sensor which measures the heat sink temperature of the red channel (reference 18 image 4-54). 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 18 image 4-54) which measures the heat sink temperature of the red channel. When disconnecting the wire unit of the temperature sensor from the Signal Backplane (reference 8 image 4-53) the error code is changed to "dmd red - temperature sensor open".	Replace the temperature sensor (reference 18 image 4-54) which measures the heat sink temperature of the red channel.

Code 5351: "smps primary heatsink - temperature high" (Warning)

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Blocked large dust filter.	Clean the large dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.
Malfunction air extraction system.	<p>Check the condition of the air extraction system. The air extraction system must be capable of removing minimum 4 m³/min (140 CFM) per installed DP2K-E series digital projector.</p> <p>Note: limit the amount of extraction to a maximum of 5m³/min (180 CFM). Excessive air extraction can dramatically speed-up contamination of the projector air inlet filters, hence requiring more regular filter cleaning interventions.</p>
Malfunction SMPS board.	Replace the SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

Code 5361: "smps secondary heatsink - temperature high" (Warning)

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Blocked large dust filter.	Clean the large dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.

Situation	Solution
Malfunction air extraction system.	Check the condition of the air extraction system. The air extraction system must be capable of removing minimum 4 m ³ /min (140 CFM) per installed DP2K-E series digital projector. Note: limit the amount of extraction to a maximum of 5m ³ /min (180 CFM). Excessive air extraction can dramatically speed-up contamination of the projector air inlet filters, hence requiring more regular filter cleaning interventions.
Malfunction SMPS board.	Replace the SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

Code 5364: "smps secondary heatsink - temperature sensor open " (Error)

Situation	Solution
Malfunction SMPS board.	Replace the SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 5365: "smps secondary heatsink - temperature sensor short" (Error)

Situation	Solution
Malfunction SMPS board.	Replace the SMPS board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 5646: "lamp - set lamp on failed" (Error)

Situation	Solution
Lamp exhausted	Install a new lamp module.
Power cables disconnected from the Lamp Ballast module.	Check that the power cables of the Lamp Ballast module (reference 1 of image 4-55) are connected properly.
The lamp module is not properly installed. Use self-test item "Lamp switches" in Communication to test if the lamp modules have been installed correctly.	Reinstall the lamp modules. See service manual chapter "Installation of the Lamp Module", page 105.
Malfunction in PFC module.	Replace PFC module.
Malfunction Barco Cinema Controller board.	Replace the malfunction Barco Cinema Controller board. See service manual chapter "Replacement of the Cinema Controller", page 238.

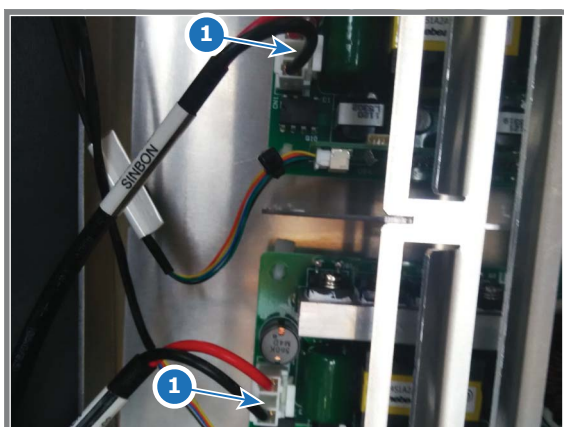


Image 4-55

Code 5647: “lamp - lamp is off due to an error” (Error)

Situation	Solution
The Lamp Power Supply was triggered to switch off the lamp due to an error.	Check the projector log files for other listed errors and solve these errors first. See "Log files", page 67.
Fan problems.	Check the projector log files for fan—related errors and warnings and try to solve these first. See "Log files", page 67

Code 5724: “lamp 1 run time - read failed” (Error)

Situation	Solution
Lamp 1 is not reset.	Reset lamp 1. See service manual chapter "Resetting the lamp parameters", page 106.

Code 5727: “lamp 1 run time - exceeds maximum” (Notification)

Situation	Solution
Lamp 1 has exceeded its maximum run time limit.	Replace lamp 1 and reset hours and bulb type. See service manual chapter "Lamp and Lamp Module", page 101.

Code 5728: “lamp 1 run time - read limits failed” (Error)

Situation	Solution
Lamp 1 is not reset.	Reset lamp 1. See service procedure "Resetting the lamp parameters", page 106.

Code 5729: “lamp 1 run time - warning (Notification)

Situation	Solution
Lamp 1 is about to exceed its maximum run time.	Replace Lamp module 1 as soon as possible. See service manual chapter "Lamp and Lamp Module", page 101.

Code 5734: “lamp 2 run time - read failed” (Error)

Situation	Solution
Lamp 2 is not reset.	Reset lamp 2. See service procedure "Resetting the lamp parameters", page 106.

Code 5737: “lamp 2 run time - exceeds maximum” (Notification)

Situation	Solution
Lamp 2 has exceeded its maximum run time limit.	Replace lamp module 2 and reset hours and bulb type. See service manual chapter "Lamp and Lamp Module", page 101.

Code 5738: “lamp 2 run time - read limits failed” (Error)

Situation	Solution
Lamp 2 is not reset.	Reset lamp 2. See service manual chapter "Resetting the lamp parameters", page 106.

Code 5739: “lamp 2 run time - warning (Notification)

Situation	Solution
Lamp 2 is about to exceed its maximum run time.	Replace Lamp module 2 as soon as possible. See service manual chapter "Lamp and Lamp Module", page 101.

Code 5740: “lamp - light is on, but at least one lamp is off” (Warning)

Situation	Solution
This warning will always appear in conjunction with warning 5741 or 5742.	Resolve the cause of warning 5741 or 5742.

Code 5741: “lamp - light is on, but lamp 1 is off” (Warning)

Situation	Solution
Lamp 1 is exhausted.	Replace lamp module 1. See service manual chapter .“Lamp and Lamp Module”, page 101.
Malfunction of the Lamp Ballast on the Lamp 1 chain.	Replace the Lamp Ballast. See procedure “Replace a Lamp Driver ”, page 92.
The lamp power cable is disconnected from the Lamp Ballast.	Check that the lamp power cable (reference 1 of image 4-56) is properly connected.
Malfunction on the ULCB module.	Replace ULCB module. See procedure “Replace the ULCB”, page 99.

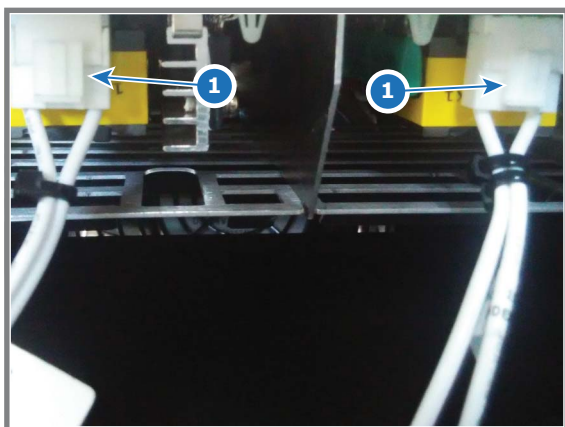


Image 4-56

Code 5742: “lamp - light is on, but lamp 2 is off” (Warning)

Situation	Solution
Lamp 2 is exhausted.	Replace lamp module 2. See service manual chapter .“Lamp and Lamp Module”, page 101.
Malfunction of the Lamp Ballast on the Lamp 2 chain.	Replace the Lamp Ballast. See procedure “Replace a Lamp Driver ”, page 92.
The lamp power cable is disconnected from the Lamp Ballast.	Check that the lamp power cable (reference 2 of image 4-57) is properly connected.
Malfunction on the ULCB module.	Replace ULCB module. See procedure “Replace the ULCB”, page 99.

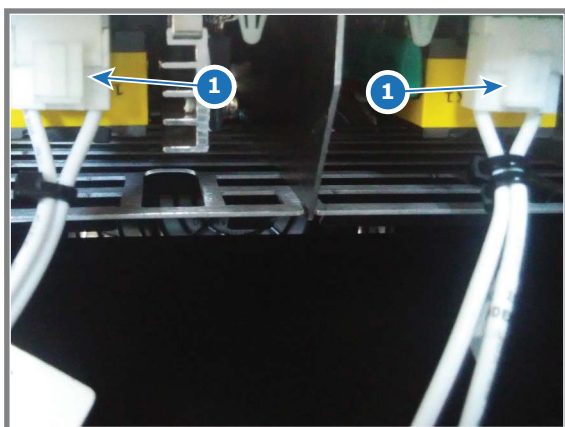


Image 4-57

Code 5960: “light pipe - temperature too high” (Error)

This error code is probably preceded by the warning code 5961: “light pipe - temperature high”. The same troubleshooting table can be applied.

Code 5961: “light pipe - temperature high” (Warning)

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Blocked large dust filter.	Clean the large dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.
Malfunction air extraction system.	Check the condition of the air extraction system. The air extraction system must be capable of removing minimum 4 m³/min (140 CFM) per installed DP2K-E series digital projector. Note: limit the amount of extraction to a maximum of 5m³/min (180 CFM). Excessive air extraction can dramatically speed-up contamination of the projector air inlet filters, hence requiring more regular filter cleaning interventions.
Defect temperature sensor.	Replace the temperature sensor (reference 3 of image 4-58) on the heatsink of the Light Pipe entrance.



Image 4-58

Code 5964: “light pipe - temperature sensor open” (Error)

Situation	Solution
The wire of the temperature sensor is disconnected.	<ol style="list-style-type: none"> 1. Check if the wire (reference 1 of image 4-59) of the temperature sensor is plugged into its socket. 2. Check if the wire (reference 2 of image 4-60) is plugged into its socket on the Signal Backplane.
The wire of the temperature sensor is damaged.	<ol style="list-style-type: none"> 1. Repair the wire of the temperature sensor which measures the heat sink temperature of the Light Pipe (reference 3 image 4-61) 2. If not repairable, replace the temperature sensor.
Defect temperature sensor.	Replace the temperature sensor which measures the heat sink temperature of the Light Pipe (reference 3) .
Malfunction on the Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

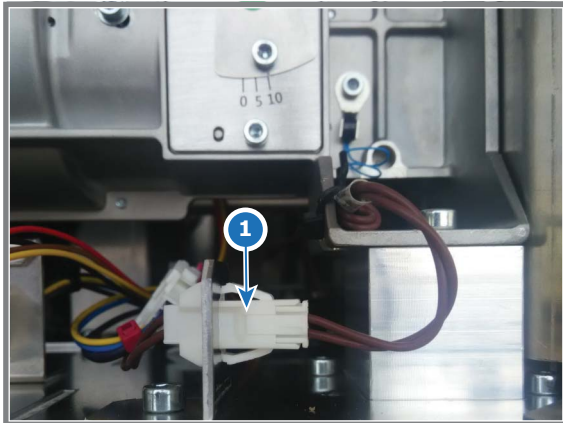


Image 4-59

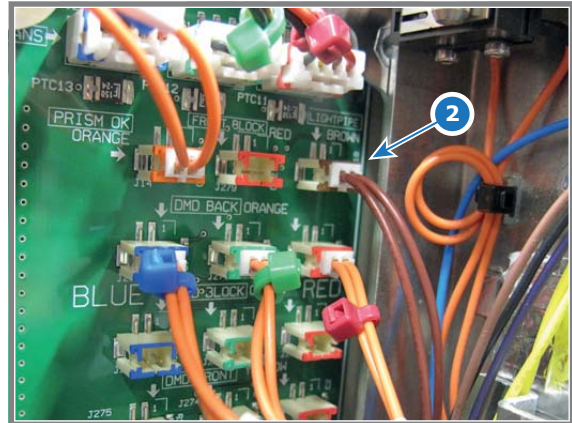


Image 4-60



Image 4-61

Code 5965: “light pipe - temperature sensor short” (Error)

Situation	Solution
Damaged wire insulation of the temperature sensor which measures the temperature at the Light Pipe entrance. When disconnecting the wire of the temperature sensor from its socket (reference 1 image 4-59) or from the Signal Backplane (reference 2 image 4-60) the error code is changed to “light pipe - temperature sensor open”.	<ol style="list-style-type: none"> 1. Repair the insulation of the of the temperature sensor which measures the temperature of Light Pipe entrance (reference 3 image 4-61). 2. If not repairable, replace the temperature sensor and wiring.

Code 6040: “engine air - temperature too high” (Error)

This error code is probably preceded by the warning code 6041: “engine air - temperature high”. The same troubleshooting table can be applied.

Code 6041: “engine air - temperature high” (Warning)

Situation	Solution
Blocked large dust filter.	Clean the large dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter "Dust Filters and Filter Foams", page 269.
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).

4. Troubleshooting

Situation	Solution
Malfunction air extraction system.	Check the condition of the air extraction system. The air extraction system must be capable of removing minimum 4 m³/min (140 CFM) per installed DP2K-E series digital projector. Note: limit the amount of extraction to a maximum of 5m³/min (180 CFM). Excessive air extraction can dramatically speed-up contamination of the projector air inlet filters, hence requiring more regular filter cleaning interventions.
Defect temperature sensor.	Replace the temperature sensor (reference 16 image 4-62) which measures the ambient temperature inside the Light Processor compartment.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.



Image 4-62

Code 6044: "engine air - temperature sensor open" (Error)

Situation	Solution
Disconnected wire of the temperature sensor.	Check if the wire (reference 6 image 4-63) of the temperature sensor is plugged into its socket on the Signal Backplane.
Damaged wire of the temperature sensor.	<ol style="list-style-type: none"> 1. Repair the wire of the temperature sensor which measures the temperature inside the compartment of the Light Processor Unit. (reference 16 image 4-62). 2. If not repairable, replace the temperature sensor.
Defect temperature sensor.	Replace the temperature sensor (reference 16 image 4-62) which measures the ambient temperature inside the Light Processor compartment.

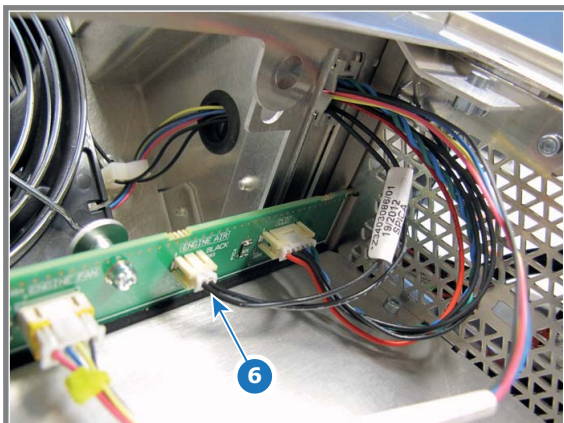


Image 4-63

Code 6045: “engine air - temperature sensor short” (Error)

Situation	Solution
Damaged wire insulation of the temperature sensor which measures the ambient temperature of the Light Processor compartment. When disconnecting the wire of the temperature sensor from the Signal Backplane (reference 6 image 4-64) the error code is changed to “engine air - temperature sensor open”.	<ol style="list-style-type: none"> 1. Repair the insulation of the of the temperature sensor which measures the ambient temperature of the Light Processor compartment (reference 16 image 4-65). 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 16 image 4-65) which measures the ambient temperature of the Light Processor compartment. When disconnecting the wire unit of the temperature sensor from the Signal Backplane (reference 6 image 4-64) the error code is changed to “engine air - temperature sensor open”.	Replace the temperature sensor (reference 16 image 4-65) which measures the ambient temperature of the Light Processor compartment.

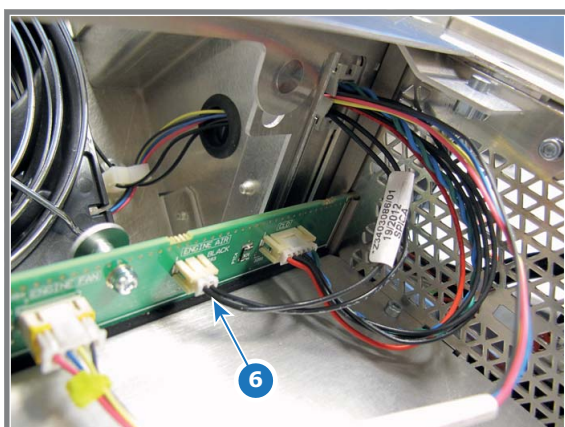


Image 4-64



Image 4-65

Code 6050: “dmd - temperature hardware protection warning” (Warning)

Situation	Solution
DMD temperature low.	Make sure that the ambient temperature is within specs. Let the projector acclimate to the normal room temperature which should be higher then 10°C (50°F) and lower then 35°C (95°F). Do not ignite the lamp, otherwise there is a risk for condensation.
DMD temperature high.	Check all cooling systems: small dust filter, large dust filter, air extraction system, etc.

Code 6061: “+24v - voltage high” (Warning)

Situation	Solution
Malfunction Cinema Control board or SMPS board.	<p>Put the projector in Stand-By mode, remove the lamp module and the Lamp Cathode Fan assembly to access the Signal Backplane connections with the SMPS wires (reference 6 image 4-66). Then, measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector with the black wires coming from the SMPS board. See image 4-66.</p> <p>If the measured voltage is about 24V then replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238. Otherwise replace the SMPS board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.</p> <p>Note: To remove the lamp module see service manual chapter "Removal of the Lamp Module", page 103.</p> <p>Note: The projector must be in Standby mode otherwise no voltages are generated by the SMPS board.</p>

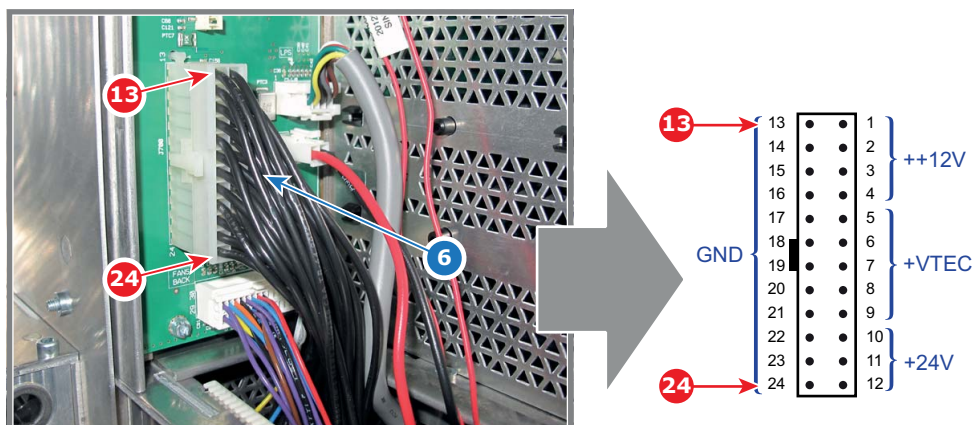


Image 4-66

Code 6062: “+24v - voltage too low” (Error)

This error code is probably preceded by the warning code 6063: “+24v - voltage low”. The same troubleshooting table can be applied.

Code 6063: “+24v - voltage low” (Warning)

Situation	Solution
Malfunction Fan Control board or SMPS board.	<p>Put the projector in Stand-By mode, remove the lamp module and the Lamp Cathode Fan assembly to access the Signal Backplane connections with the SMPS wires (reference 6 image 4-66). Then, measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector with the black wires coming from the SMPS board. See image 4-66.</p> <p>If the measured voltage is about 24V then replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238. Otherwise replace the SMPS board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.</p> <p>Note: To remove the lamp module see service manual chapter "Removal of the Lamp Module", page 103.</p> <p>Note: The projector must be in Stand-By mode otherwise no voltages are generated by the SMPS board.</p>
Short circuit or bad connection.	<ol style="list-style-type: none"> Check the Signal Backplane for bad connections. Ensure that all wires are well connected (reference 6 image 4-66). (Note that the +24V supply is generated on the SMPS board and enters the Cinema Control board via the Signal Backplane) Check the wiring (reference 1 image 4-67) of the Lamp Anode Fan for short circuits. Check the wiring (reference 3 image 4-68) of the Lamp Cathode Fan for short circuits. <p>Note: To access the SMPS connections with the Signal Backplane the lamp module and Lamp Cathode Fan assembly (reference 1 image 4-68) has to be removed from the projector.</p>

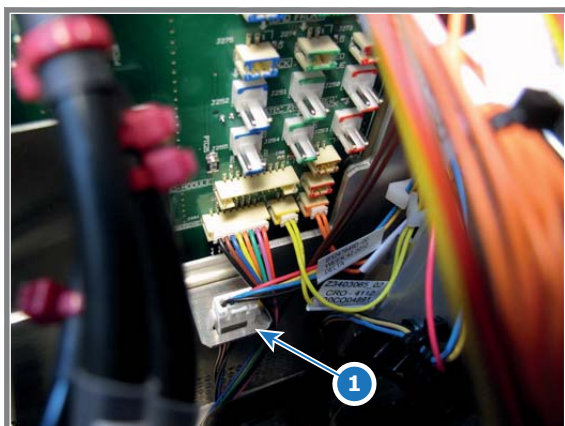


Image 4-67

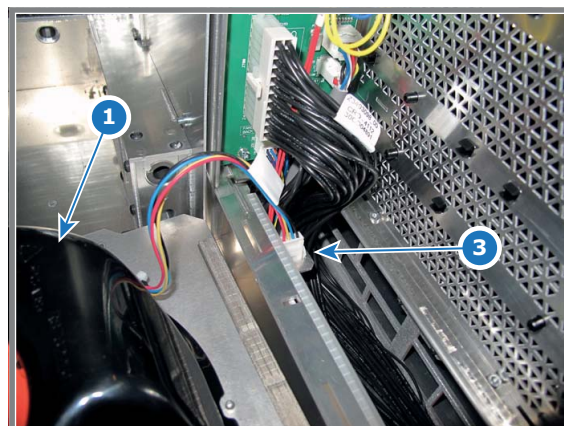


Image 4-68

Code 6071: “++12v - voltage high” (Warning)

Situation	Solution
Malfunction Cinema Control board or SMPS board.	<p>Put the projector in Stand-By mode, remove the lamp module and the Lamp Cathode Fan assembly to access the Signal Backplane connections with the SMPS wires (reference 6 image 4-69). Then, measure on the Signal Backplane the ++12V voltage on pin 1, 2 or 3 of the connector with the black wires coming from the SMPS board. See image 4-69.</p> <p>If the measured voltage is about 12V then replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238. Otherwise replace the SMPS board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.</p> <p>Note: To remove the lamp module see service manual chapter "Removal of the Lamp Module", page 103.</p> <p>Note: The projector must be in Stand-By mode otherwise no voltages are generated by the SMPS board.</p>

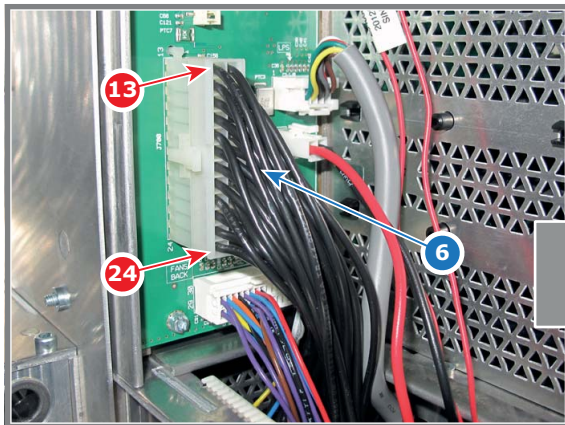
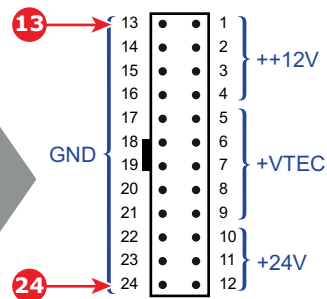


Image 4-69

**Code 6073: “++12v - voltage low” (Warning)**

Situation	Solution
Malfunction Fan Control board or SMPS board.	<p>Put the projector in Stand-By mode, remove the lamp module and the Lamp Cathode Fan assembly to access the Signal Backplane connections with the SMPS wires (reference 6 image 4-69). Then, measure on the Signal Backplane the ++12V voltage on pin 1, 2 or 3 of the connector with the black wires coming from the SMPS board. See image 4-69.</p> <p>If the measured voltage is about 12V then replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238. Otherwise replace the SMPS board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.</p> <p>Note: To remove the lamp module see service manual chapter "Removal of the Lamp Module", page 103.</p> <p>Note: The projector must be in Stand-By mode otherwise no voltages are generated by the SMPS board.</p>
Short circuit or bad connection.	<p>Check the Signal Backplane for bad connections.</p> <p>Note: To access the SMPS connections with the Signal Backplane the lamp module and Lamp Cathode Fan assembly (reference 1 image 4-68) has to be removed from the projector.</p>

Code 6082: “lens motors - voltage too low” (Error)

Situation	Solution
The supply voltage for the lens motors is below its minimum.	<p>Put the projector in Stand-By mode, remove the lamp module and the Lamp Cathode Fan assembly to access the Signal Backplane connections with the SMPS wires (reference 6 image 4-70). Then, measure on the Signal Backplane the +24V voltage on pin 9, 10, 11 or 12 of the connector with the black wires coming from the SMPS board. See image 4-70.</p> <p>(The supply voltage for the lens motors is derived from the +24V on the Cinema Controller board. The +24V supply is generated on the SMPS board and enters the Cinema Control board via the Signal Backplane.)</p> <p>If the measured voltage is about 24V then:</p> <ol style="list-style-type: none"> 1. reseal the Cinema Control board. See "Replacement of the Cinema Controller", page 238. 2. if the problem remains, replace the Cinema Controller board. <p>If the measured voltage is not OK then:</p> <ol style="list-style-type: none"> 1. Check the Signal Backplane for bad connections. Ensure that all wires are well connected. 2. Check the wiring (reference 1 image 4-67) of the Lamp Anode Fan for short circuits. 3. Check the wiring (reference 3 image 4-68) of the Lamp Cathode Fan for short circuits. 4. Replace the SMPS board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79. <p>Note: To remove the lamp module see service manual chapter "Removal of the Lamp Module", page 103.</p> <p>Note: The projector must be in Stand-By mode otherwise no voltages are generated by the SMPS board.</p>

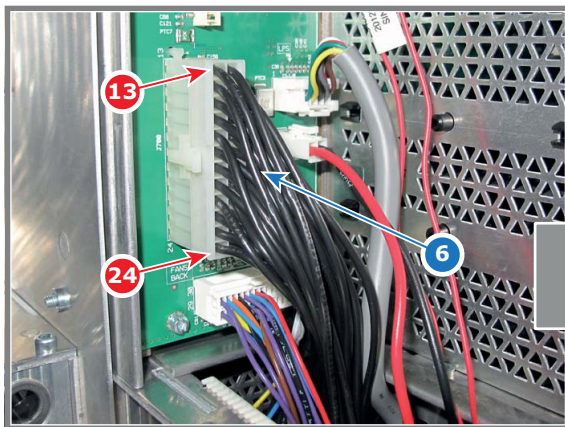
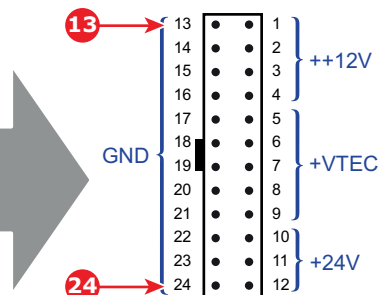


Image 4-70

**Code 6200: “maintenance - maintenance required” (Notification)**

Situation	Solution
Projector requires maintenance.	<p>Go to the menu "Maintenance → Smart maintenance" in the Communicator software.</p> <p>See also maintenance program of the projector (included in the service manual).</p>

Code 6210: “lens - no lens parameter file has been activated” (Warning)

Situation	Solution
No lens parameter file has been activated.	<p>Select a suitable lens parameter file for the installed lens using the Communicator software.</p> <p>>Installation >Advanced >Lens parameters >Select</p>

Code 6233: “light pipe fan - speed low” (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely (reference 2 image 4-71).

Situation	Solution
Damaged wire.	Check the wire of the fan. Repair if possible, otherwise replace with new one. See service manual chapter "Light Pipe", page 135.
Fan end of life.	Replace the fan. See service manual chapter "Light Pipe", page 135.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

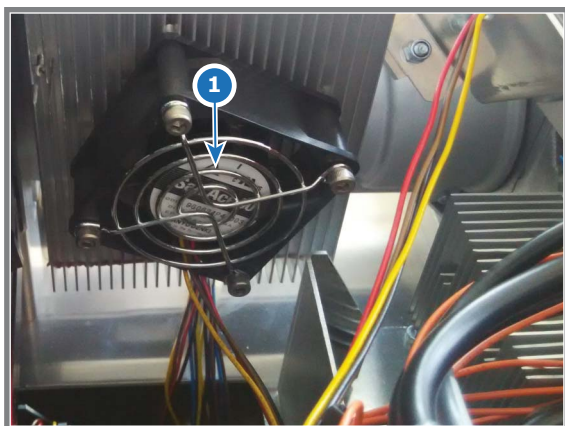


Image 4-71

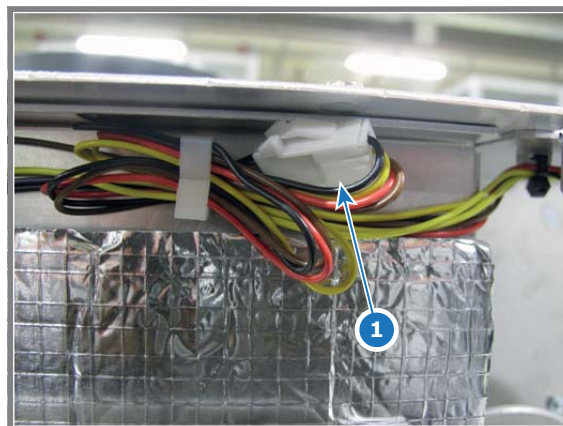


Image 4-72

Code 6262: lamp 1 fan (bottom side) speed too low (Error)

This error code is probably preceded by the warning code 6263: "lamp 1 fan (bottom side) - speed low". The same troubleshooting table can be applied.

Code 6263: lamp 1 fan (bottom side) - speed low (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely (reference 1 image 4-73).
Damaged wire.	Check the wire of the fan. Repair if possible, otherwise replace with new one.
Fan end of life.	Replace the fan.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service procedure "Replacement of the Cinema Controller", page 238.

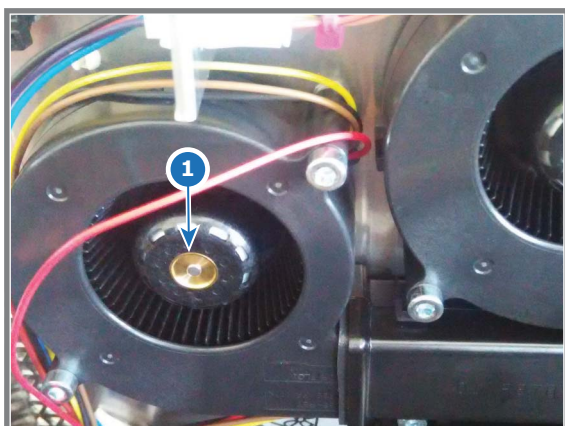


Image 4-73

Code 6270: lamp 1 fan (bottom side) - voltage too high (Error)

This error code is probably preceded by the warning code 6271: "lamp 1 fan (bottom side) - voltage high". The same troubleshooting table can be applied.

Code 6271: lamp 1 fan (bottom side) - voltage high (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 6272: lamp 1 fan (bottom side) - voltage too low (Error)

This error code is probably preceded by the warning code 6273: "lamp 1 fan (bottom side) - voltage low". The same troubleshooting table can be applied.

Code 6273: lamp 1 fan (bottom side) - voltage low (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 6282: lamp 1 fan (top side) speed too low (Error)

This error code is probably preceded by the warning code 6283: "lamp 1 fan (top side) - speed low". The same troubleshooting table can be applied.

Code 6283: lamp 1 fan (top side) - speed low (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely (reference 1 image 4-74).
Damaged wire.	Check the wire of the fan. Repair if possible, otherwise replace with new one.
Fan end of life.	Replace the fan.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

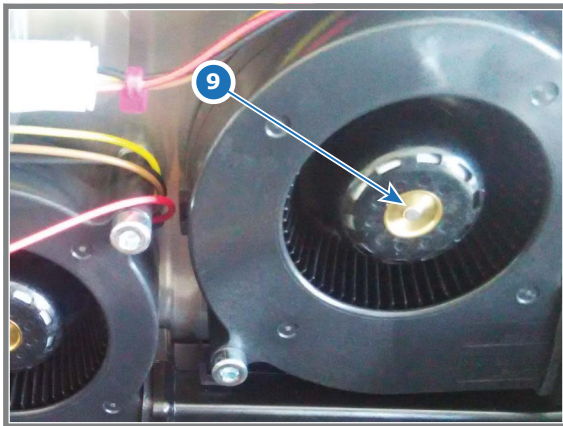


Image 4-74

Code 6290: lamp 1 fan (top side) - voltage too high (Error)

This error code is probably preceded by the warning code 6291: "lamp 1 fan (top side) - voltage high". The same troubleshooting table can be applied.

Code 6291: lamp 1 fan (top side) - voltage high (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 6292: lamp 1 fan (top side) - voltage too low (Error)

This error code is probably preceded by the warning code 6293: "lamp 1 fan (top side) - voltage low". The same troubleshooting table can be applied.

Code 6293: lamp 1 fan (top side) - voltage low (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 6302: lamp 2 fan (bottom side) speed too low (Error)

This error code is probably preceded by the warning code 6303: "lamp 2 fan (bottom side) - speed low". The same troubleshooting table can be applied.

Code 6303: lamp 2 fan (bottom side) - speed low (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely.
Damaged wire.	Check the wire of the fan. Repair if possible, otherwise replace with new one.
Fan end of life.	Replace the fan.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

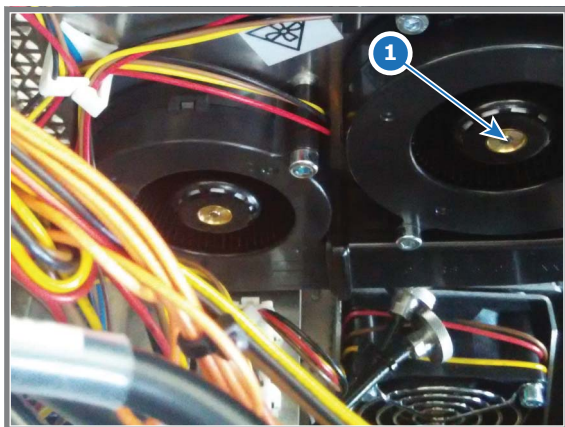


Image 4-75

Code 6310: lamp 2 fan (bottom side) - voltage too high (Error)

This error code is probably preceded by the warning code 6311: "lamp 2 fan (bottom side) - voltage high". The same troubleshooting table can be applied.

Code 6311: lamp 2 fan (bottom side) - voltage high (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79

Code 6312: lamp 2 fan (bottom side) - voltage too low (Error)

This error code is probably preceded by the warning code 6313: "lamp 2 fan (bottom side) - voltage low". The same troubleshooting table can be applied.

Code 6313: lamp 2 fan (bottom side) - voltage low (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79

Code 6322: lamp 2 fan (top side) speed too low (Error)

This error code is probably preceded by the warning code 6323: "lamp 2 fan (top side) - speed low". The same troubleshooting table can be applied.

Code 6323: lamp 2 fan (top side) - speed low (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely.
Damaged wire.	Check the wire of the fan. Repair if possible, otherwise replace with new one.
Fan end of life.	Replace the fan.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

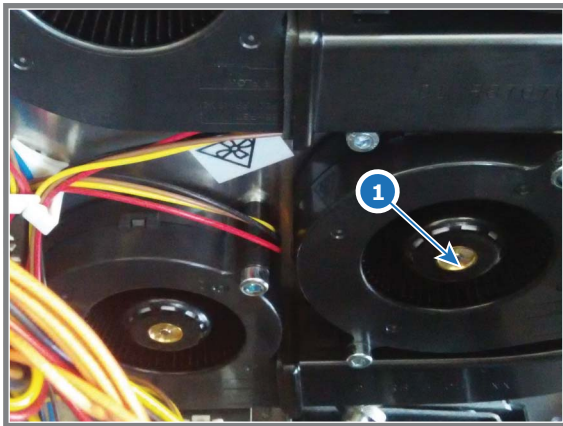


Image 4-76

Code 6330: lamp 2 fan (top side) - voltage too high (Error)

This error code is probably preceded by the warning code 6331: "lamp 2 fan (top side) - voltage high". The same troubleshooting table can be applied.

Code 6331: lamp 2 fan (top side) - voltage high (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 6332: lamp 2 fan (top side) - voltage too low (Error)

This error code is probably preceded by the warning code 6333: "lamp 2 fan (top side) - voltage low". The same troubleshooting table can be applied.

Code 6333: lamp 2 fan (top side) - voltage low (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 6342: pfc fan — speed too low (Error)

This error code is probably preceded by the warning code 6343: "pfc fan - speed low". The same troubleshooting table can be applied.

Code 6343: pfc fan - speed low (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely.
Damaged wire.	Check the wire of the fan. Repair if possible, otherwise replace with new one.
Fan end of life.	Replace the fan.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

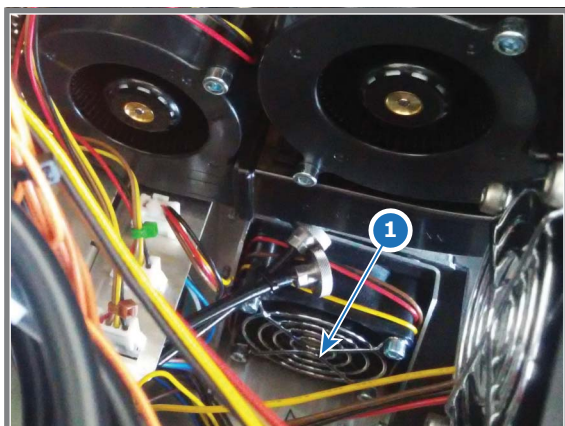


Image 4-77

Code 6350: pfc fan - voltage too high (Error)

This error code is probably preceded by the warning code 6351: "pfc fan - voltage high". The same troubleshooting table can be applied.

Code 6351: pfc fan - voltage high (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 6354: pfc fan - voltage too low (Error)

This error code is probably preceded by the warning code 6353: "pfc fan - voltage low". The same troubleshooting table can be applied.

Code 6353: pfc fan - voltage low (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 6362: Lamp drivers fan — speed too low (Error)

This error code is probably preceded by the warning code 6363: "lamp drivers fan - speed low". The same troubleshooting table can be applied.

Code 6363: Lamp drivers fan - speed low (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely (reference 1 image 4-78).
Damaged wire.	Check the wire of the fan. Repair if possible, otherwise replace with new one.
Fan end of life.	Replace the fan.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

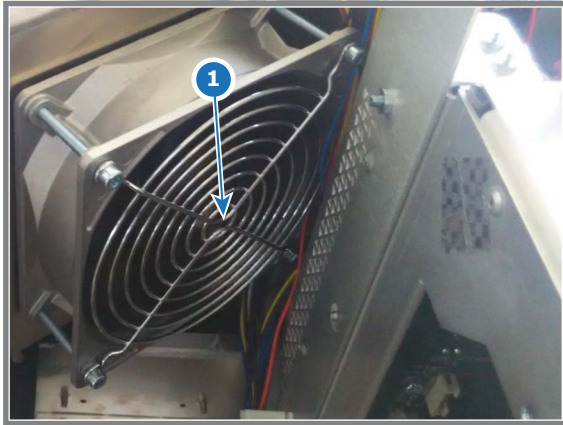


Image 4-78

Code 6370: Lamp drivers fan - voltage too high (Error)

This error code is probably preceded by the warning code 6371: "lamp drivers fan - voltage high". The same troubleshooting table can be applied.

Code 6371: Lamp drivers fan - voltage high (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 6372: Lamp drivers fan - voltage too low (Error)

This error code is probably preceded by the warning code 6373: "lamp drivers fan - voltage low". The same troubleshooting table can be applied.

Code 6373: Lamp drivers fan - voltage low (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79.

Code 6382: system fan (outlet) — speed too low (Error)

This error code is probably preceded by the warning code 6383: "system fan (outlet) - speed low". The same troubleshooting table can be applied.

Code 6383: system fan (outlet) - speed low (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely (reference 1 image 4-79).
Damaged wire.	Check the wire of the fan. Repair if possible, otherwise replace with new one.
Fan end of life.	Replace the fan.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.



Image 4-79

Code 6390: system fan (outlet) - voltage too high (Error)

This error code is probably preceded by the warning code 6391: "system fan (outlet) - voltage high". The same troubleshooting table can be applied.

Code 6391: system fan (outlet) - voltage high (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79

Code 6394: system fan (outlet) - voltage too low (Error)

This error code is probably preceded by the warning code 6393: "system fan (outlet) - voltage low". The same troubleshooting table can be applied.

Code 6393: system fan (outlet) - voltage low (Warning)

Situation	Solution
Malfunctioning SMPS module.	Replace SMPS module. See service manual chapter "Switch Mode Power Supply (SMPS)", page 79

Code 6402: light pipe internal fan - speed too low (Error)

This error code is probably preceded by the warning code 6403: "light pipe internal fan - speed low". The same troubleshooting table can be applied.

Code 6403: light pipe internal fan - speed low (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely (reference 1 image 4-80).
Damaged wire.	Check the wire of the fan. Repair if possible, otherwise replace with new one. See service manual chapter "Light Pipe", page 135.
Fan end of life.	Replace the fan. See service manual chapter "Light Pipe", page 135.
Malfunctioning Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 238.

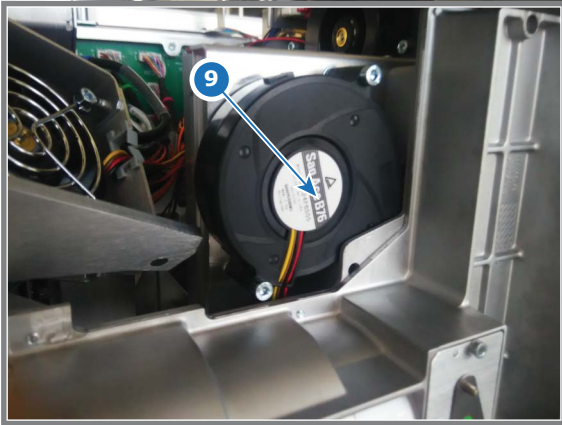


Image 4-80

4.2 Log files

Creating and downloading log files

A diagnostic package can be created with the Communicator software. Start up the software and go to *Diagnostics* → *Package*. A zip file will be created with the following information:

- ICP log file
- Security log file
- Projector log

These log files can be read with the Diagnostic package reader which was delivered as separate program together with the Communicator software. For more information about the use of this Diagnostic package reader, consult the User Guide of the Communicator software.

ICP Log File

Records events listed below:

- Handshakes with server
- TI system initialization
- Reading of TI board status
- Opening of TCP connection
- Failure of TI boards

Security Log File

Records events listed below:

- Monitoring of security switches
- Monitoring of key exchange
- Authorizing of Dallas key

Projector Log

Records events listed below:

- Lamp control commands
- Booting of Barco software
- Detection of TI boards
- Log on details of users
- Detection of Barco modules (LPS, FCB, etc.)

DP2K Log file analysis

Example of log file content

```
Dec 31 17:00:17 localhost local0.info license-manager[221]: main - starting application (version 1.0.1)
Dec 31 17:00:17 localhost local0.info router[224]: main - starting application (version 1.0.1)
Dec 31 17:00:17 localhost local0.info router[231]: network - wan ip-address is 0.0.0.0
Dec 31 17:00:18 localhost local0.info dp60[233]: main - starting application (version 1.0.7)
Dec 31 17:00:18 localhost local0.info dp60[233]: main - projector type is "DP2K-20C"
Dec 31 17:00:21 localhost local0.info dp60[233]: ti-icp - wait until ready
Dec 31 17:00:34 localhost local0.info dp60[233]: system - synchronize date to 20100406124925
Apr 6 12:49:25 localhost local0.info dp60[233]: system - ti-link-decryptor login started...
Apr 6 12:49:41 localhost local0.info dp60[233]: system - ti-link-decryptor login successful
Apr 6 12:49:41 localhost local0.info dp60[233]: system - load lens encoder file "R9855931"
Apr 6 12:49:41 localhost local0.info dp60[233]: command (port = internal) - execute lens file '.init'
...
```

Format :

```
'Time' localhost 'facility code'.'severity code' 'component name' ['pid']: 'message'
```

Where :

- 'Time' = the time when the event occurred
- 'facility code' = component level that generates a log message
- 'severity code' = the severity can be : info – debug – warning – alert – err.
- 'component name' = component name that generates a log message.
 - dp60 = main process
 - kernel = Linux kernel
 - router = component which manages the router
 - TI_marriage = component which handles the marriage
 - clo = component which handles Light Sensor logic
 - license-manager = internal license manager
 - crypto memory = process which handles communication with crypto memory module (ID card)
- 'pid' = Process identifier. The internal process identifier, of the component generating the log message.
- 'message' = The actual error message.

The Barco controller inserts every hour an unique entry in the Barco log file and in the TI log file. This is done to be able to synchronize events in both log files, when the clocks are not aligned. It will also be used for a tool, that is still to be implemented, that will merge both log files, to make better analysis.

Example of such an entry :

```
Feb 3 02:41:16 localhost local0.info dp60[233]: log mark - 0000003c1b84 - 8
```

Each Barco entry into a TI log is proceeded with a B.

What does the id means (as in the example) :

- 0000003c
 - the first 4 bytes give a hex interpretation of how many time the system has been booted.
 - 3c hex is 60 in decimal. It means that this system has been booted 60 times. Every boot cycle increases the timer with 1.
- 1b84 = the last two bytes, are random unique 2 bytes.
- 8 = the last digit indicates the number of hours passed in this boot cycle (in a decimal value). Every boot cycle resets this number to 0.

Ethernet connection messages in log file (some examples).

```
Apr 6 14:05:19 localhost local0.info dp60[233]: main - closing connection of  
150.158.197.64:43680 (keep-alive time expired)
```

→ after 15 minutes of inactivity projector will close connection.

```
Apr 6 14:08:55 localhost local0.info dp60[233]: main - accepted connection from  
150.158.192.133:43680
```

→ connection from communicator, from pc with ip address 150.158.192.133

```
Apr 6 14:08:58 localhost local0.info dp60[233]: log (port = 150.158.192.133:43680:1e) - lo-  
gon-phmt-barco-default
```

→ communicator inserts in log file, who logged on to projector

```
Apr 6 14:09:07 localhost local0.info dp60[233]: command (port = 150.158.192.133:43680:1e) - set  
lamp on
```

→ Command messages also indicate originator.

```
Apr 6 14:09:07 localhost local0.info dp60[233]: system - load fcb file "lamp-on"
```

→ on fan controller board, lamp-on state is set.

External commands received by the Barco controller are preceded with the command (port = xxx) string

Where xxx can be :

- /dev/ttyS0:0 = Command comes from the serial connection labeled ("RS232 IN"). That can be from a touch panel which is connected through a RS232 cable, or from a communicator which is connected serially.
- /dev/ttyS2:0 = Command comes from a touch panel attached with a dedicated cable to the back of the projector (touch panel input).
- /dev/ttyS3:0 = Command comes from the TI board. This is typically a command that is part of a macro stored on that board.
- 10.36.62.17:43680 = Command comes from a remote machine with indicated IP address, followed by the local of the remote machine that send this command internal. The command is initiated internally, due to an internal reason.
- button = button is triggered from the keypad, attached to the projector.

Some examples :

- `command (port = /dev/ttyS2:0) - set network ip-address to 10.140.162.141 (dhcp off)` = From the touch panel, the IP address of the projector was set to 10.140.162.141
- `command (port = 10.36.62.17:43680) - set network ip-address to 10.36.62.62 (dhcp off)` = From a device with IP address 10.36.63.17, the IP address of the projector was changed to 10.36.63.17
- `command (port = /dev/ttyS0:0) - set dowser open.` = From a touch panel or PC, connected serially (connector labeled "Touch panel"), the dowser was set to open.
- `command (port = /dev/ttyS0:0) - set lamp off` = From a touch panel or PC, connected serially (connector labeled "Touch panel"), the lamp was powered off.
- `command (port = internal) - set lamp off` = For an internal reason the state of the lamp was set to off.
- `command (port = button) - set dowser closed` = The dowser was closed from the keypad.

The error messages are explained in the troubleshooting list - code 5831

ICP log files

Example of log file content :

```
2010/04/06 09:02:40.964797 I ICP application 1.2(126) init Shows the ICP package
2010/04/06 09:02:40.980964 I successfully initialized the LoginLevelProtection mutex
2010/04/06 09:02:41.039022 I Autotiming initialized
2010/04/06 09:02:41.049829 I Autotiming using VSyncs
2010/04/06 09:02:41.051245 I Started Autotiming Port threads
2010/04/06 09:02:41.051755 I Autotiming started
2010/04/06 09:02:41.052149 I Port thread running
2010/04/06 09:02:41.052897 I Port thread running
2010/04/06 09:02:43.632304 I Started Autotiming Main thread
2010/04/06 09:02:43.633017 D Autotiming thread running
2010/04/06 09:02:43.633476 D Autotiming: blank the image
2010/04/06 09:02:43.792939 D Autotiming: unblank the image
...
```

Format

'Date Time' 'Severity' 'message'

Where :

- 'Date Time' = the time when the event occurred.
- 'Severity' = One character severity indication can be : 'D' (Debug) – "E" (Error) – "I" (Informational) - "U" (User).
- 'message' = The actual error message.

Example :

```
24.03.2010 17:17:12.185 TPPL = 2848, APPL = 2048, TLPF = 4095, ALPF = 128
```

This line is entered when the auto timing on the ICP computes values that are not within valid ranges.

Where :

- TPPL = Total Pixels Per Line
- APPL = Active Pixels Per Line
- TLPF = Total Lines Per Frame
- ALPF = Active Lines Per Frame
- $512 \leq APPL \leq TPPL \leq 8191$
- $288 \leq ALPF \leq TLPF \leq 4095$

In this example ALPF = 128 which is less than the minimum of 288. When this happens, auto timing will attempt to blank the image.

5. MAINS INPUT

About this chapter

This chapter describes the several parts of the projector mains input.

Overview

- Introduction DP2K-E series Mains Input
- Accessing the Mains Input compartment
- Replacing the ON/OFF Switch
- Replacing the Mains Filter
- Replacing the Solid State relay

5.1 Introduction DP2K-E series Mains Input

Introduction

The Mains Input compartment is a removable module located at the rear right side of the projector.

The Mains Input comprises a terminal block, an ON/OFF switch, a mains input filter and a solid state relay.

The purpose of the solid state relay is to switch off the Lamp Power Supply (LPS) when the projector is in Sleep mode.

Component identification Mains Input

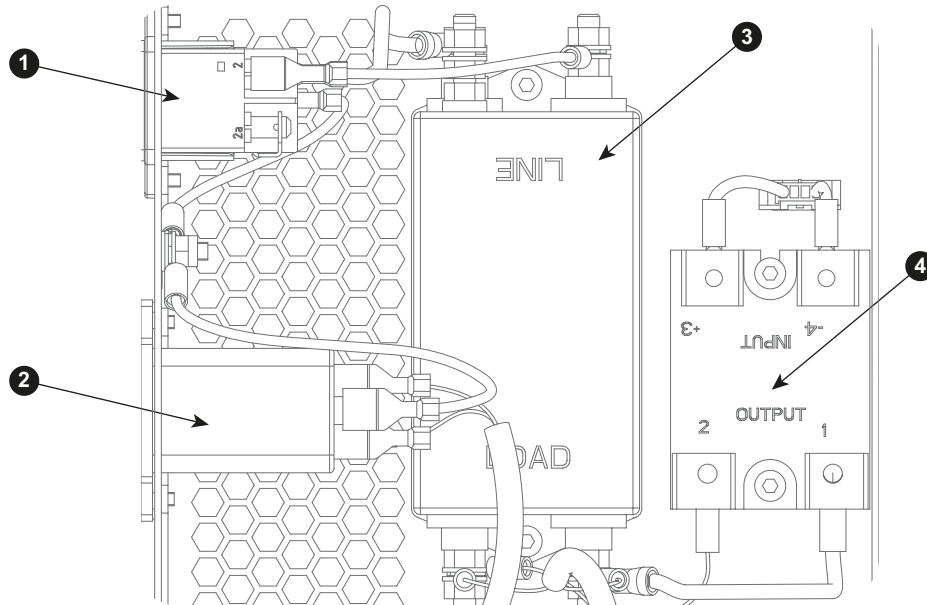


Image 5-1

- 1 ON/OFF switch.
- 2 UPS input.
- 3 Mains filter.
- 4 Solid state relay.

5.2 Accessing the Mains Input compartment



WARNING: Disconnect the power cord of the projector from the power net and wait a few minutes (to discharge the capacitors) prior to starting this procedure.

Necessary tools

3 mm Allen Key.

How to access the compartment of the Mains Input?

1. Remove the rear cover of the projector. See service procedure "Installation of the rear cover", page 288.
2. Use a 3 mm Allen key to unfasten the 2 screws of the Mains Input compartment cover (reference 1 image 5-2). Remove the cover.

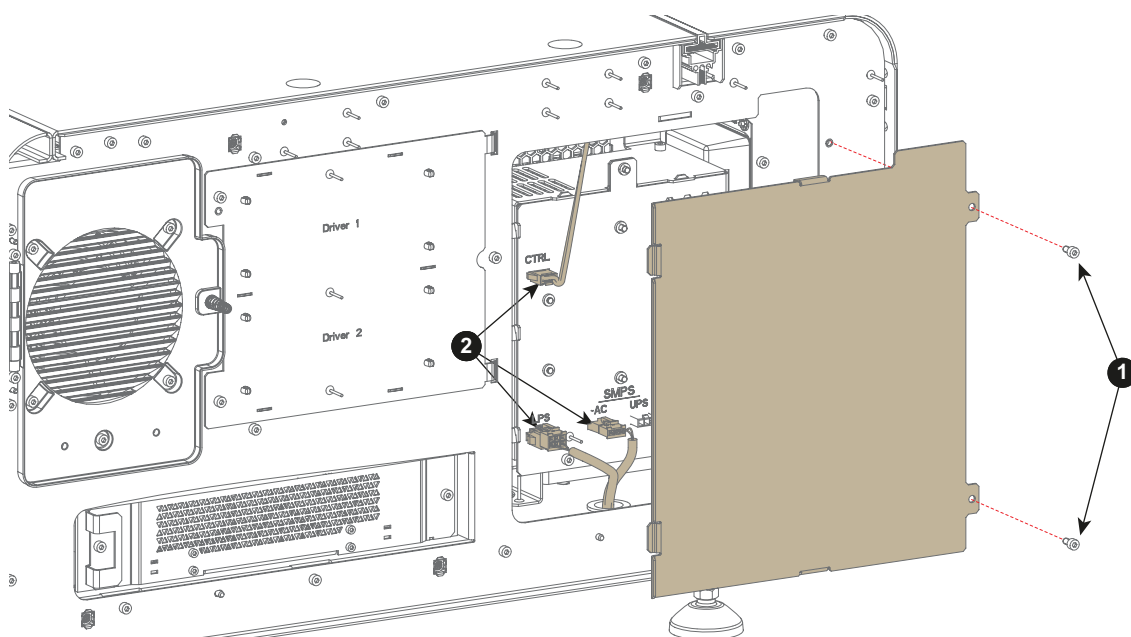


Image 5-2

3. Unplug the three cables (reference 2, image 5-2).
4. Unfasten the three screws (reference 1, image 5-1) and carefully pull the Mains Input compartment out of the projector chassis.

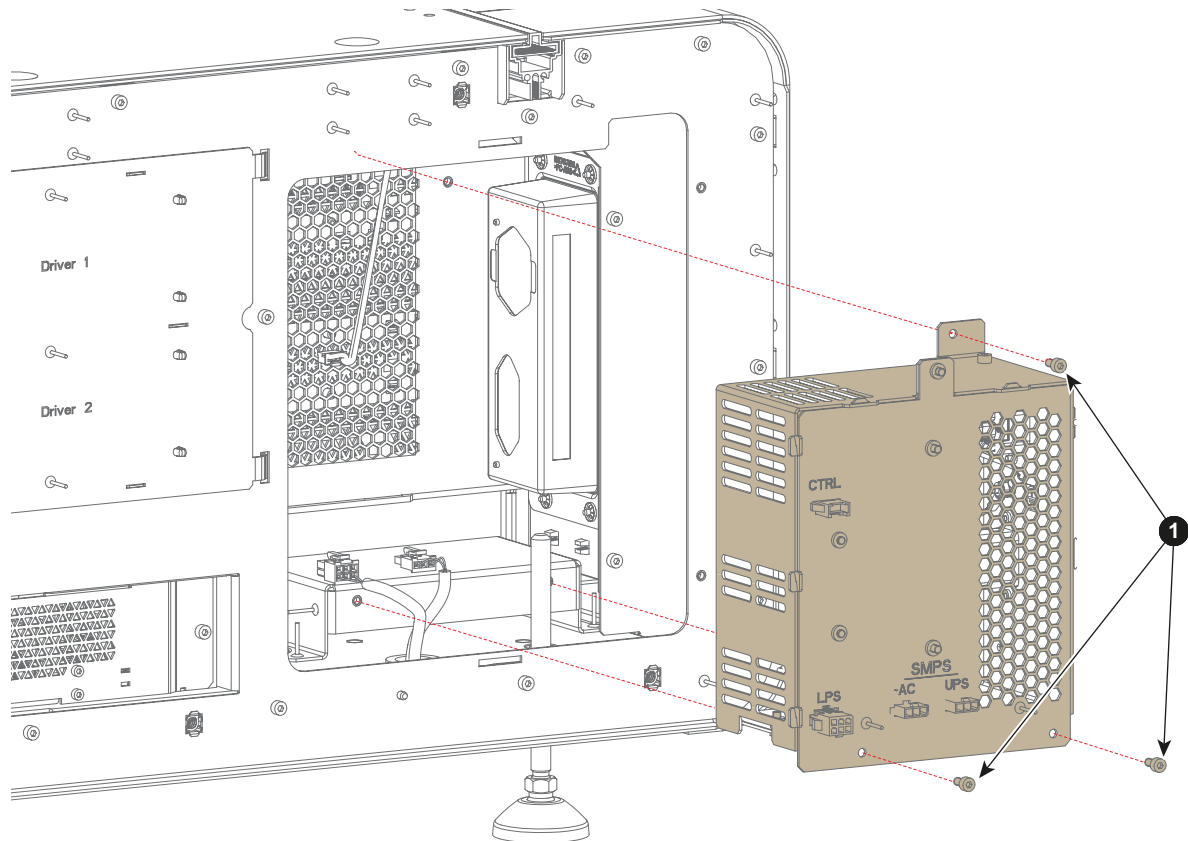


Image 5-3

How to close the Mains Input compartment?

1. Position the Mains Input compartment in the projector chassis. Reconnect the cables (reference 2, image 5-2).
2. Fasten the three fixation screws of the compartment. Reference 1 image 5-1
3. Position and fasten the two screws on the compartment security cover. Reference 1 image 5-2.
4. Install the rear cover of the projector. See procedure "Installation of the rear cover", page 288.

5.3 Replacing the ON/OFF Switch



To replace the ON/OFF switch, the Mains Input Compartment must be first removed from the projector chassis. See procedure "Accessing the Mains Input compartment", page 73.

Necessary tools

- 2.5mm Allen wrench.
- Torque flat screw driver (T10).

How to replace the ON/OFF Switch?

1. Loosen the two screws from the on/off switch of the Mains Input Compartment (reference 1, image 5-4). Use a T10 screw driver.
2. Pull the switch out of the Mains Input Compartment as far as the electrical wires will allow.
3. Disconnect the three electrical wires from the ON/OFF switch.
4. Connect the **Earthing** line of the new switch to the loose wire from the UPS mains inlet (reference 2, image 5-4).
5. Connect the **LINE** side of the new on/off switch with the two loose wires of the **Mains Filter** (reference 3,4 image 5-4).
6. Install the new ON/OFF switch into the Mains Input compartment. Use a T10 screw driver to fasten the two screws (reference 1 image 5-4).

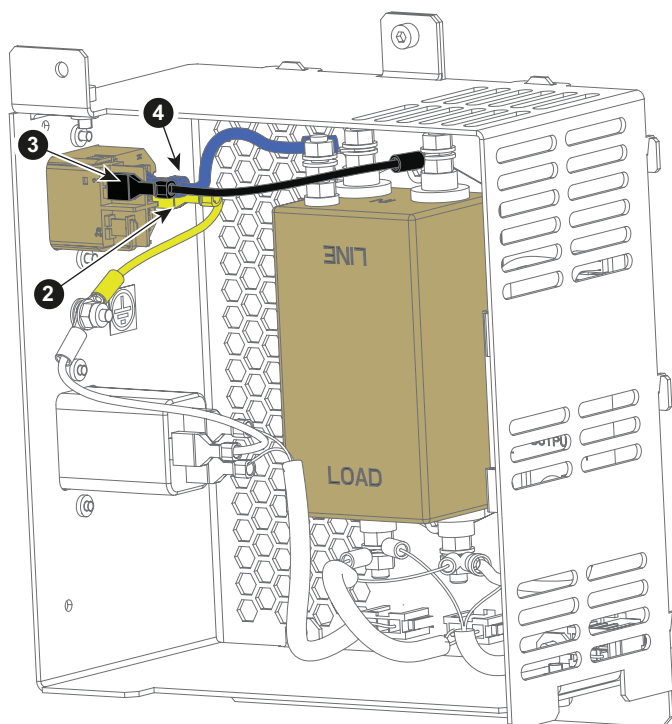
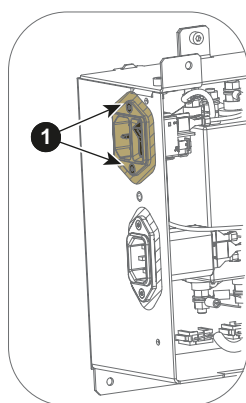


Image 5-4

7. Install the Mains Input compartment and the rear cover of the projector.

5.4 Replacing the Mains Filter



To replace the Main Filter, the Mains Input Compartment must be first removed from the projector chassis. See procedure "Accessing the Mains Input compartment", page 73.

Necessary tools

- 3mm Allen key wrench.
- 8mm open end wrench.
- Torque wrench with 8mm hexagon bit.

How to replace the Mains Filter?

1. Remove the Mains Filter from the Mains Input Compartment by loosening the two nuts (reference 1). Use a 3mm Allen key.
2. Disconnect the six electrical wires from the Mains Filter. Use a 8mm open end wrench.
3. Connect the **LINE side** (reference 2,) of the new Mains Filter with the two loose wires from the ON/OFF switch. Fasten the nuts with a torque of **2.7Nm** (2.0 lbf*ft).
Note: Adhere to the mounting order on the threaded rod of the connection pin: first a plain washer, then a nut, then the cable eye of the wire, then another plain washer and finally the second nut.
4. Connect the blue wire (LPS) and thin white wire (SMPS) with the left side pin of the **LOAD side** (reference 3,) of the new Mains Filter. Fasten the nut with a torque of **2.7Nm** (2.0 lbf*ft).
Note: Adhere to the mounting order on the threaded rod of the connection pin: first a plain washer, then a nut, then the cable eye of the two wires, then another plain washer and finally the second nut.
5. Connect the black wire (Solid State relay) and black wire (SMPS) with the right side pin of the **LOAD side** (reference 4) of the new Mains Filter. Fasten the nut with a torque of **2.7Nm** (2.0 lbf*ft).
Note: Adhere to the mounting order on the threaded rod of the connection pin: first a plain washer, then a nut, then the cable eye of the two wires, then another plain washer and finally the second nut.
6. Install the new Mains Filter into the Mains Input compartment. Use a 3mm Allen key to fasten the two screws (reference 1).

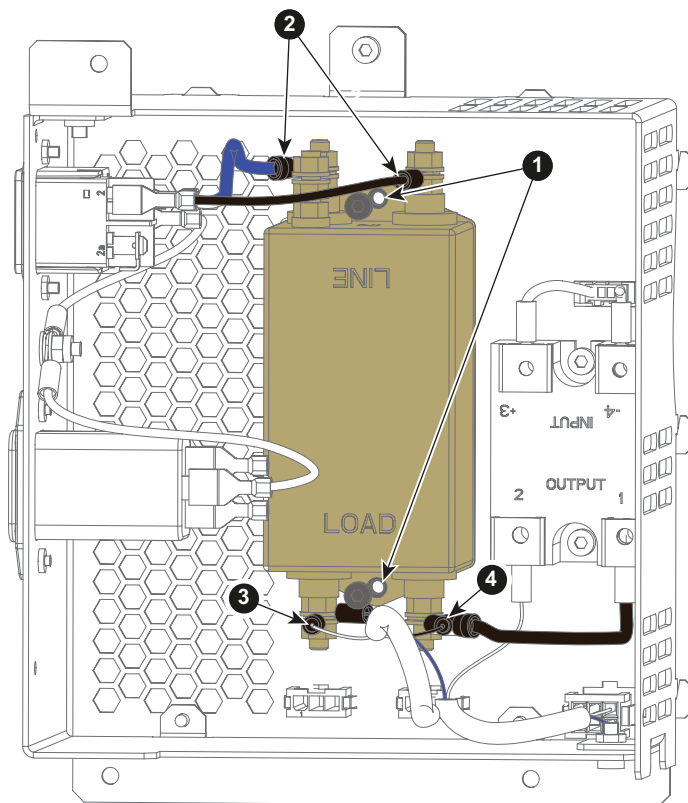


Image 5-5

5.5 Replacing the Solid State relay



To replace the Solid State Filter, the Mains Input Compartment must be first removed from the projector chassis. See procedure "Accessing the Mains Input compartment", page 73.

Necessary tools

- 3 mm Allen wrench.
- Phillips PH2 screw driver.
- Torque screw driver with PH2 socket.

How to replace the Solid State relay?

1. Disconnect the four electrical wires (reference 1, 2, 3 & 4) from the Solid State relay. Use a Phillips PH2 screw driver.
2. Loosen the two screws holding the Solid State relay in place (reference 5) . Use a 3 mm Allen wrench.
3. Install the new Solid State relay. The line side (pin 3& pin 4) of the Solid State relay should be at the top. Use a 3 mm Allen wrench to fasten the two screws (reference 5).
4. Connect the wires with the Solid State relay. Use a torque screw driver and apply a torque of **1.1Nm** (0.81 lbf*ft) per screw.
 - Connect the **black wire** (LPS cable) with **pin 1** of the Solid State relay (reference 1).
 - Connect the **black wire** from the LOAD side of the Mains Filter with **pin 2** of the Solid State relay (reference 2).
 - Connect the **thin red wire** with **pin 3** of the Solid State relay (reference 3).
 - Connect the **thin black wire** with **pin 4** of the Solid State relay (reference 4).

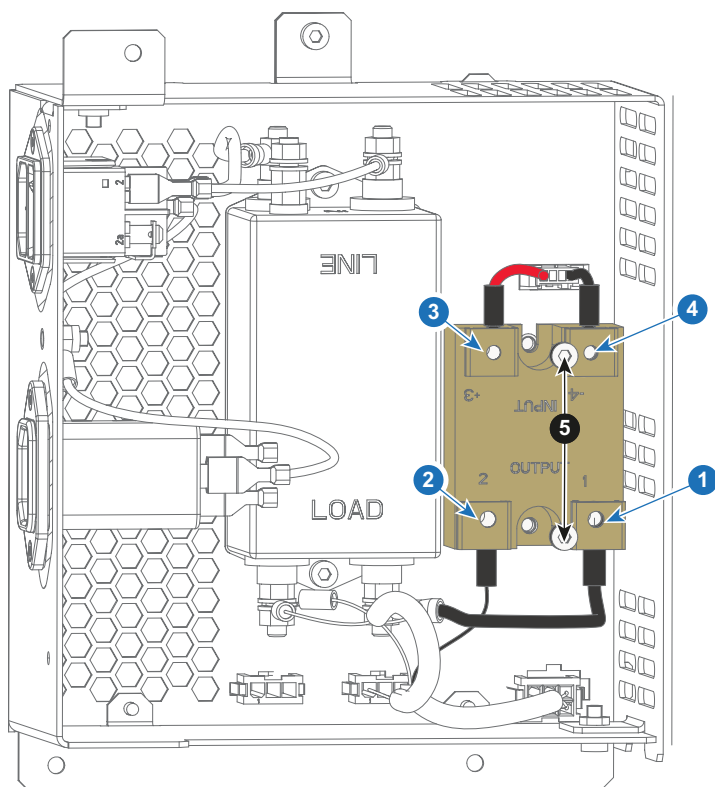


Image 5-6

6. SWITCH MODE POWER SUPPLY (SMPS)

About this chapter

This chapter briefly describes the Switch Mode Power Supply (SMPS) for the DP2K-E series projector. More detail is explained how to replace the SMPS.

Overview

- Introduction DP2K-E series SMPS board
- Removing the SMPS board
- Installing the SMPS board
- Replacing the fans of the SMPS compartment

6.1 Introduction DP2K-E series SMPS board

Introduction

The SMPS board has a separate compartment which is located below the Card Cage at the lower right side of the projector. The SMPS compartment is air cooled by two small fans located behind the large dust filter at the front side of the projector.

The SMPS board provides power to all electronic boards of the DP2K-E series projector except for the Lamp Power Supply (LPS). The SMPS board has five connectors: one to connect the mains voltage coming from the mains filter, one to connect the PE wire, one to connect the control signals and two for the DC output voltages (connected with the Power Backplane).

Connections

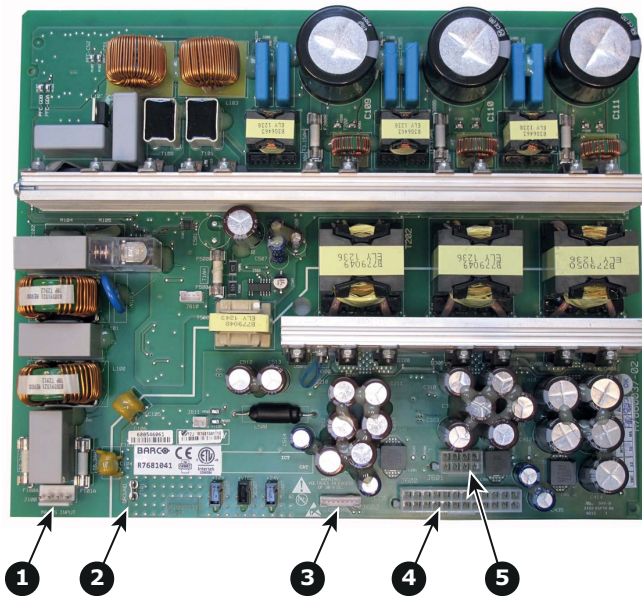


Image 6-1

- 1 Mains Power.
- 2 Protected Earth (PE).
- 3 Control signals.
- 4 DC output voltages 2 (large socket).
- 5 DC output voltages 1 (small socket).

6.2 Removing the SMPS board



WARNING: Disconnect the power cord of the projector from the power net and wait a few minutes (to discharge the capacitors) prior to starting this procedure.

Necessary tools

3 mm Allen key wrench.

How to remove the SMPS board from the projector?

1. Remove the cover of the Card Cage as described in procedure .
2. Gently pull the SMPS board 3 to 4 centimeters out of its compartment and disconnect the following connectors:
 - Power out connector 2 (reference 2 image 6-2)
 - Power out connector 1 (reference 1 image 6-2)
 - Control connector (reference 3 image 6-2)
 - Ground wire (reference 4 image 6-2)
 - Mains input (reference 5 image 6-2)

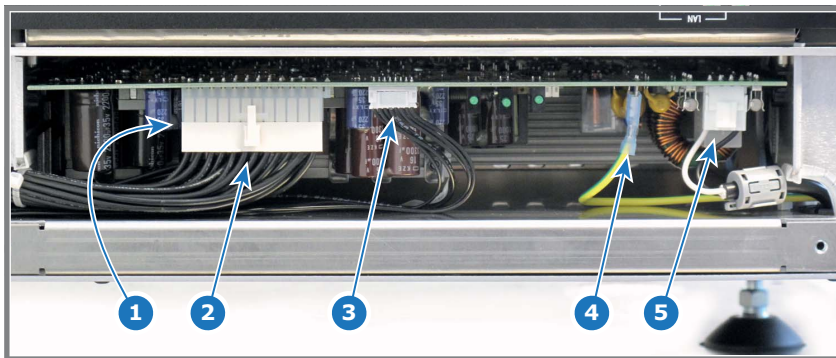


Image 6-2

3. Pull the SMPS board completely out of its compartment.

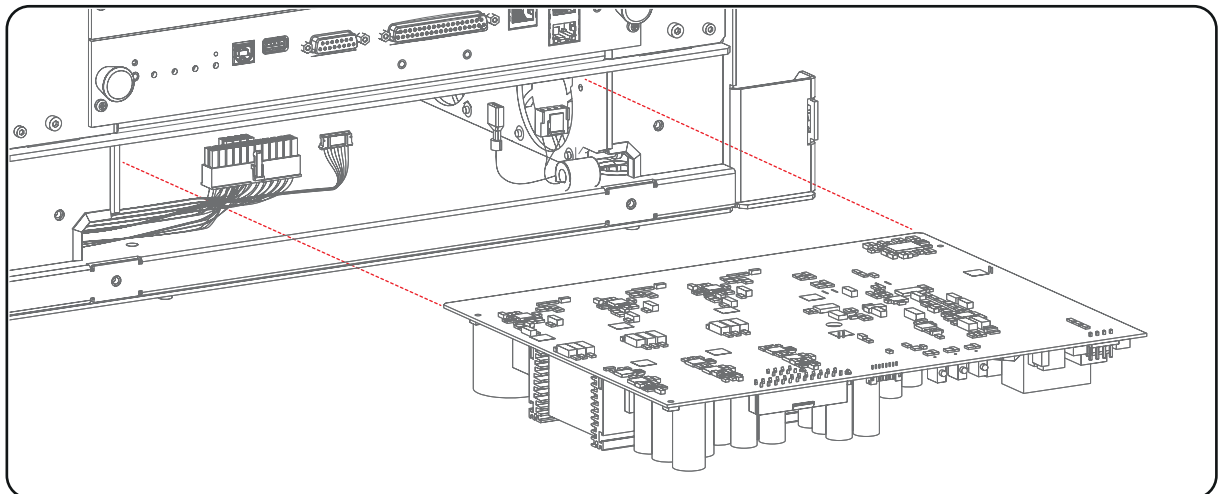


Image 6-3

6.3 Installing the SMPS board

Necessary tools

3mm Allen wrench.

How to install the SMPS board in its compartment?

1. Gently insert the SMPS board in the guides of the SMPS compartment as illustrated. Push it completely in.

Caution: Do not damage the wires. Move the wires towards the sides of the opening of the SMPS compartment.

Caution: Ensure that the both sides of the SMPS board are captured by the guides inside the SMPS compartment. See reference 1 of image 6-4.

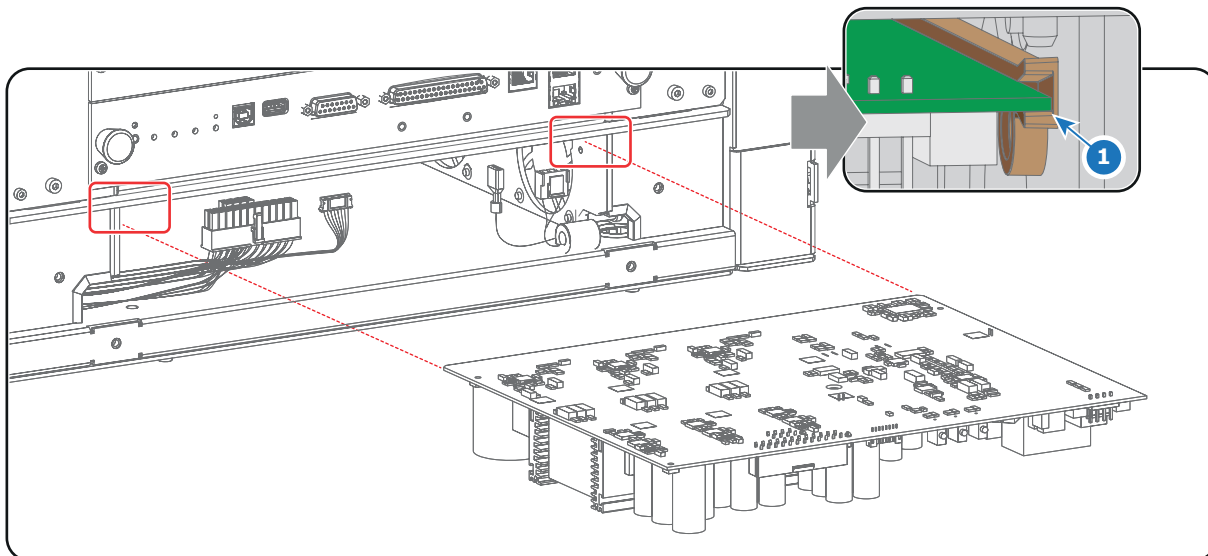


Image 6-4

2. Make the electrical connections:

- Power out connector 1 (reference 1 image 6-5)
- Power out connector 2 (reference 2 image 6-5)
- Control connector (reference 3 image 6-5)
- Ground wire (reference 4 image 6-5)
- Mains input (reference 5 image 6-5)

Caution: Support the SMPS board while plugging in the wires.

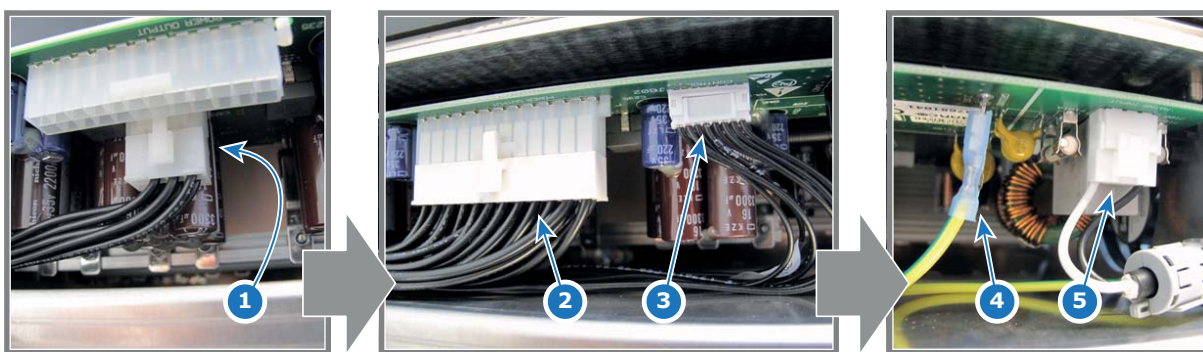


Image 6-5

6.4 Replacing the fans of the SMPS compartment

Where are the SMPS fans located?

The two SMPS fans are located at the right side of the SMPS compartment, behind the small dust filter of the projector.



To access the SMPS fans the projector front cover and small dust filter has to be removed. This procedure assumes that this is already done.

Necessary tools

3 mm Allen key wrench

How to replace the fans of the SMPS compartment?

1. Disconnect the wire of both SMPS fans (reference 1 & 2 image 6-6).

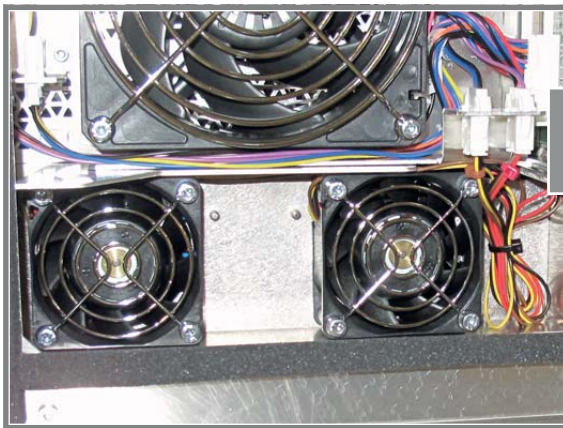
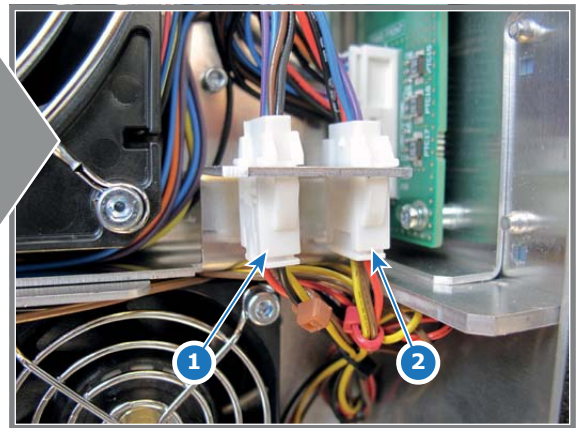


Image 6-6



2. Remove the fans from the projector chassis. Use a 3 mm Allen wrench to loosen the screws (reference 3 image 6-7) of the fans.

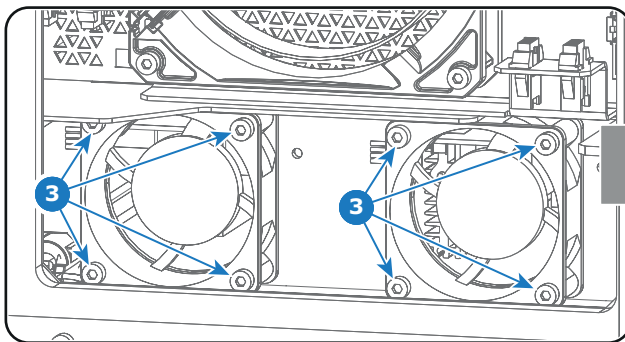
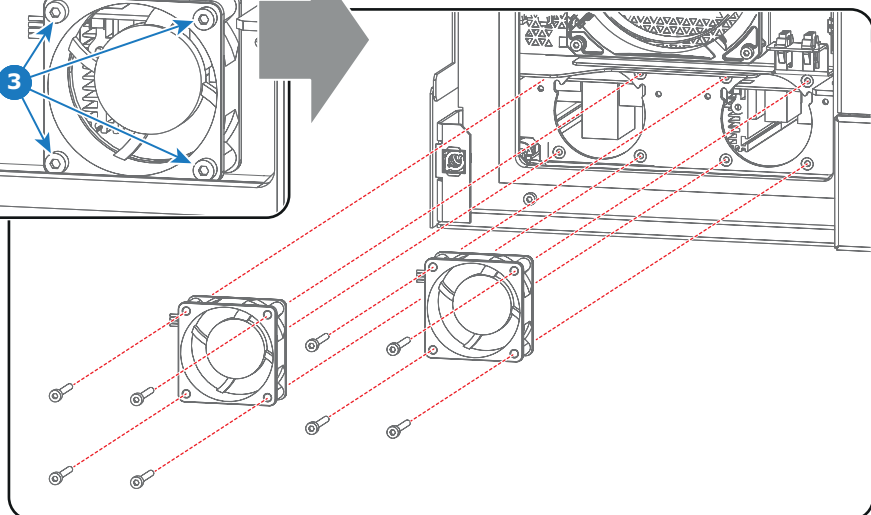


Image 6-7



3. Install two new SMPS fans. Guide the wires above the housing of the fans. Use a 3 mm Allen wrench to fasten the screws (reference 3 image 6-7) of the fans.

Caution: Ensure that the airflow of the fans is towards the SMPS compartment.

4. Connect the wire of both fans with the projector:
 - The wire of the left fan with the left socket (reference 1 image 6-6).
 - The wire of the right fan with the right socket (reference 2 image 6-6).

7. LAMP POWER SUPPLY (LPS)

About this chapter

This chapter describes briefly the functionality, the different parts, and the replacement of the Lamp Power Supply (LPS).

Overview

- Introduction to the DP2K-E Series Lamp Power Supply
- Remove the LPS
- Install the LPS

7.1 Introduction to the DP2K-E Series Lamp Power Supply

About the Lamp Power Supply (LPS)

The Lamp Power Supply (LPS) is located at the rear of the projector, below the lamp modules and lamp driver compartment.

The Power Factor Correction (PFC) board converts the 220 VAC input and generates 380 VDC to each of the Lamp Drivers.

7.2 Remove the LPS

Necessary tools

- 3 mm Hex key
- Nipple pliers



The back cover of the projector must be removed before the LPS can be removed. This procedure assumes the back cover is already removed.

How to remove the LPS?

1. Loosen the two screws (reference 1) of the LPS security cover. Use a 3 mm Hex key. Remove the security cover (reference 2).

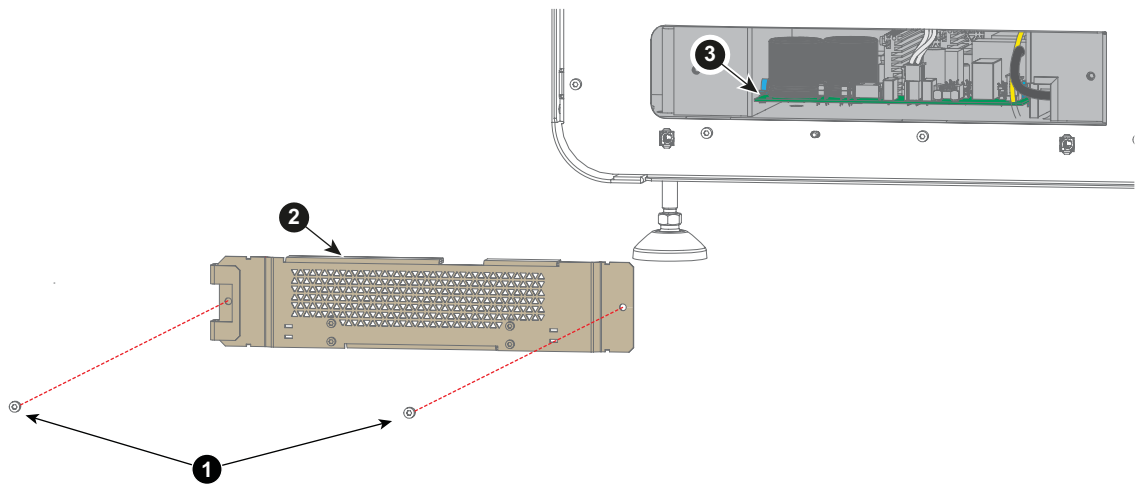


Image 7-1

2. Disconnect the three cables. If the grounding cable is difficult to pull out, use a pair of nipple pliers to get a better grip.
3. Gently slide the board out of the projector chassis in a straight motion. Do not angle the board up or down when removing it.

7.3 Install the LPS

How to install the LPS

1. Gently push the LPS board (reference 3) into the chassis. Make sure that the board enters the guiding rails correctly, as illustrated in the detail view.
2. Connect the three cables.
3. Replace the LPS cover (reference 2) and install the two screws (reference 1) using a 3 mm Hex key.

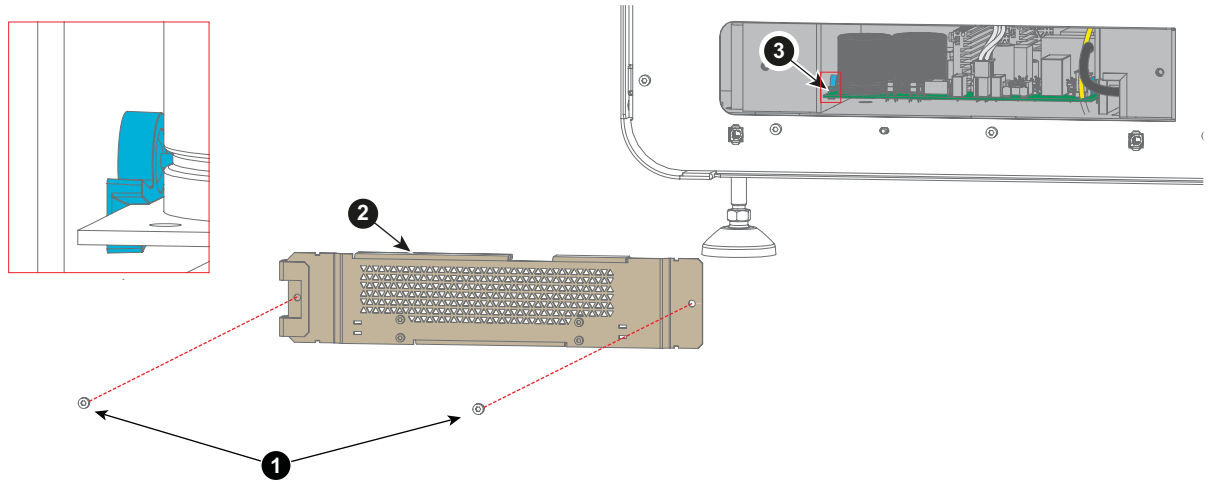


Image 7-2

8. LAMP DRIVERS

About this chapter

This chapter describes briefly the main components and replacement procedure for the Lamp Drivers (Lamp Ballast).

Overview

- Introduction to the DP2K-E series Lamp Drivers
- Remove the Lamp Driver Module
- Replace a Lamp Driver
- Install the Lamp Driver Module
- Replacement of the lamp driver fan

8.1 Introduction to the DP2K-E series Lamp Drivers

Lamp Drivers

The DP2K-E series has two Lamp Drivers (ballast) installed, one for each lamp module.

The lamp drivers are powered by 380 VDC.

Each ballast delivers the following functionality for its respective lamp (1 or 2):

- Lamp ignition
- Lamp waveform control
- Lamp status monitor

8.2 Remove the Lamp Driver Module



The rear cover of the projector must be removed before the Lamp Drivers can be removed. This procedure assumes that this is already done.

How to remove the Lamp Driver Module?

1. Loosen the outlet fan door screw (reference 1) and swing open the outlet fan door. Unplug the two Lamp Power cables (reference 3).
2. Loosen and remove the two fastening screws (reference 4), and rotate the lamp driver module outwards, as illustrated.

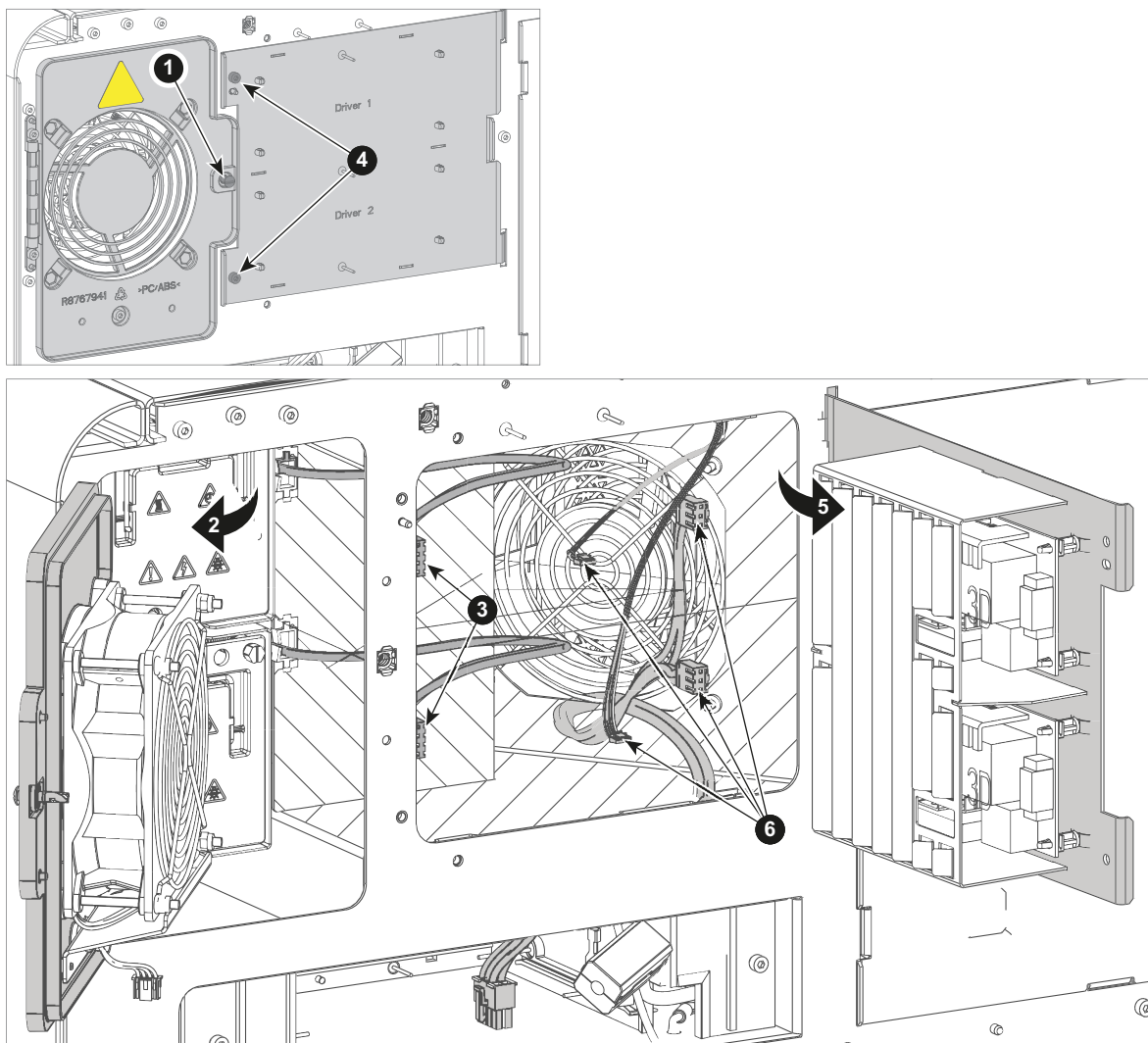


Image 8-1

3. Disconnect the PSU power cables and control cables from the ULCB (reference 6).
4. Remove the module from the projector chassis and place on a flat surface.

8.3 Replace a Lamp Driver



The Lamp Driver module must be removed from the projector chassis before the Lamp Driver can be replaced. This procedure assumes that this is already done.

How to replace a Lamp Driver Board?

1. Remove the relevant four standoff hooks from the outer side of the driver module plate. To do this, clamp the ribs of the standoff hook towards the center pin and then push the hook down and through the hole to unsnap it from the plate, as shown in detail below. Reference image 8-2.

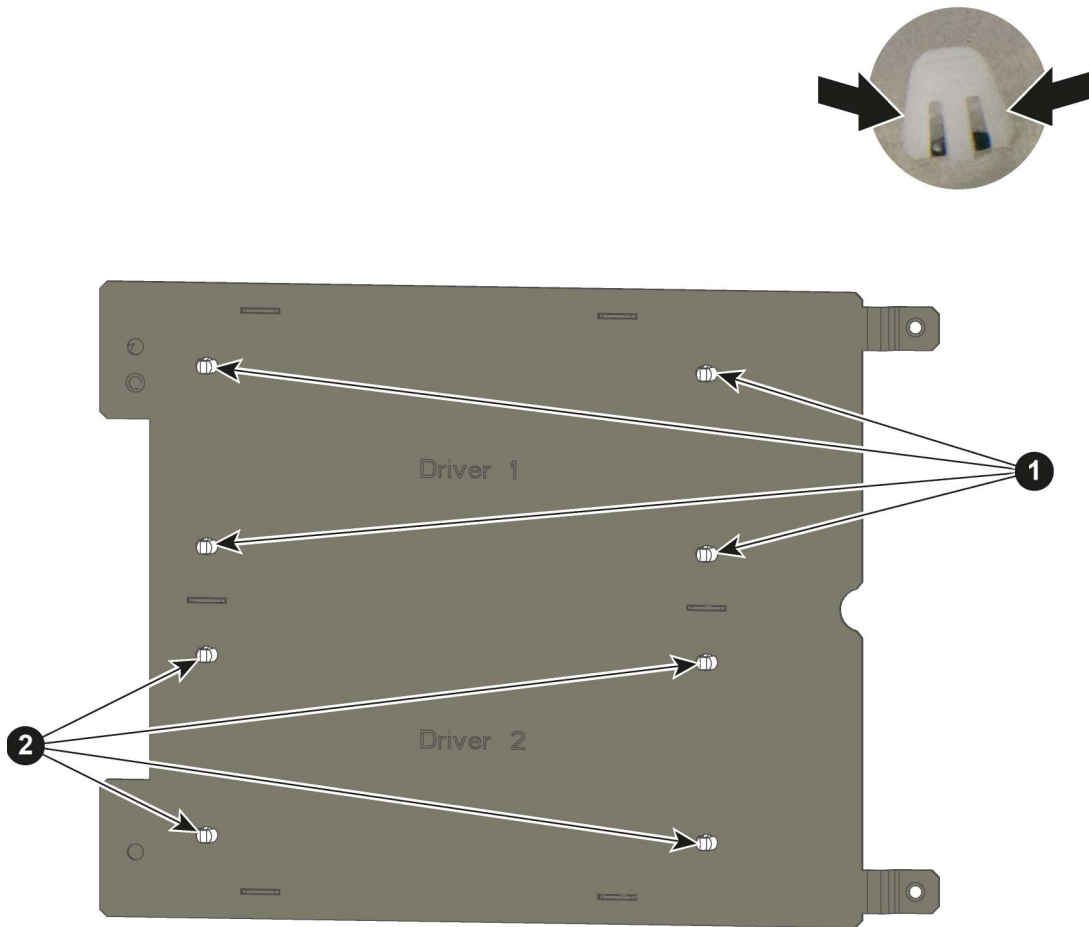


Image 8-2

2. Remove the four standoff hooks for the Lamp Driver 1 board (reference 1) or Lamp Driver 2 board (reference 2).
3. Install the standoff hooks onto the new Lamp Driver Board.
4. Check that all the hooks are properly installed, and that the hook ribs are not caught or obstructed in any way.
5. Place the board back into position in the module, and refasten the four standoff clips on the outer side of the module plate.
6. Check that all hooks are properly installed and that the hook ribs are not caught or obstructed in any way.

8.4 Install the Lamp Driver Module

How to install the Lamp Driver module?

1. Position the Lamp Driver Module in the projector chassis.
2. Connect the ULCB cables to the Lamp Driver module.
3. Install the 2 screws of the lamp driver cover. Use a 3 mm Hex key.
4. Open the Lamp Module door. Use a 7mm flat screwdriver to open the captive screw on the door.
5. Connect the PSU power cables to the driver assembly.
6. Close the fan door and fasten the captive screw.

8.5 Replacement of the lamp driver fan

Necessary tools

3mm Allen key wrench



To access the lamp driver fan, the projector front, rear, top and side covers must be removed first. This procedure assumes that this is already done.

How to replace the lamp driver fan?

1. Loosen the two fastener screws. Open the lamp driver module cover. Disconnect all driver cables. Remove the driver cover (reference 1).
2. Loosen the two fastener screws. Remove the mains input rear cover (reference 2).
3. Loosen the nine fastener screws. Remove the Elca box side cover (reference 3).

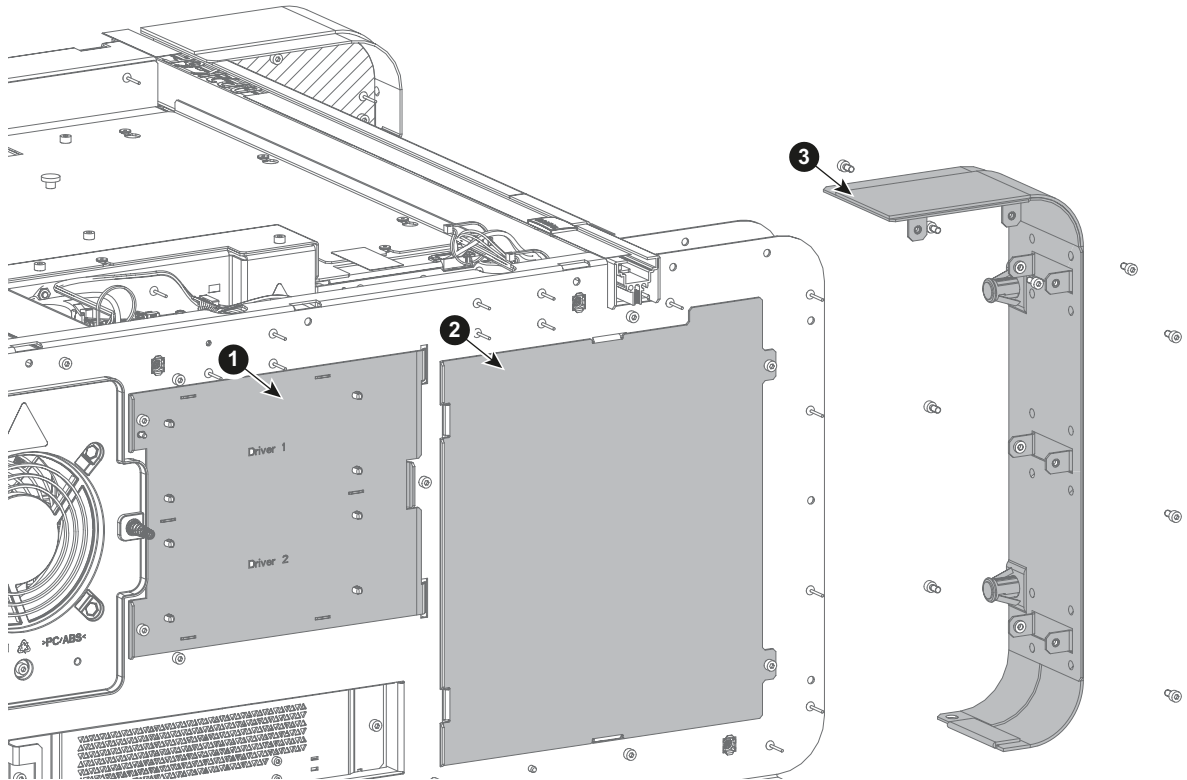


Image 8-3

4. Loosen the thirteen fastener screws. Remove the projector rear frame.
5. Loosen the three screws (reference 5). Remove the lamp driver assembly from the projector chassis.

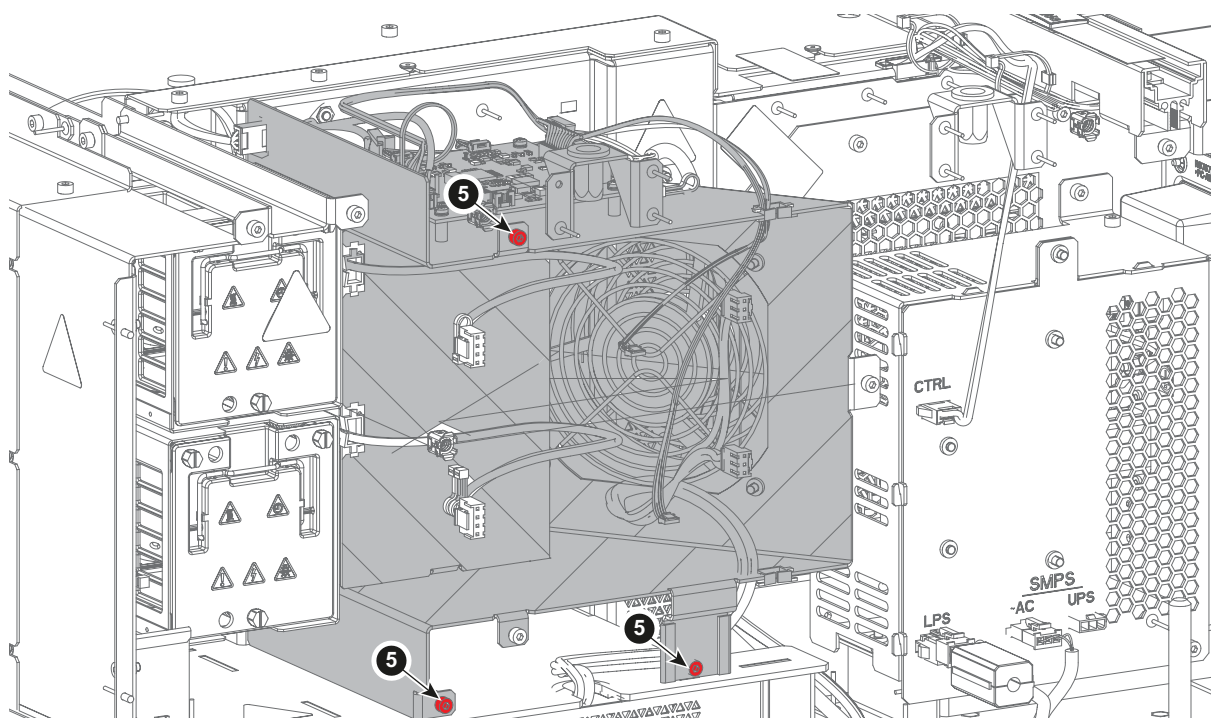


Image 8-4

6. Release the fan assembly screws, and remove the fan and two fan guards.
7. Replace the fan, as illustrated in image 8-5

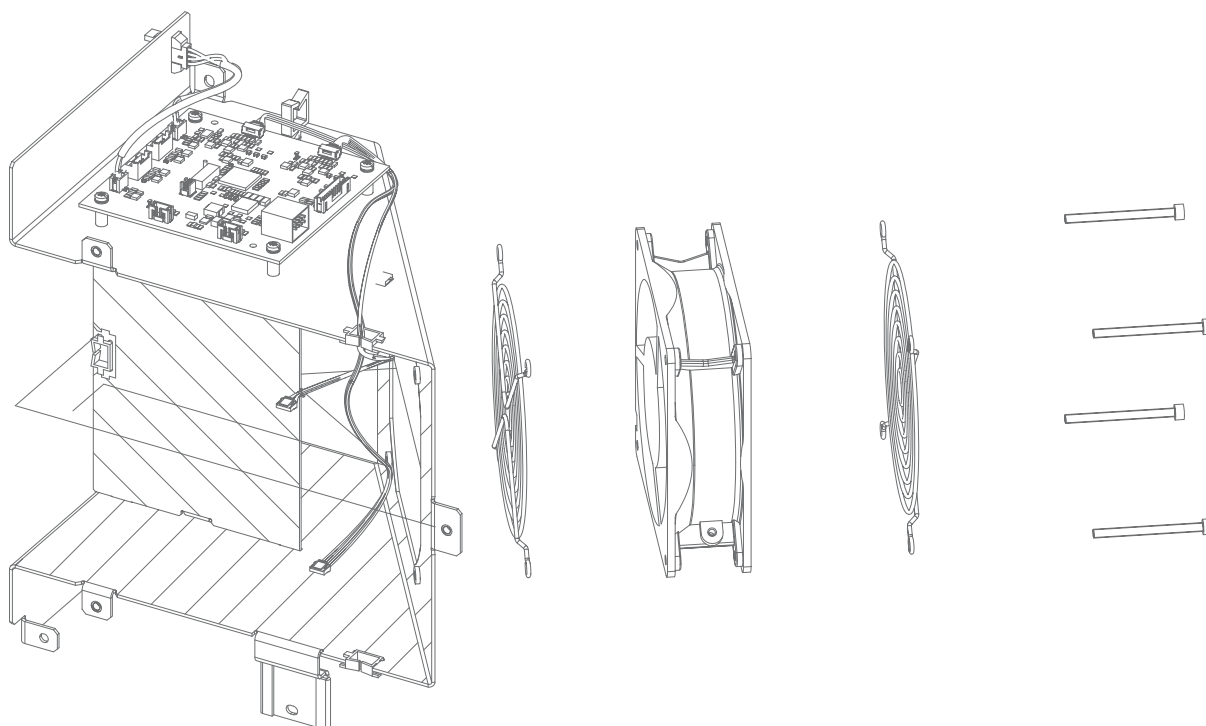


Image 8-5

8. Reinstall the driver assembly.
9. Reinstall the project rear frame.
10. Reinstall the projector mains input rear cover.
11. Reinstall the mains input side cover.
12. Position the lamp driver module cover in position, as illustrated. Reconnect the driver cables.
13. Reinstall the lamp driver module cover.

9. LAMP CONTROL BOARD

About the chapter

This chapter describes in brief the DP2K-E Lamp Control Board, as well as explains the procedure for replacing the board.

Overview

- Introduction to the DP2K-E Series Lamp Control Board
- Replace the ULCB

9.1 Introduction to the DP2K-E Series Lamp Control Board

About the ULCB

The Lamp Control Board (reference 1) is located directly above the lamp driver (ballast) module. The board is accessed from the top of the projector. The top cover of the projector must be removed to access the ULCB.

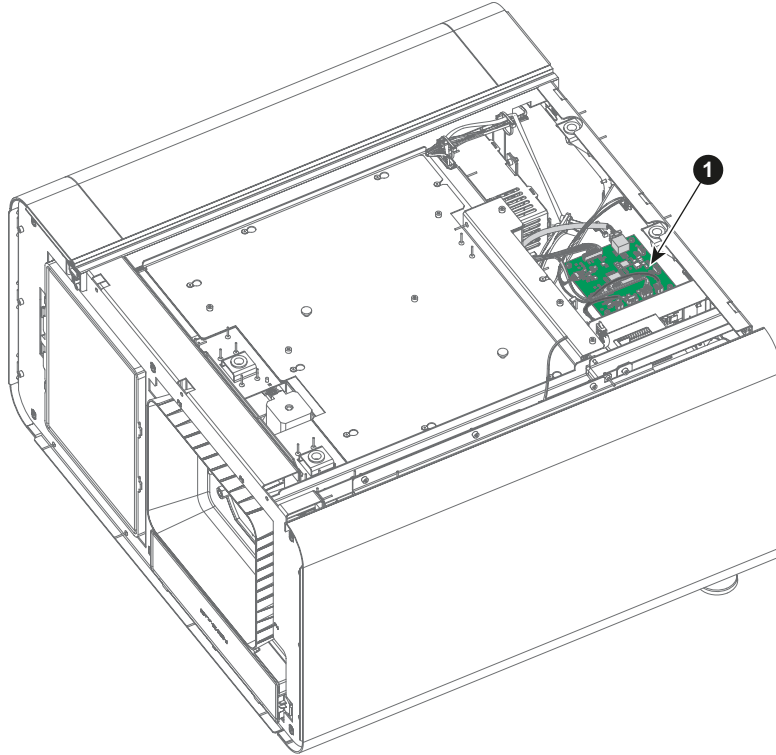


Image 9-1

The Lamp Control Board (ULCB) provides the following functionality:

- Drive and control of the two Lamp Drivers (ballast)
- Lamp Module presence detection
- Light pipe internal fan control

9.2 Replace the ULCB

Necessary tools

Torx 15 (T15) screw driver



The back, front, and top covers of the projector must be removed before the ULCB can be accessed and replaced. This procedure assumes that this is already done.

How to replace the ULCB?

1. Unplug all cables on board.
2. Remove the four fixation screws (reference 1). Use a Torx 15 (T15) screw driver.
3. Replace the new board into position.
4. Install the four fixation screws (reference 1).

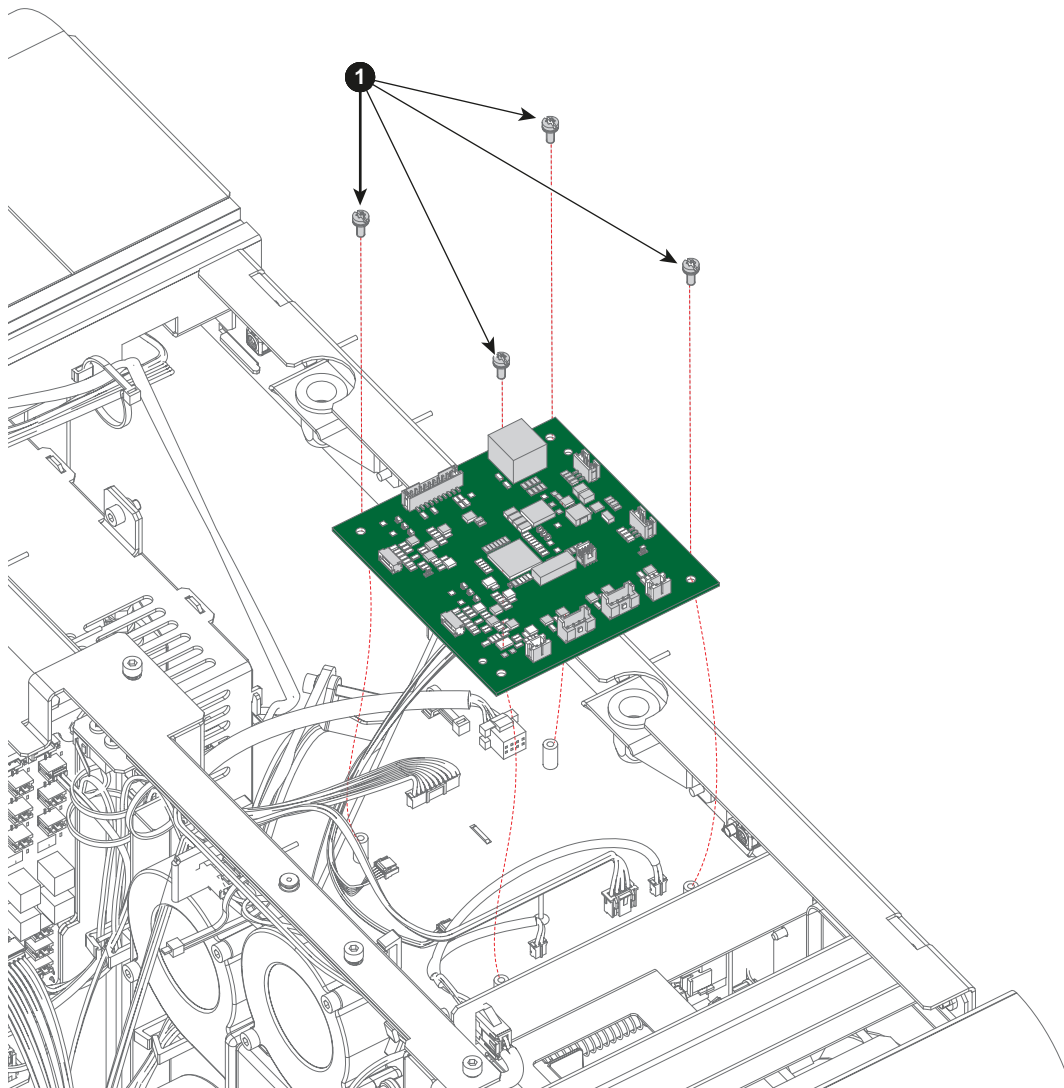


Image 9-2

5. Reconnect all cables.

10. LAMP AND LAMP MODULE

About this chapter

This chapter explains how to replace the Lamp Modules and reset the lamp parameters.

Overview

- Introduction
- Removal of the Lamp Module
- Installation of the Lamp Module
- Resetting the lamp parameters
- Replace the outlet fan
- Lamp Module blower

10.1 Introduction

Lamp Module

The DP2K-E series is delivered with two Lamp Modules installed. The Lamp Module is a consumable item of the projector.



Used lamps must be disposed of correctly. Barco recommends any used lamp be delivered to a qualified recycling company.



For a better user experience, it is recommended to replace both Lamp Modules at the same time.

Lamp strike policy and lamp warning/error policy versus the lamp runtime

- The projector issues a lamp run time notification message (and displays a blue status LEDs) approximately 30 hours before the maximum lamp runtime occurs.
- The projector issues a lamp run time notification message (and displays a blue status LEDs) when the maximum lamp runtime occurs.
- The projector will always try to strike the lamp, independent of the lamp runtime.

Parts identification Lamp Module

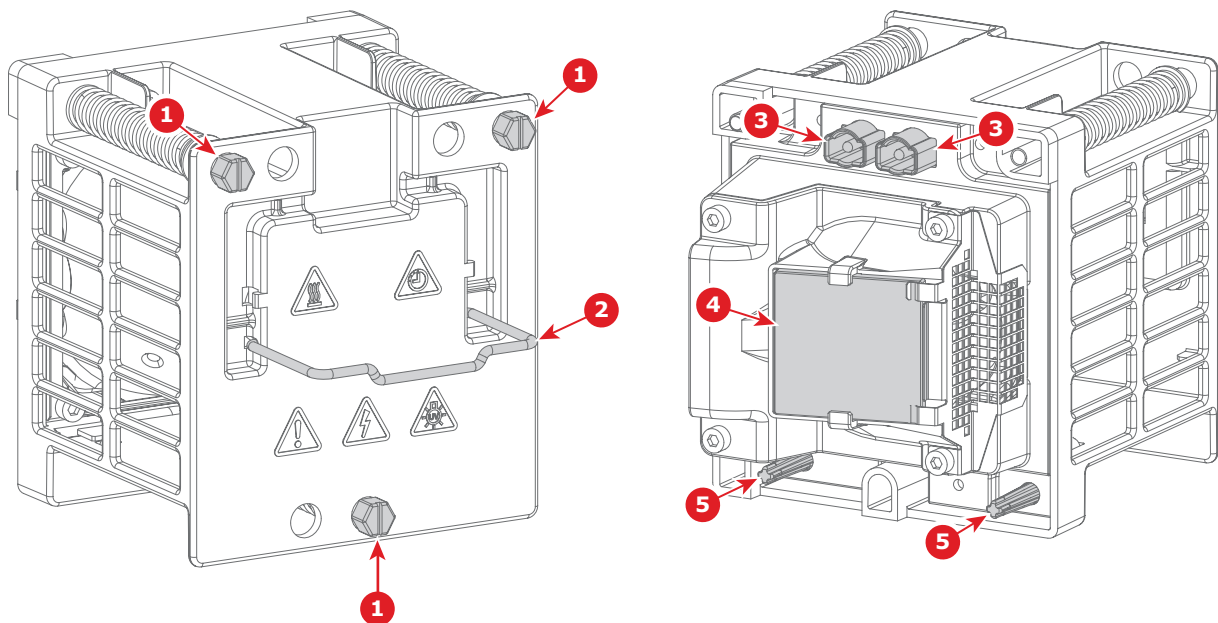


Image 10-1

- 1 Retaining screws for fixation of the Lamp Module
- 2 Handle
- 3 Power cable connections
- 4 UV/IR blocker
- 5 Positioning pins

10.2 Removal of the Lamp Module



WARNING: The Lamp Module is extremely hot during and directly after operation. Let the projector cool down for at least 15 minutes before attempting to access or handle the Lamp Module.



WARNING: This procedure may only be carried out by trained projectionists or qualified technical service personnel.



CAUTION: Due to its high internal pressure, the lamp may explode in hot state if improperly handled.

Necessary tools

7mm nut driver or flat screw driver.

How to remove the Lamp Module from the projector?

1. Ensure the projector is switched off and cooled down.
2. Remove the rear cover of the projector. See "Removal of the rear cover", page 275.
3. Loosen the retaining screw (1) of the fan door and open the door (2).

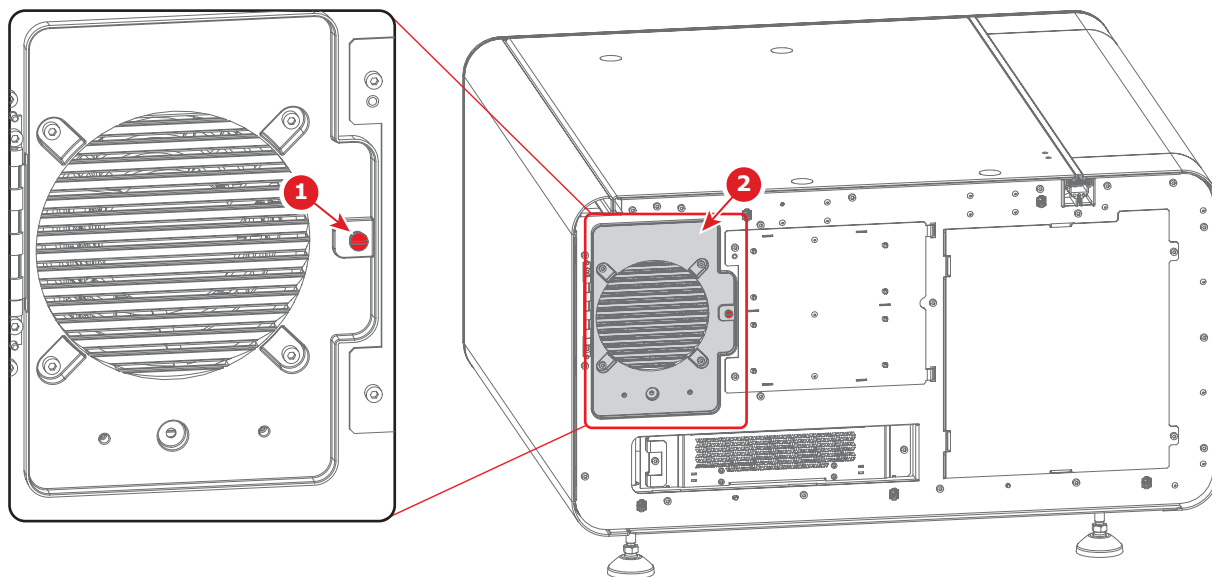


Image 10-2

4. Release the three retaining screws (3) of the Lamp Module. Use a 7mm nut driver or a flat screw driver.

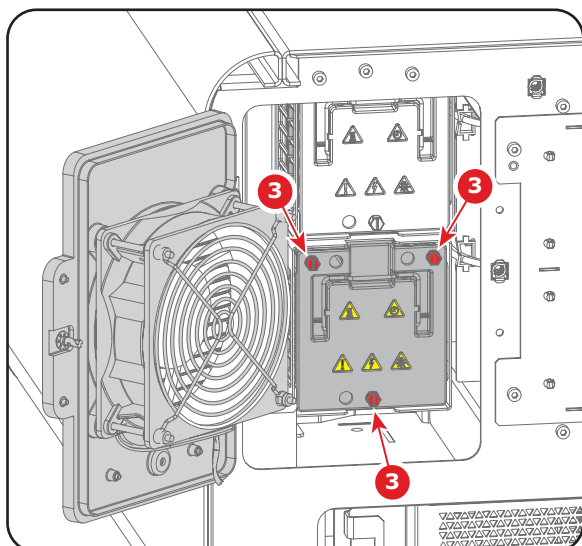


Image 10-3

5. Remove the Lamp Module as follows:

- Grip the Lamp Module by the handle (4) and slide it out half way of the lamp compartment.
- Support the Lamp Module at the bottom with the other hand and remove it from the lamp compartment.
- Place the Lamp Module on a stable support.

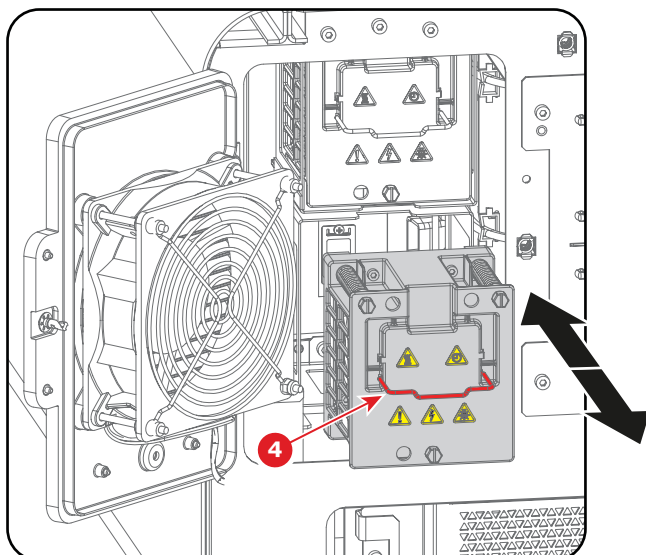


Image 10-4

10.3 Installation of the Lamp Module

Necessary tools

7mm nut driver or flat screw driver.



WARNING: This procedure may only be carried out by trained projectionists and qualified service personnel.

How to install the Lamp Module?

1. Insert the Lamp Module as follows:
 - a) Grip the Lamp Module by the handle (4) and support it at the bottom with the other hand.
 - b) Carefully insert the Lamp Module into the projector. Make sure the positioning pins (reference 5, image 10-1) match the holes in the projector.

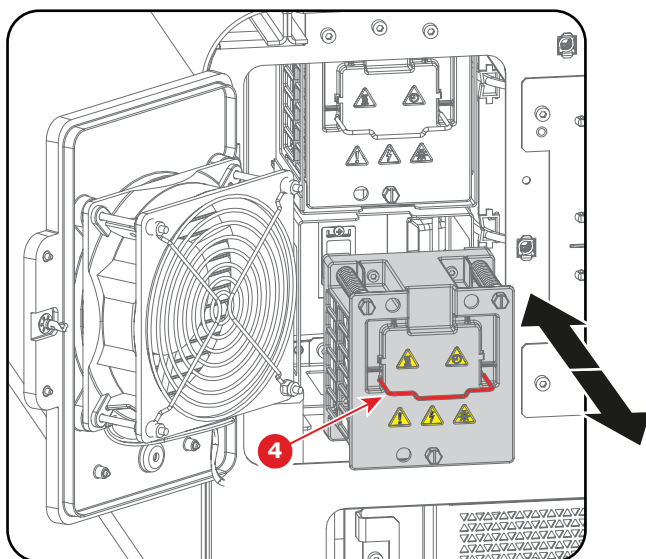


Image 10-5

10.4 Resetting the lamp parameters



CAUTION: The LAMP INFO parameters must be updated any time a Lamp Module is replaced. Neglecting to do this will result in poor performance and a reduced lamp lifetime.

How to reset the lamp parameters?

1. In the Communicator software, click on **Installation** (1) and click on **Lamp** (2).

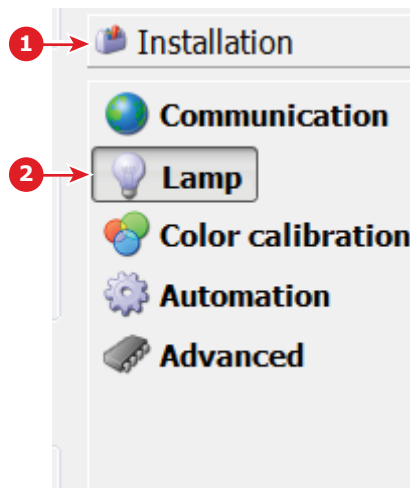


Image 10-6

2. Click on **Lamp information** (3).

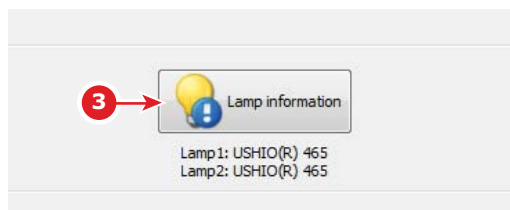


Image 10-7

The *Lamp information* window is displayed.

3. Click on **Get service code** (4) of the lamp you wish to replace.

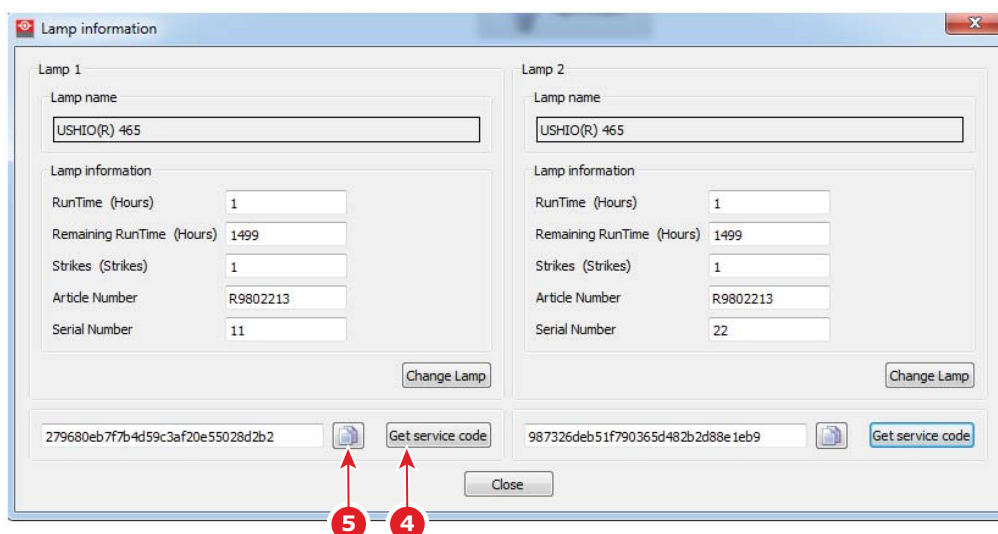


Image 10-8

The service code appears. Click the **copy** icon (5) to copy the service code to the clipboard. Paste the service code in a text editor and save the file. This service code will be required to claim a lamp which is failing within its warranty. A replacement lamp cannot be shipped if this code is not provided.

4. Click on **Change Lamp** (6).

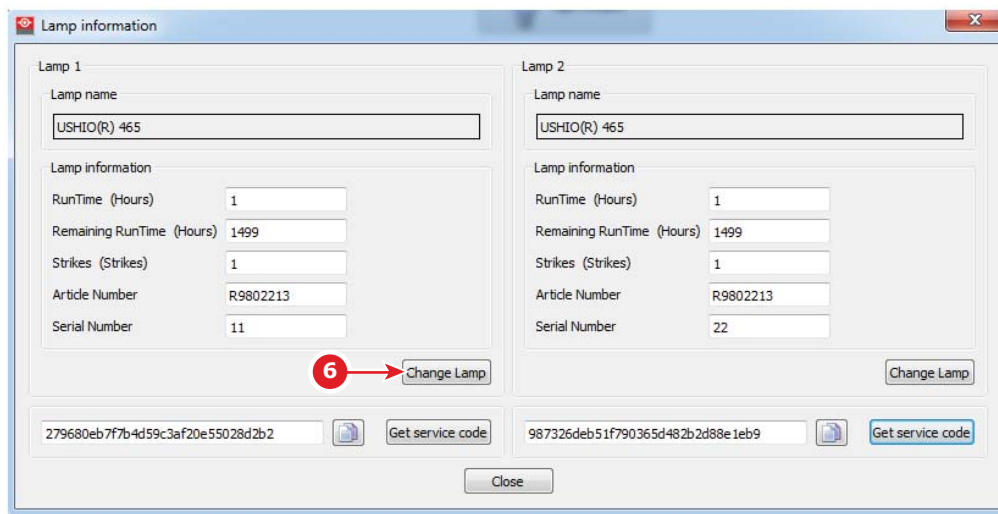


Image 10-9

The **Reset lamp** window appears.

5. Fill in the serial number of the new Lamp Module and click **OK** (7).

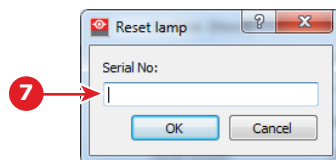


Image 10-10

6. A warning appears. Click **Yes** (8) to proceed.

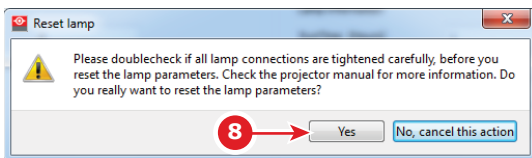


Image 10-11

10.5 Replace the outlet fan

Necessary tools

- 7mm flat screwdriver
- 3mm Allen key wrench



The projector rear cover must be removed before you can replace the outlet fan. This procedure assumes this is already done.

How to replace the outlet fan?

1. Loosen the captive screw (reference 1) of the lamp module door. Use a 7mm flat screwdriver.

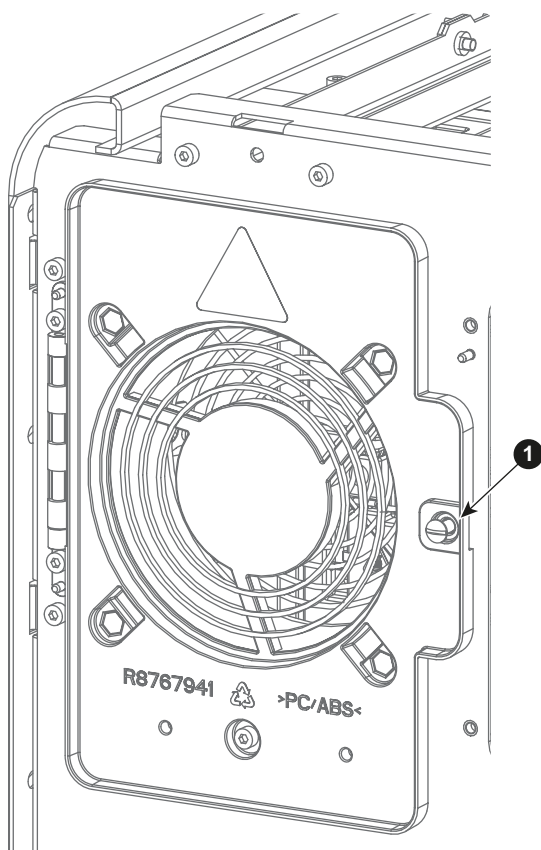


Image 10-12

2. Swing open the lamp door, as illustrated, and disconnect the wire of the fan (reference 2).

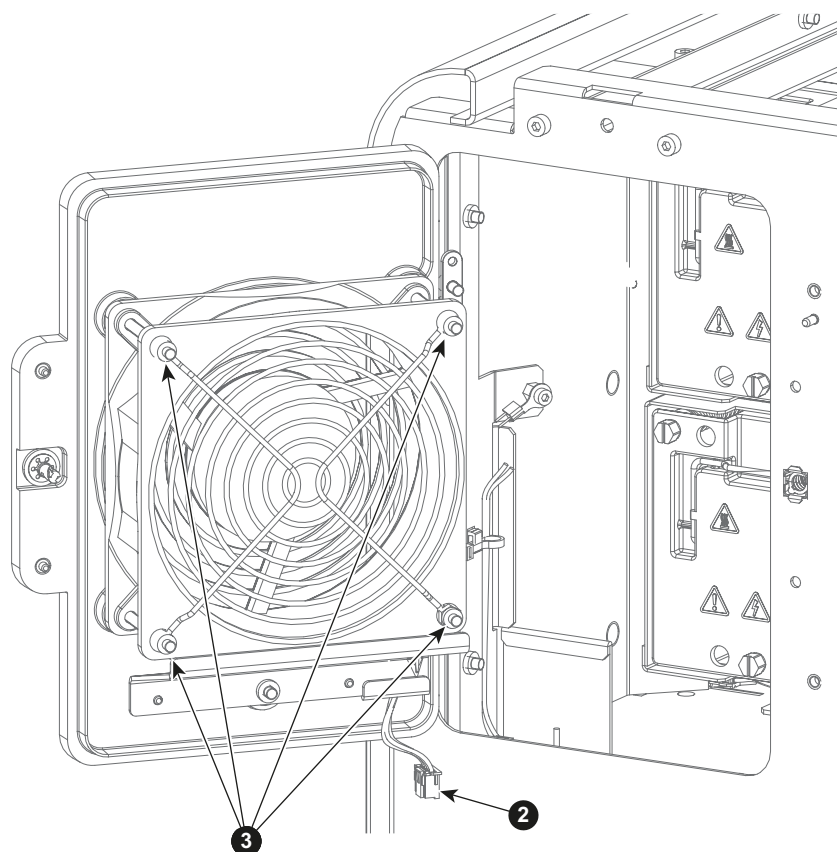


Image 10-13

3. Remove the fan from the door. Use a 3mm Allen key wrench to loosen the screws (reference 3).
4. Install the new fan as illustrated. Secure the fan wire with the cable tie.

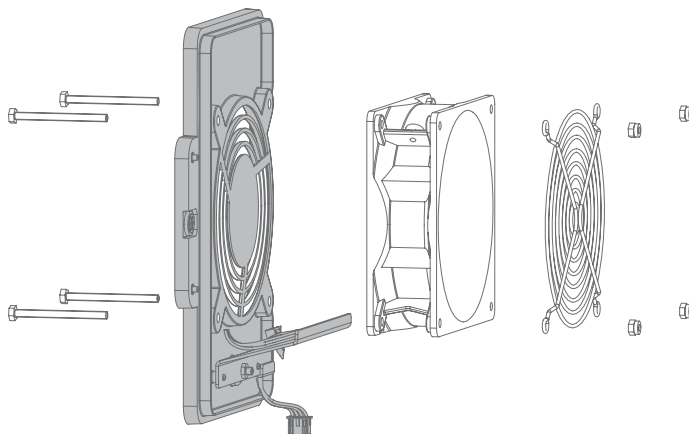


Image 10-14

5. Connect the wire of the fan (reference 2, image 10-13).

10.6 Lamp Module blower

About the Lamp Module blowers

Cooling to the Lamp Modules is provided by four (4) blowers located at rear interior wall of the projector chassis (reference image 10-15). Each blower operates individually and can be changed without interference to the other blowers.

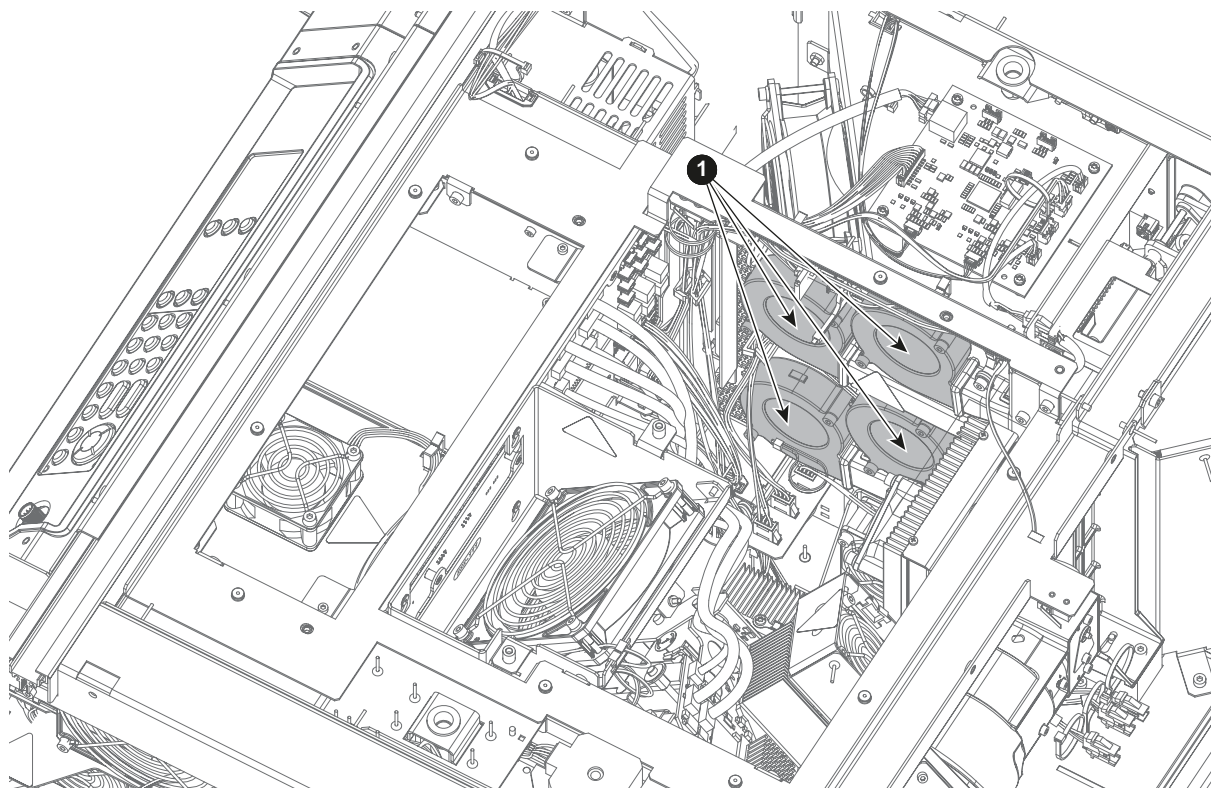


Image 10-15



The projector top and left side covers must be removed before the Lamp Module blowers can be replaced.

How to replace a Lamp Module blower?

1. Disconnect the wire of the relevant blower. See image image 10-16 and image 10-17

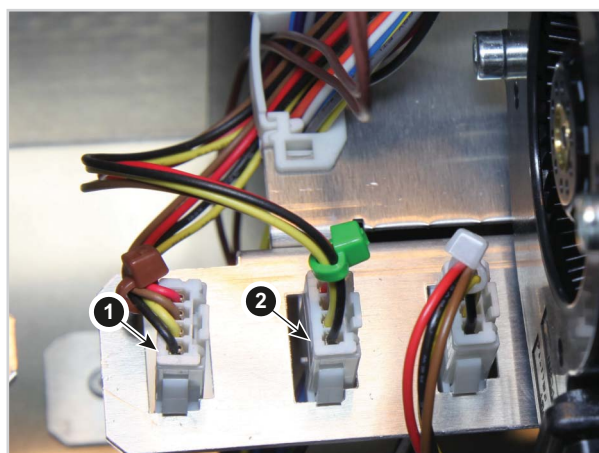


Image 10-16

- 1 Wire for lamp module 2, upper blower
- 2 Wire for lamp module 2, lower blower

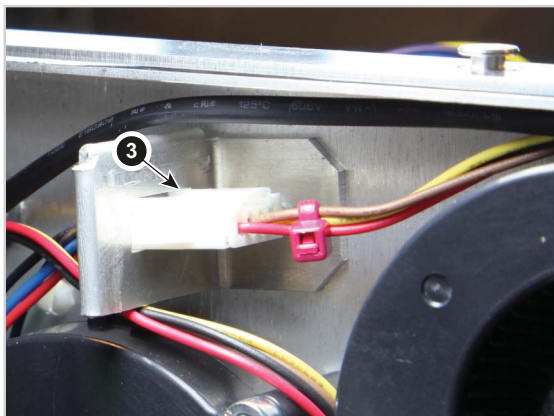


Image 10-17

- 3 Wire for lamp module 1, upper blower
- 4 Wire for lamp module 1, lower blower

2. Remove the relevant blower from the projector chassis. See image 10-18 Use a 3mm Allen key wrench to loosen the two screws.
Caution: Take care not to drop the screws in the projector chassis!

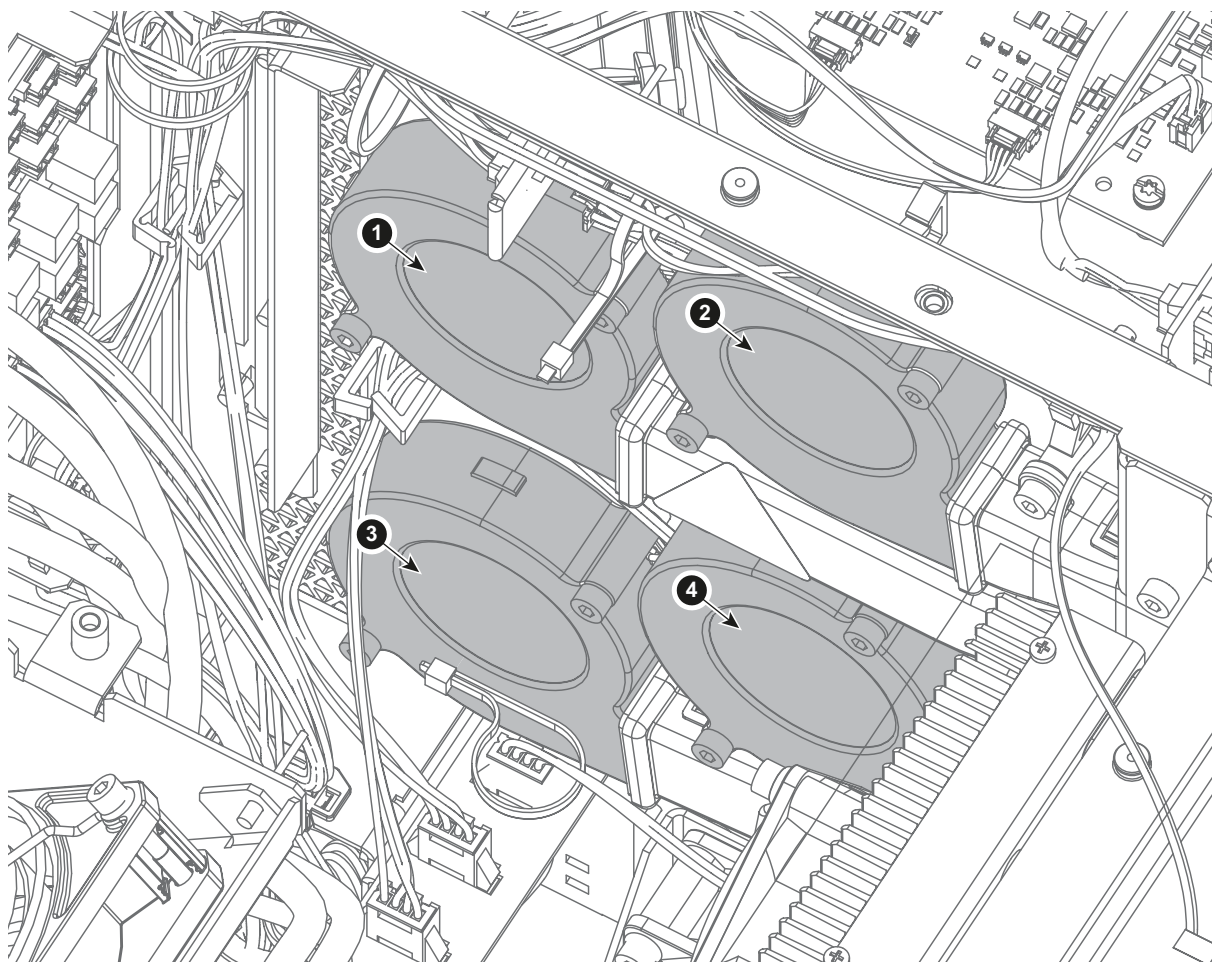


Image 10-18

- 1 Lamp module 1, Lower blower
- 2 Lamp module 1, Upper blower
- 3 Lamp module 2, Lower blower
- 4 Lamp module 2, Upper blower

3. Install the new blower. Use a 3mm Allen key wrench to fasten the 2 screws.
4. Reconnect the wire of the blower.

11. LIGHT PROCESSOR

Overview

- Introduction Light Processor
- Diagnostic
- Light Processor replacement process
- Removing the Light Processor
- Installing the Light Processor
- Cleaning the Prism exit side
- Replacement of the fan of the Light Processor compartment
- Replacement of the fan of the Red channel
- Replacement of the fan of the Green channel
- Replacement of the fan of the Blue channel
- Authorization to clear security warning on the projector

About this chapter

This chapter gives a brief introduction of the Light Processor assembly. Furthermore, this chapter includes the replacement procedure of the whole Light Processor. The convergence adjustment procedure is explained in a separate chapter of the manual, "Convergence", page 175.



WARNING: The procedures below may only be performed by Barco trained and qualified technicians.



WARNING: Disconnect the power cord of the projector from the power net and wait a few minutes (to discharge the capacitors) prior to starting this procedure.



CAUTION: Wear a wrist band which is connected to the ground while handling the electrostatic discharge sensitive parts.



CAUTION: Remove the light processor of the projector only in a clean and dust free area. Never remove the side cover in an area which is subject to airborne contaminants such as that produced by smoke machines or similar.



CAUTION: Remove the projector lens before removing the Light Processor.

11.1 Introduction Light Processor

Light Processor

The Light Processor is the heart of the projector. The prism of the Light Processor splits homogeneous white light coming from the Light Pipe into red, green and blue light. The video information on the three DMD's is converted to these red green and blue light beams. The prism merges the three integrated light beams back in to one full color video image, which is projected via the lens onto the screen.

Each DMD has its own formatting board (satellite board) which drives the micro mirrors to convert the video signal into the light beam. Heat is produced during the integration of the video information. To protect the DMD's from overheating the Light Processor is cooled by several fans and four temperature sensors. Each channel is equipped with its own dedicated fan, heatsink and temperature sensor to protect the Light Processor for overheating.

Both the blue and the green channel DMD are equipped with three convergence adjustment knobs each. The red channel DMD is fixed and serves as the reference channel for convergence alignment. Two of the three adjustment knobs per channel (red/green) are extended for easier access.

All critical air-gaps are sealed. The DMD are also sealed.

At the bottom of the prism exit a "touch" sensor is mounted to protect the prism against accidental lens movements.

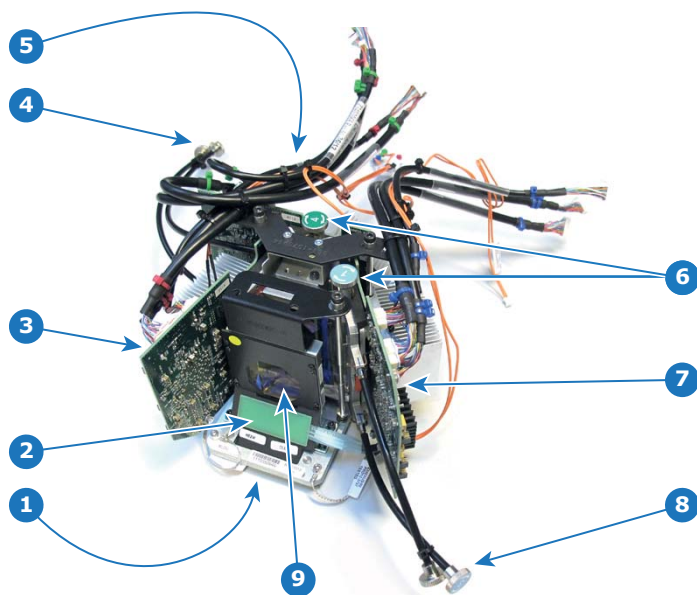


Image 11-1

- 1 Prism entrance.
- 2 Prism sensor.
- 3 Satellite board Red channel.
- 4 Convergence adjustment knobs .
- 5 Satellite board Green channel.
- 6 Convergence adjustment knobs .
- 7 Satellite board Blue channel.
- 8 Convergence adjustment knobs .
- 9 Prism exit.



CAUTION: Misalignment of the light path can rapidly damage the sealing between the prism and DMD.

11.2 Diagnostic

Troubleshooting of the Light Processor

There are several potential reasons why removal or replacing of the Light Processor could be required. Nevertheless, try to avoid unnecessary removal of the Light Processor. The list below gives an overview of the most common problems which require removal or replacement of the Light Processor. Check this list to ensure the problem is caused by the Light Processor.

- Artifacts in the projected image. These artifacts are also visible on the internal service patterns of the Satellite boards.
- Abnormal convergence fault which one is not able to correct. This could indicate prism damage (E.g. crack in prism).
- Unable to focus the projected image.

11.3 Light Processor replacement process

Process overview:

1. Remove the malfunctioning Light Processor. See detailed procedure "Removing the Light Processor", page 117.
2. Install the new Light Processor. See detailed procedure "Installing the Light Processor", page 119.
3. Obtain serial number of the installed Light Processor. See included procedure on page 169.
4. Check on the secured Barco website if a LUT-SCC file exists for the installed Light Processor serial.
 - a) If file exists:
 - Download the Light Processor specific LUT-SCC file from the secured Barco website. See included procedure on page 170.
 - Upload the LUT-SCC file into the projector file system. (e.g. 1110351581.LUT-SCC). See included procedure on page 172.
 - Activate the LUT-SCC file. See included procedure on page 173.
 - b) If file does NOT exist: activate the default LUT-SCC file which is already installed on the ICP board.
 - For 2K projectors use the default LUT-SCC file: "ones2K_LE"
 - For 4K projectors use the default LUT-SCC file: "ones4K_LE"
5. Backup projector files (including the LUT-SCC file). See Communicator User Guide chapter "Installation" where 'cloning' is explained.

11.4 Removing the Light Processor



WARNING: Disconnect the power cord from the projector and wait a few minutes (to discharge the capacitors) prior to start with this procedure.



The projector lens, top cover, left side cover, front cover, back cover, top cover plate and side cover plate must be removed before the light processor can be removed. This procedure assumes that these items have already been removed.



CAUTION: Ensure that the lens is removed from the projector prior to remove the Light Processor.

Necessary tools

- 2.5 mm Allen key wrench.
- 3 mm Allen key wrench.

How to remove the Light Processor from the projector?

1. Remove the top fan of the Light Processor and place it on top of the Card Cage. There is no need to disconnect the wire of the fan.
2. Disengage the Convergence flex cables from the cable clamp on the Anode Fan assembly (green channel) and the cable clamp on the projector chassis (blue channel).
3. Disconnect the nine RGB connectors (reference 3 image 11-2) from the Signal Distribution board. To do this, push the little tab (reference 4 image 11-2) down with your fingernail and then pull the connector gently out of its socket. The connector should come out easily from its socket.

Caution: Always push-in the little tab of the connector to remove the connector from its socket. Neglecting this will result in irreversible damage of the socket.

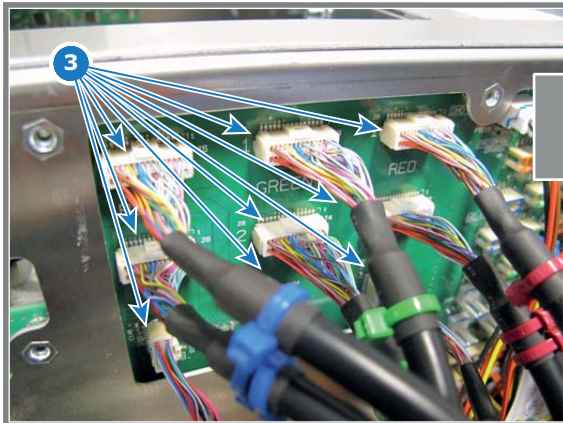
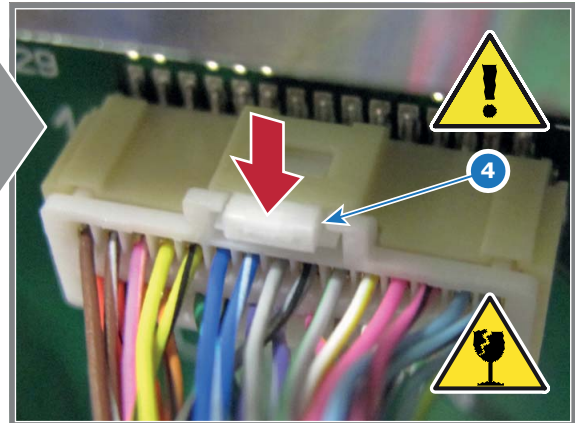


Image 11-2



4. Disconnect the other four orange wires of the Light Processor from the Signal Distribution board (reference 5, 6, 7 & 8 of image 11-3).

11. Light Processor

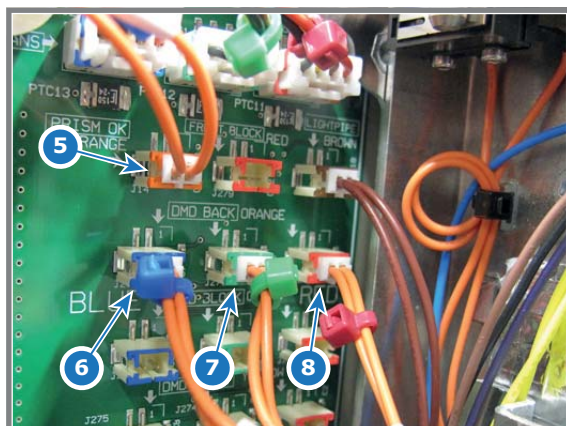


Image 11-3

5. Loosen the three captive screws (reference 9 image 11-4) of the Light Processor by a few turns until you feel that the screws can bob up-and-down. Use a 2.5 mm Allen key wrench.

Caution: Do not keep turning the captive screws as this will dismantle the screws' captive system.

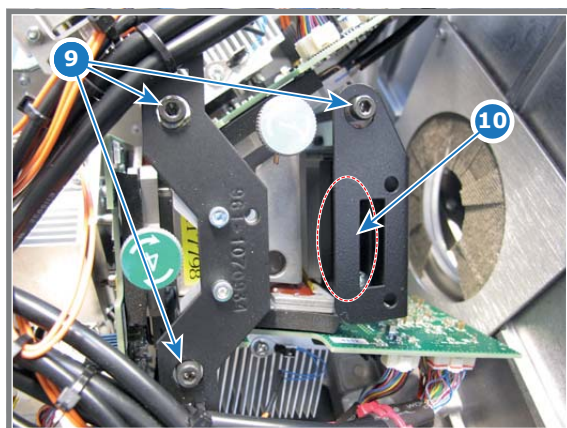


Image 11-4

6. Gently remove the Light Processor from the projector chassis. Lift the Light Processor using the black bracket which serves as a handle.

7. Place the Light Processor on a clean flat surface with the prism entrance (reference 1 image 11-5) facing down. (Remove screws or such from the table that could roll under the Light Processor while putting it down)

Caution: Do not place the Light Processor upon one of its heat sinks.

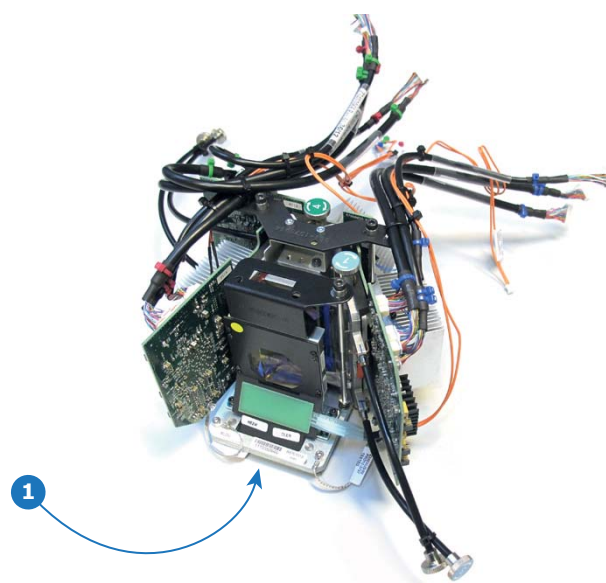


Image 11-5

11.5 Installing the Light Processor



The Light Processor and the Notch Filter are matched with each other. For that when replacing the Light Processor the Notch Filter has to be replaced as well. The Light Processor spare part kit contains a matched Notch filter for the Light Processor.



After installing a new Light Processor, the LUT-SCC file of the new Light Processor has to be installed and activated. See chapter "Spatial Color Calibration (LUT-SCC)", page 167.

Necessary tools

- 7mm flat screwdriver.
- 2.5mm Allen key.

How to install the Light Processor in the projector?

1. Gently place the Light Processor in its place on the optical base of the projector as illustrated. Ensure that the positioning pins (reference 12 image 11-6) of the Light Processor matches the positioning holes (reference 13 image 11-6) in the optical base.

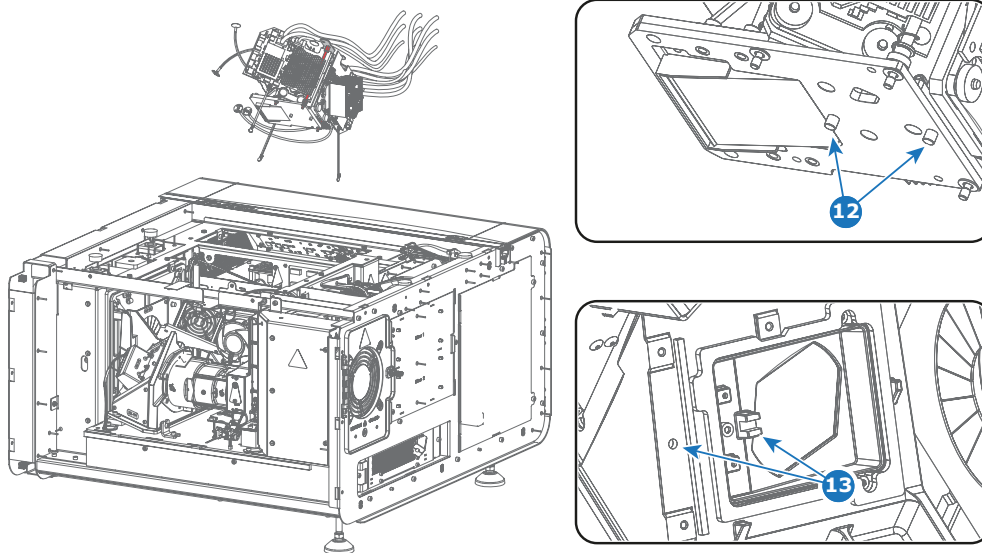


Image 11-6

2. Fasten the three captive screws (reference 9 image 11-7) of the Light Processor assembly as illustrated. Use a 2.5mm Allen key.

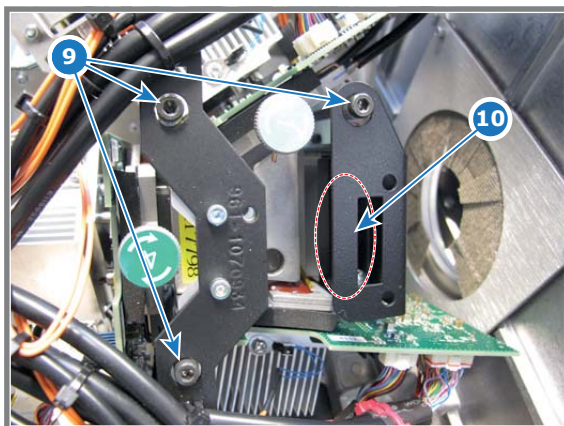


Image 11-7

3. Connect the nine RGB connectors (reference 1 to 9 of image 11-8) with the Signal Distribution board as illustrated.

11. Light Processor

- Reference 1 - small connector with blue cable tie.
- Reference 2 - small connector with green cable tie.
- Reference 3 - small connector with red cable tie.
- Reference 4 - connector with two blue cable tie.
- Reference 5 - connector with two green cable tie.
- Reference 6 - connector with two red cable tie.
- Reference 7 - connector with one blue cable tie.
- Reference 8 - connector with one green cable tie.
- Reference 9 - connector with one red cable tie.

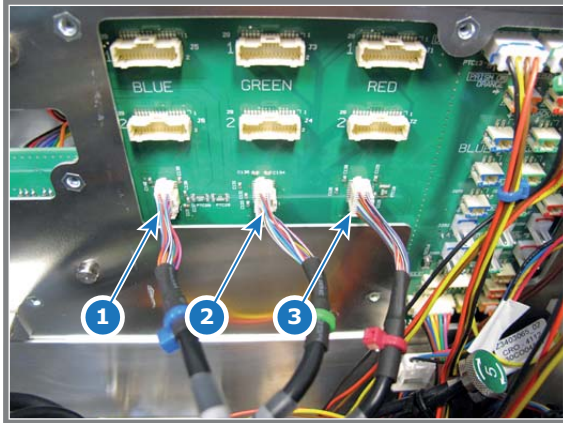
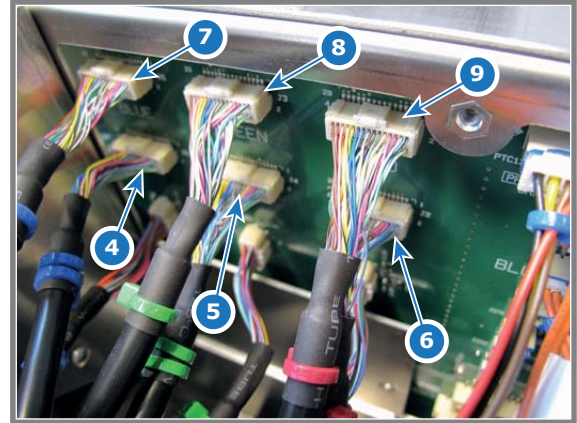


Image 11-8



4. Connect the four orange wires of the Light Processor with the Signal Distribution board as illustrated in image 11-9.

- Reference 5 - Prism Sensor: orange wire without cable tie.
- Reference 6 - Temperature Sensor DMD Blue Channel: orange wire with blue cable tie.
- Reference 7 - Temperature Sensor DMD Green Channel: orange wire with green cable tie.
- Reference 8 - Temperature Sensor DMD Red Channel: orange wire with red cable tie.

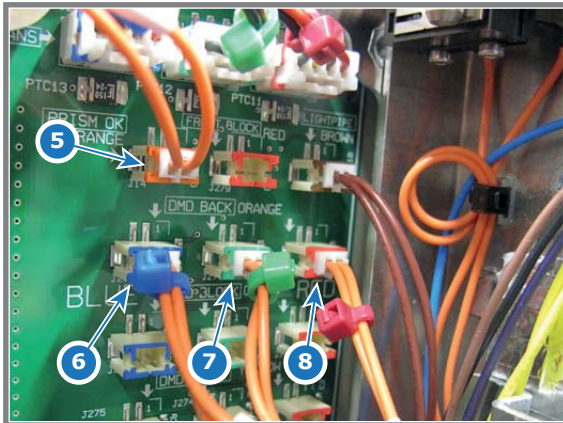


Image 11-9

5. Gently insert the Convergence flex cables into the corresponding cable clamp on the Green DMD Fan assembly (reference 1).

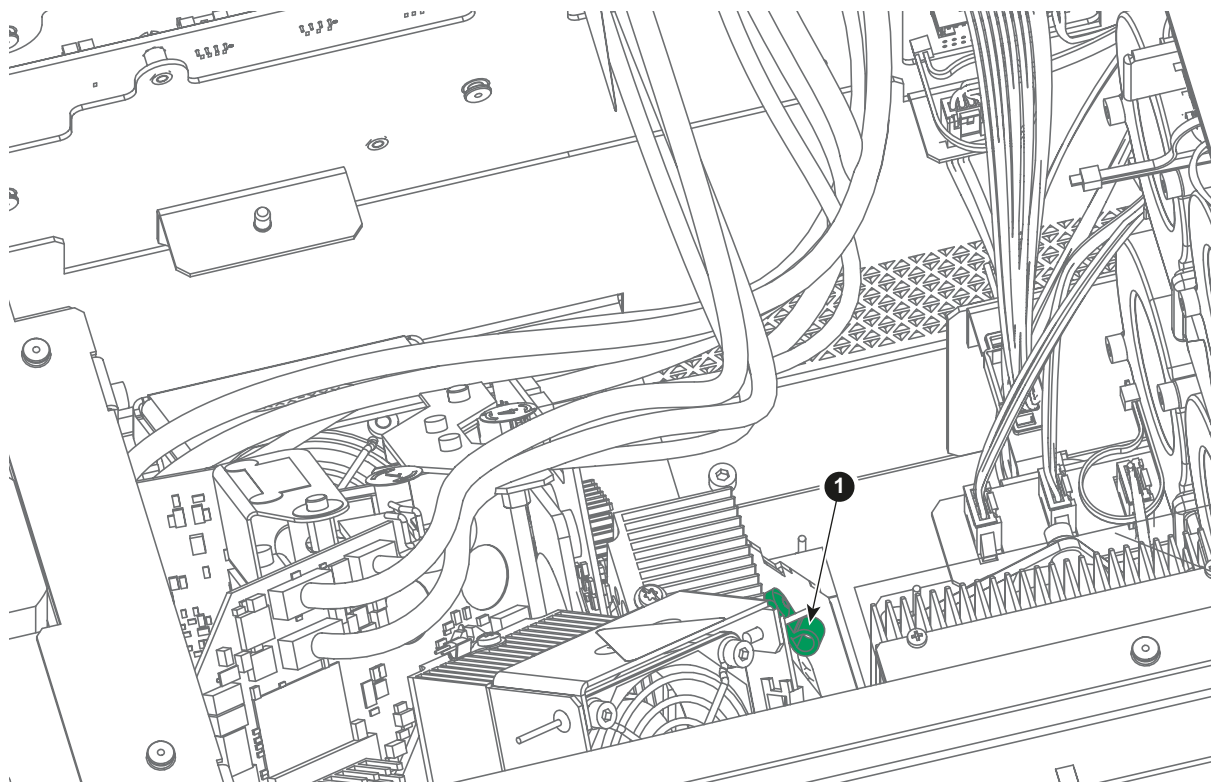


Image 11-10

6. Place the top fan of the Light Processor in the lower position. Ensure that the four mounting pins (reference 1 image 11-11) of the fan assembly are engaged.

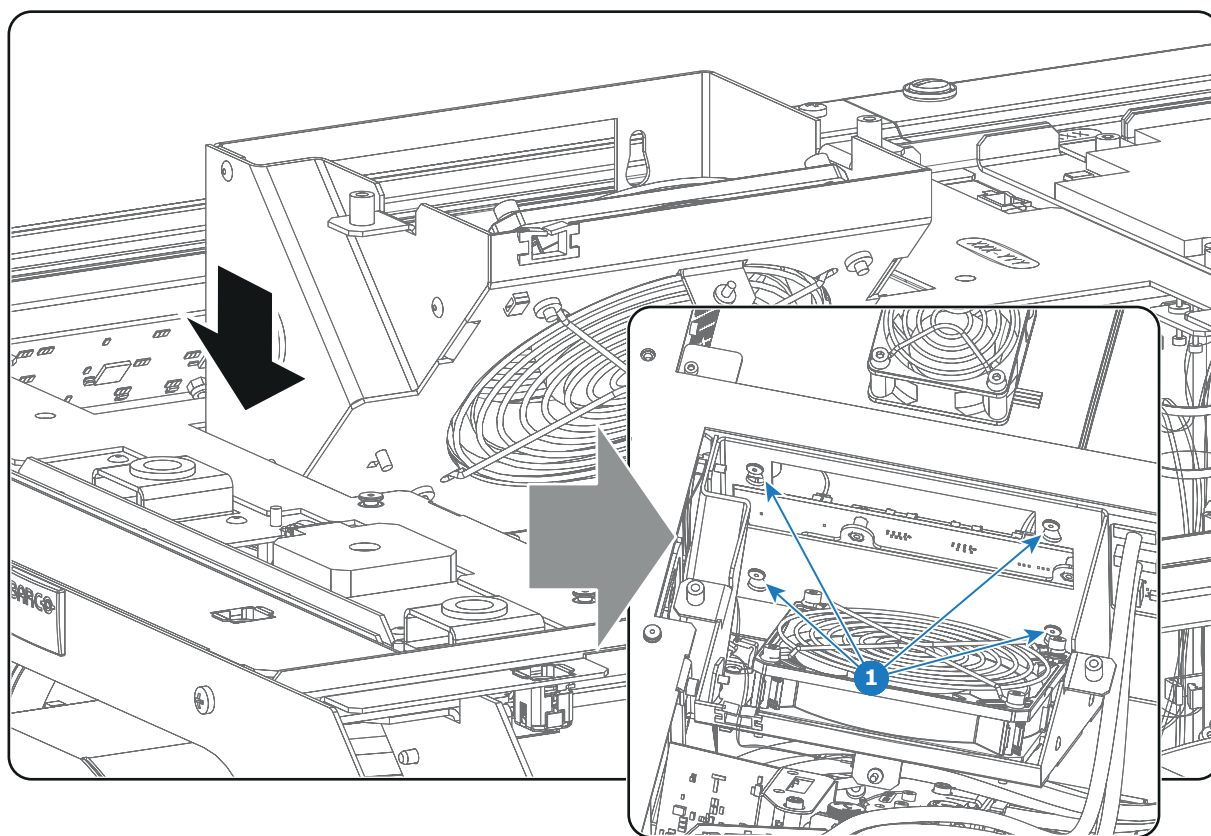


Image 11-11

7. Is the Light Processor replaced by a new spare Light Processor?
If yes,

- a) replace the Notch Filter in the Light Pipe with the new Notch Filter included in spare part kit of the Light Processor. See procedure "Adjusting the Notch Filter", page 156.
 - b) after finishing this procedure, proceed with installing and activating the LUT-SCC file of the new Light Processor. See chapter "Spatial Color Calibration (LUT-SCC)", page 167.
8. Close off the Light Processor compartment:
- Install the top cover plate.
 - Install the side cover plate.
 - Install the top cover of the projector.
 - Install the left side cover of the projector.

11.6 Cleaning the Prism exit side

When should one clean the Prism exit side?

Clean the Prism exit on a regular basis to maintain light output level.



This procedure requires that the lens is removed from the projector.

Necessary tools

- Compressed air.
- Clean Toraysee® cloth or any micro fiber lens cleaning cloth.

Necessary parts

Lens cleaner (e.g. Carl Zeiss lens cleaner or Purasol® or any waterbased lens cleaner)

How to clean the Prism exit side?

1. Wipe off the dust of the Prism exit. Use for that a clean Lens cleaning cloth.
Tip: *Limit the number of wipe movements. This to protect the optical coating. It is better to wipe off the dust with one good wipe movement than with 10 soft wipe movements.*
2. Is all dust removed from the Prism exit?
If yes, stop this cleaning procedure.
If no, wipe off the dust of the Prism exit with a clean lens cleaning cloth and lens cleaner.

11.7 Replacement of the fan of the Light Processor compartment



To access the fan of the Light Processor compartment the top cover and the top cover plate have to be removed from the projector. This procedure assumes that the top cover and top cover plate are already removed from the projector.

Necessary tools

3mm Allen wrench.

How to replace the fan of the Light Processor compartment?

1. Disconnect the wire of the fan (reference 5 image 11-13) and the wire of the temperature sensor (reference 6 image 11-13) from the Signal Backplane.
2. Remove the fan assembly from the projector chassis. Note that the fan assembly is engaged with four mounting pins (reference 8 image 11-12).. Pull the fan assembly a few mm upwards and then away from the projector chassis.

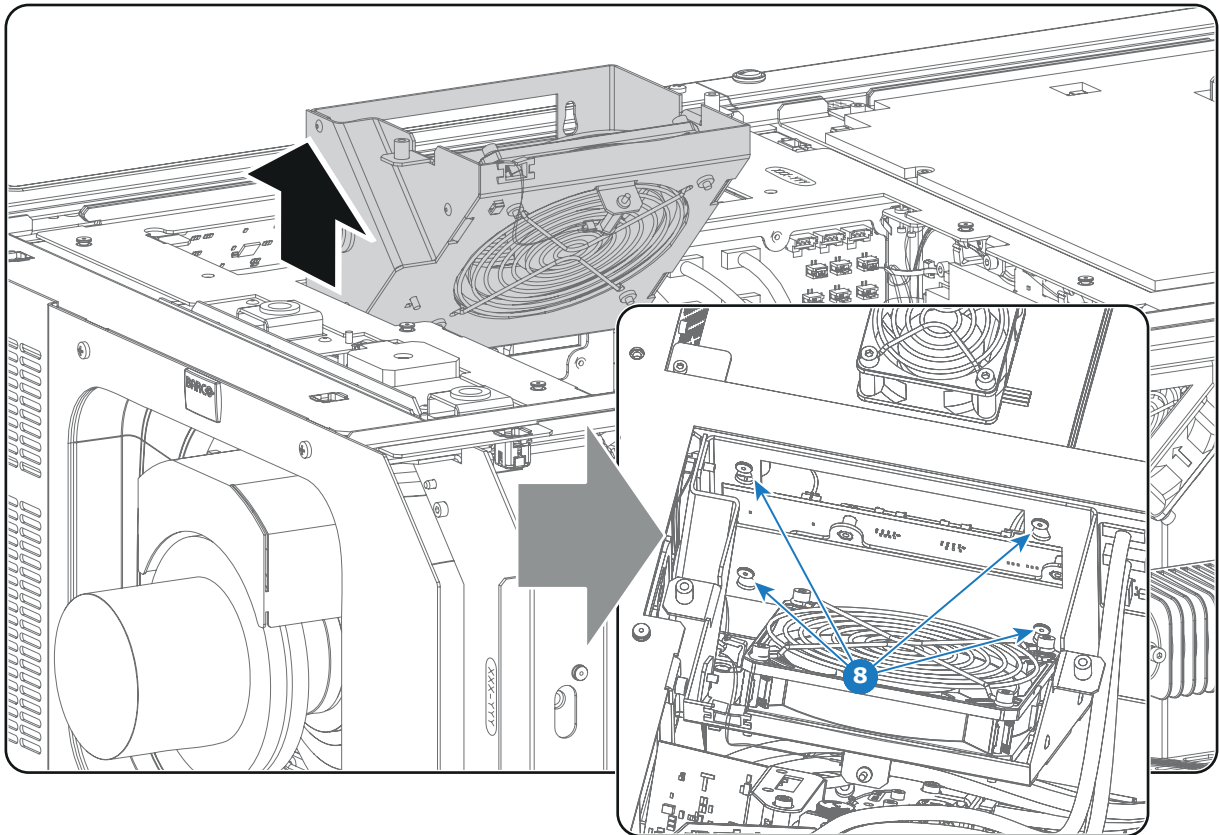


Image 11-12

3. Release both wires from the cable clamp at the side (reference 7 image 11-13).

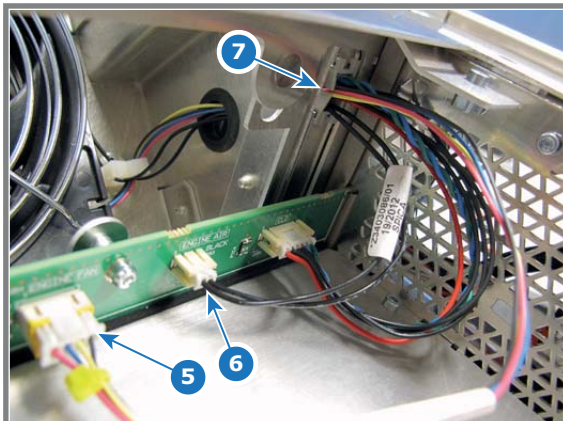


Image 11-13

4. Remove the fan from the assembly. Use a 3mm Allen wrench to release the four screws (reference 3 image 11-14). While remove the fan guide the wire through the grommet (reference 4 image 11-14).

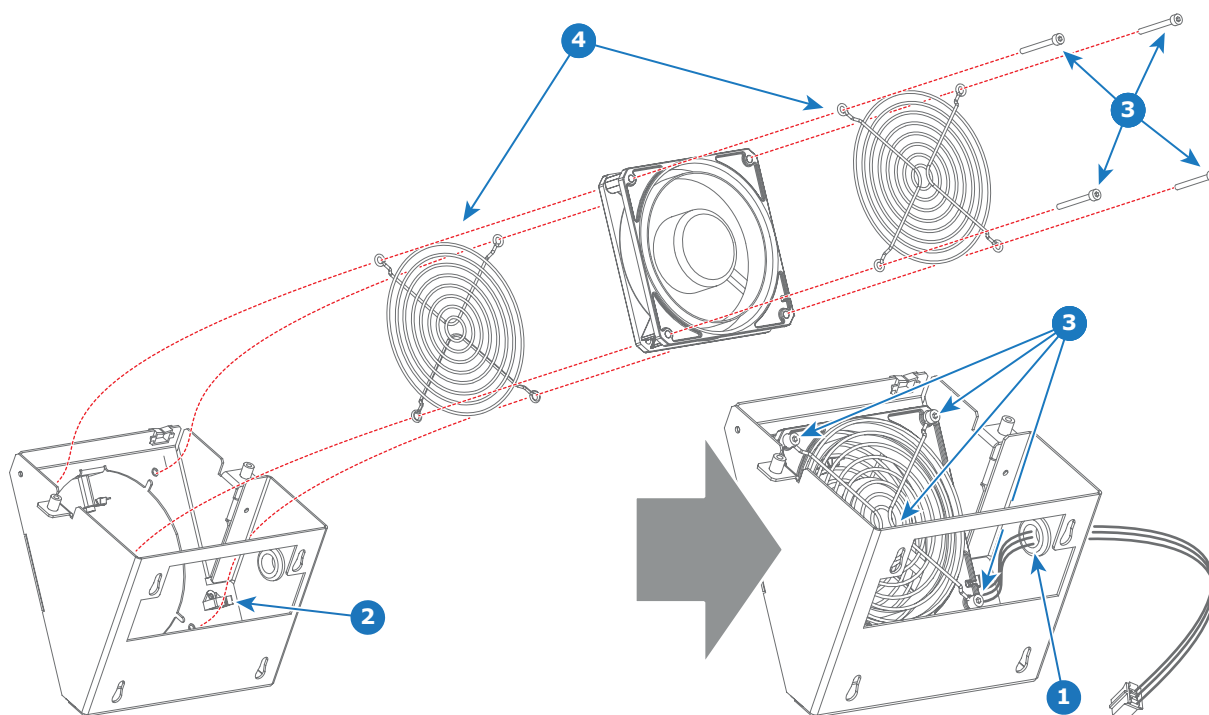


Image 11-14

5. Install the new fan. Guide the wire of the new fan through the grommet (reference 4 image 11-14) and ensure that the wire is inserted in the cable clamp (reference 2 image 11-14). Use a 3mm Allen wrench to fasten the four screws (reference 3 image 11-14).
Caution: Ensure that the airflow of the fan is towards the Light Processor.
6. Place the wire of the fan and the wire of the temperature sensor in the cable clamp (reference 7 image 11-13).
7. Install the fan assembly. Ensure that the four mounting pins (reference 1 image 11-15) of the fan assembly are engaged.

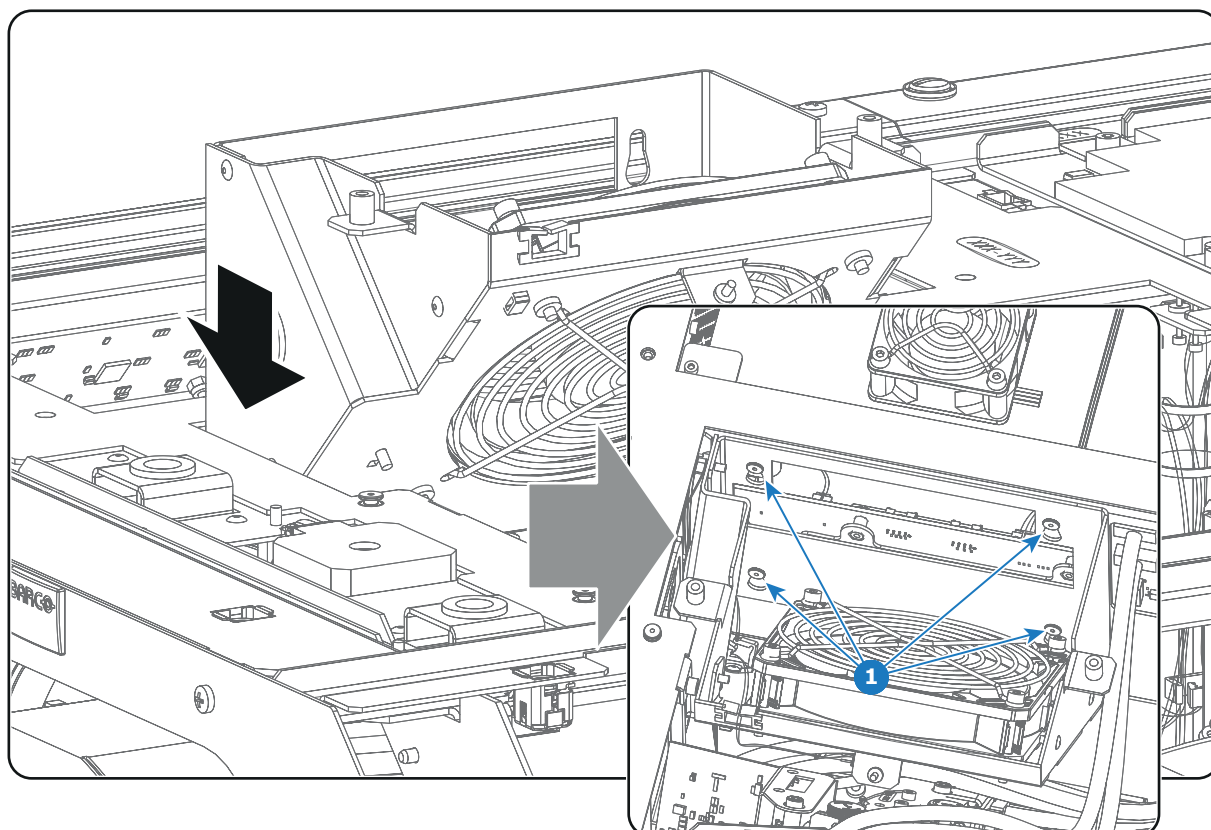


Image 11-15

11. Light Processor

8. Connect the wire of the fan (reference 5 image 11-13) and the wire of the temperature sensor (reference 6 image 11-13) with the Signal Backplane.
9. Close up the projector.

11.8 Replacement of the fan of the Red channel



To access the fan of the Red channel in the Light Processor compartment the Light Processor unit has to be removed from the projector. This procedure assumes that the Light Processor unit is already removed from the projector.

Necessary tools

3mm Allen wrench.

How to replace the fan of the Red channel?

1. Disconnect the wire (reference 3 image 11-16) of the fan from the Signal Backplane.

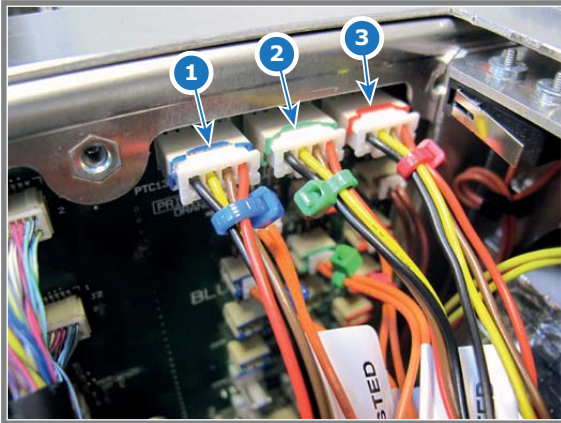


Image 11-16

2. Remove the fan assembly from the chassis. Use a 3mm Allen wrench to loosen the three fixation screws of the assembly (reference 4 image 11-17).

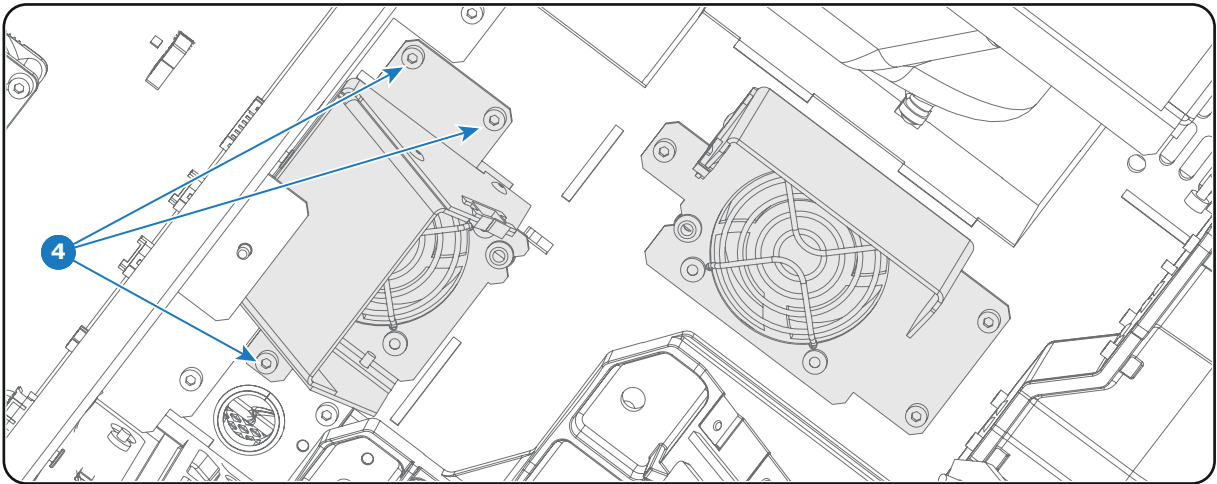


Image 11-17

3. Remove the fan from the assembly. Use a 3mm Allen wrench to loosen the four screws (reference 5 image 11-18) as illustrated.

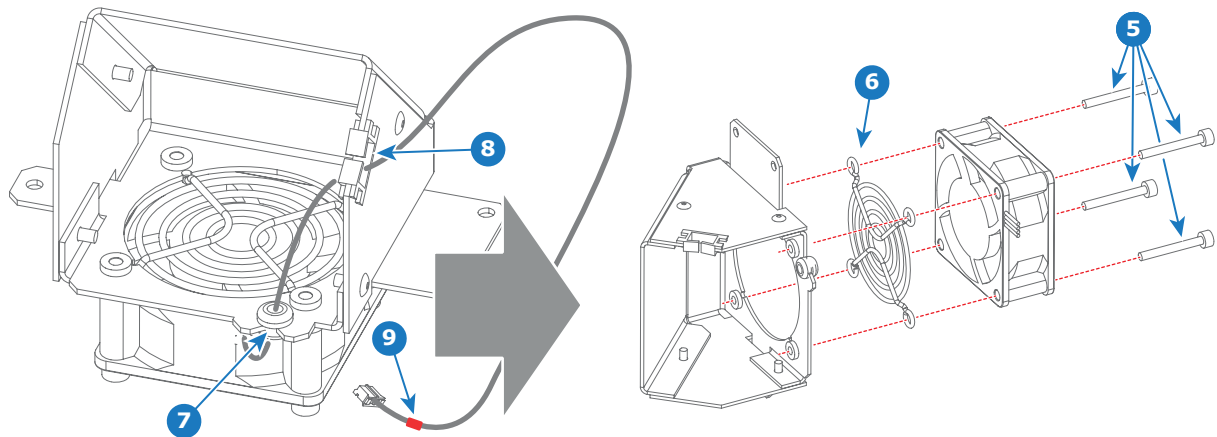


Image 11-18

4. Mount the new fan on the assembly as illustrated. Place the fan guard (reference 6 image 11-18) between the fan and mounting plate. Fixate fan and fan guard with four long screws (reference 5 image 11-18) using a 3mm Allen wrench.
Caution: Ensure that the airflow of the fan is towards the heatsink of the Red channel.
5. Guide the wire of the fan through the rubber grommet (reference 7 image 11-18) and cable clamp (reference 8 image 11-18) and mark the wire by attaching a red colored cable tie two centimeters from the plug (reference 9 image 11-18).
6. Install the fan assembly onto the projector chassis. Use a 3mm Allen wrench to fasten the three screws (reference 4 image 11-17).
7. Connect the wire of the fan with the Signal Backplane. (reference 3 image 11-16)

11.9 Replacement of the fan of the Green channel



To access the fan of the Green channel in the Light Processor compartment the Light Processor unit has to be removed from the projector. This procedure assumes that the Light Processor unit is already removed from the projector.

Necessary tools

3mm Allen wrench.

How to replace the fan of the Green channel?

1. Disconnect the wire (reference 2 image 11-19) of the fan from the Signal Backplane.

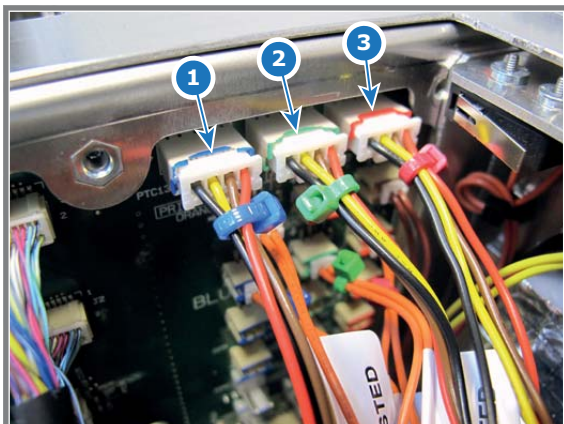


Image 11-19

2. Remove the fan assembly from the chassis. Use a 3mm Allen wrench to loosen the three fixation screws of the assembly (reference 4 image 11-20).

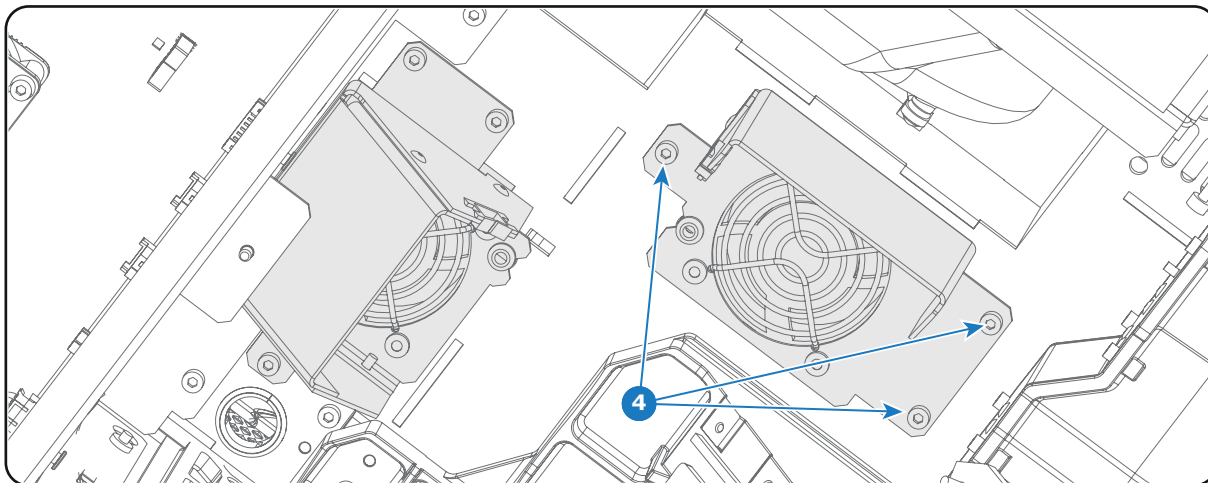


Image 11-20

3. Remove the fan from the assembly. Use a 3mm Allen wrench to loosen the four screws (reference 5 image 11-21) as illustrated.

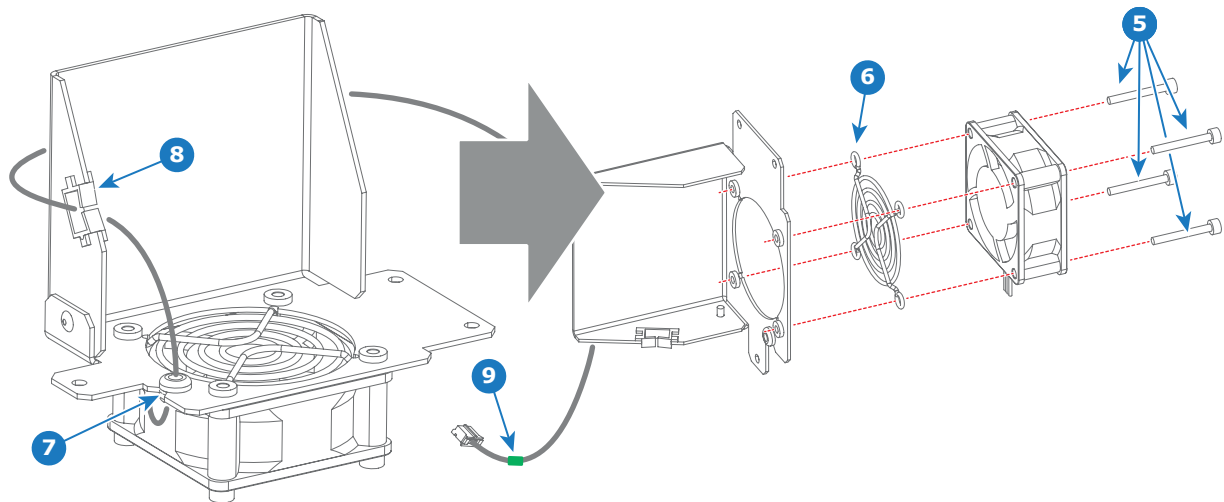


Image 11-21

4. Mount the new fan on the assembly as illustrated. Place the fan guard (reference 6 image 11-21) between the fan and mounting plate. Fixate fan and fan guard with four long screws (reference 5 image 11-21) using a 3mm Allen wrench.
Caution: Ensure that the airflow of the fan is towards the heatsink of the Green channel.
5. Guide the wire of the fan through the rubber grommet (reference 7 image 11-21) and cable clamp (reference 8 image 11-21) and mark the wire by attaching a green colored cable tie two centimeters from the plug (reference 9 image 11-21).
6. Install the fan assembly onto the projector chassis. Use a 3mm Allen wrench to fasten the three screws (reference 4 image 11-20).
7. Connect the wire of the fan with the Signal Backplane. (reference 2 image 11-19)

11.10 Replacement of the fan of the Blue channel



To access the fan of the Blue channel in the Light Processor compartment the top cover, the top cover plate, the left side cover and the light processor side cover have to be removed from the projector. This procedure assumes that this is already done.

Necessary tools

- 3mm Allen wrench.
- 4mm monkey wrench.

How to replace the fan of the Blue channel?

1. Disconnect the blue-tagged wire (reference 1 image 11-22) of the fan from the Signal Backplane.

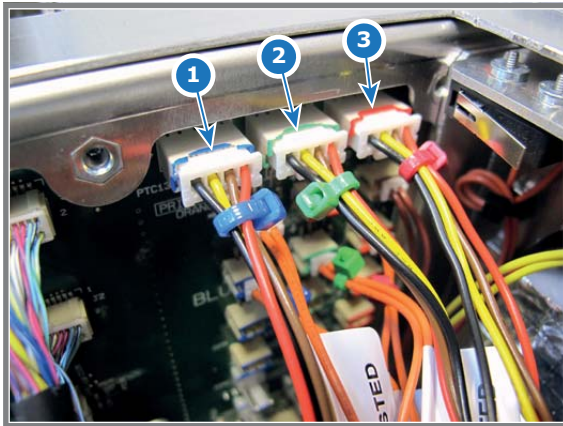


Image 11-22

2. Loosen and remove the two fastening nuts (reference 1, image 11-23). Lift the fan assembly out of the projector chassis.

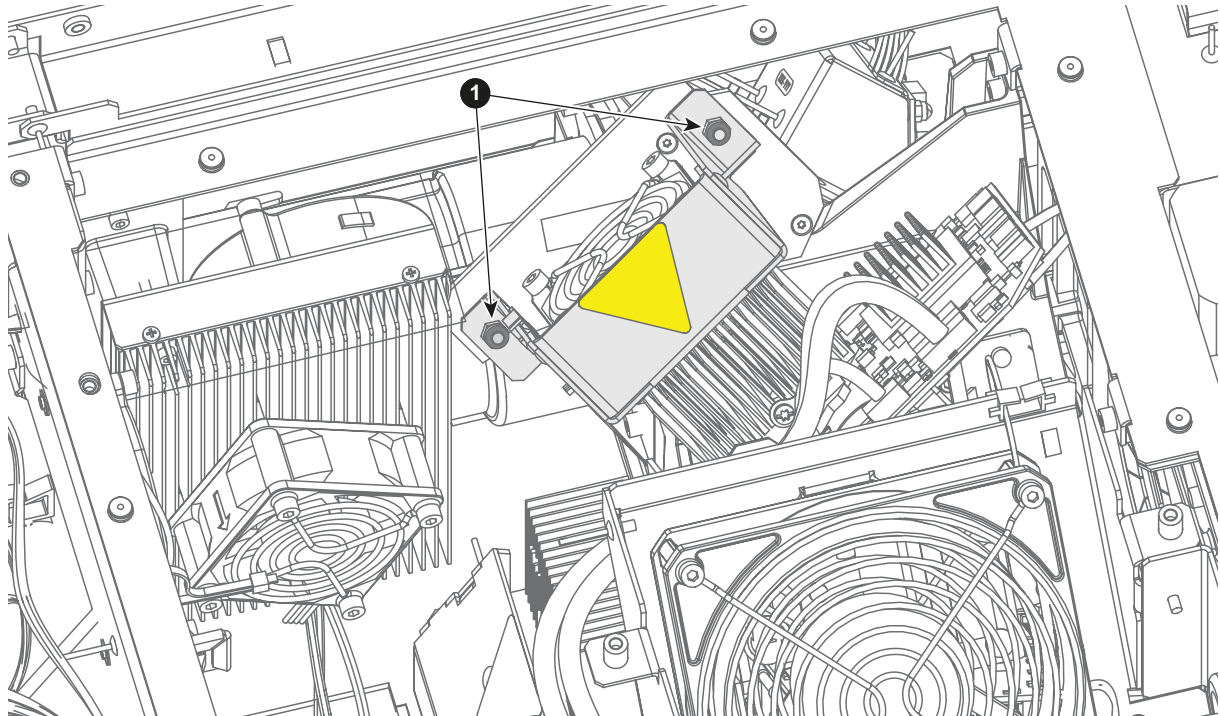


Image 11-23

3. Loosen the four long screws holding the fan in place (reference 4, image 11-24). Use a 3 mm Allen wrench.
 4. Remove the fan from the assembly.
 5. Mount the new fan on the assembly as illustrated. Place the fan guard (reference 5, image 11-24) on top of the fan and install the fan and fan guard with four long screws (reference 4, image 11-24) using a 3 mm Allen wrench.
- Caution:** Ensure that the airflow of the fan is towards the heatsink of the Blue channel.

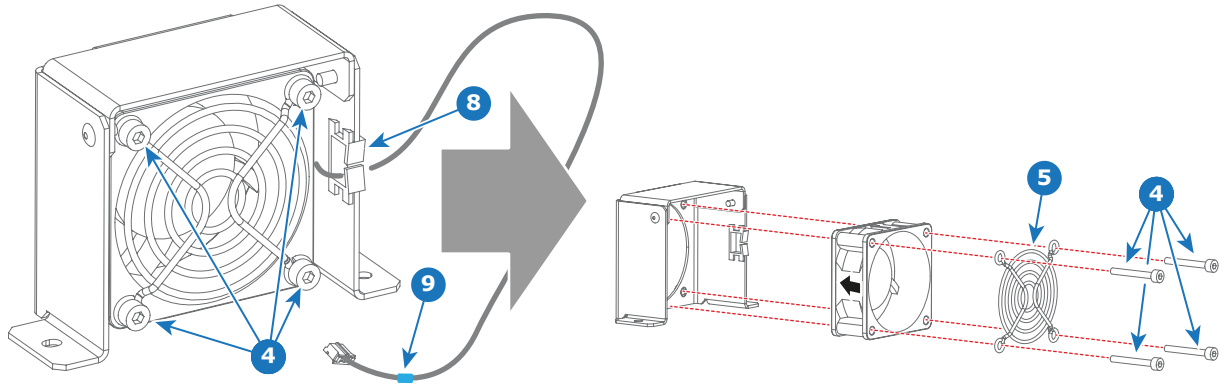


Image 11-24

6. Guide the wire of the fan through the cable clamp (reference 8, image 11-24) and mark the wire by attaching a blue colored cable tie two centimeters from the plug (reference 9, image 11-24).
7. Connect the wire of the fan with the blue—marked socket on the Signal Backplane. (reference 1 image 11-22)

11.11 Authorization to clear security warning on the projector

When is an authorization required to clear the security warning?

If a module has been removed or if the sealed compartment has been opened, an authorization will be required to clear the security warning.

Necessary tools

Authorization pin code.

Authorization procedure to clear security warning

1. Ensure that all modules are properly installed.
2. Start up the projector (Standby mode).
3. Initiate authorization by pushing the Key button on the Local Keypad:



The color of the backlight of the Numeric keys 1 to 6 of the Local Keypad changes from white to yellow.

4. Enter pin code within 5 seconds.
 - In case no keys are pressed, the color of the backlight of the Numeric keys 1 to 6 changes back to white.
 - In case of an **incorrect code** entry, the color of the backlight of the Numeric keys changes to **red** for 1 second and then back to **white**.
 - In case of a **correct code** entry, the color of the backlight of the Numeric keys 1 to 6 changes to **green** for 1 second and then back to **white**.



Each attempt to clear the security warning and its result (successfully or unsuccessfully) is logged inside the projector.

12. LIGHT PIPE

About this chapter

This chapter gives a brief introduction of the Light Pipe and its components. It also describes the replacement procedure of the Light Pipe.

Overview

- Introduction Light Pipe
- Removal of the Light Pipe
- Removal of the Light Pipe cover plate
- Replacing Light Pipe lens No. 1 (focus lens)
- Replacing Light Pipe lens No. 2
- Replacing Light Pipe lens No. 3 (zoom lens)
- Replacing Light Pipe lens No4
- Cleaning the Light Pipe lenses
- Install the Light Pipe cover
- Install the Light Pipe
- Adjusting the Light Pipe lens No. 1 (focus lens)
- Adjusting the Light Pipe lens No. 3 (zoom lens)
- Replacing the Notch Filter
- Adjusting the Notch Filter
- Cleaning the Notch Filter
- Replacing the Fold Mirror set
- Adjusting the Fold Mirror
- Cleaning the Fold Mirrors
- Replacing the Light Sensor module (CLO)
- Replace the light pipe fan
- Replace the Light Pipe blower

12.1 Introduction Light Pipe

Light pipe

The Light Pipe transforms the light emitted by the lamp into a homogenous light beam, and focuses this beam precisely on to the active surface of the DMD. The Light Pipe is mounted on the Corner Block, and can be easily removed for servicing.

The Light Pipe itself contains the Integration Rod at the Light Pipe entrance, the Light Pipe lenses Nos 1, 2, and 3, the Notch Filter, and the High Contrast Plate.251. None of the light pipe components can be changed individually; the light pipe must be replaced as a whole.

The Corner Block contains the Fold Mirrors which are folding up the light path of the projector to make the projector more compact, the Light Pipe lens No. 4, and the Light Sensor Module which ensures a Constant Light Output (CLO) of the projector. Note that the Light Processor and Lens Holder are directly mounted onto the Corner Block. This ensures a precise mounting with minimum tolerance of all optical components in the light path which results in perfect optical performance.

Location of optical components in the Light Pipe

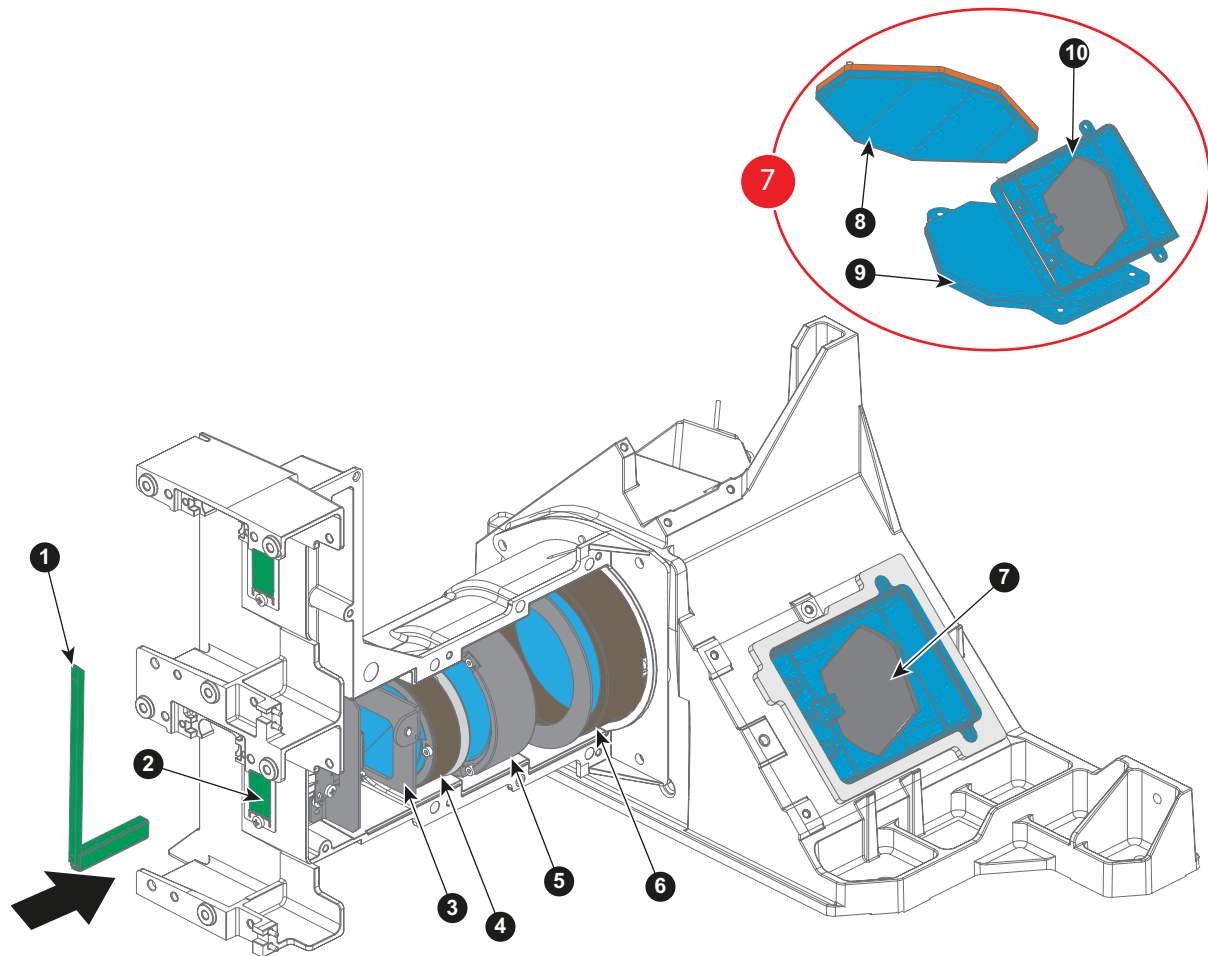


Image 12-1

- 1 Integration rod
- 2 Anti-dust cover
- 3 Notch filter
- 4 Lens no. 1 (light pipe focus lens)
- 5 Lens no. 2 (light pipe diverging fixed lens)
- 6 Lens no. 3 (light pipe zoom lens)
- 7 Fold mirror assy
- 8 Adjustable fold mirror
- 9 Fixed fold mirror
- 10 Lens no. 4 assy (light pipe converging fixed lens)

Light Pipe and Corner Block Parts

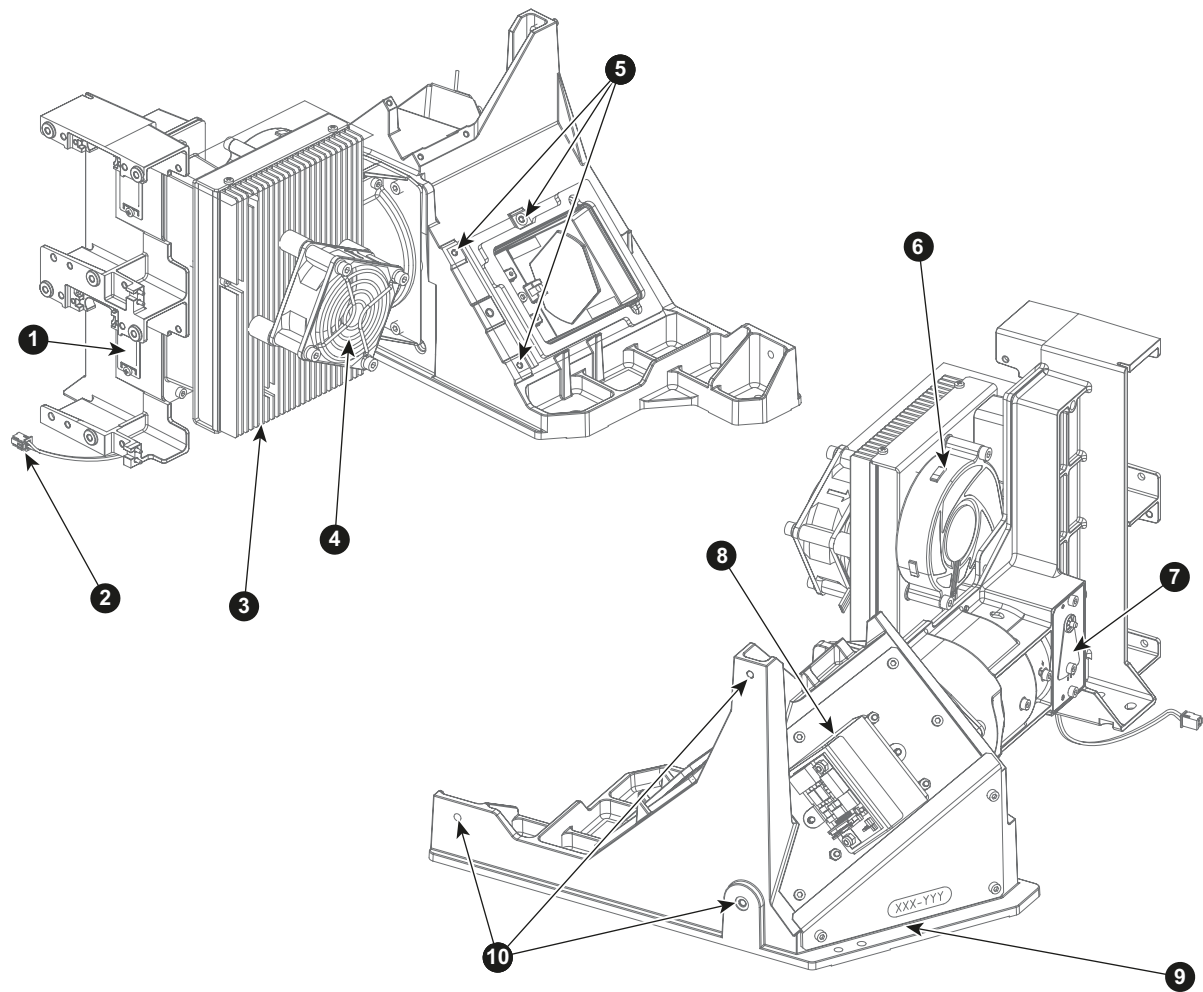


Image 12-2

- 1 Anti-dust cover
- 2 Light Pipe temperature sensor
- 3 Light pipe heatsink
- 4 Axial fan blower
- 5 Light processor installation points
- 6 Centrifugal fan blower
- 7 Notch filter adjustment screw
- 8 Light sensor module
- 9 Corner block housing
- 10 Lens holder installation points

12.2 Removal of the Light Pipe



In order to remove the light pipe from the projector, the front, top and back housings, the top and side engine security cover plates, and the top engine fan must first be removed. This procedure assumes this is already done.

Necessary tools

- 7 mm flat screw driver
- 3 mm Allen key wrench
- 7 mm nut driver

How to remove the Light Pipe from the corner block?

1. Loosen the four screws (reference 3) of the lamp compartment cover plate. Remove the cover plate.

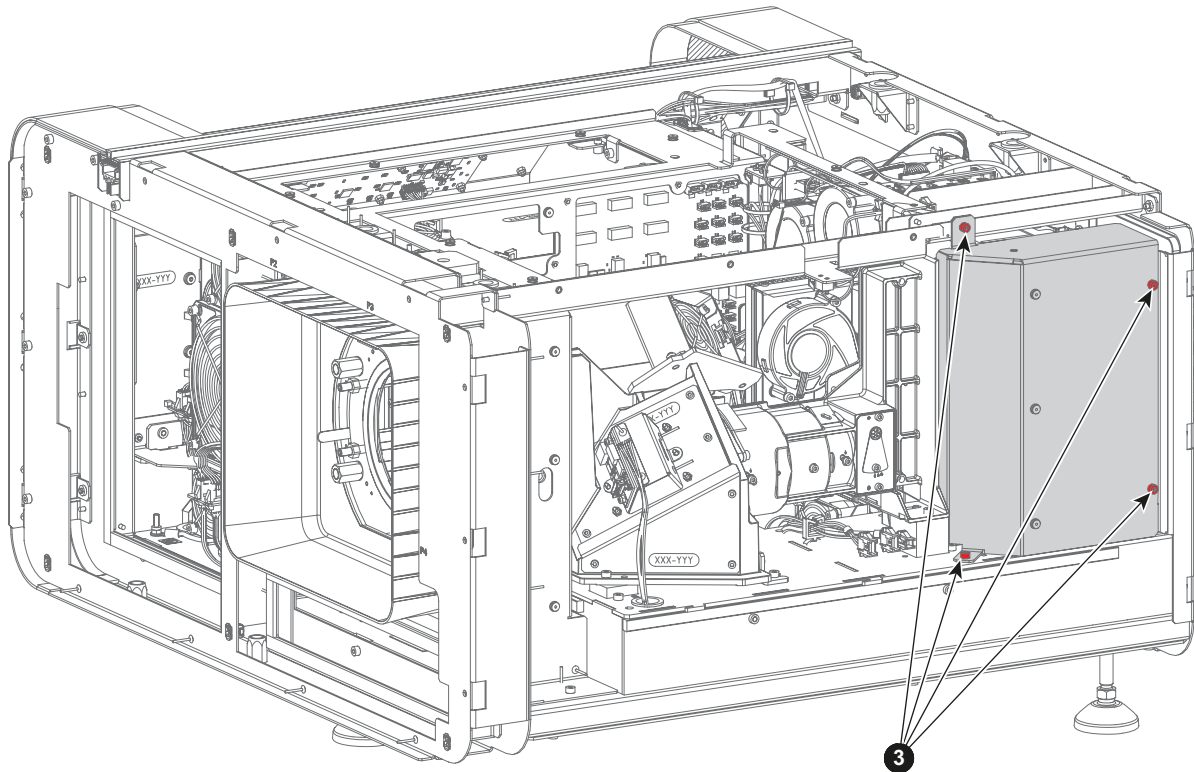


Image 12-3

2. Remove both of the lamp modules from the projector chassis. See procedure "Removal of the Lamp Module", page 103.
3. Loosen the four screws (reference 2 and 4) and remove the two connector blocks. Use a Philips head screw driver.

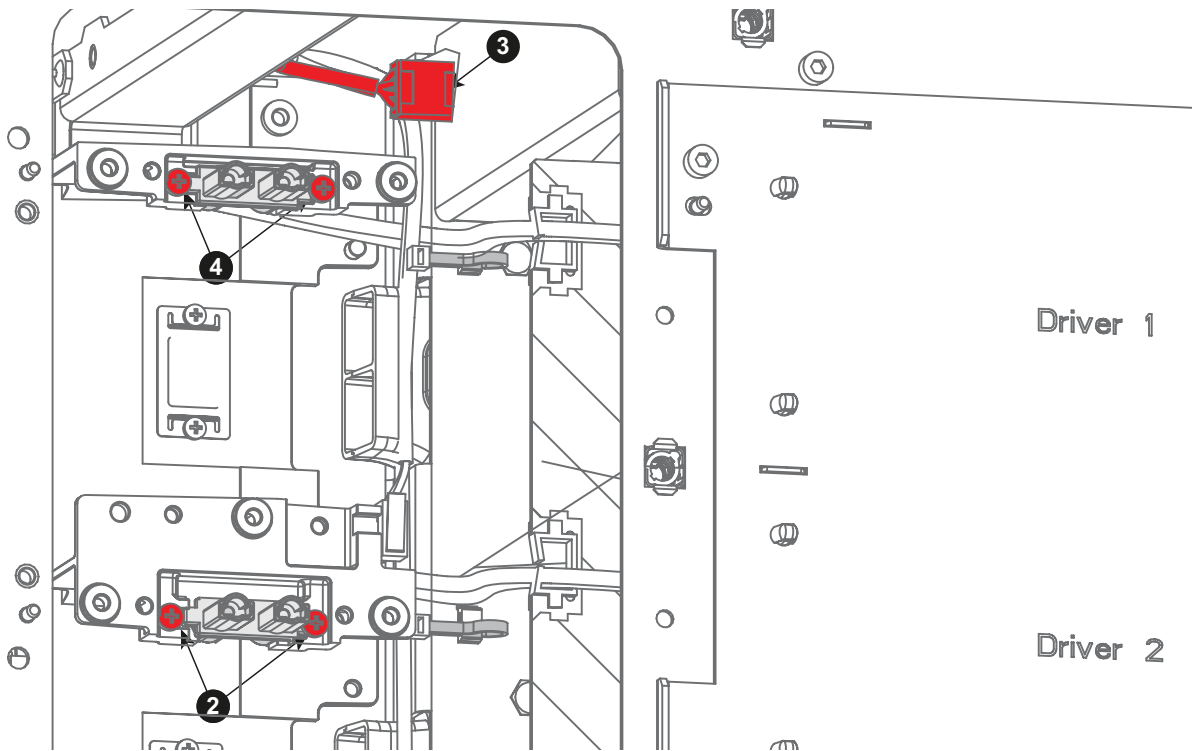


Image 12-4

4. Unplug the lamp detect switch connector (reference 3).
5. Loosen the two rear Light Pipe fastening screws (reference 5).

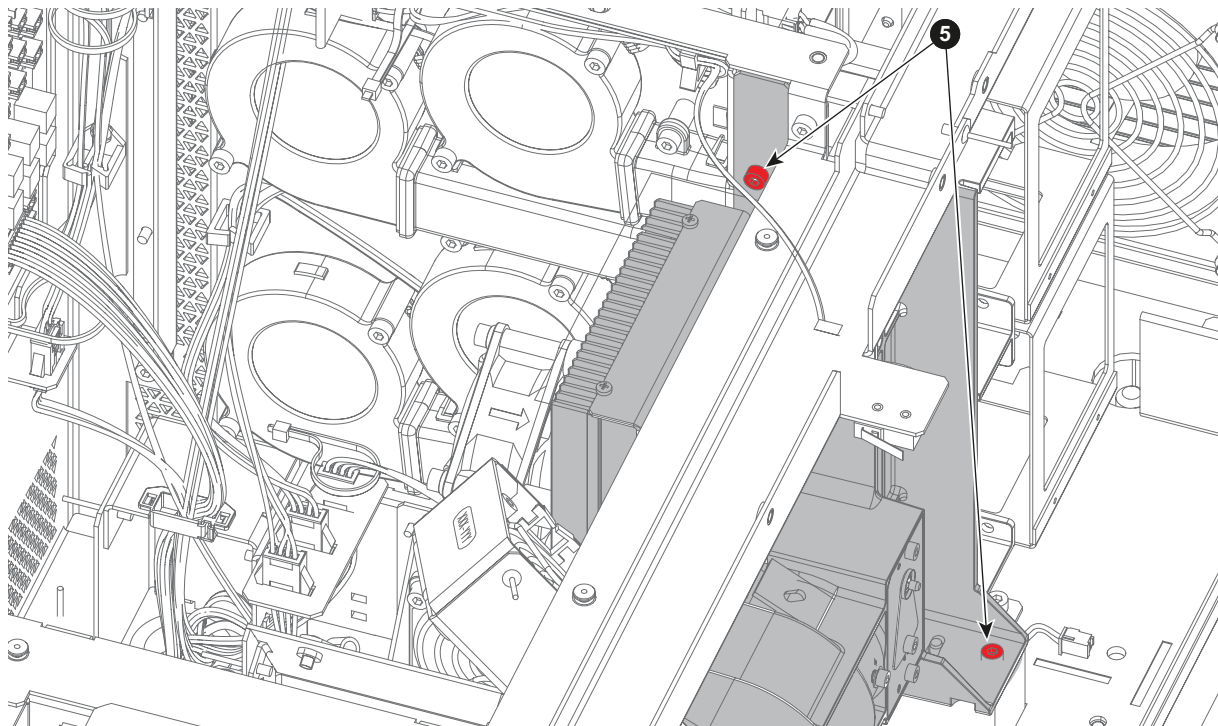


Image 12-5

6. Loosen the four front Light Pipe fastening screws (reference 6).

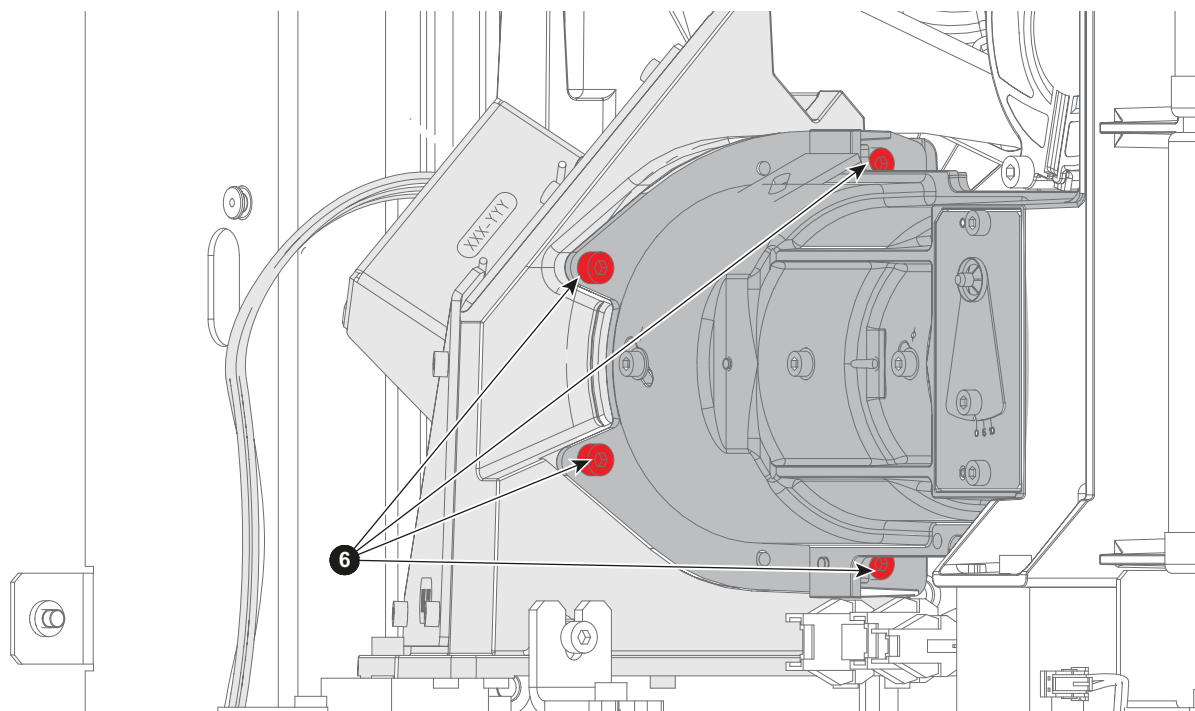


Image 12-6

7. Verify that all connections, screws, and sensors to and around the Light Pipe have been disconnected and removed.
8. To remove the Light Pipe, move it first towards the back of the projector (reference A), and then lift it up (reference B) and out of the projector chassis.

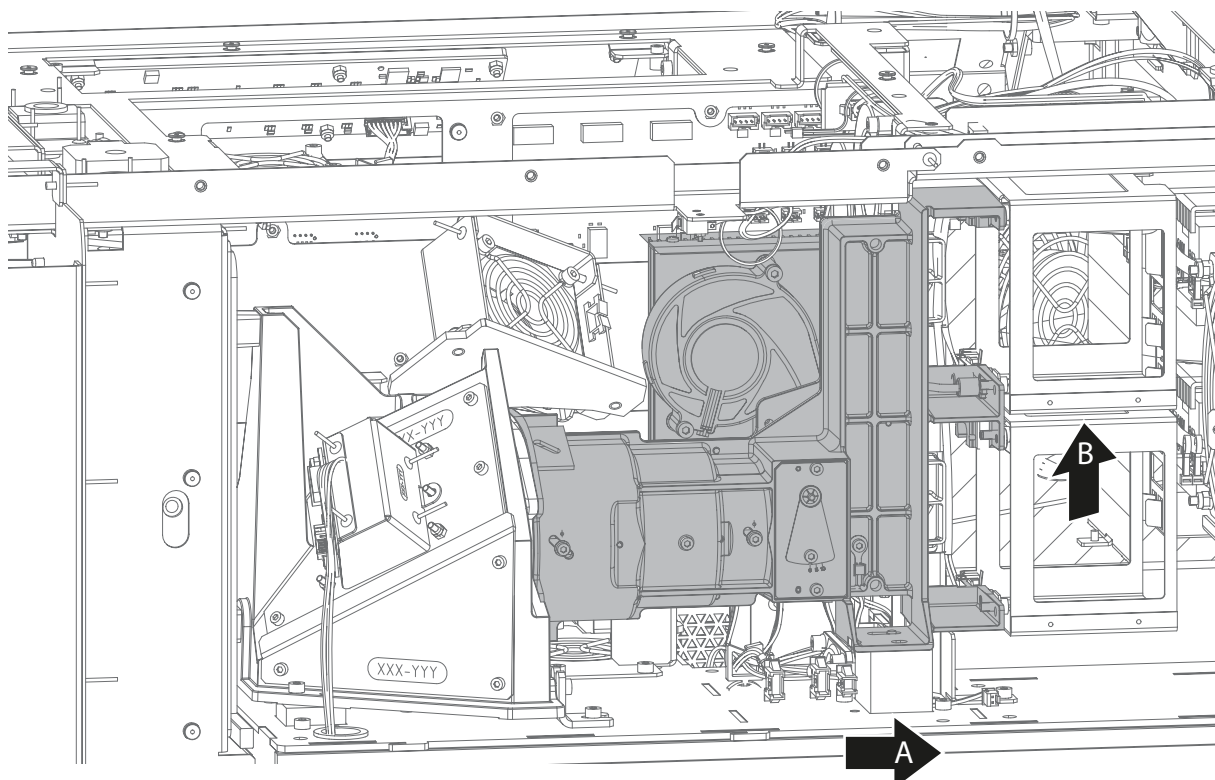


Image 12-7

12.3 Removal of the Light Pipe cover plate



The Light Pipe must be removed from the projector chassis before the cover plate can be removed. See procedure "Removal of the Light Pipe", page 138.

Necessary tools

- 3 mm Allen key wrench
- 2.5 mm Allen key wrench

How to remove the Light Pipe cover plate?

1. Loosen the four screws (reference 1 image 12-8) and remove the axial fan.

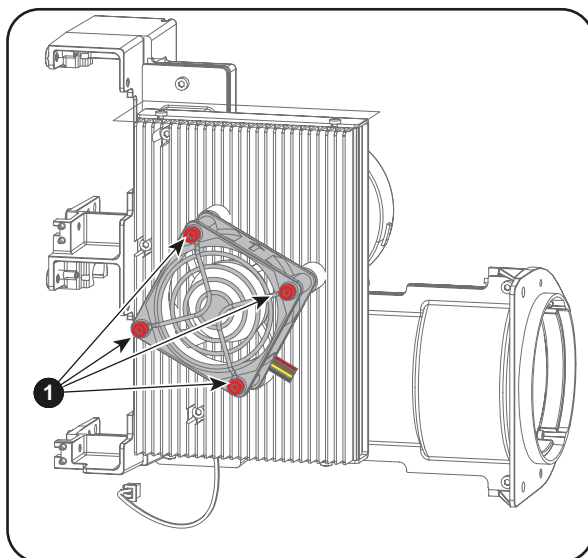
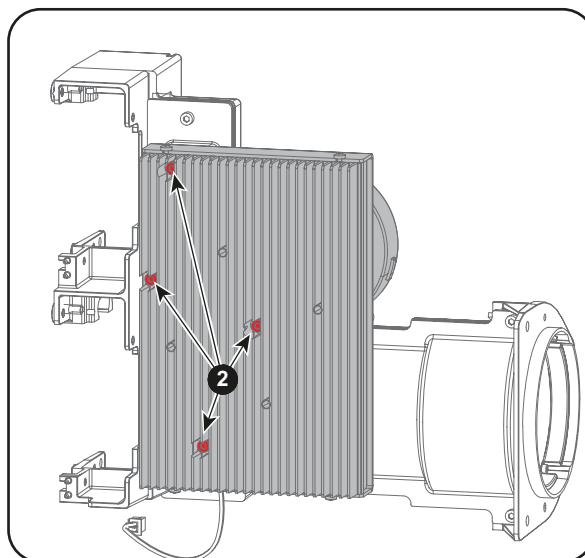


Image 12-8



2. Loosen the four screws (reference 2 image 12-8) and remove the heat sink.
3. Loosen the seven screws (reference 5 image 12-9).

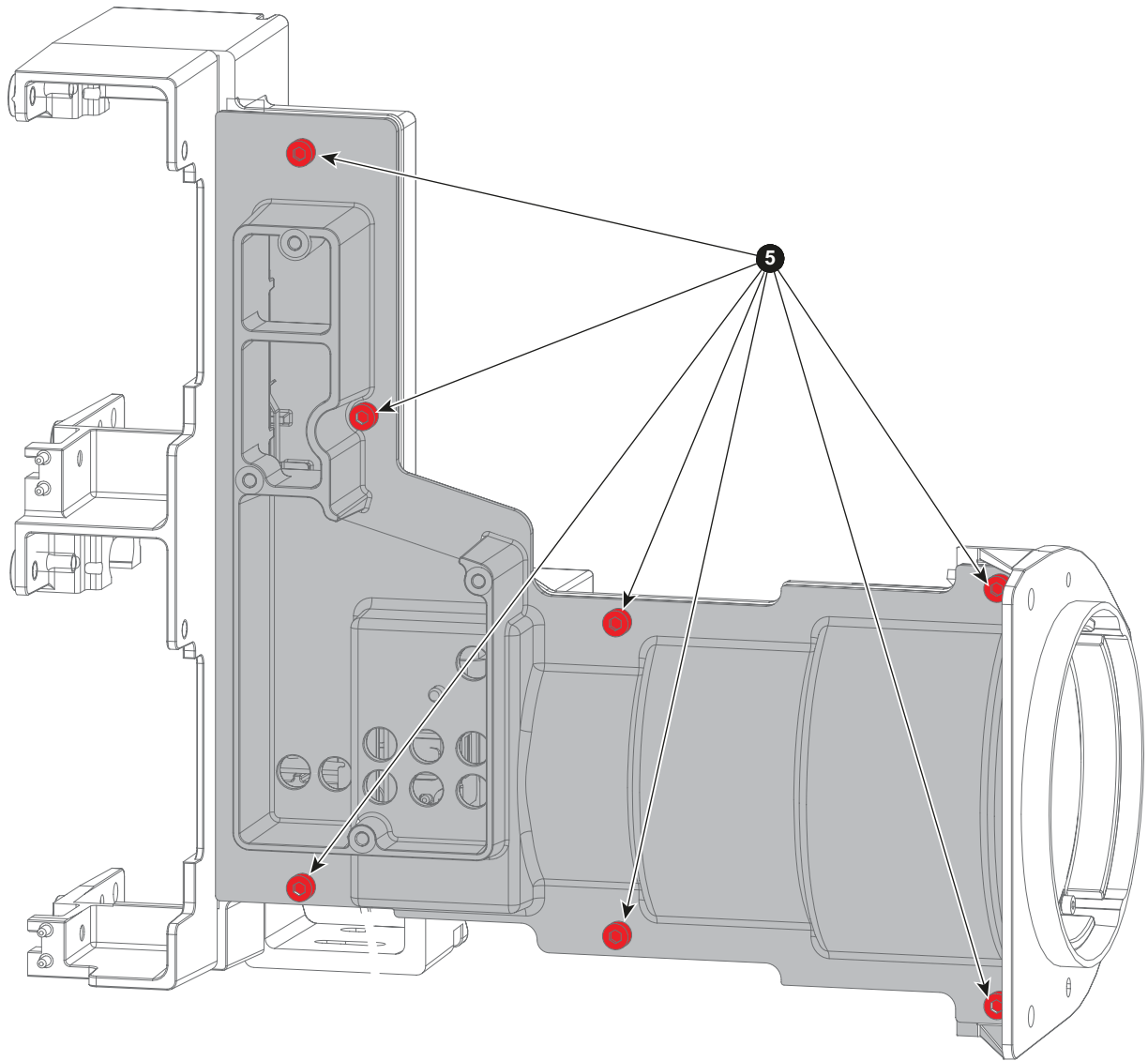


Image 12-9

4. Remove the Light Pipe cover.

12.4 Replacing Light Pipe lens No. 1 (focus lens)



To replace the Light Pipe lens No. 1 the Light Pipe has to be removed from the Corner Block. This procedure assumes that the Light Pipe is already removed.

Necessary tools

- Cotton gloves. (never use gloves that leave particles on the surfaces)
- 2.5 mm Allen wrench.

How to replace the Light Pipe focus lens?

1. Open the Light Pipe cover. See procedure "Removal of the Light Pipe cover plate", page 141.
2. Remove the adjustment screw (reference 1, image 12-10) of the Light Pipe focus lens.
3. Remove the lens container from the Light Pipe (reference 2, image 12-10).

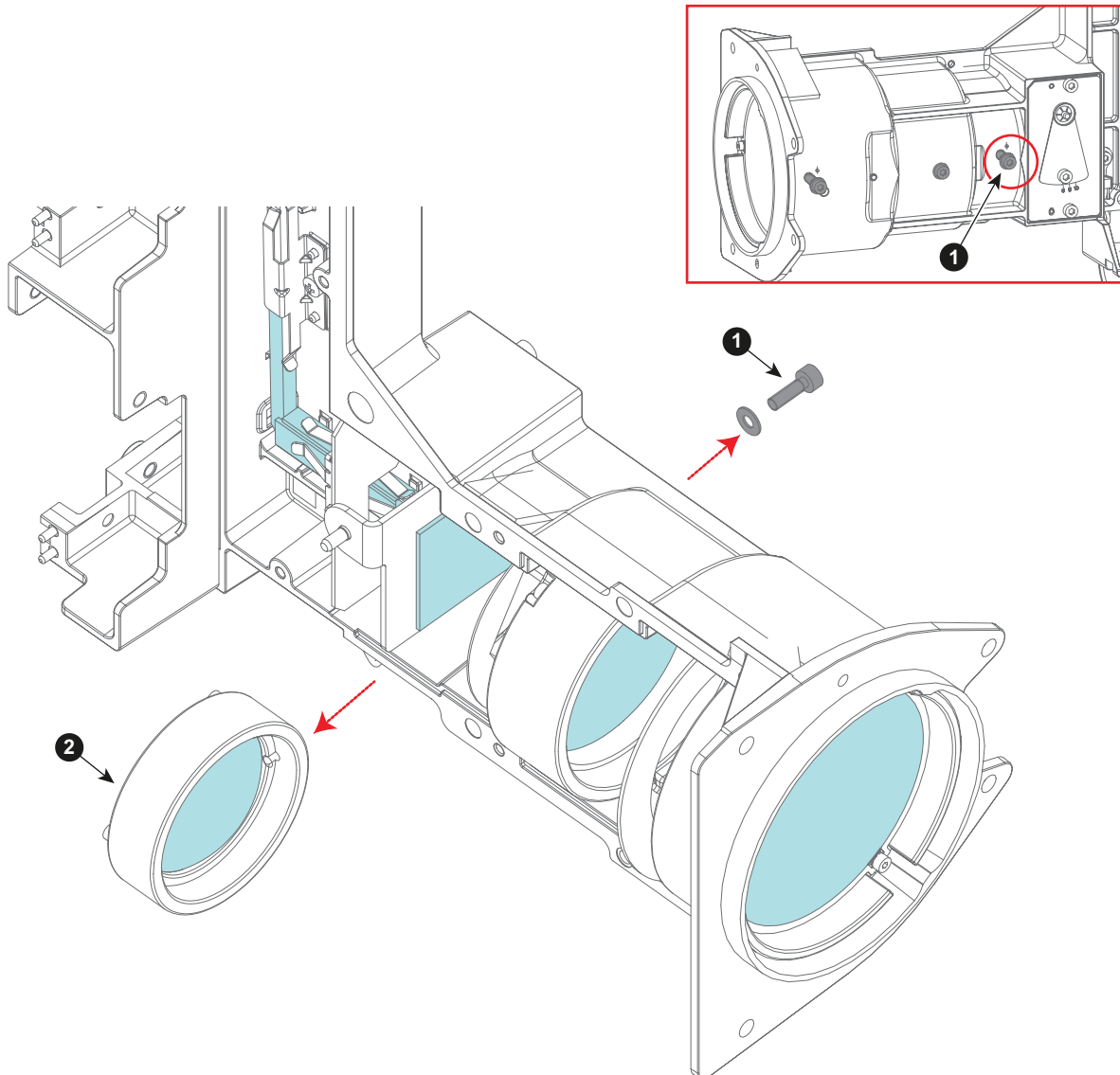


Image 12-10

4. Replace the focus lens (reference 5, image 12-11) from the container (reference 6, image 12-11) as illustrated. Use a 2.5mm Allen wrench. Ensure that the concave side of the lens faces the Integration Rod (convex side towards Folding Mirror).

Caution: Wear cotton gloves. Do not touch the glass with bare hands. Furthermore, ensure that the lens remains clean.

Note: Light Pipe lens No. 1 (focus lens) is the smallest lens of the four Light Pipe lenses.

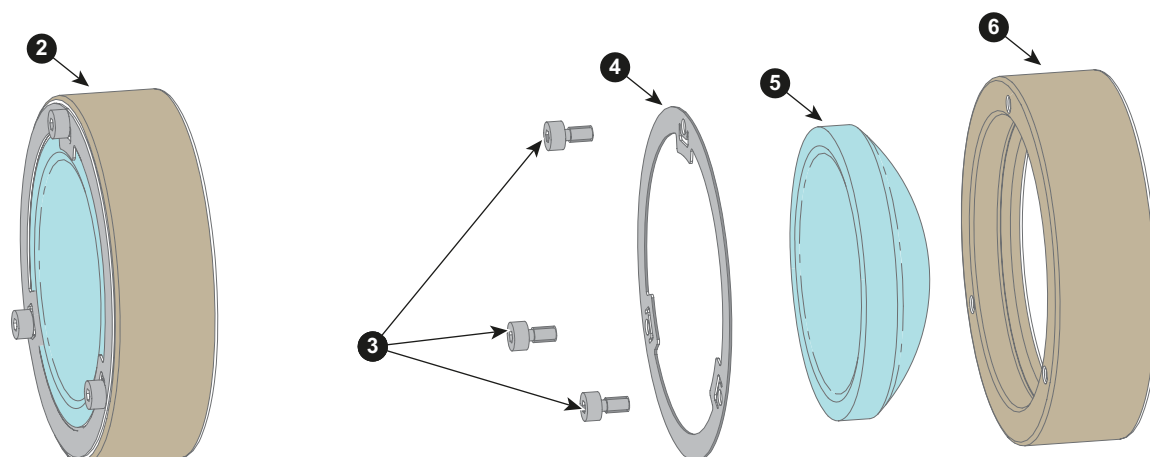


Image 12-11

5. Place the lens container (reference 2, image 12-11) back in the Light Pipe. Ensure that the concave side of the lens faces the Integration Rod (convex side towards Folding Mirror).
6. Secure the lens container with the adjustment screw (reference 1, image 12-10).
7. Close the Light Pipe housing. See procedure "Install the Light Pipe cover", page 151.



The Light Pipe focus lens needs readjustment after replacement. See procedure "Adjusting the Light Pipe lens No. 1 (focus lens)", page 153.

12.5 Replacing Light Pipe lens No. 2



To replace the Light Pipe lens No. 2 the Light Pipe has to be removed from the Corner Block. This procedure assumes that the Light Pipe is already removed.

Necessary tools

- Cotton gloves. (never use gloves that leave particles on the surfaces)
- 2.5 mm Allen wrench.

How to replace the Light Pipe lens No. 2?

1. Open the Light Pipe cover. See procedure "Removal of the Light Pipe cover plate", page 141.
2. Remove the adjustment screw (reference 1, image 12-12) of the Light Pipe focus lens.
3. Remove the lens container from the Light Pipe (reference 2, image 12-12).

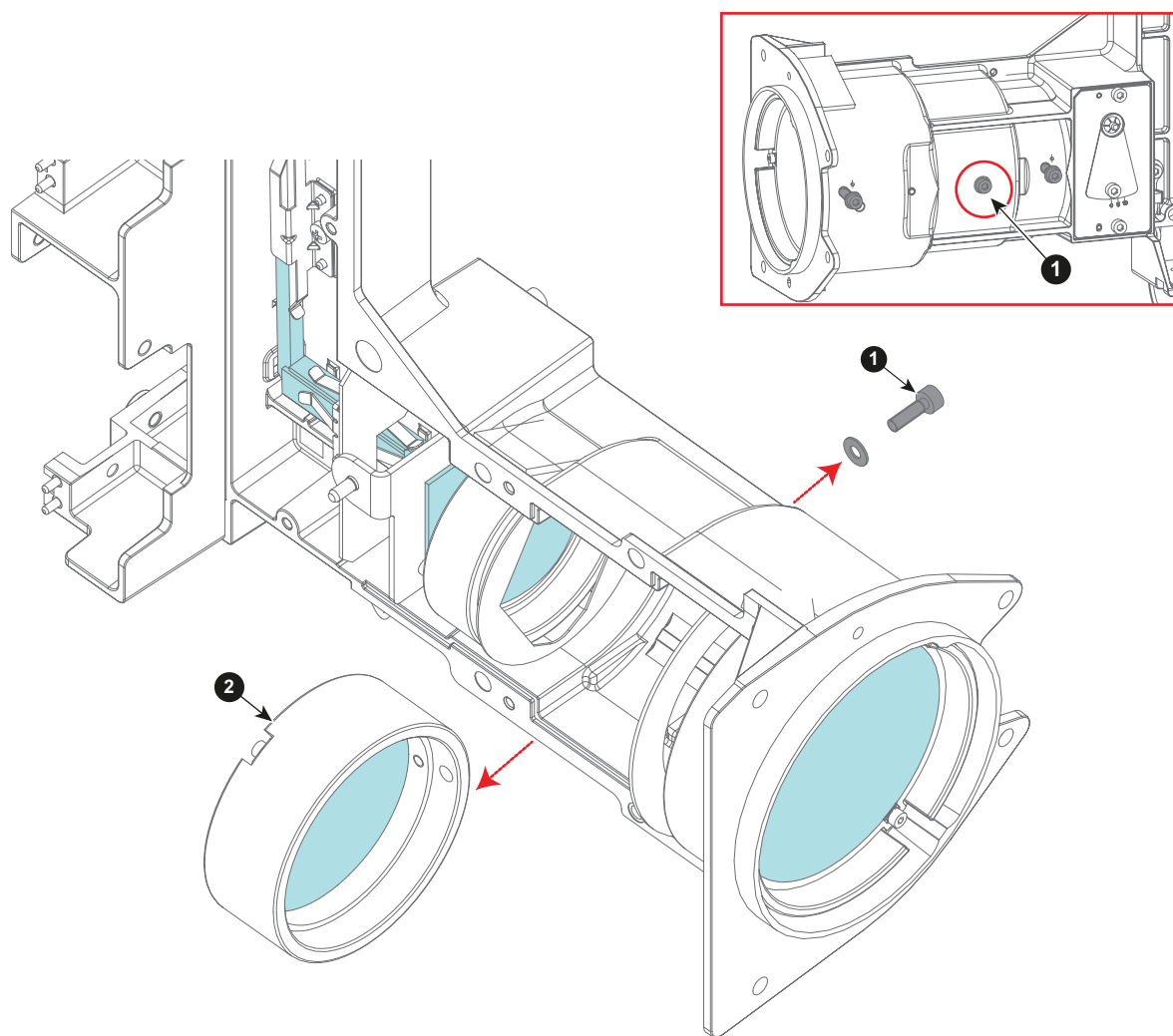


Image 12-12

4. Replace the lens (reference 5, image 12-13) from the container (reference 6, image 12-13) as illustrated. Use a 2.5 mm Allen wrench. Ensure that the concave side of the lens faces the Integration Rod (convex side towards Folding Mirror).

Caution: Wear cotton gloves. Do not touch the glass with bare hands. Furthermore, ensure that the lens remains clean.

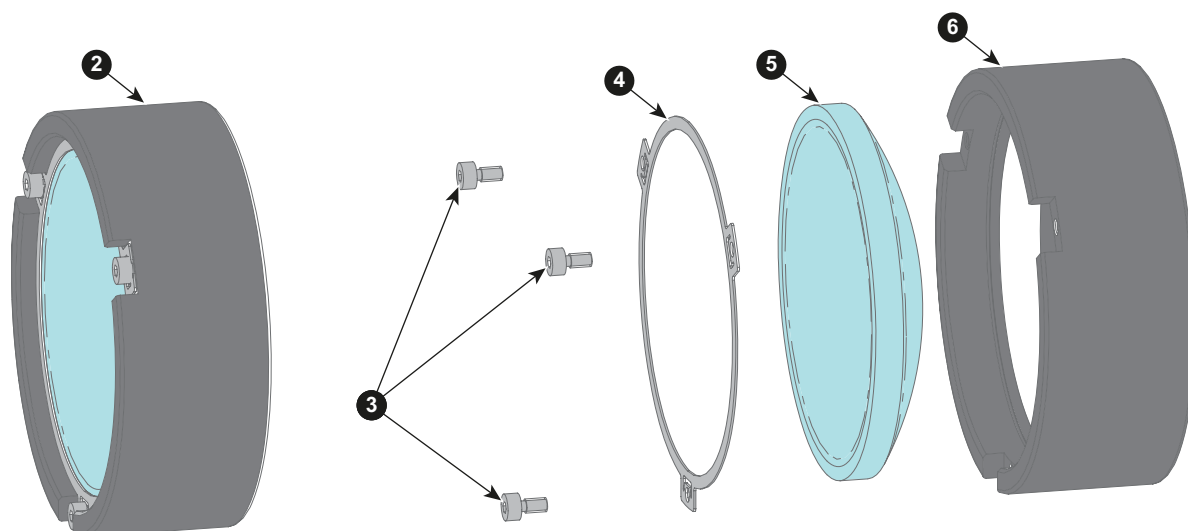


Image 12-13

5. Place the lens container (reference 2, image 12-12) back in the Light Pipe. Ensure that the concave side of the lens faces the Integration Rod (convex side towards Folding Mirror).
6. Secure the lens container with the adjustment screw (reference 1, image 12-12).
7. Close the Light Pipe housing. See procedure "Install the Light Pipe cover", page 151.

12.6 Replacing Light Pipe lens No. 3 (zoom lens)



To replace the Light Pipe lens No. 3 the Light Pipe has to be removed from the Corner Block. This procedure assumes that the Light Pipe is already removed.

Necessary tools

- Cotton gloves. (never use gloves that leave particles on the surfaces)
- 2.5 mm Allen wrench.

How to replace the Light Pipe lens No. 3?

1. Open the Light Pipe cover. See procedure "Removal of the Light Pipe cover plate", page 141.
2. Remove the adjustment screw (reference 1, image 12-14) of the Light Pipe focus lens.
3. Remove the lens container from the Light Pipe (reference 2, image 12-14).

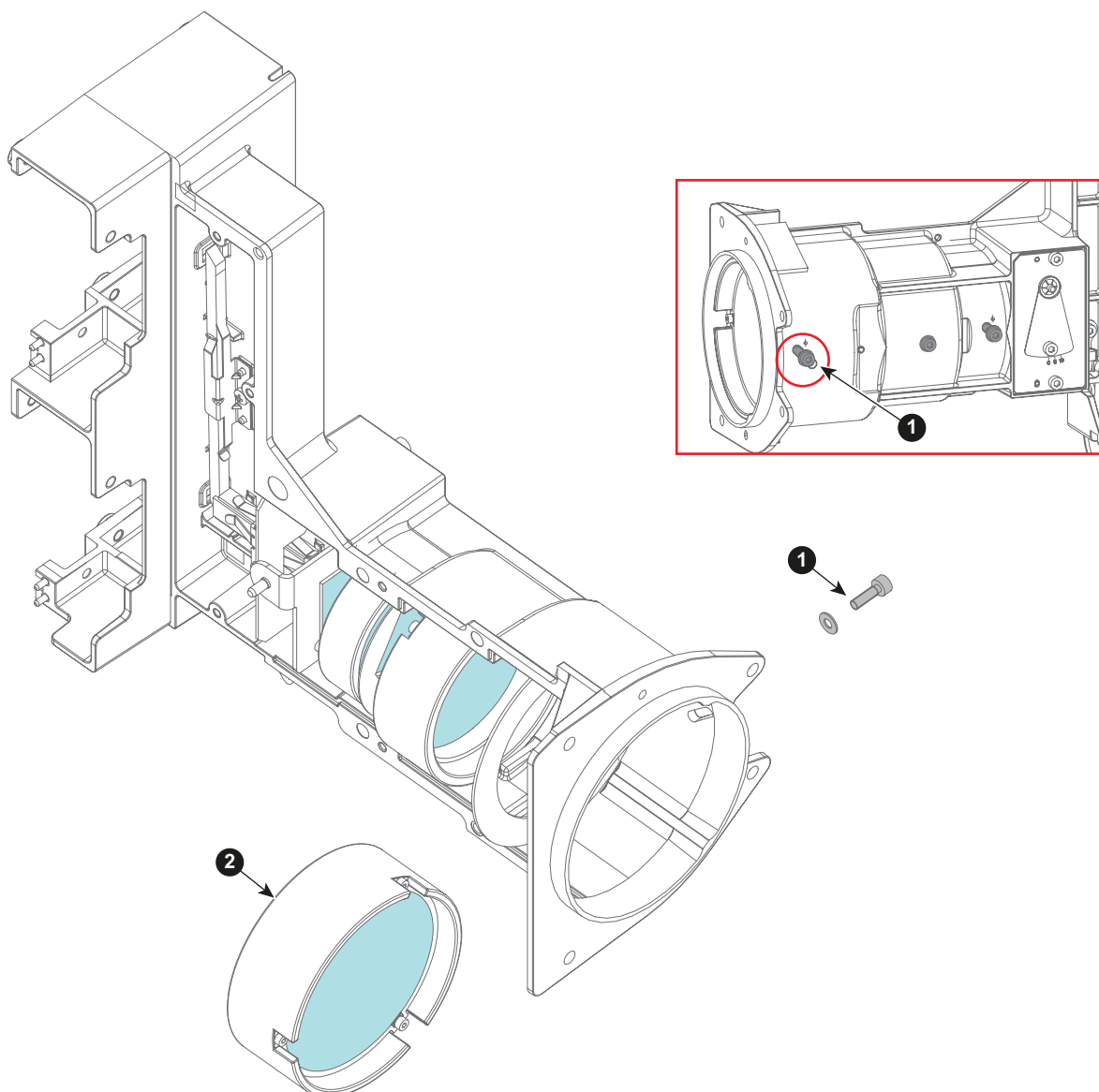


Image 12-14

4. Replace the zoom lens (reference 5, image 12-15) from the container (reference 6, image 12-15) as illustrated. Use a 2.5 mm Allen wrench. Ensure that the flat side of the lens faces the Integration Rod (convex side towards Folding Mirror).

Caution: Wear cotton gloves. Do not touch the glass with bare hands. Furthermore, ensure that the lens remains clean.

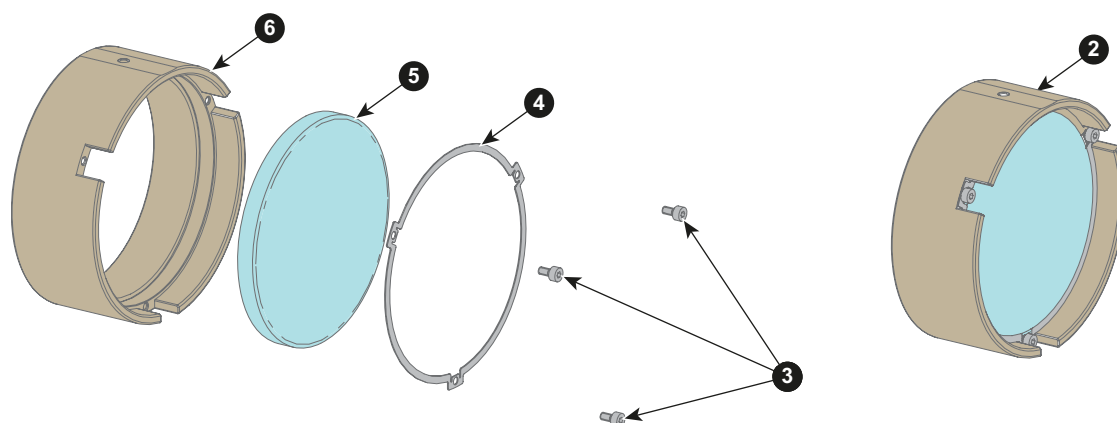


Image 12-15

5. Place the lens container (reference 2, image 12-14) back in the Light Pipe. Ensure that the concave side of the lens faces the Integration Rod (convex side towards Folding Mirror).
6. Secure the lens container with the adjustment screw (reference 1, image 12-14).
7. Close the Light Pipe housing. See procedure "Install the Light Pipe cover", page 151.



The Light Pipe zoom lens needs readjustment after replacement. See procedure "Adjusting the Light Pipe lens No. 3 (zoom lens)", page 154.

12.7 Replacing Light Pipe lens No4



To replace the Light Pipe lens No4 the Light Processor has to be removed. This procedure assumes that the Light Processor is already removed.

Necessary tools

- Cotton gloves. (never use gloves that leave particles on the surfaces)
- 2.5mm Allen wrench.
- 1.5mm Allen wrench.

How to replace the Light Pipe lens No4?

1. Remove the three fixation screws (reference 1 image 12-16) of the lens container. Use a 2.5mm Allen wrench.
2. Remove the lens container from the Corner Block as illustrated in image 12-16.

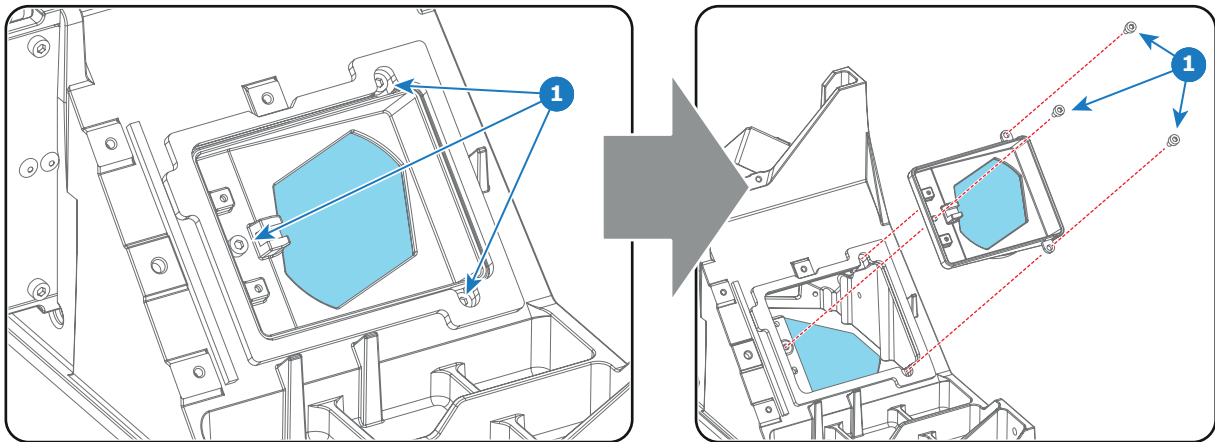


Image 12-16

3. Remove the lens (reference 4 image 12-17) from the container (reference 5 image 12-17) as illustrated. Use a 1.5mm Allen wrench to loosen the four lens fixation screws (reference 2 image 12-17).

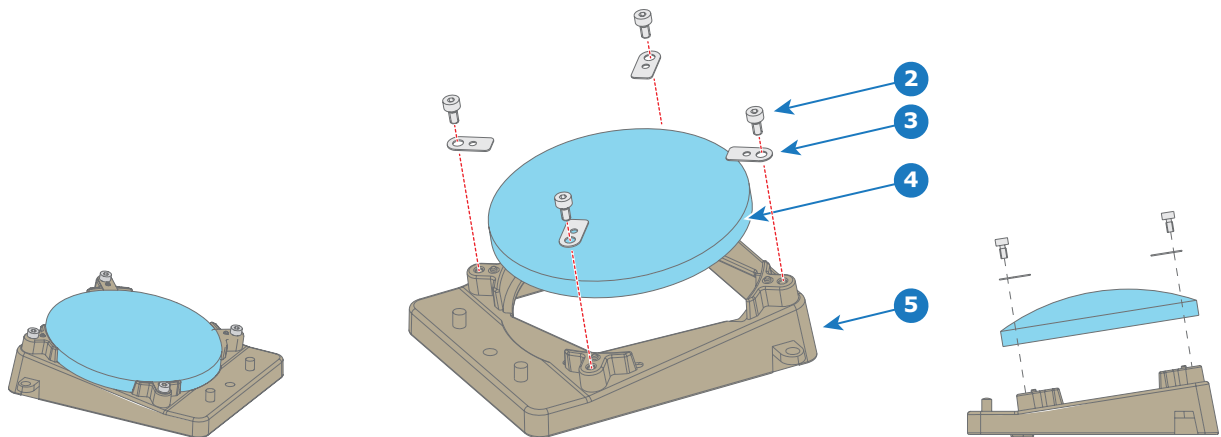


Image 12-17

4. Install the new lens No4 (reference 4 image 12-17) in the container (reference 5 image 12-17) as illustrated. Secure the lens with small brackets and four screws (reference 3 & 2 image 12-17) as illustrated. Use a 1.5mm Allen wrench. Ensure that the flat side of the lens faces towards the Light Processor (convex side towards the Folding Mirror)
Caution: Wear cotton gloves. Do not touch the glass with bare hands. Furthermore, ensure that the lens remains clean.
Note: Light Pipe lens No3 (zoom lens) and lens No4 are the biggest Light Pipe lenses. Lens No3 and Lens No4 have a diameter of 60mm. But lens No3 has an edge thickness of 7mm, while lens No4 has an edge thickness of 5mm.
5. Place the lens container back in the Corner Block as illustrated in image 12-16.
6. Fasten the lens container with three fixation screws (reference 1 image 12-16). Use a 2.5mm Allen wrench.

12.8 Cleaning the Light Pipe lenses

When cleaning the Light Pipe lenses?

Only clean the Light Pipe lenses in case it is really necessary. This means in case dust is clearly visible upon the surface of the Light Pipe Lenses.



This procedure requires that the Light Pipe lenses are removed from the Light Pipe.

Necessary tools

- Compressed air.
- Clean Toraysee® cloth or any micro fiber lens cleaning cloth.
- Clean cotton cloth.
- Cotton gloves (never use gloves that leave particles on the surfaces).

Necessary parts

Lens cleaner (e.g. Carl Zeiss lens cleaner or Purasol® or any waterbased lens cleaner)

How to clean the Light Pipe lenses?

1. Blow off dust with clean compressed air (or pressurized air cans).
Tip: Wear cotton gloves to handle the Light Pipe lenses.
2. Clean with lens cleaner together with a clean lens cleaning cloth to remove the dust and contamination. Use big wipes.
3. Use a dry lens cleaning cloth to remove left liquid or stripes. Polish with small circles.
4. If there are still fingerprints on the surface, wipe them off with lens cleaner together with a clean lens cleaning cloth. Polish again with a dry one.

12.9 Install the Light Pipe cover

Necessary tools

3 mm Allen key wrench

How to install the Light Pipe cover?

1. Position the Light Pipe cover on the light pipe.
2. Install and fasten the seven screws (reference 5 image 12-9) using a 3 mm Allen key wrench.
3. Install the heatsink on to the light pipe. Fasten the 4 screws (reference 1 image 12-8) using a 3 mm Allen key wrench.
4. Install the Axial fan onto the heatsink. Fasten the 4 screws (reference 2 image 12-8) using a 3 mm Allen key wrench.

12.10 Install the Light Pipe

How to install the Light Pipe?

1. Position the Light Pipe in the projector chassis.

Note: Make sure that the Lamp Detect Switch cable and Lamp Power cable are not overlapped by the air guide outlet (see detail below).

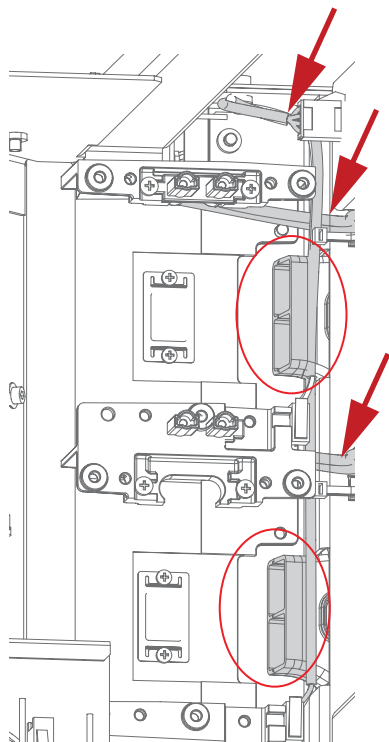


Image 12-18

2. Install the 2 rear fastening screws (reference image 12-5).
3. Install the 4 front Light Pipe screws (reference image 12-6).

12.11 Adjusting the Light Pipe lens No. 1 (focus lens)



CAUTION: Only qualified and authorized personnel may perform this procedure.



To adjust the Light Pipe focus lens the left cover of the projector and the side cover plate of the Light Processor compartment have to be removed.

Necessary tools

2.5mm Allen key.

How to adjust the Light Pipe focus lens?

1. Loosen the adjustment screw of the focus lens (reference 2 image 12-19) a few turns. Use a 2.5mm Allen key. Do not remove the adjustment screw.
2. Start up the projector but do not activate the lamp yet.
3. Set up the projector to display a **full white internal pattern** with a maximum contrast and a **maximum dimming**. Do not activate the lamp yet. Make sure that you have a 2.5mm Allen key within reach for the next steps.
4. Activate the lamp and zoom the projector lens in or out until the projected image is focused.
Note: *Dialog windows must be displayed sharp instead of blurry. This is independent of the focus of the light beam.*
5. Gently move the adjustment screw (reference 2 image 12-19) of the Light Pipe focus lens **UP** or **DOWN** into a position which projects the sharpest possible edges on the screen (**FOCUS**). Use a 2.5mm Allen key as an extension bar of the adjustment screw. This allows a more precise adjustment.
Warning: *The adjustment screw of the Light Pipe focus lens is hot. To prevent burn injuries, use a 2.5mm Allen key to move the Integration Rod.*
6. Fasten the adjustment screw (reference 2 image 12-19) which you released in step 1. Use a 2.5mm Allen key.

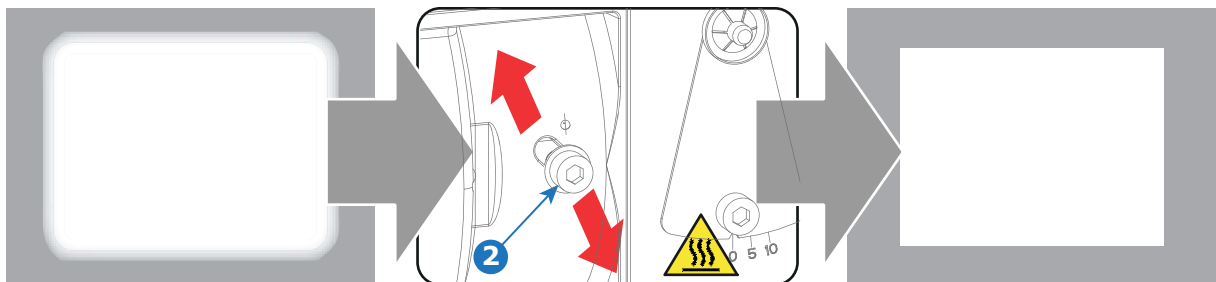


Image 12-19



When you are familiar with this adjustment procedure you can optimize the focus position by first rotate the Integration Rod until you clearly see the sloped edges on the screen and then focusing these edges as sharp as possible. Then rotate the Integration Rod back until the projected light beam matches the projected outline of the DMD's. This way of focusing has to be done quickly. Otherwise, the sealing between the DMD's and the prism will be damaged

12.12 Adjusting the Light Pipe lens No. 3 (zoom lens)

Purpose of the Light Pipe zoom lens

The Light Pipe zoom lens is located inside the Light Pipe between the Integration Rod and the Fold Mirror. The light spot upon the DMDs can be reduced or enlarged with the Light Pipe zoom lens to fit with the outline of the DMDs.



CAUTION: Only qualified and authorized personnel may perform this procedure.



To adjust the Light Pipe focus lens the left cover of the projector and the side cover plate of the Light Processor compartment have to be removed.

Necessary tools

2.5mm Allen screw.

How to adjust the Light Pipe zoom lens?

1. Loosen the adjustment screw of the Light Pipe zoom lens (reference 5 image 12-20) a few turns. Use a 2.5mm Allen screw. Do not remove the adjustment screw.
2. Start up the projector but do not activate the lamp yet.
Caution: Projecting a light spot which is larger than the DMD outline for more than 10 seconds may cause irreversible damage to the Sealed Light Processor. Therefore, it is important to maximum dim the light output and adjust the light spot as quickly as possible.
3. Set up the projector to display a **full white internal pattern** with a maximum contrast and a **maximum dimming**. Do not activate the lamp yet. Make sure that you have a 2.5mm Allen screw within reach for the next steps.
4. Activate the lamp and zoom the projector lens in or out until the projected image is focused.
Note: Dialog windows must be displayed sharp instead of blurry. This is independent of the focus of the light beam.
5. Adjust the position of the Light Pipe zoom lens by moving the adjustment screw (reference 5) **UP** or **DOWN** into a position where the light spot (reference 2) matches the projected outline (reference 3) of the DMDs upon the screen (reference 4). Use a 2.5mm Allen screw as an extension bar of the adjustment screw. This allows a more precise adjustment.
Warning: The adjustment screw of the Light Pipe zoom lens is hot. To prevent burn injuries, use a 2.5mm Allen Key to move the Integration Rod.

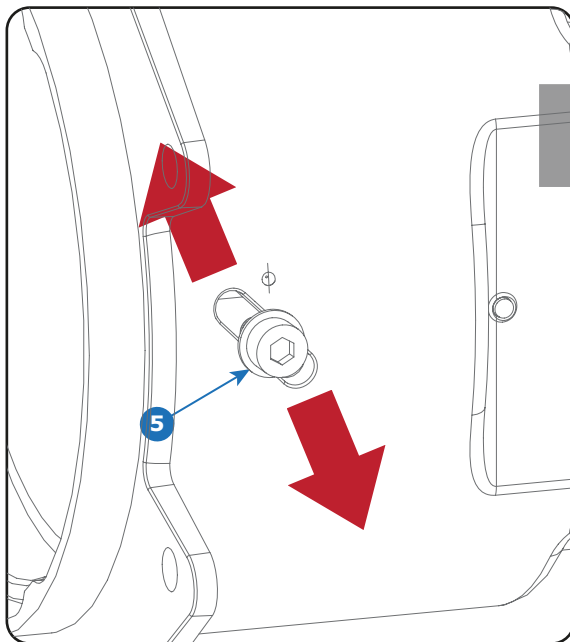
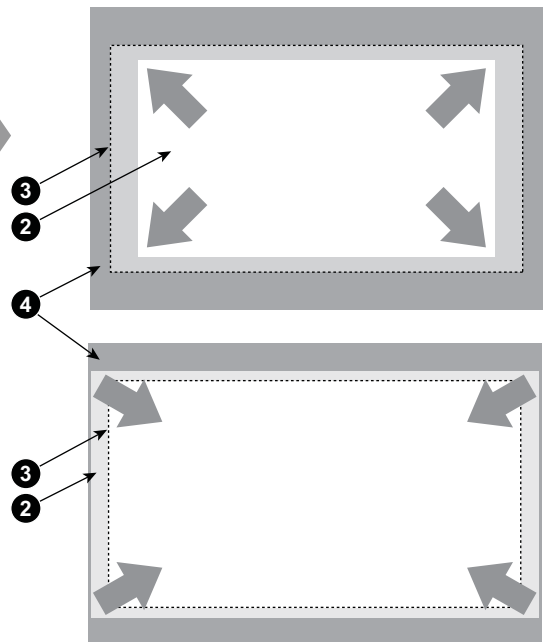


Image 12-20



6. Fasten the adjustment screw (reference 5 image 12-20) which you released in step 1. Use a 2.5mm Allen screw.

12.13 Replacing the Notch Filter



The Light Processor and the Notch Filter are matched. When replacing the Light Processor the Notch Filter needs to be replaced as well. The Light Processor spare part kit contains the matched Notch filter.



To access the old Notch Filter, installed inside the projector, the left side cover and side cover plate has to be removed from the projector. This procedure assumes that the left side cover and side cover plate are already removed from the projector.

Matching Notch Filter

On the front side of the Light Processor either a Green, Red, Yellow or no colored dot is applied. (green, red or yellow). The Notch Filter has only a Green or a Red colored dot.

Light Processor	→	Matching Notch Filter
● GREEN	→	● GREEN
● RED	→	● RED
● YELLOW	→	● GREEN or ● RED
No colored dot.	→	● GREEN

Necessary tools

2.5mm Allen wrench.

How to replace the Notch Filter?

1. Remove the old Notch Filter from the Light Pipe by releasing the two hexagon head cap screws (reference 1 image 12-21) as illustrated. Use for that a 2.5mm Allen wrench.

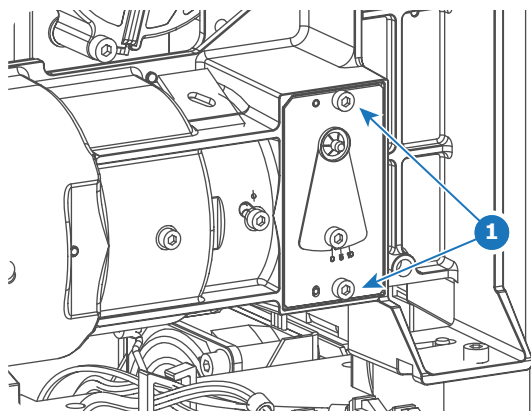


Image 12-21

2. Insert a new Notch Filter. Note that the Notch Filter has a mounting hole which must match the mounting pin inside the Light Pipe.
Caution: Do not touch the Notch Filter with bare fingers. To clean the Notch Filter see procedure "Cleaning the Notch Filter", page 158.
Caution: Ensure that the colored dot on the Notch Filter matches with the colored dot on the front side of the Light Processor.
3. Fasten the Notch Filter with two hexagon head cap screws (reference 1 image 12-21). Use for that a 2.5mm Allen wrench.
4. Readjust the Notch Filter. See procedure "Adjusting the Notch Filter", page 156.

12.14 Adjusting the Notch Filter

Purpose of the Notch Filter

The Notch Filter is a coated glass plate located in the middle of the Light Pipe assembly. The Notch Filter applies some small color corrections of the light coming out of the Light Pipe, which is emitted by the lamps of the projector. This is done to achieve an optimal color calibration of the native colors. The Notch Filter can slightly turn, with respect to the light path, which allows a small adjustment of the native colors. Note that, next to the pure optical color calibration by the Notch Filter there is also a software color calibration.

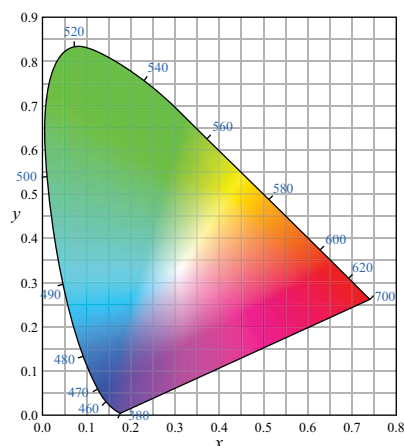


Image 12-22
Color triangle.

Target range for x, y Chroma values

- **Uncorrected GREEN:** (changes together with red)
 - x : 0.245 – 0.285
 - y : 0.67 – 0.71
- **Uncorrected RED:** (changes together with green)
 - x : 0.67 – 0.69
 - y : 0.31 – 0.33
- **Uncorrected BLUE:** (no impact)
 - x : 0.12 – 0.16
 - y : 0.02 – 0.08



To access the Notch Filter the left side cover and the side cover plate have to be removed from the projector. This procedure assumes that the left side cover and side cover plate are already removed from the projector.

Necessary tools

- 2.5mm Allen wrench.
- Colorimeter (e.g. CS-200 chroma meter from Konica Minolta or the PR-650 SpectraScan® from Photo Research)

How to adjust the Notch Filter?

1. Release the adjustment screw (reference 2 image 12-23) of the Notch Filter a few turns. Use a 2.5mm Allen wrench.

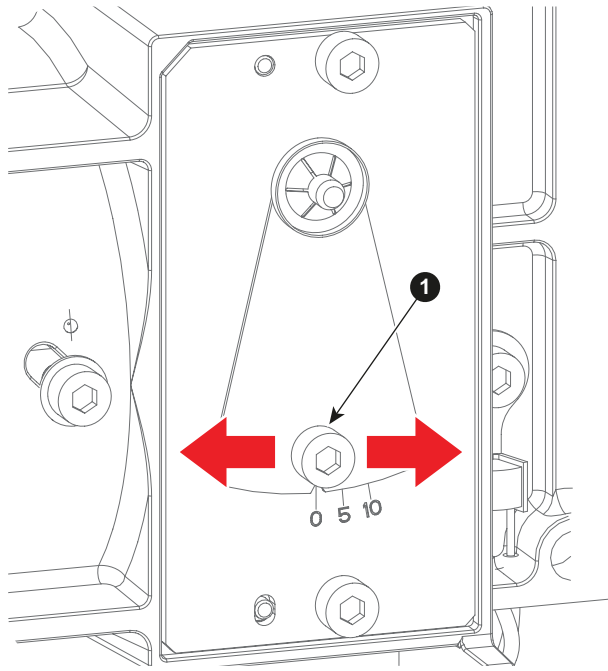


Image 12-23

2. Start up the projector.
3. Display an uncorrected RED test pattern.
Tip: See user guide of the Communicator software for detail instructions about color calibration
4. Measure the x and y values of the projected RED test pattern. Use for that a colorimeter. Make sure that the RED test pattern is uncorrected.
5. Slightly move the adjustment screw (reference 2) of the Notch Filter to a position until the measured x and y values for RED are within the required specs (see above).
6. Display an uncorrected GREEN test pattern.
7. Measure the x and y values of the projected GREEN test pattern. Use for that a colorimeter. Make sure that the GREEN test pattern is uncorrected.
8. Slightly move the adjustment screw (reference 2) of the Notch Filter to a position until the measured x and y values for GREEN are within the required specs (see above).
9. Repeat from step 3 until no adjustment is required and all measured x and y values for RED and GREEN are within the required specs (see above).
10. Fasten the adjustment screws (reference 2 image 12-23) to secure the position of the Notch Filter. Use a 2.5mm Allen wrench. Make sure that the position of the Notch Filter remains unchanged while fastening the screw.

12.15 Cleaning the Notch Filter

When should one clean the Notch Filter?

Only clean the Notch Filter in case it is really necessary. This means in case dust is clearly visible upon the surface of the Notch Filter.



This procedure requires removal of the Notch Filter.

Necessary tools

- Compressed air.
- Clean Toraysee® cloth or any micro fiber lens cleaning cloth.
- Clean cotton cloth.

Necessary parts

Lens cleaner (e.g. Carl Zeiss lens cleaner or Purasol® or any waterbased lens cleaner)

How to clean the Notch Filter?

1. Blow off dust with clean compressed air (or pressurized air cans).
2. Clean with lens cleaner together with a clean lens cleaning cloth to remove the dust and contamination. Use big wipes.
3. Use a dry lens cleaning cloth to remove left liquid or stripes. Polish with small circles.
4. If there are still fingerprints on the surface, wipe them off with lens cleaner together with a clean lens cleaning cloth. Polish again with a dry one.

12.16 Replacing the Fold Mirror set



This procedure assumes that the Light Processor and the Light Pipe lens No4 are already removed.

Necessary tools

- 2.5mm Allen wrench.
- 5.5mm nut driver.
- Caliper.
- Clean cotton gloves.

How to replace the fixed Fold Mirror and the adjustable Fold Mirror?

1. Disconnect the wire unit (reference 1 image 12-24 or image 12-25) of the Light Sensor module.

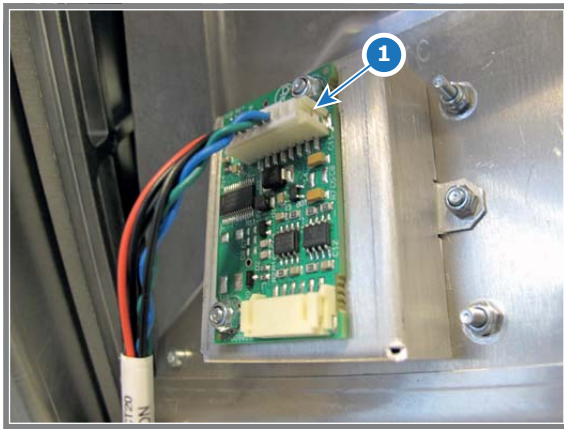


Image 12-24
Type "A" Light Sensor.



Image 12-25
Type "B" Light Sensor.

2. Remove the side cover plate from the Corner Block. Use a 2.5mm Allen wrench to loosen the three screws (reference 1 image 12-26).

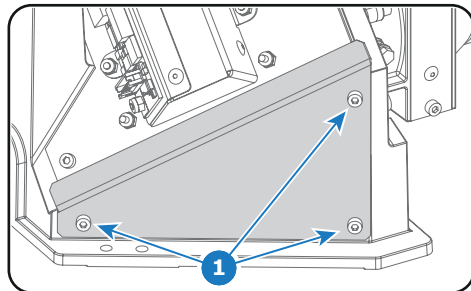
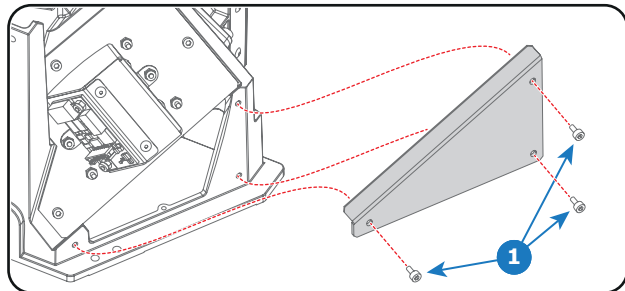


Image 12-26



3. Carefully remove the Light Sensor assembly from the Corner Block. Use a 2.5mm Allen wrench to loosen the four screws (reference 2 image 12-27).

Caution: The adjustable Fold Mirror is attached on the bottom side of the assembly.

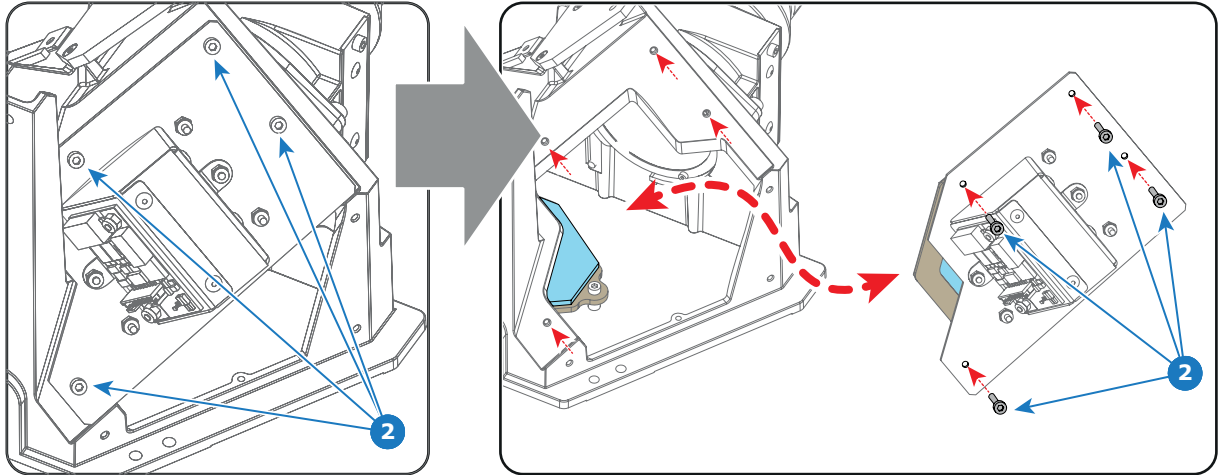


Image 12-27

4. Replace the fixed Fold Mirror at the base of the Corner Block. Use a 2.5mm Allen wrench to loosen the three fixation screws (reference 3 & 4 image 12-28).

Note: To access the two fixation screws with reference 3 in image 12-28 the Light Processor and the Light Pipe lens No4 have to be removed. This procedure assumes that these components are already removed.

Caution: Do not touch the surface of the Fold Mirror. Use cotton gloves to handle the Fold Mirror. Ensure that the Fold Mirror remains clean.

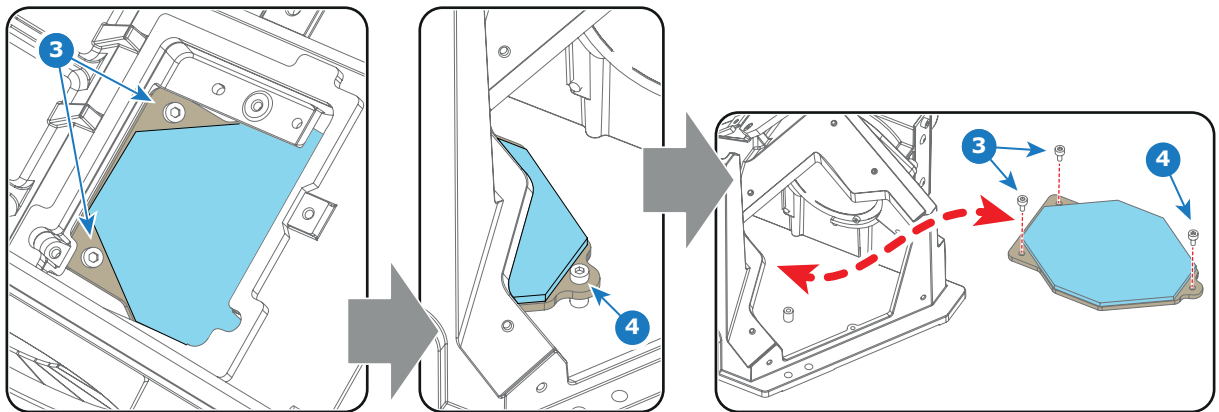


Image 12-28

5. Replace the adjustable Fold Mirror at the bottom of the Light Sensor assembly as illustrated. Use a 5.5mm nut driver to loosen the three adjustment nuts (reference 5 image 12-29). Reuse the three springs (reference 7 image 12-29) and the three plain washers (reference 6 image 12-29) on the threaded rods of the new adjustable Fold Mirror.

Caution: Do not touch the surface of the Fold Mirror. Use cotton gloves to handle the Fold Mirror. Ensure that the Fold Mirror remains clean.

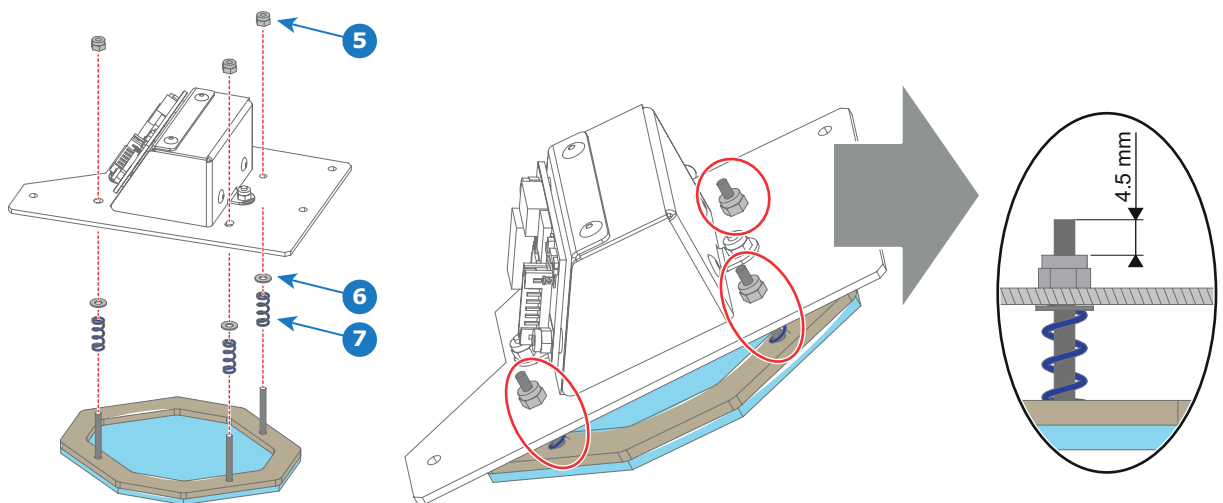


Image 12-29

6. Adjust the Fold Mirror for **nominal position**. Do this by turning each adjustment nut in or out until the threaded rod 4.5mm sticks out above the adjustment nut. See detail in image 12-29.

7. Carefully install the Light Sensor assembly on the Corner Block. Use a 2.5mm Allen wrench to fasten the four screws (reference 2 image 12-27).
8. Install the side cover plate of the Corner Block. Use a 2.5mm Allen wrench to fasten the three screws (reference 1 image 12-26).
9. Connect the wire of the Light Sensor module.



The adjustable Fold Mirror has to be readjusted after replacement!

12.17 Adjusting the Fold Mirror

Purpose of the Fold Mirror

The Fold Mirror is folding up the light path of the projector to make the projector more compact. The Fold Mirror is located at the left side of the Light Pipe and reflects the light, which entrance the Light Pipe via the Integration Rod, upon the prism of the Light Processor. The position of the light spot upon the DMD's can be adjusted with the Fold Mirror.



CAUTION: Normally the Fold Mirror should never be readjusted in the field. In case a readjustment is required follow the instructions in this chapter precisely. Only qualified technicians who have experience with adjusting the Fold Mirror may adjust the Fold Mirror. A misaligned Fold Mirror may cause irreversible damage to other parts of the projector!

When starting the readjustment procedure?

When dark parts (small dark bars) or yellow lines are visible in one of the corners of the projected image.

Start by adjusting the folding mirror. In most cases that will be sufficient to eliminate these small misalignments. If not, continue with the adjustment of the integration rod.



To access all three adjustment screws of the Fold Mirror the left side projector cover and the side plate of the Light Processor compartment have to be removed. This adjustment procedure assumes that these components are already removed.

Necessary tools

5.5 mm nut driver.

How to adjust the Fold Mirror of the projector?

1. Start up the projector and display a white test pattern with maximum dimming.
Caution: Projecting a misaligned spot for more than 10 seconds may cause irreversible damage to the Light Processor. Always apply maximum dimming to the light output, and adjust the light spot as quickly as possible.
2. Turn the adjustment screws A, B or C in or out until the light spot (5) matches with the outline of the DMDs (4). Use a 5.5mm nut driver. The illustration below shows the movements of the light spot (5) upon the screen (6) for each adjustment screw.

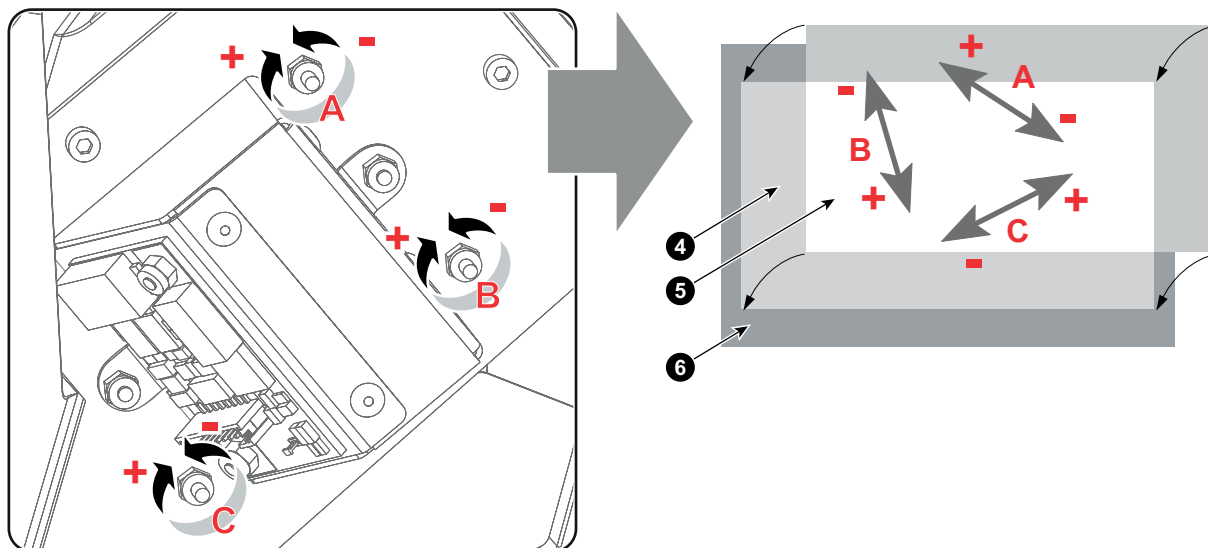


Image 12-30



Turn the three adjustment screws of the Fold Mirror equally bit by bit clockwise to achieve a higher contrast of the projected image. Then, readjust the adjustment screws individual until the light spot matches with the outline of the DMDs.

Take into account that a higher contrast is at the expense of brightness.

12.18 Cleaning the Fold Mirrors

When should one clean the Fold Mirror?

Only clean the Fold Mirror in case it is really necessary. This means in case dust is clearly visible upon the surface of the Fold Mirror.



This procedure requires removal of the adjustable Fold Mirror. The fixed Fold Mirror at the bottom of the Corner Block is accessible when the adjustable Fold Mirror is removed.

Necessary tools

- Compressed air.
- Clean Toraysee® cloth or any micro fiber lens cleaning cloth.
- Clean cotton cloth.

Necessary parts

Lens cleaner (e.g. Carl Zeiss lens cleaner or Purasol® or any waterbased lens cleaner)

How to clean the Fold Mirror?

1. Blow off dust with clean compressed air (or pressurized air cans).
2. Clean with lens cleaner together with a clean lens cleaning cloth to remove the dust and contamination. Use big wipes.
3. Use a dry lens cleaning cloth to remove left liquid or stripes. Polish with small circles.
4. If there are still fingerprints on the surface, wipe them off with lens cleaner together with a clean lens cleaning cloth. Polish again with a dry one.

12.19 Replacing the Light Sensor module (CLO)



WARNING: Disconnect the power cord from the projector and wait a few minutes (to discharge the capacitors) prior to start with this procedure.



This procedure assumes that the left side projector cover and the side plate of the Light Processor compartment are already removed.

Necessary tools

- 5.5mm nut driver.
- 5.5mm open-end wrench.

How to replace the Light Sensor of the Light Pipe?

1. Disconnect the wire unit (reference 1 image 12-31 or image 12-32) of the Light Sensor module.

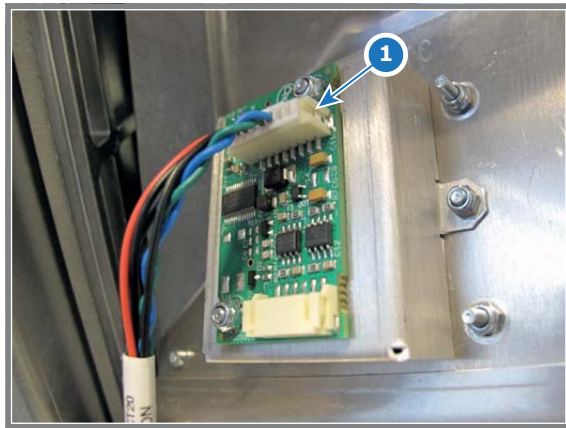


Image 12-31
Type "A" Light Sensor.

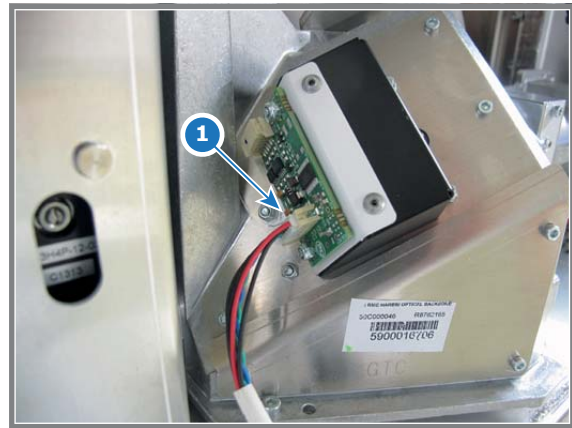


Image 12-32
Type "B" Light Sensor.

2. Remove the Light Sensor module by loosening the two nuts (reference 2 image 12-33).

Note: There exist two types of Light Sensors: type "A" (image 12-31) and type "B" (image 12-32). In case of type "B" the fixation nuts (reference 2 image 12-33) are not accessible with a 5.5mm nut driver. Either use 5.5mm open end wrench or first remove the Light Sensor housing from the Light Pipe.

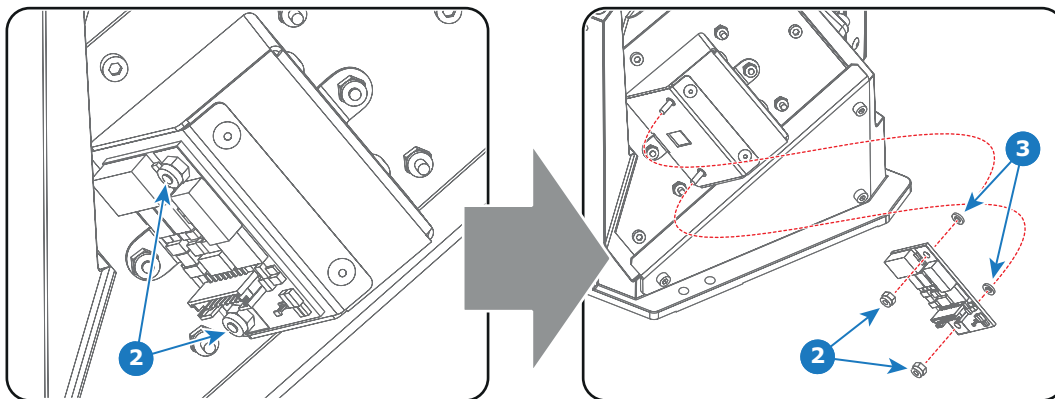


Image 12-33

3. Install the new Light Sensor. Use 5.5mm open end wrench to fasten the two nuts (reference 2 image 12-33).
Note: There must be a plastic spacer (reference 3 image 12-33) between the Light Sensor board and chassis. Normally the plastic spacers remained seated on the threaded rods when the Light Sensor board was removed.
4. Connect the wire unit of the Light Sensor module.
5. Install the side plate of the Light Processor compartment and the left side projector cover.
6. Connect the power cord and switch on the projector.
7. Create a new Light Sensor Calibration file (LSC file). See Communicator User Guide.

12.20 Replace the light pipe fan

How to replace the light pipe fan?

1. Disconnect the wire of the fan (reference 1 image 12-34).

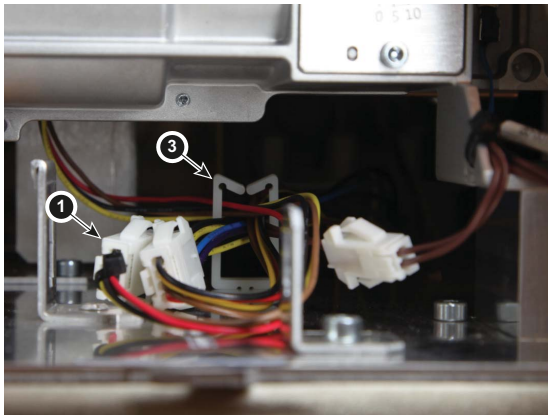
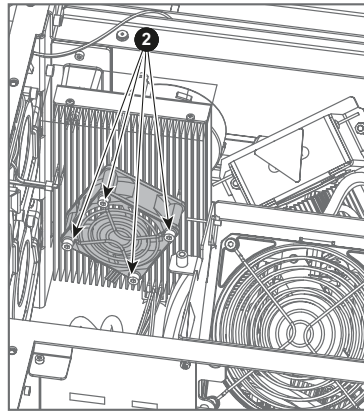


Image 12-34



2. Remove the fan assembly from the projector chassis. Use a 3mm Allen key to loosen the four screws (reference 2 image 12-34).
3. Install the new fan, as illustrated in image 12-35.

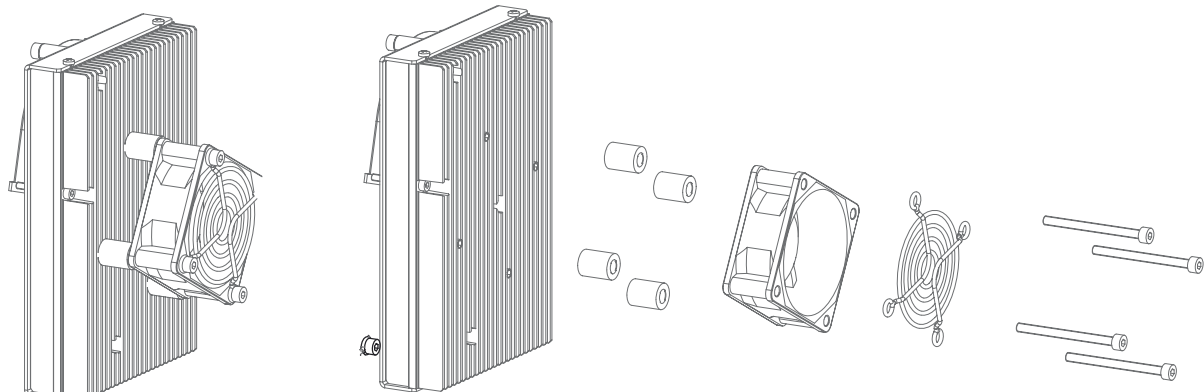


Image 12-35

4. Replace the fan assembly in the projector chassis.
5. Reconnect the wire of the fan (reference 1 image 12-34). Guide the wire through the cable clamp (reference 3 image 12-34).

12.21 Replace the Light Pipe blower

How to replace the Light Pipe blower?

1. Disconnect the wire of the blower (reference 1 image 12-36)

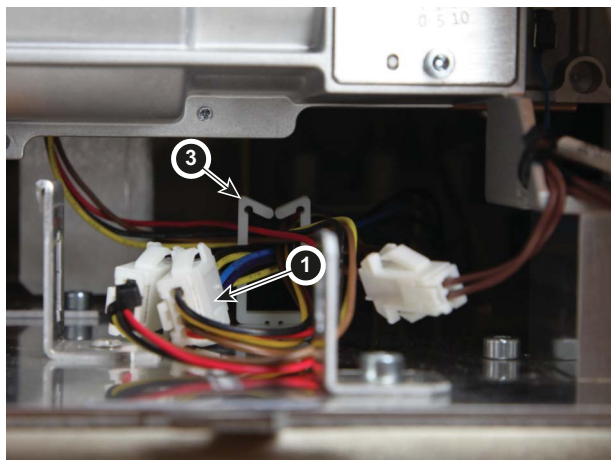
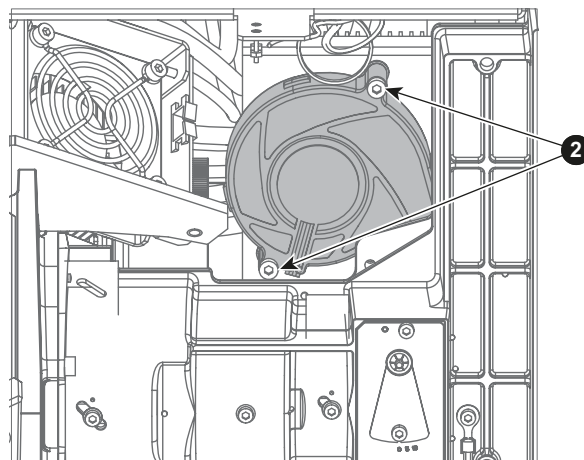


Image 12-36



2. Remove the blower assembly from the projector chassis. Use a 3mm Allen key wrench to loosen the 2 screws (reference 2 image 12-36).
3. Install the new blower assembly, as illustrated in image 12-37.

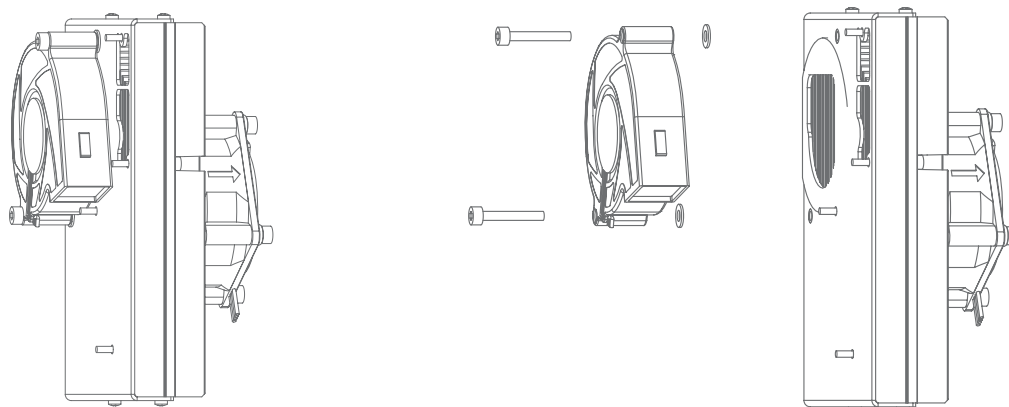


Image 12-37

4. Replace the blower assembly in the projector chassis.
5. Reconnect the wire of the blower. Guide the wire through the cable clamp (reference 3 image 12-36).

13. SPATIAL COLOR CALIBRATION (LUT-SCC)

About this chapter

This chapter explains how to obtain the correct LUT-SCC file and how to install it after having replaced the Light Processor or ICMP/ICP board.

Overview

- Introduction to SCC file
- Obtain the Serial Number of the installed Light Processor
- Download the LUT-SCC file from the Barco website
- Upload Spatial Color Calibration file
- Activate Spatial Color Calibration file

13.1 Introduction to SCC file

Introduction

Barco has introduced the Spatial Color Calibration (SCC) file on the DP2K-E series digital projectors. The SCC file contains information to improve the color uniformity of the image. The uniformity is measured in the factory and stored in a LUT-SCC file on the ICP board. This LUT-SCC file is activated on the projector at factory.

Impact on service

As the LUT-SCC file is Light Processor specific, when replacing the **Light Processor** of the projector a **new LUT-SCC file** has to be uploaded and set as active file. As the LUT-SCC file is stored on the Integrated Cinema Processor (located on the **ICMP or ICP** board) the **LUT-SCC file** should be uploaded and activated after replacement of the ICMP or ICP board.

This chapter explains how to obtain the correct LUT-SCC file and how to install it after having replaced the Light Processor or ICMP/ICP.



Communicator version 4.7.8 ⁽¹⁾ or later is required to activate LUT-SCC files.

1. For DP4K-P and DP2K-S the SCC functionality is already incorporate in the Communicator version 4.7.3

13.2 Obtain the Serial Number of the installed Light Processor



The Serial Number of the installed Light Processor can be obtained in two different ways. Either by reading it from the label on site or by reading it remotely using the Communicator software.

How to obtain the Serial Number of the installed Light Processor remotely?

1. Start up the Communicator software version **4.7.9** ⁽²⁾ or later.
Note: The **DP2K/DP4K software package** version **1.11** ⁽³⁾ or later must be installed to read out the Light Processor serial via the Communicator.
2. Create a Diagnostic Package of the projector. For detailed instructions see User Guide of the Communicator chapter "Diagnostic Package".
3. Open the Diagnostic Package using Windows Explorer or the 'Diagnostic Package Reader' included in the PC version of the Communicator software.
4. Look in the file/section "Hardware Info" for the serial number of the Light Processor.
Note: Only for recent Light Processors the serial number will be available in the Diagnostic Package. For older Light Processors the serial number has to be read from the label (see below).

How to obtain the Serial Number of the installed Light Processor on site?

1. Remove the Lens from the projector.
2. Write down the Serial Number of the Light Processor. The label with Serial Number of the Light Processor (reference 1 image 13-1) is visible through the Lens Holder opening. The label is located at the front base of the Light Processor.



Image 13-1
Location label with Serial Number of the Light Processor of a DP4K-P projector.



The position of the label with Serial Number of the Light Processor may be slightly different. However, it will always be located at the front base of the Light Processor.

2. For DP4K-P and DP2K-S the SCC functionality is already incorporate in the Communicator version 4.7.3

3. For DP4K-P and DP2K-S the SCC functionality is already incorporate in the DP2K/DP4K software package version 1.09.104

13.3 Download the LUT-SCC file from the Barco website



A login ID is required to access the secured zone myBarco on the Barco website <https://www.barco.com>. A login ID for the secured zone can be requested at the portal page of the Barco website.

Necessary parts

Serial Number of the installed Light Processor.

How to download the Spatial Color Calibration file (LUT-SCC) from the secured Barco website?

1. Open the url: <https://www.barco.com> in a web browser.
2. Login into the secured Barco website.



Image 13-2

Or,

in case you are already logged in, click on your login name and select "My support section".

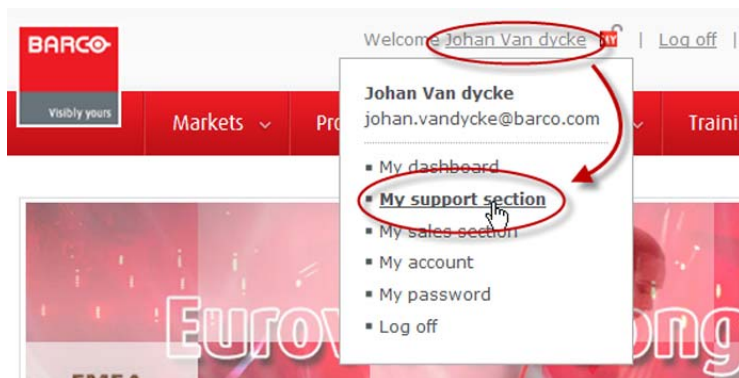


Image 13-3

3. Navigate in the **My Support** section at the left side to **Digital Cinema > Spatial color corrections**.
4. Fill in the Serial Number of the Light Processor and press the "Search file" button.

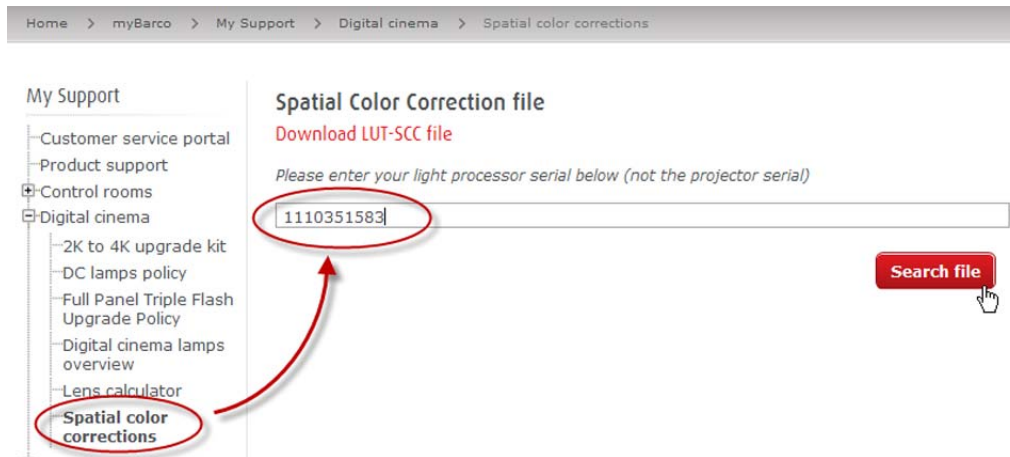


Image 13-4

If a LUT-SCC file is found a download link will appear. Proceed with the next step.

In case no LUT-SCC file is found end this procedure and use the default LUT-SCC file which is already installed on the ICP board. For 2K projectors this is "ones2K_LE", for 4K projectors this is "ones4K_LE".

- Click on the LUT-SCC download file.

Color file overview

Serial number	1110351583
Last time modified	05/02/2013
Download file	<u>1110351583.LUT-SCC</u>

Image 13-5

13.4 Upload Spatial Color Calibration file



When replacing the Light Processor a new LUT-SCC file should be downloaded from the secured Barco website.

When replacing the ICP board the LUT-SCC file should be available if the projector files were backed up properly. If not, the LUT-SCC file can also be downloaded from the secured Barco website using the serial number of the installed Light Processor.

For detailed instructions see procedures "Obtain the Serial Number of the installed Light Processor", page 169, and "Download the LUT-SCC file from the Barco website", page 170.

Necessary tools

Communicator software version 4.7.9 (or later)

Necessary parts

- Serial Number of the installed Light Processor.
- LUT-SCC file available on the PC of the Communicator or on USB-stick when using the Communicator Touch Panel.

How to upload the LUT-SCC file into the projector?

1. Start up the projector and the Communicator (version **4.7.9** ⁽⁴⁾ or later).
2. Ensure that the projector is connected with the Communicator. Either via a direct connection or via network. For detailed instructions see User Guide of the Communicator (manual version 07).
3. Go to the File manager of the Communicator.
4. Click on the drop down box in *Local files* (1) and browse to the LUT-SCC file to be uploaded (2).

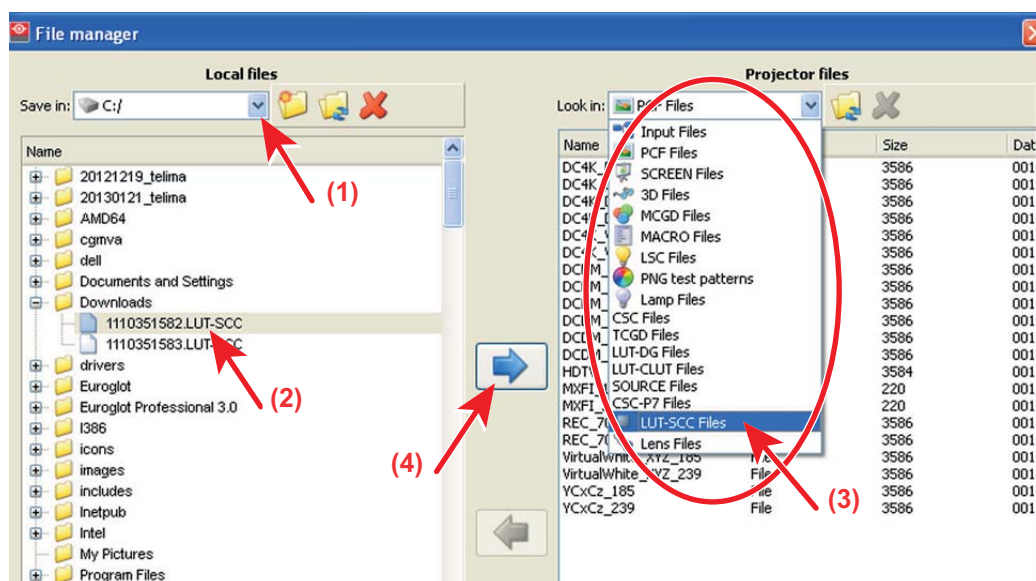


Image 13-6

5. Click on the drop down box in *Projector files* and select the file type LUT-SCC (3).
6. Click on the arrow pointing to the right (4).

The file is uploaded from its original location to the projector file system.

4. For DP4K-P and DP2K-S the SCC functionality is already incorporate in the Communicator version 4.7.3

13.5 Activate Spatial Color Calibration file

Necessary tools

Communicator software version 4.7.9 (or later)

How to activate the LUT-SCC file?

1. Open the *File manager* in the Communicator and select in the drop down box of *Projector files* the file type LUT-SCC (1).
2. Select the desired LUT-SCC file from the list (2).
3. Click **Select active** (3).

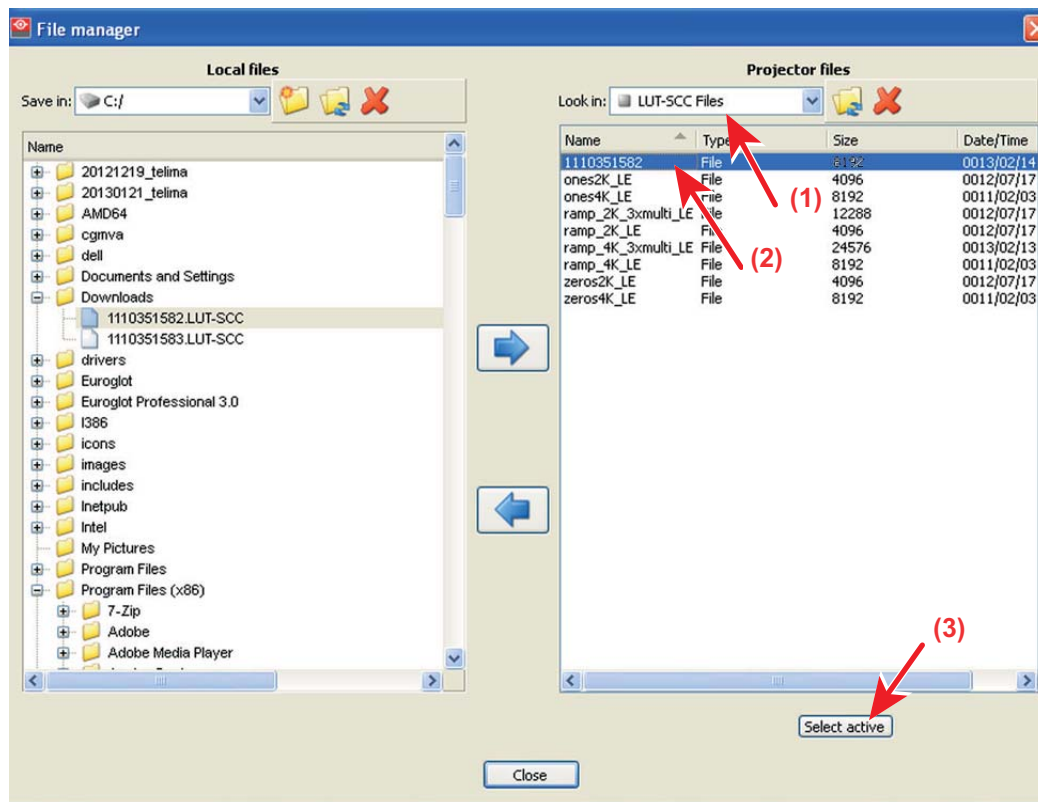


Image 13-7

4. Click on **Close** to exit the File manager.



In case no Light Processor serial LUT-SCC file is available use the default LUT-SCC file which is factory installed on the ICP board and thus displayed in the list. For 2K projectors this is "ones2K_LE", for 4K projectors this is "ones4K_LE".

14. CONVERGENCE

About this chapter

This chapter describes how to prepare your DP2K-E series projector for convergence adjustment and how to adjust the convergence.

Overview

- Convergence controls
- Preparing for convergence adjustment
- Converging the blue pattern onto the red pattern
- Converging the green pattern onto the red pattern
- Closing off the Light Processor compartment

14.1 Convergence controls

Extended control knobs

As the DMD of the red channel is not accessible in the projector, it remains fixed. Therefore the image of this DMD will be taken as reference. Blue and green may be aligned onto red when a small convergence drift is recognized. The blue and green channels have pivot plates equipped with three control knobs for convergence adjustment, two of which are extended (reference 2, 3, 5 and 6 of image 14-1). The adjustment knobs are numbered from 1 to 6 and have the same color as the channel which they affect.

To access the control knobs the top cover and left side cover of the projector and the top cover plate and side cover plate of the Light Processor compartment have to be removed. For easy access to control knobs No1 and No4, we advise locating the Light Processor top fan unit in its upper position, hereby still providing the necessary cooling to the unit.

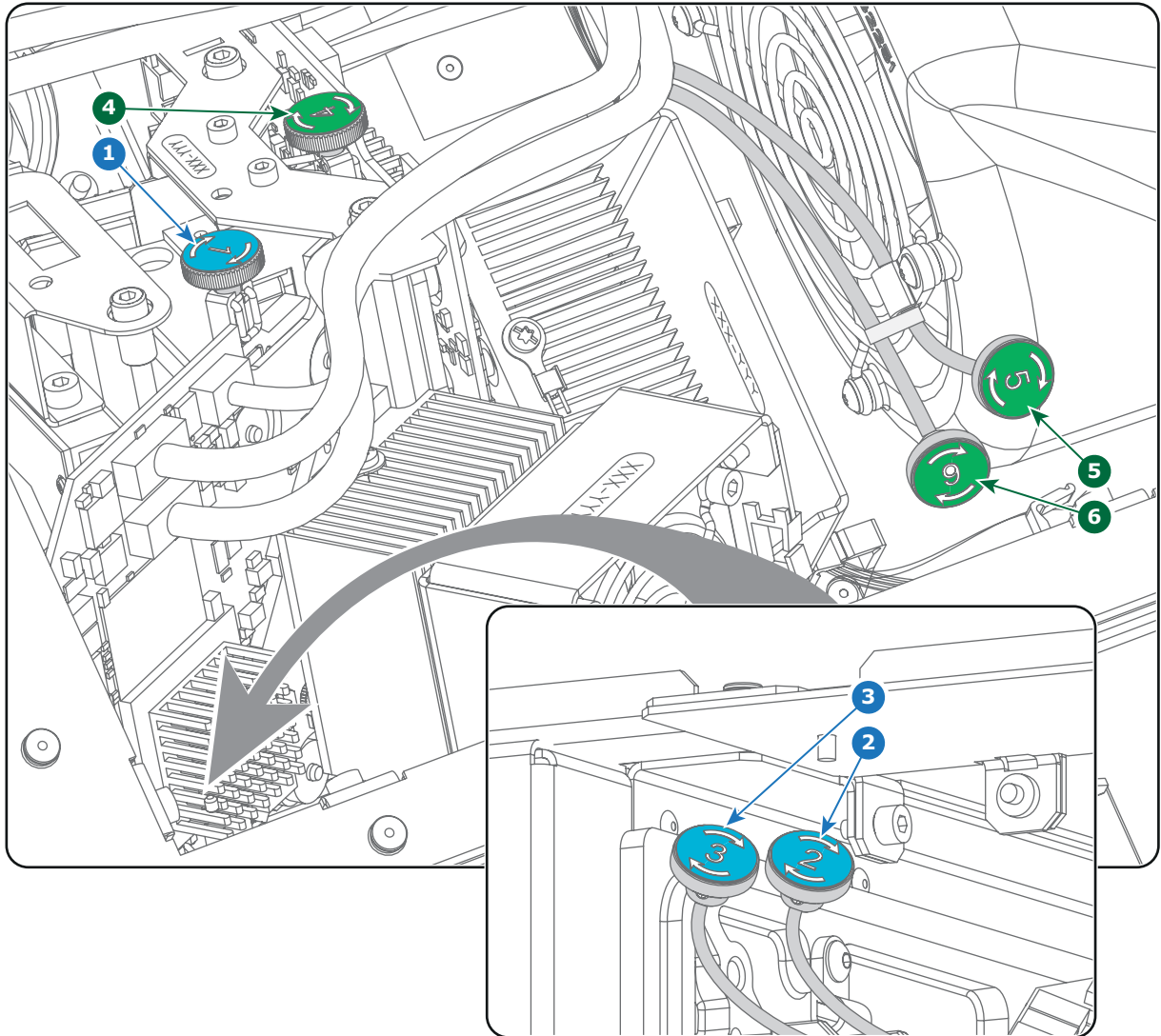


Image 14-1

- 1 Blue channel, knob number 1.
- 2 Blue channel, knob number 2.
- 3 Blue channel, knob number 3.
- 4 Green channel, knob number 4.
- 5 Green channel, knob number 5.
- 6 Green channel, knob number 6.

Convergence test pattern

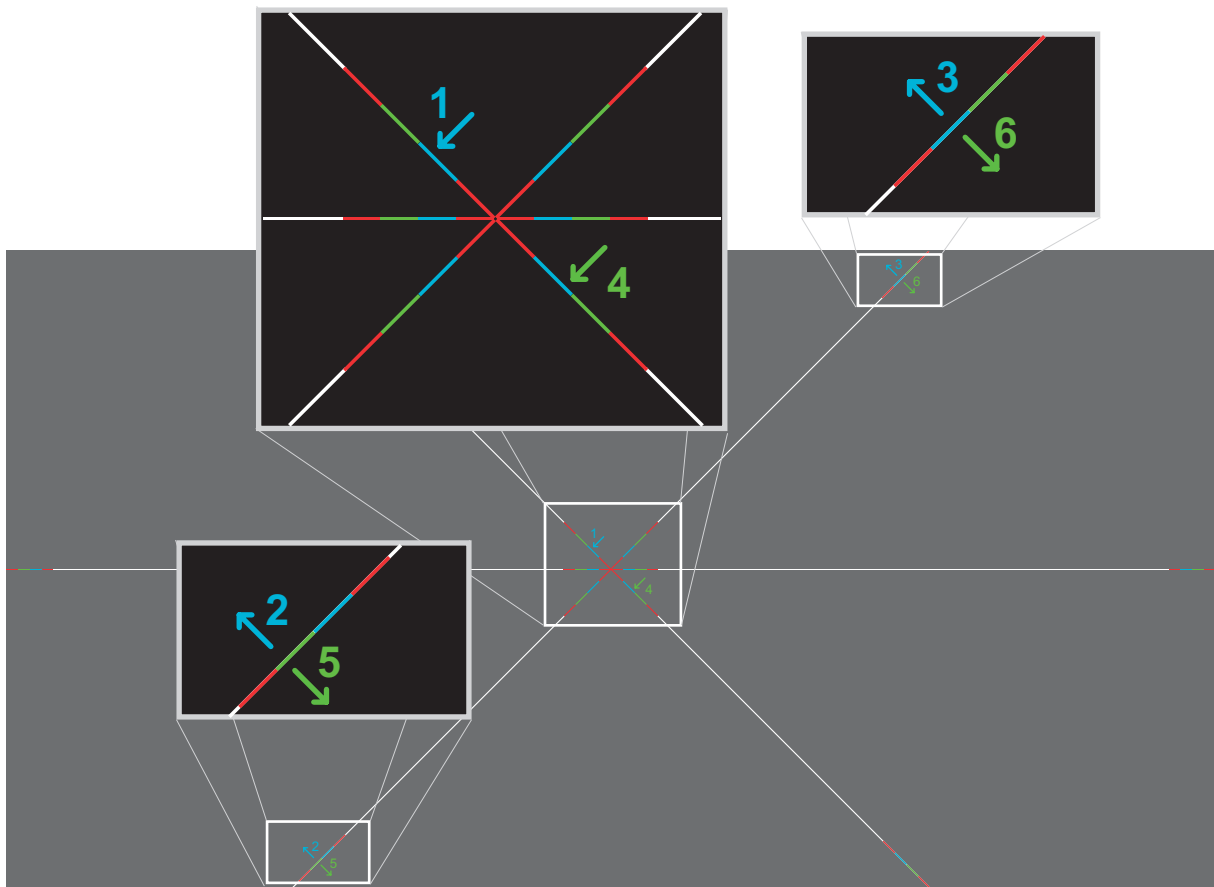


Image 14-2

The test pattern illustrated above is specifically designed for convergence purposes. The test pattern has three blue arrows numbered from 1 to 3 and three green arrows numbered from 4 to 6. These numbers and colors correspond to those of the control knobs. Each knob is marked with an arrow which corresponds to the direction indicated on the screen.

Adjustment Range

Prevent damage to the system by limiting the amount/number of adjustment(s) made. Typically the convergence adjustments serve to correct a convergence fault of a few pixels at the most. Any convergence fault beyond this is considered grossly abnormal and likely indicates abuse or rough handling. However, in extreme cases correction of up to 10 pixels is possible.



CAUTION: The system does have an end of travel in either direction, but using excessive force may cause damage. Please handle gently.

Troubleshooting 'dead zone' of control knob

In the rare event that a knob is loose in the perfect convergence position, it is preferable to continue translating the image away for approximately 20 to 30 pixels (max 1 revolution of the knob(s)). Note that this is the only time we allow for extreme adjustment. Thereafter, return the image back immediately to the correct position. The knob should now have become tighter in the final position and therefore resists turning due to vibrations and such. Repeat the procedure if you feel the knob is still loose.

14.2 Preparing for convergence adjustment

Necessary tools

- 7mm flat screwdriver.
- 3mm Allen wrench.

How to set up the projector for convergence adjustment?

1. Remove the top cover from of the projector.
2. Remove the left side cover from of the projector.
3. Remove the left cover plate of the Light Processor compartment.
4. Place the fan on top of the Light Processor in the upper position as illustrated. Do this by engaging the two lower slots (2) into the upper mounting pins as illustrated. The two upper slots (3) remain free.

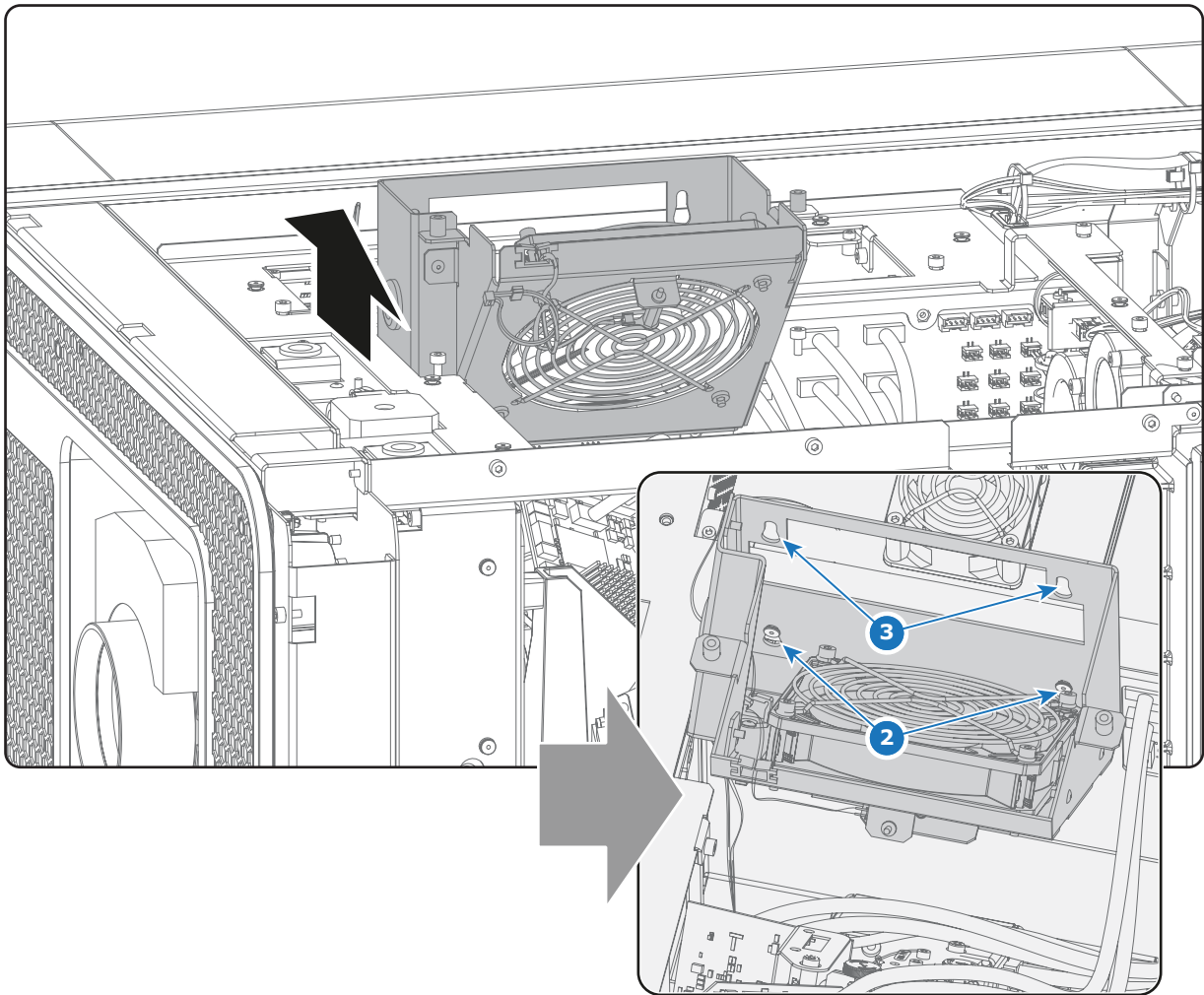


Image 14-3

5. Switch on the projector, ignite the lamp and open the dower.
6. Select the convergence test pattern, which is illustrated below (image 14-4). Use the communicator to activate the convergence test pattern.

Note: The convergence test pattern can NOT be activated via the **PATTERN** button on the Local Keypad.

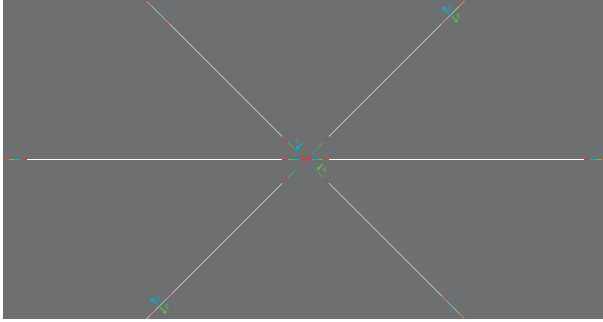


Image 14-4

14.3 Converging the blue pattern onto the red pattern



This adjustment procedure assumes that the projector is prepared for convergence adjustment.

Necessary tools

No tools.

How to converge the blue pattern onto the red pattern?

1. Slightly turn the blue colored control knob number 1 until the blue pattern in the **center** of the projected image converges with the red pattern. Note that a turn of a few degrees corresponds with one full pixel. The direction on the control knob corresponds to the direction of the arrow of the test pattern.

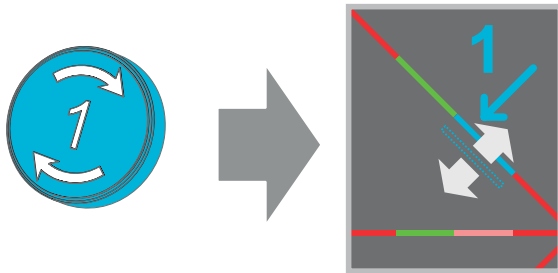


Image 14-5

2. Slightly turn the blue colored control knob number 2 until the blue pattern in the **lower left** of the projected image converges with the red pattern.

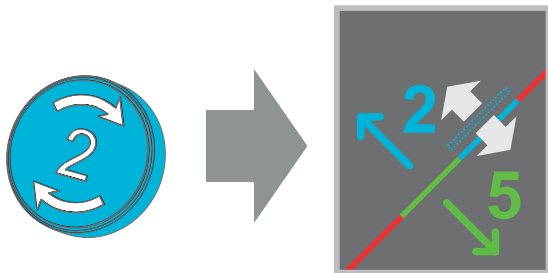


Image 14-6

3. Slightly turn the blue colored control knob number 3 until the blue pattern in the **upper right** of the projected image converges with the red pattern.

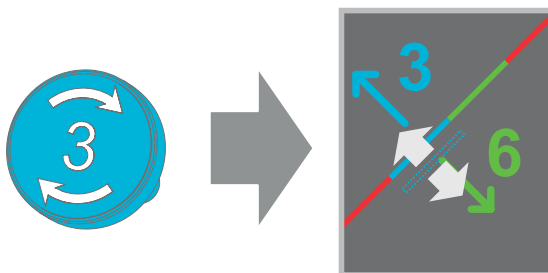


Image 14-7

4. Repeat step 2 and 3 until **coincidence** is obtained of the blue pattern in the **lower left** and **upper right** of the projected image.
5. Repeat from step 1 until **full coincidence** is obtained of the blue pattern in the **center**, **lower left** and **upper right** of the projected image.
6. Continue with the procedure: "Converging the green pattern onto the red pattern", page 181.

14.4 Converging the green pattern onto the red pattern



This adjustment procedure assumes that the projector is prepared for convergence adjustment.

Necessary tools

No tools.

How to converge the green pattern onto the red pattern?

1. Slightly turn the green colored control knob number 4 until the green pattern in the **center** of the projected image converges with the red pattern. Note that a turn of a few degrees corresponds with one full pixel. The direction on the control knob corresponds to the direction of the arrow of the test pattern.

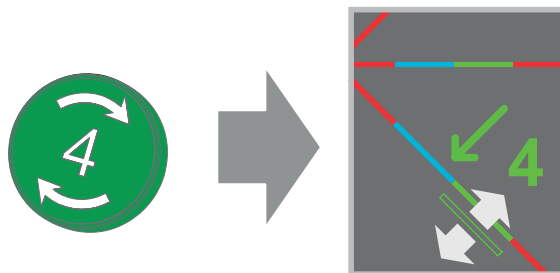


Image 14-8

2. Slightly turn the green colored control knob number 5 until the green pattern in the **lower left** of the projected image converges with the red pattern.



Image 14-9

3. Slightly turn the green colored control knob number 6 until the green pattern in the **upper right** of the projected image converges with the red pattern.

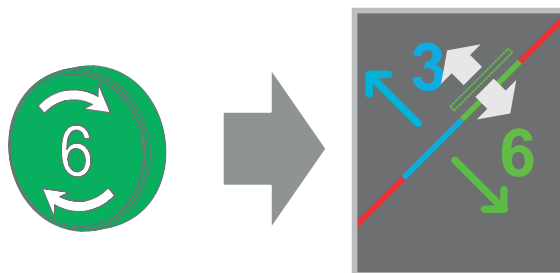


Image 14-10

4. Repeat step 2 and 3 until **coincidence** is obtained of the green pattern in the **lower left** and **upper right** of the projected image.
5. Repeat from step 1 until **full coincidence** is obtained of the green pattern in the **center**, **lower left** and **upper right** of the projected image.
6. Switch off the projector.
7. Continue with the procedure **Closing off the Light Processor compartment**.

14.5 Closing off the Light Processor compartment

Necessary tools

- 7mm flat screwdriver.
- 3mm Allen wrench.

How to close off the Light Processor compartment?

1. Place the fan on top of the Light Processor in the lower position. Ensure that the four mounting pins (1) of the fan assembly are engaged.

Caution: Take care of the wire.

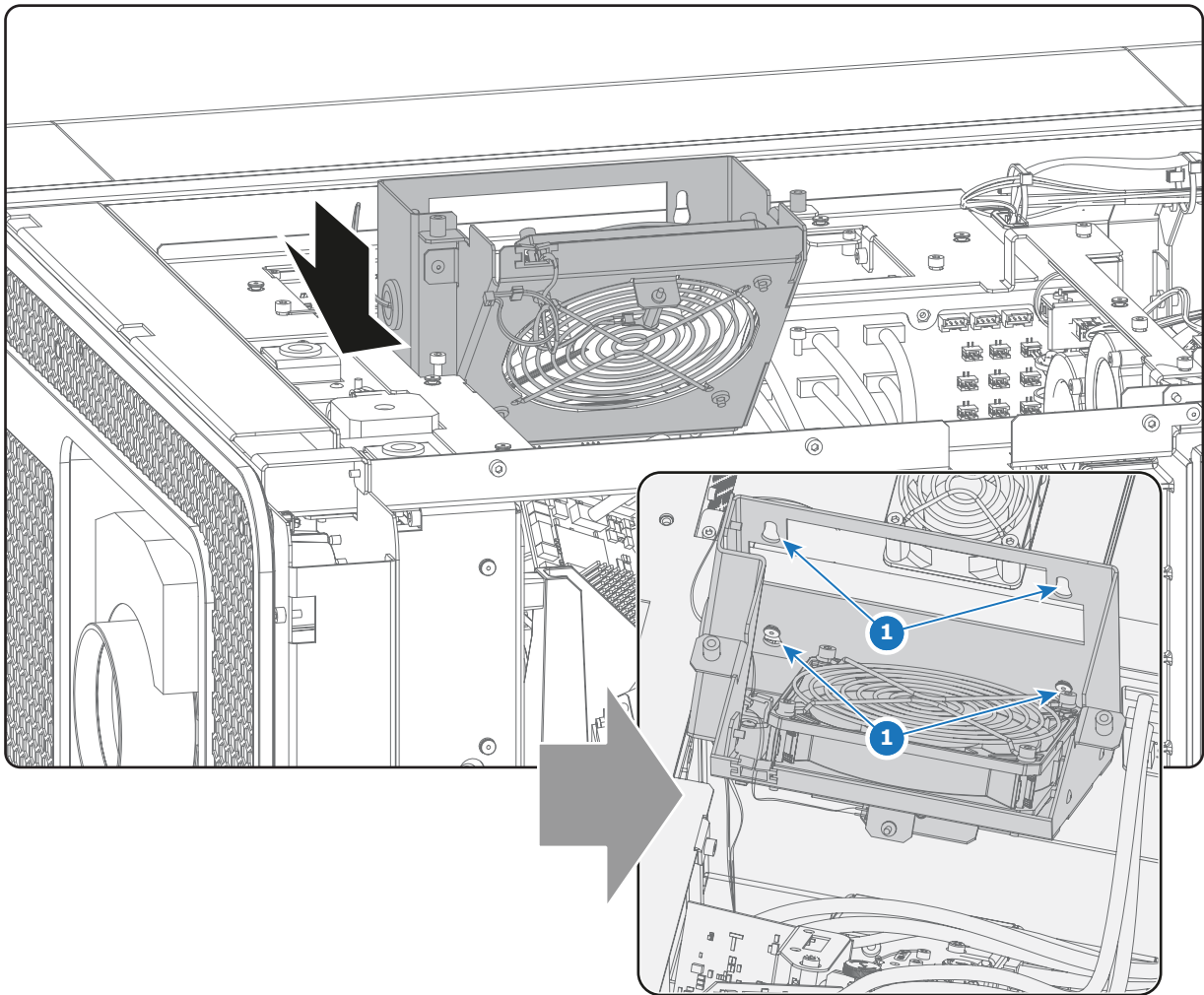


Image 14-11

2. Install the side cover plate of the Light Processor compartment.
3. Install the top cover of the projector.
4. Install the left side cover of the projector.
5. Switch on the projector.
6. Clear the security warning. See "Authorization to clear security warning on the projector", page 133.

15. LENS HOLDER

About this chapter

This chapter describes how to replace the complete Lens Holder assembly, and some individual parts of the Lens Holder, such as the motors for lens shift. Note that the motors for the shift functionality are built into the Lens Holder. The motors for zoom and focus functionality are built into the Lens. Lens cleaning procedure is also included in this chapter. Not included in this chapter are the adjustment procedures for the Lens Holder (Scheimpflug and Back Focal Length), for that see chapter "Scheimpflug", page 213.



CAUTION: Never transport the projector with a Lens mounted in the Lens Holder. Always remove the Lens before transporting the projector. Neglecting this can damage the Lens Holder and Prism.



CAUTION: Caution when removing or installing the lens! Fragile parts at the inner side of the Lens Holder.



Each time a lens is manipulated (e.g. removed and installed in a projector), it needs to be homed and returned.

Overview

- Introduction Lens Holder
- Removal of the lens holder
- Installation of the lens holder
- Available lenses
- Lens selection
- Lens installation
- Lens removal
- Lens shift, zoom & focus
- Cleaning the lens
- Replacement of the Vertical Shift stepper motor
- Replacement of the Horizontal Shift stepper motor
- Replacement of the motor assembly for 0.69" DC2K lenses (Type 'M')
- Replacement of the motor assembly for 0.69" DC2K lenses (Type 'F')
- Replacement of the motor assembly for 0.69" DC2K lenses (Type 'B')
- First Placement of the Inner Dust Rubber
- Replacement of the Inner Dust Rubber

15.1 Introduction Lens Holder

Lenses and Lens Holder

Next to securing the Lens, the Lens Holder makes it possible to shift, tilt and swing the lens plane with respect to the DMD plane of the projector. This adjustment mechanism ensures that the projected image can be perfectly aligned with the screen. The motors used for horizontal and vertical shift are integrated in the Lens Holder. The Lens Holder has an electrical socket for the zoom and focus functions of the motorized Lens.

Parts identification of the Lens Holder

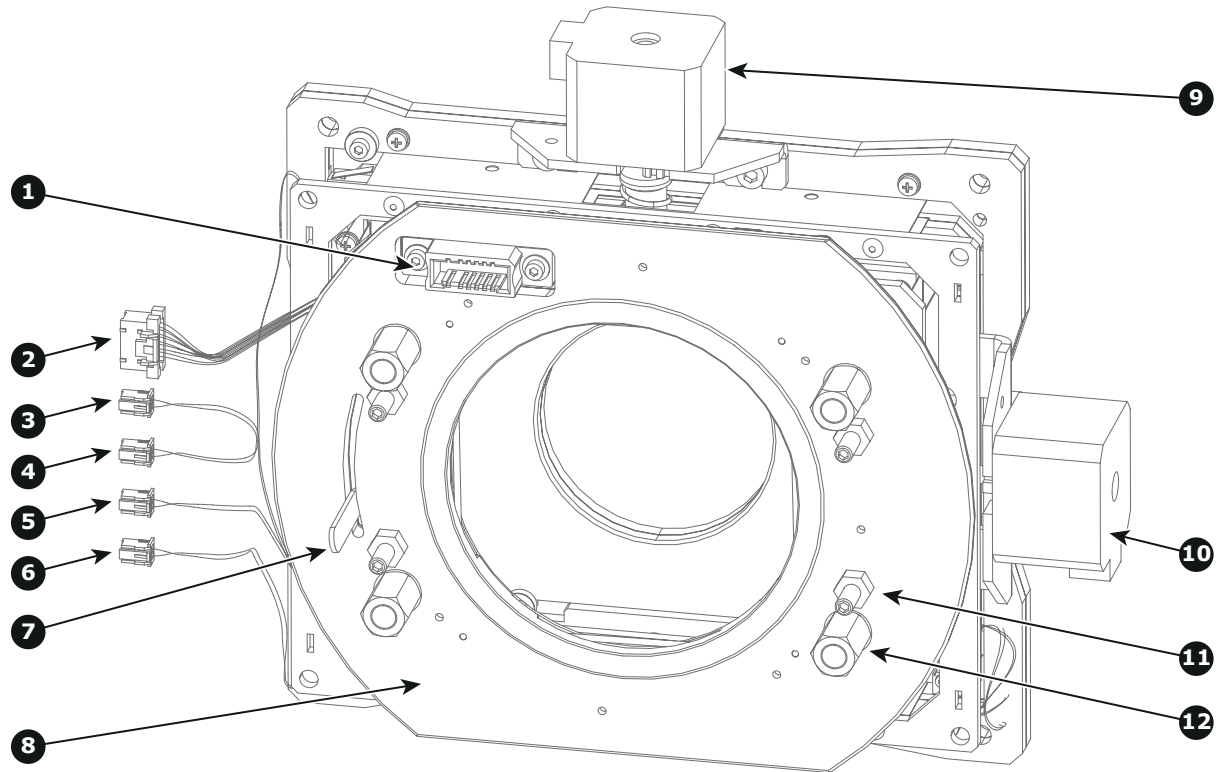


Image 15-1

- 1 Electrical socket lens connection.
- 2 Wire lens connection (zoom & focus) (orange wires).
- 3 Horizontal-Left end loop wires (yellow/black).
- 4 Vertical-Top end loop wires (red/black).
- 5 Vertical-Bottom end loop wires (brown/black).
- 6 Horizontal-Right end loop wires (orange/black).
- 7 Lens lock handle.
- 8 Lens Holder front plate.
- 9 Lens Holder Vertical Shift motor.
- 10 Lens Holder Horizontal Shift motor.
- 11 Scheimpflug set screw + lock nut.
- 12 Scheimpflug adjustment nut.

15.2 Removal of the lens holder

Necessary tools

- 2.5 mm Allen key wrench
- 5 mm Allen key wrench



The front cover of the projector must be removed before the lens holder can be accessed. This procedure assumes this is already done.

Remove the lens holder cover plate

1. Remove the four screws of the lens holder cover plate. Use a 3 mm Allen key wrench.
2. Loosen the lens holder grounding screw (reference 1). Use a 2.5 mm Allen key.
3. Remove the lens holder cover plate.

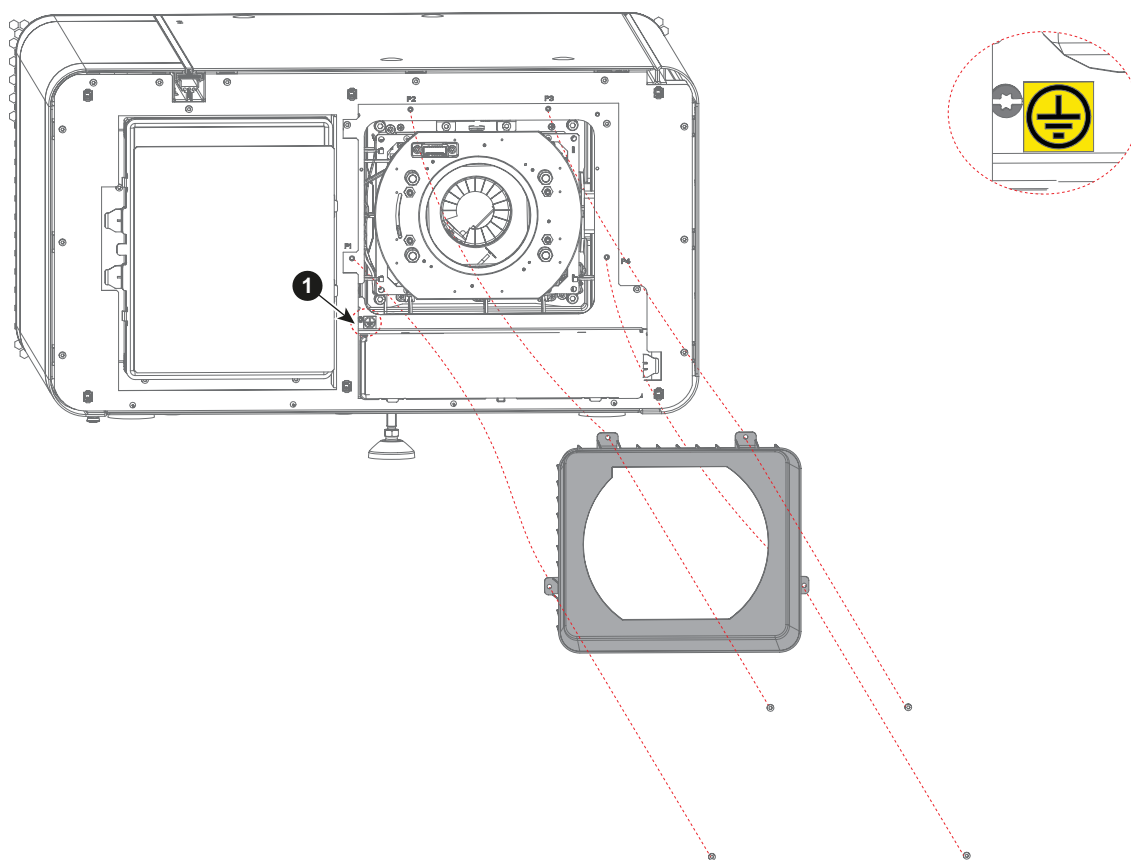


Image 15-2

Remove the lens holder

1. Remove the four lens holder screws. Use a 5 mm Allen key.
2. Unplug the two accessible motor connectors.
3. Move the lens holder slightly to the left, so as to gain access to the other connectors. Unplug all connectors.
4. Remove the lens holder from the chassis.

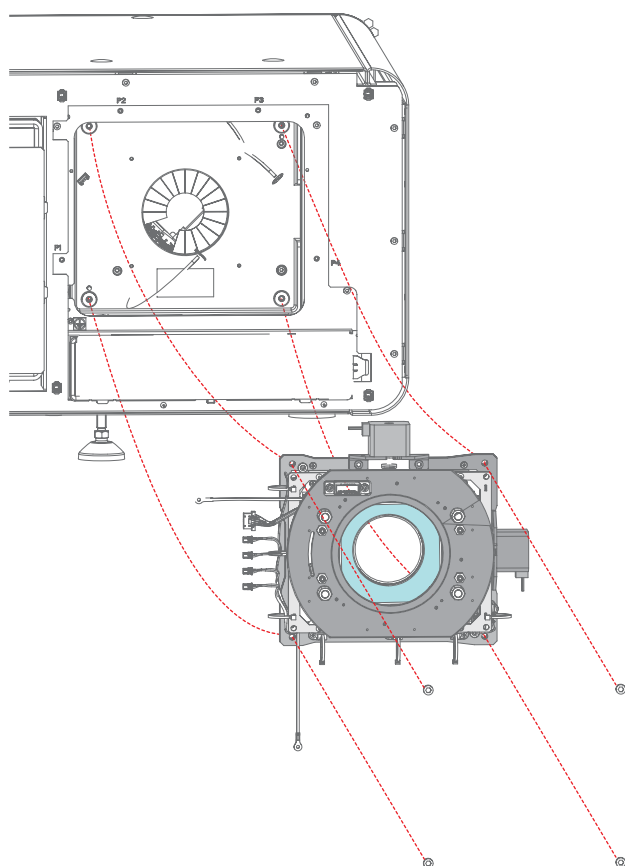


Image 15-3

15.3 Installation of the lens holder

Install the lens holder

1. Position the lens holder in the projector chassis as illustrated.
2. Plug in all motors connectors.
3. Use a 5 mm Allen key wrench to secure the four lens holder fixation screws.

Install the lens holder cover plate

1. Position the lens holder cover plate as illustrated.
2. Install the lens holder grounding screw (reference 1). Use a 2.5 mm Allen key wrench.
3. Install the cover plate fixation screws. Use a 3 mm Allen key wrench.

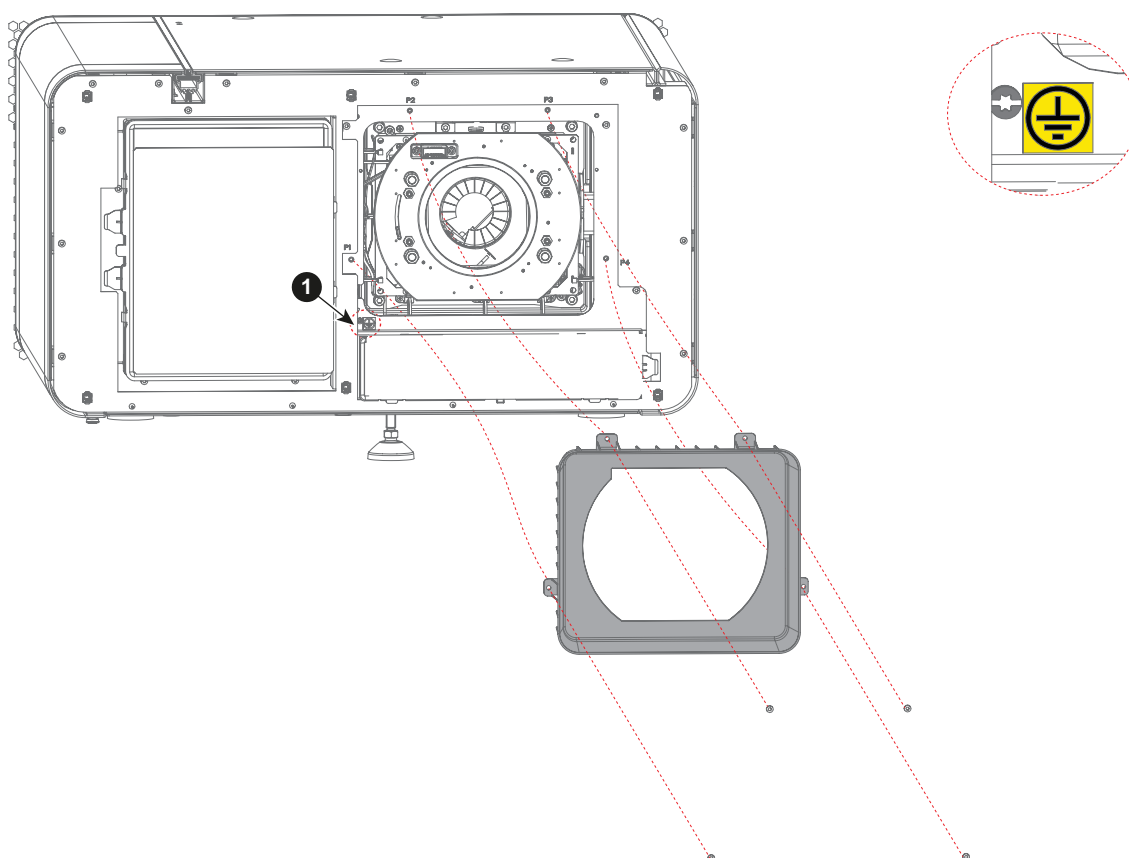


Image 15-4

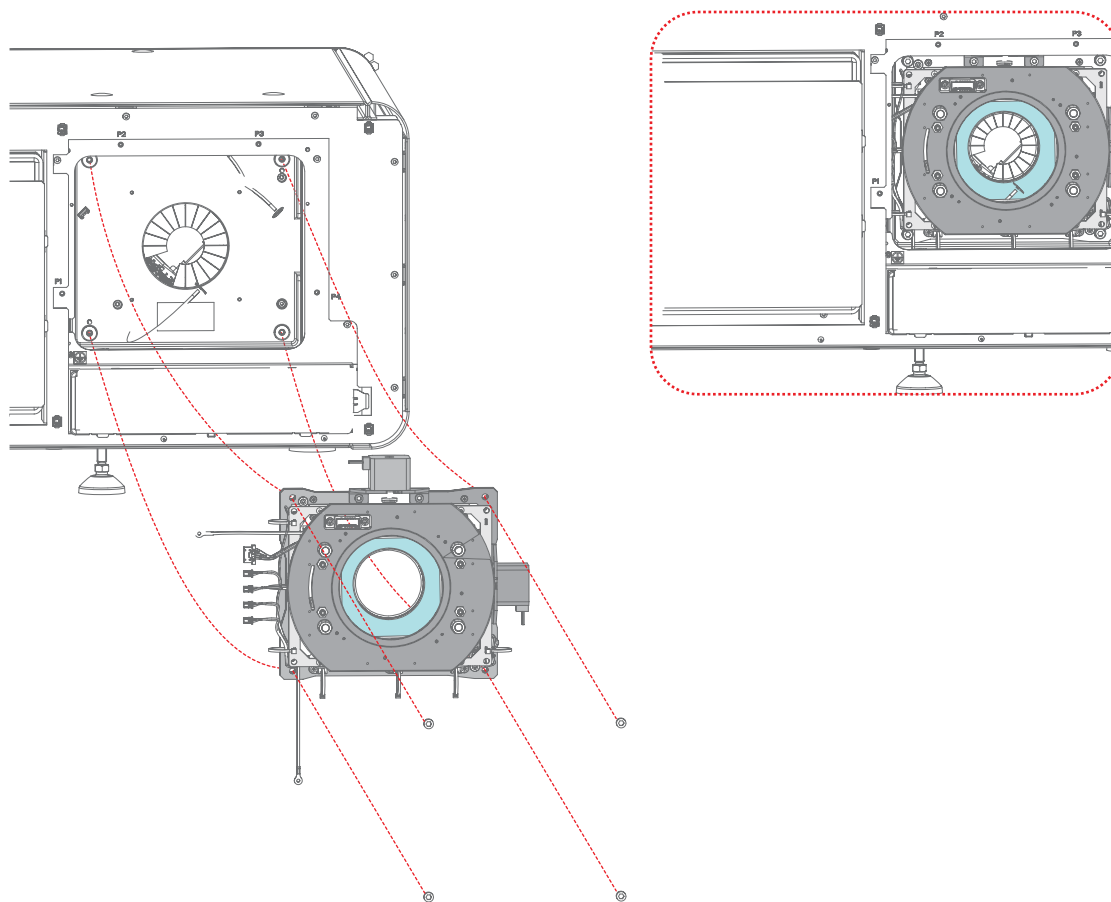


Image 15-5

15.4 Available lenses

Which lenses are available?

For the DP2K-E series the **0.69" DC2K** lens family is used.



The table below is subject to changes and was last updated on 15 October 2012. Consult <https://my.barco.com> for the most recent information about available lenses for the DP2K-E series.

0.69" DC2K zoom lenses			
Product Number	2K zoom range	Image	Motor Block type
R9856520	1.2 - 1.7	image 15-6	M
R98565201	1.2 - 1.7		B
R9856521	1.34 - 1.9	image 15-7	M
R9856522	1.5 - 2.15	image 15-8	M
R9856523	1.7 - 2.55	image 15-9	M
R9856524	2 - 3.9	image 15-10	M
R98565241	2.09 - 3.9		F



Image 15-6
0.69" DC2K zoom lens 1.2 - 1.7 (**R9856520**)



Image 15-7
0.69" DC2K zoom lens 1.34 - 1.9 (**R9856521**)



Image 15-8
0.69" DC2K zoom lens 1.5 - 2.15 (**R9856522**)



Image 15-9
0.69" DC2K zoom lens 1.7 - 2.55 (**R9856523**)



Image 15-10
0.69" DC2K zoom lens 2 - 3.9 (**R9856524**)

15.5 Lens selection

Which lens do I need?

- Go to Barco's website on www.barco.com and click on myBarco
- Login on.
If you are not yet registered create a login and password. With the created login and password, it is possible to enter myBarco.
When your login is correct, the start page is displayed.
- Click the **Support** tab, then **Digital cinema calculator** (on the left of the screen) and select the appropriate lens calculator.

The lens calculator (see screenshot, image 15-11) will be displayed.

The lens calculator allows you to have an overview of which lenses are suitable for your specific projector setup. Just make your selection of parameters and all possible configurations are displayed.

Digital cinema Lens calculator - Series 2

Barco.com | Digital Cinema Calculator - Series 2 - Beta

Make your selection

Resolution: ☐ only 4k ☐ only 2k

Projection: ☒ 2D projection ☐ 3D projection

Masking: ☒ Side Masking ☐ Top Masking

Screen Width:

Screen Height:

Projector Distance: m

Screen gain:

Optical losses: %

Lamp life: %

Foot-Lambert: fL

Required lens ratios: scope: 2.32 flat: 3 scope 4K: 2.57 flat 4K: 3.32

Possible configurations

DP4K-32B
Ultra-bright Enhanced 4K DLP Cinema® projector
Lamp: 6,5kW High Performance Bulb

Available lenses

Lens	Ratio
1.38" DC4K (1.13-1.31)	
1.38" DC4K (1.27-1.86)	
1.38" DC4K (1.45-2.13)	
1.38" DC4K (1.63-2.53)	
1.38" DC4K (1.95-3.26)	✓
1.38" DC4K (2.53-4.98)	

Required lens ratios: scope : 2.32 flat: 3

DP2K-19B
Ultra-bright DLP Cinema® projector for screens up to 19m (62ft)
Lamp: 3kW Standard short-arc Bulb

Available lenses

Lens	Ratio
1.2" DC2K (1.25-1.45)	
1.2" DC2K (1.4-2.05)	
1.2" DC2K (1.6-2.35)	
1.2" DC2K (1.8-2.8)	
1.2" DC2K (2.15-3.6)	✓
1.2" DC2K (2.8-5.5)	

Required lens ratios: scope : 2.32 scope 4K: 2.57 flat: 3 flat 4K: 3.32

DP2K-12C

Available lenses

Lens	Ratio
0.98" DC2K (1.2-1.8)	

Image 15-11
Digital cinema lens calculator



Take into account that when the projector is tilted the Screen Width you have to fill in should be larger than the physical screen width due to the keystone distortion of the projected image. How much larger depends on the amount of tilt.



Due to production tolerances the real distances can differ by 2% from the calculated values.

For critical situations (fixed installs that use the lens at one of its extreme zoom positions) this should be taken into account.

15.6 Lens installation

How to install a lens into the Lens Holder?

1. Remove the foam rubber in the opening of the Lens Holder if not removed yet.
2. Take the lens assembly out of its packing material and remove the lens caps on both sides.
Caution: Do not touch the glass of the lens!
3. Ensure that the Lens Holder stands in the On-Axis position (horizontal and vertical mid position).
4. Place the Lens Holder in the **"locked"** position by moving the lens lock handle (1) downwards, away from the lens power supply socket (2).
5. Gently insert the lens in such a way that the lens connector matches the socket. To prevent collision of the lens with the critical electronics inside the projector, ensure you centre the lens and keep it on-axis while approaching.
Caution: Do not accidentally bump with the lens against the electronic boards inside the Lens Holder.
Warning: Do not release the Lens yet, as the Lens may fall out of the Lens Holder.
6. **Push** the lens completely against the Lens Holder front plate. An **audible click** should be noticed. Once seated, there may be no airgap between lens flange and Lens Holder front plate.
Caution: Ensure that the lock handle remains in the **"locked"** position.

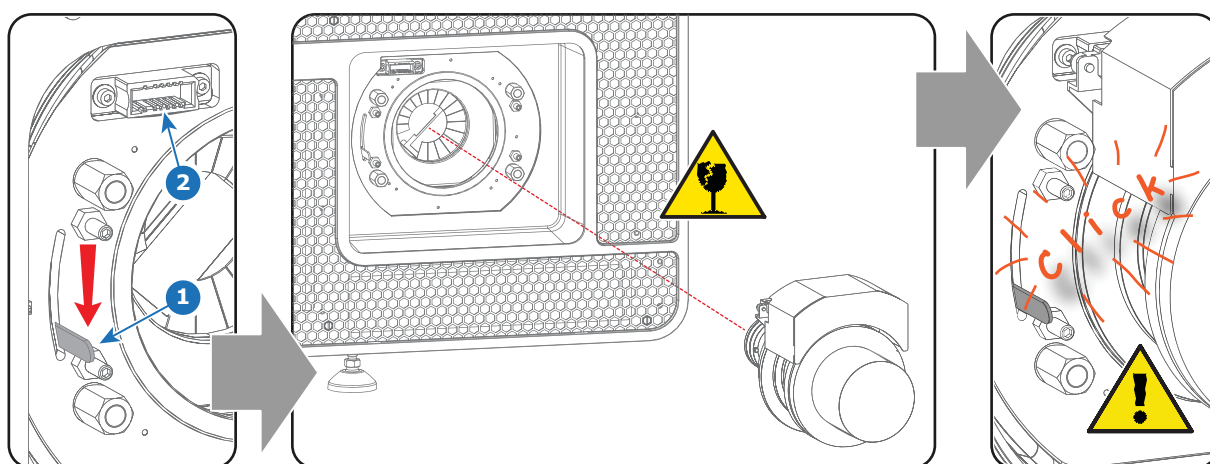


Image 15-12

Note: For frequent installation and removal of the lens it is recommended to install the lens while the lock handle is in "open" position (upwards) and put the lock handle in "locked" position once the lens is inserted. Then check if the lens is properly installed by trying to pull the lens out of the Lens Holder. (this alternative procedure result in less wear of the Lens Holder)

7. Check if the lens is really secured by trying to pull the lens out of the Lens Holder.
8. Activate the corresponding lens parameters for the installed lens. (See user guide of the *Communicator* chapter *Installation > Advanced > Lens parameters*)
Caution: Not using the correct lens parameters could result in lens damage.

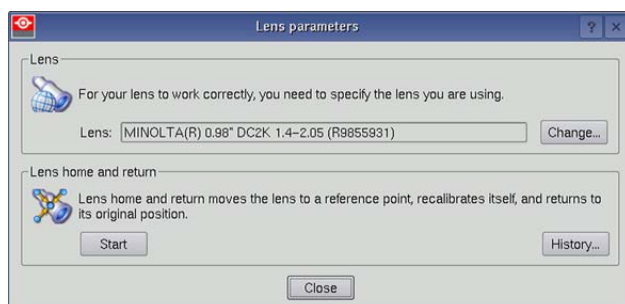


Image 15-13

9. Perform a lens **HOME & RETURN** operation. (See user guide of the *Communicator* chapter *Installation > Advanced > Lens parameters*)
Note: The **HOME & RETURN** operation enables the projector to determine the reference positions of the motorized **ZOOM** and **FOCUS** barrels of the installed lens.



CAUTION: Never transport the projector with a Lens mounted in the Lens Holder. Always remove the Lens before transporting the projector. Neglecting this can damage the Lens Holder and Prism.

15.7 Lens removal

How to remove a lens from the Lens Holder?

1. Support the lens with one hand while you unlock the lens holder by sliding the lock handle (1) towards the “unlocked” position as illustrated.
2. Gently pull the lens out of the lens holder, maintaining its coaxial direction.

Caution: Do not accidentally bump with the lens against the electronic boards inside the Lens Holder.

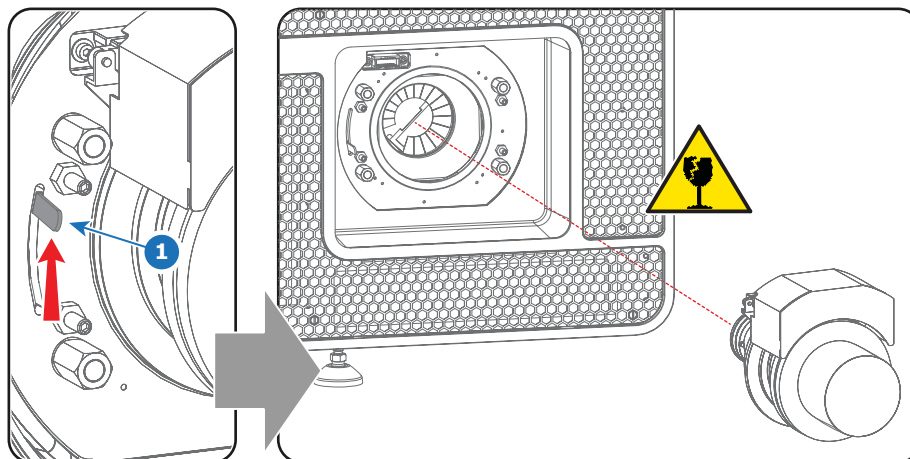


Image 15-14



It's recommended to place the Lens caps of the original Lens packaging, back on both sides of the removed Lens to protect the optics of the Lens.



It's recommended to place the plastic cover of the original projector packaging, back into the Lens opening to prevent intrusion of dust.

15.8 Lens shift, zoom & focus

Motorized lens adjustment

The DP2K-E series is equipped with a motorized lens shift and zoom & focus functionality.

Maximum shift range

The lens can be shifted with respect to the internal optics of the projector (DMD) which results in a shifted image on the screen (Off-Axis). A 100% shift means that the centre point of the projected image is shifted by half the screen size. In other words, the centre point of the projected image falls together with the outline of the image in an On-Axis projection. Due to mechanical and optical limitations the shift range is limited as well.

All lenses have a shift range of 50% up, 50% down, 30% left, and 30% right. This range is valid for all throw ratios. Within these shift ranges the projector and lens perform excellently. Configuring the projector outside these shift ranges will result in a slight decline of image quality.

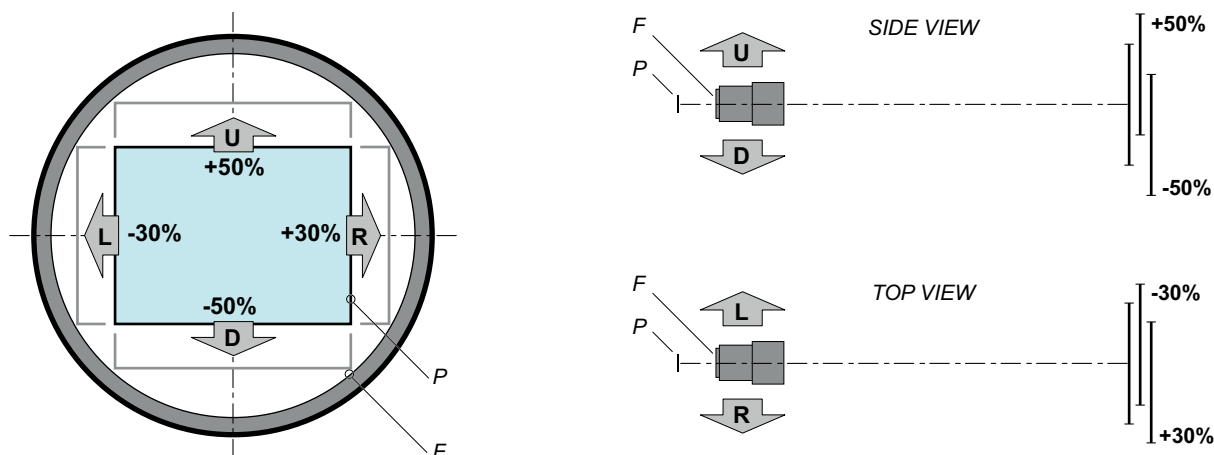


Image 15-15
P DMD.
F Field of view.



It's mechanical possible to shift outside the recommended field of view ($\pm 90\%$ UP/DOWN and $\pm 50\%$ LEFT/RIGHT), but this will result in a decline of image quality depending on the used lens and the zoom position of the used lens. Furthermore, shifting too much in both directions will result in a blurred image corner.

How to shift the lens of the DP2K-E series ?

1. Use the **up and down** arrow buttons on the Local Keypad to shift the lens **vertically** and use the **left and right** arrow buttons on the Local Keypad to shift the lens **horizontally**.

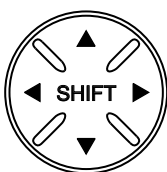


Image 15-16

How to zoom in or out?

1. Use the **“+”** and **“-”** **zoom buttons** on the Local Keypad to zoom in or out.

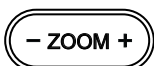


Image 15-17

How to focus?

1. Use the **“+”** and **“-”** **focus buttons** on the Local Keypad to focus the image on the screen.

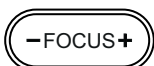


Image 15-18



Take into account that the lens focus may slightly drift while the lens is warming up from cold to operation temperature. This is a typical phenomenon for projection lenses used with high brightness projectors. The operation temperature of the lens is reached after approximately 30 minutes projection of average video.

Button backlight colors

- **BLUE** : The default backlight color of the Shift, Zoom and Focus buttons is blue which indicates that the button is enabled.
- **PURPLE** : When pushing the Shift, Zoom or Focus button the backlight color is purple of the part of the button that is pushed. This indicates that the requested action is ongoing.
- **RED** : The backlight color of the Shift, Zoom and Focus buttons is red in case of end of range.

15.9 Cleaning the lens



To minimize the possibility of damage to optical coatings, or scratches to lens surfaces follow the cleaning procedure as described here precisely.

Necessary tools

- Compressed air.
- Clean Toraysee® cloth or any micro fiber lens cleaning cloth.
- Clean cotton cloth.

Necessary parts

Lens cleaner (e.g. Carl Zeiss lens cleaner or Purasol® or any water-based lens cleaner)

How to clean the lens?

1. Blow off dust with clean compressed air (or pressurized air cans⁵).
2. Clean with lens cleaner together with a clean lens cleaning cloth to remove the dust and contamination. Use big wipes in one single direction.
Warning: Do not wipe back and forwards across the lens surface as this tends to grind dirt into the coating.
3. Use a dry lens cleaning cloth to remove left liquid or stripes. Polish with small circles.
4. If there are still fingerprints on the surface, wipe them off with lens cleaner together with a clean lens cleaning cloth. Polish again with a dry one.



If smears occur when cleaning lenses, replace the cloth. Smears are the first indication of a dirty cloth.

5. Pressurized air cans are not efficient if there is too much dust on the surface, the pressure is too low

15.10 Replacement of the Vertical Shift stepper motor



This procedure assumes that the Lens Holder is removed from the projector. See "Removal of the lens holder", page 185.

Necessary tools

- 4mm Allen wrench.
- 3mm Allen wrench.
- T10 Torx driver.
- 13mm nut driver.
- 10mm open end wrench.

How to replace the Vertical Shift stepper motor of the Lens Holder?

1. Remove the front plate from the Lens Holder. Use a 13mm nut driver to loosen the four Scheimpflug nuts (reference 3 image 15-19) as illustrated. It's not necessary to disconnect the ground wire from the front plate. Just turn the front plate away for accessing the stepper motor.

Caution: Do not loose the three large springs of the Scheimpflug adjustment mechanism (reference 4 image 15-19).

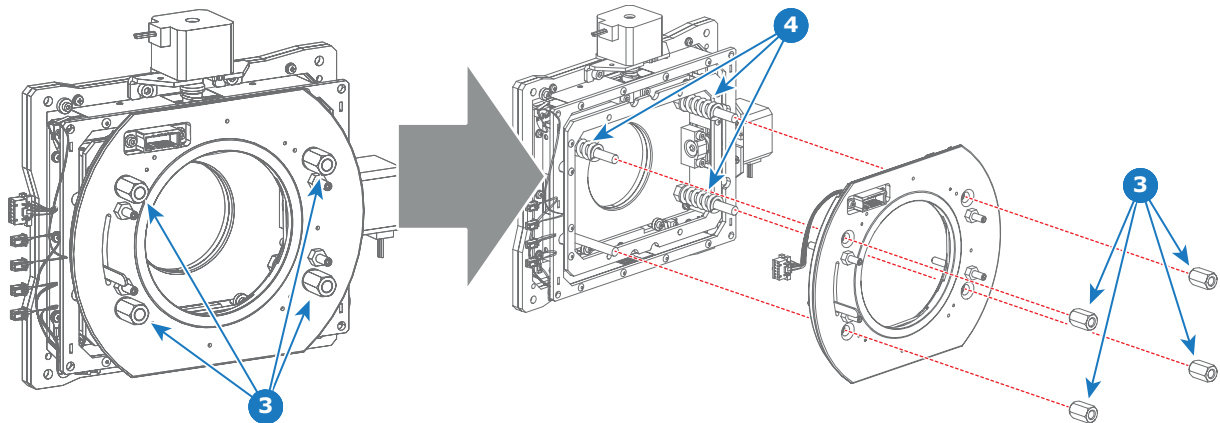


Image 15-19

2. Remove the Vertical Shift stepper motor from the assembly by loosening the four screws (reference 5 image 15-20) as indicated. Use a 3mm and 4mm Allen wrench.

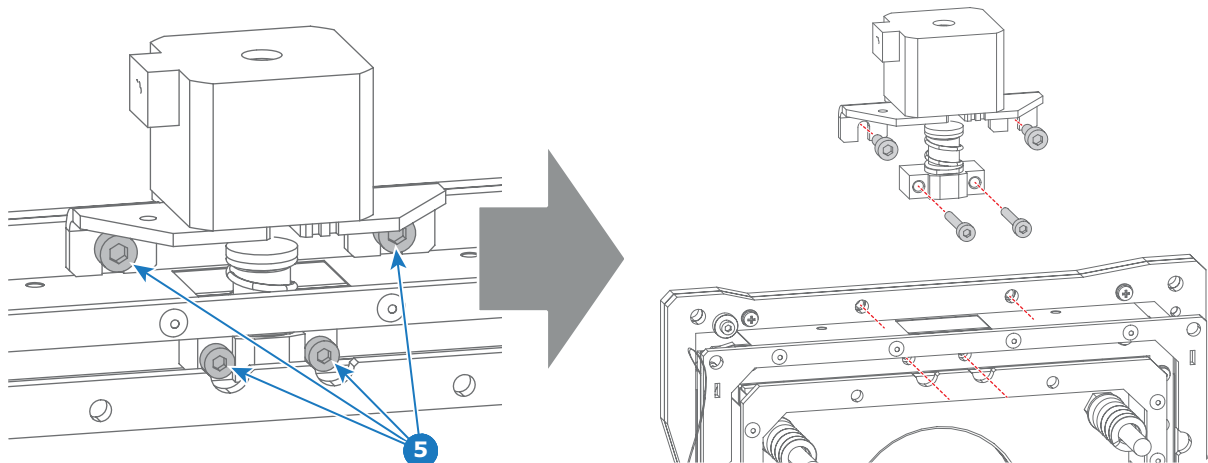


Image 15-20

3. Remove the big bracket (reference 6 image 15-21) and the small bracket (reference 8 image 15-21) from the old stepper motor and install these parts on the new stepper motor as illustrated. Use a T10 Torx driver for the four screws (reference 7 image 15-21) and a 10mm open end wrench for the small bracket (reference 9 image 15-21).

Note: The big bracket (reference 6 image 15-21) used with the Vertical Shift stepper motor has two cuts (reference 10 image 15-21).

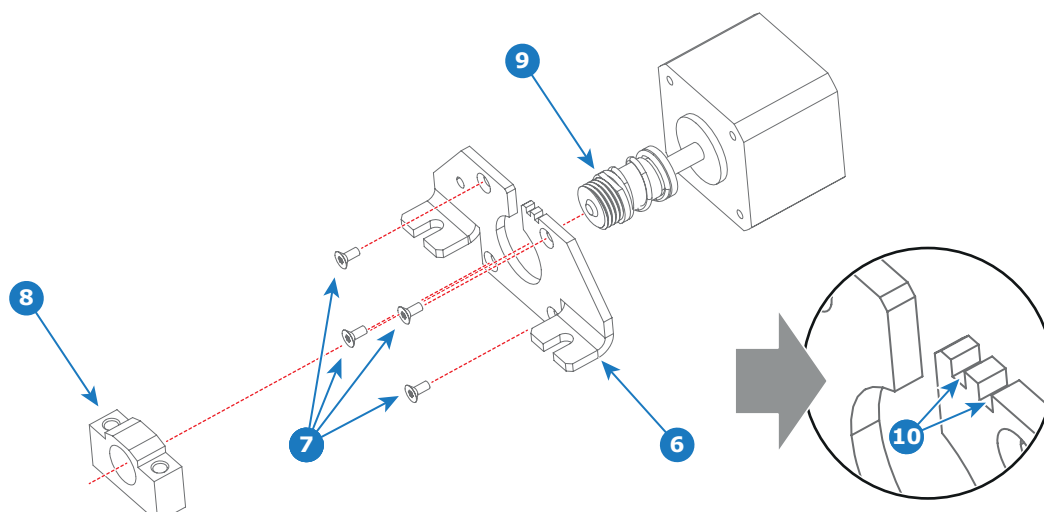


Image 15-21

4. Reinstall the stepper motor on the assembly as illustrated in image 15-20. Fasten the four screws (reference 5 image 15-20) with a 3mm and 4mm Allen wrench.
5. Reinstall the front plate from the Lens Holder. Use a 13mm open end wrench to fasten the four Scheimpflug nuts (reference 3 image 15-19). Fasten the big nuts crosswise bit by bit. Ensure that the upper two rods and the lower left rod contain a big spring (reference 4 image 15-19).



Proceed with reinstalling the Lens Holder. See procedure "Installation of the lens holder", page 187.



The Lens Holder has to be adjusted after installation. See chapter "Scheimpflug", page 213.

15.11 Replacement of the Horizontal Shift stepper motor



This procedure assumes that the Lens Holder is removed from the projector. See "Removal of the lens holder", page 185.

Necessary tools

- 4mm Allen wrench.
- 3mm Allen wrench.
- T10 Torx driver.
- 13mm nut driver.
- 10mm open end wrench.

How to replace the Horizontal Shift stepper motor of the Lens Holder?

1. Remove the front plate from the Lens Holder. Use a 13mm nut driver to loosen the four Scheimpflug nuts (reference 3 image 15-22) as illustrated. It's not necessary to disconnect the ground wire from the front plate. Just turn the front plate away for accessing the stepper motor.

Caution: Do not loosen the three big springs of the Scheimpflug adjustment mechanism (reference 4 image 15-22).

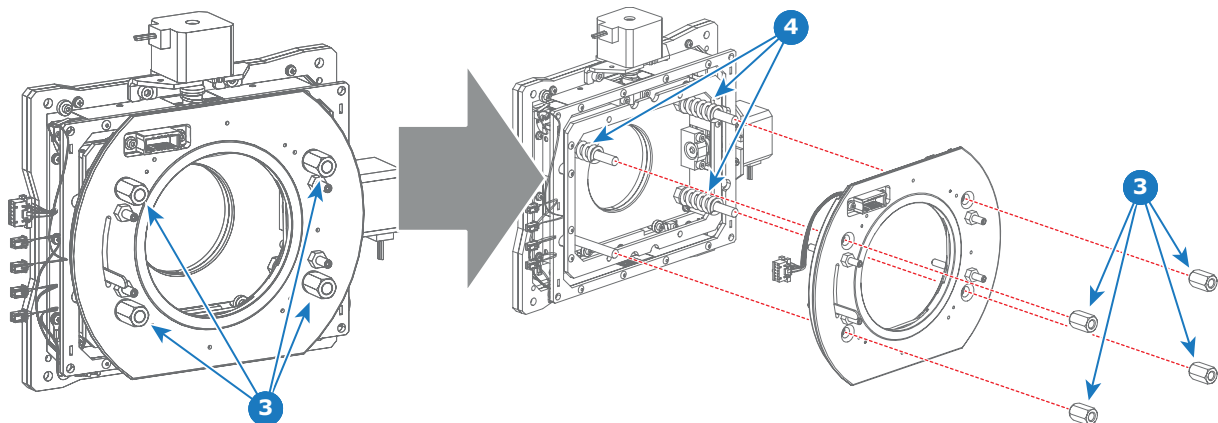


Image 15-22

2. Remove the Horizontal Shift stepper motor from the assembly by loosening the four screws (reference 5 image 15-23) as indicated. Use a 3mm and 4mm Allen wrench.

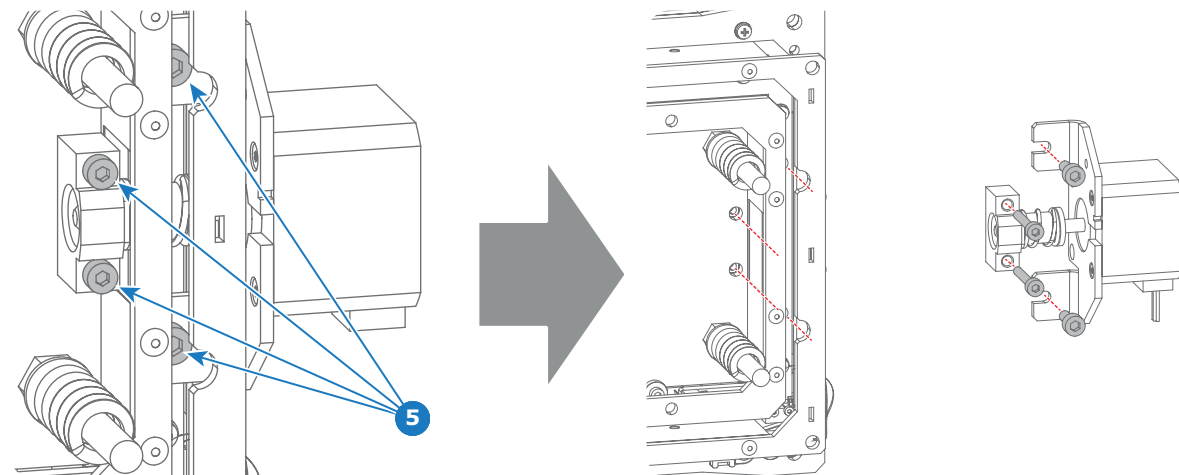


Image 15-23

3. Remove the big bracket (reference 6 image 15-24) and the small bracket (reference 8 image 15-24) from the old stepper motor and install these parts on the new stepper motor as illustrated. Use a T10 Torx driver for the four screws (reference 7 image 15-24) and a 10mm open end wrench for the small bracket (reference 9 image 15-24).

Note: The big bracket (reference 6 image 15-24) used with the Horizontal Shift stepper motor has one cut (reference 11 image 15-24).

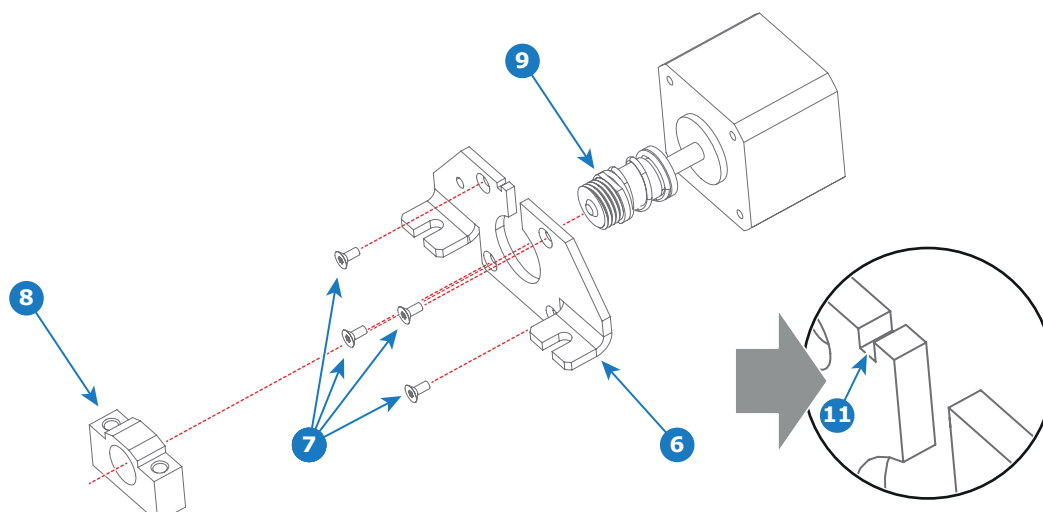


Image 15-24

4. Reinstall the stepper motor on the assembly as illustrated in image 15-23. Fasten the four screws (reference 5 image 15-23) with a 3mm and 4mm Allen wrench.
5. Reinstall the front plate from the Lens Holder. Use a 13mm open end wrench to fasten the four Scheimpflug nuts (reference 3 image 15-22). Fasten the big nuts crosswise bit by bit. Ensure that the upper two rods and the lower left rod contain a big spring (reference 4 image 15-22).



Proceed with reinstalling the Lens Holder. See procedure "Installation of the lens holder", page 187.



The Lens Holder has to be adjusted after installation. See chapter "Scheimpflug", page 213.

15.12 Replacement of the motor assembly for 0.69" DC2K lenses (Type 'M')



To know which type of lens motor assembly is mounted on the projection lens see chapter "Available lenses", page 189.

Necessary tools

- 2.5mm Allen wrench with ball end.
- Adhesive (anti-loosening agent for hex socket screws).

Necessary parts

- One motor assembly.
- One connector plate.
- One motor assembly cover.
- Two hex socket screw M3x3.
- Two hex socket screw M3x8.

How to replace the lens motor assembly?

1. Remove the lens from the projector.
2. Release the connector plate from the lens by loosening the two screws (reference 1 image 15-25). Use 2.5mm Allen wrench.

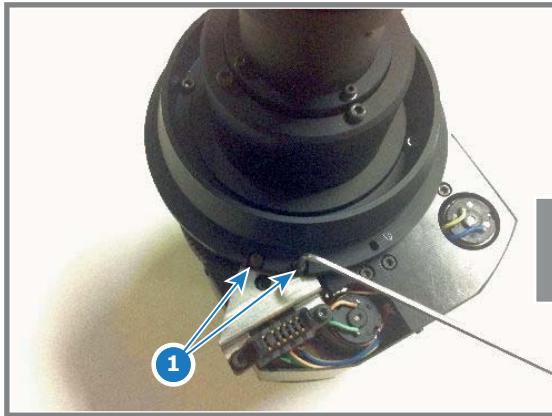
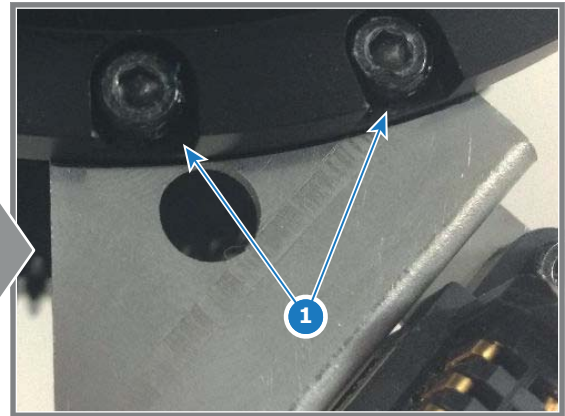


Image 15-25



3. Remove the motor unit from the lens by loosening the two screws (reference 2 image 15-26) of the motor unit. Use 2.5mm Allen wrench.



Image 15-26

4. Place the new motor unit into position and fasten **loosely** it with 2 hex socket screws M3x8 (reference 2 image 15-26) . Use a 2.5mm Allen wrench with ball end.

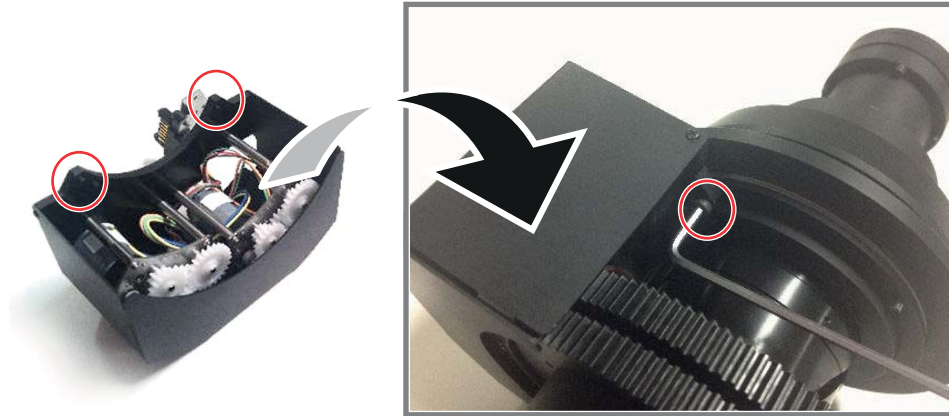


Image 15-27

5. Adjust the meshes between motor gear and lens gear to ensure that the Motor Unit will drive properly.

Note: DO NOT set the lens gears at the terminal position (Focus and Zoom lens gears, respectively)

Tip: Because of limited accessibility, it is recommendable to use the 2.5mm Allen wrench with ball end. Ball end for fastening easily screws and another end for securing tightly screws.

6. Secure **tightly** the motor unit using a 2.5mm Allen wrench as indicated in image 15-27. Bond the head of screws not to loosen those.
7. Attach the connector plate to the lens mount and secure it **tightly** with 2 hex socket screw M3x3 (reference 1 image 15-28). Use a 2.5mm Allen wrench. While securing adjust position of the connector plate along the black line drawn on the plate as indicated with reference 3 in image 15-28. Bond the head of screws not to loosen those.

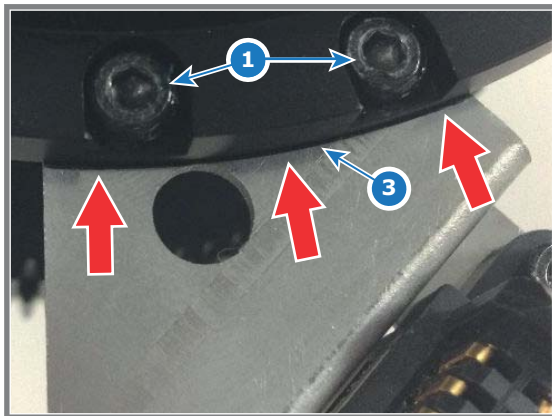


Image 15-28

15.13 Replacement of the motor assembly for 0.69" DC2K lenses (Type 'F')



To know which type of lens motor assembly is mounted on the projection lens see chapter "Available lenses", page 189.

How to replace the lens motor assembly?

1. Remove the lens from the projector.
2. Remove the front cover (reference 2 image 15-29) of the lens motor assembly by releasing the three screws (reference 1 image 15-29) as illustrated.
3. Remove the top cover (reference 4 image 15-29) of the lens motor assembly by releasing the two screws (reference 3 image 15-29) as illustrated.

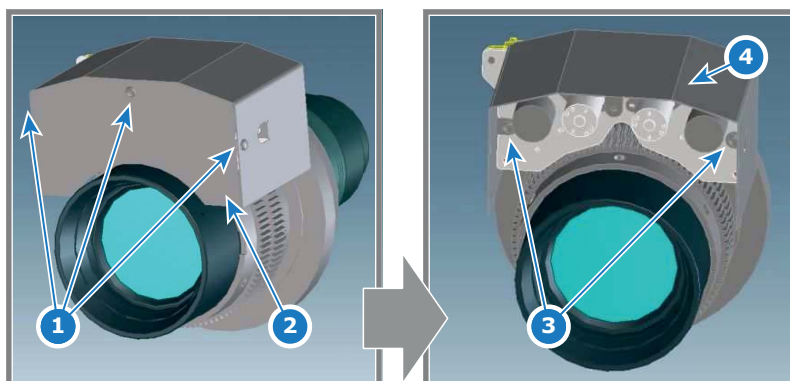


Image 15-29

4. Detach the lens motor assembly from the projection lens by releasing the three screws (reference 5 image 15-30) as illustrated.

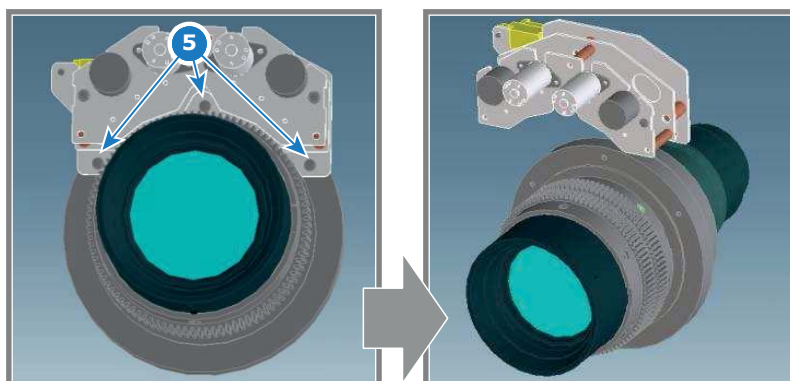


Image 15-30

5. Remove the connection plate from the lens motor assembly by releasing the five screws (reference 6 and 7 image 15-31) as illustrated.

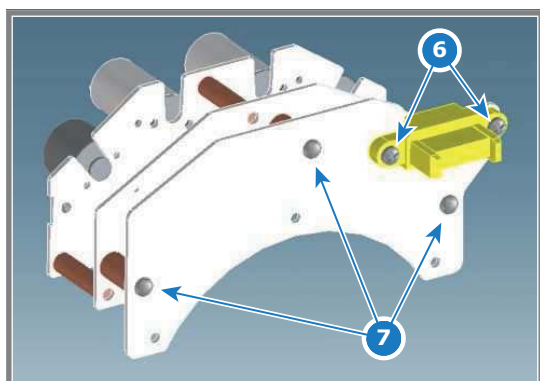


Image 15-31

6. Install the new lens motor assembly onto the connection plate. See image 15-31.
7. Mount the lens motor assembly onto the projection lens. See image 15-30.

8. Install the top cover and front cover of the lens motor assembly. See image 15-29.

15.14 Replacement of the motor assembly for 0.69" DC2K lenses (Type 'B')



To know which type of lens motor assembly is mounted on the projection lens see chapter "Available lenses", page 189.

How to replace the lens motor assembly?

1. Remove the lens from the projector.
2. Place the lens in vertical position as illustrated and remove the cover of the motor block. Use an Allen wrench to loosen the three screws (reference 1 image 15-32).

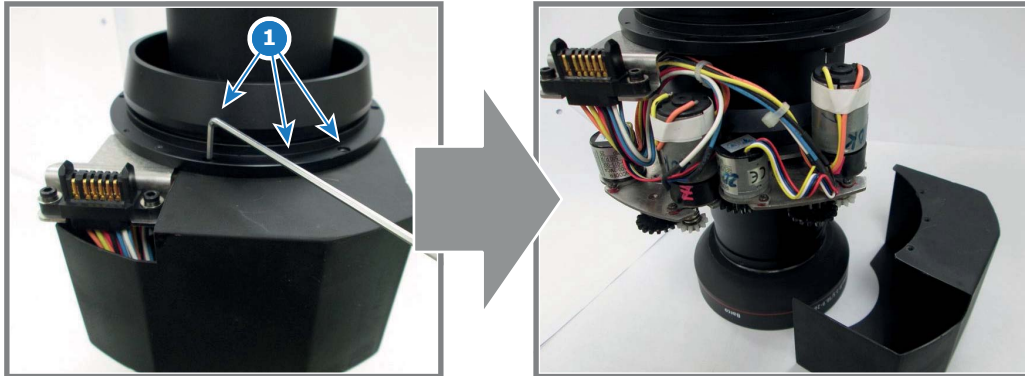


Image 15-32

3. Remove the electrical socket from the lens chassis. Use an Allen wrench to loosen the two screws (reference 2 image 15-33).

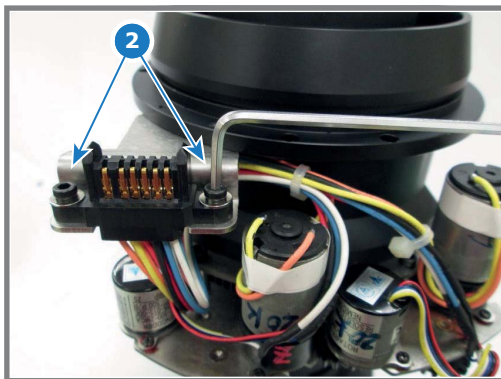


Image 15-33

4. Inverse the lens position and remove the motor block from the lens chassis. Use an Allen wrench to loosen the two screws (reference 3 image 15-34) of the motor block.

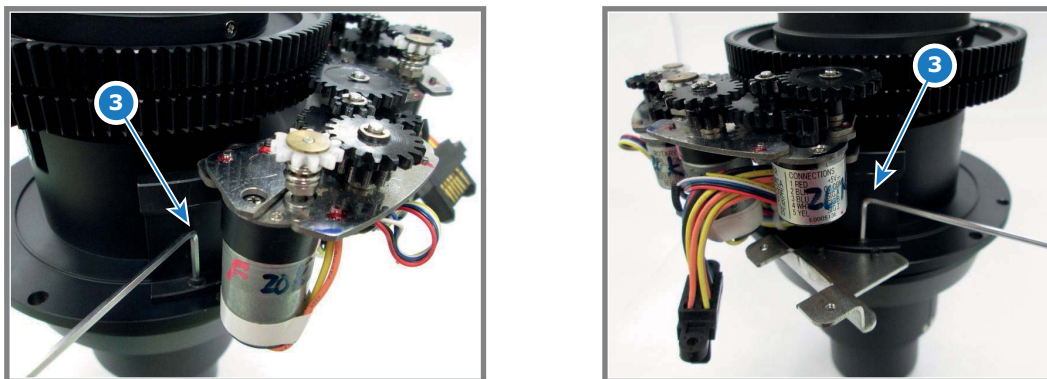


Image 15-34

5. Place the new motor block into position and secure with two screws (reference 3 Use an Allen wrench to fasten the two screws (reference 1 image 15-34).

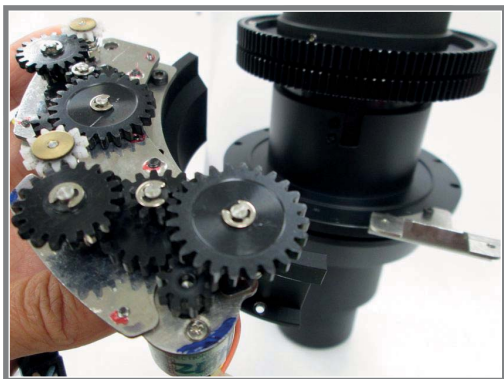


Image 15-35

6. Mount the electrical socket. Use an Allen wrench to fasten the two screws.

Caution: Ensure to orient the electrical socket as illustrated.

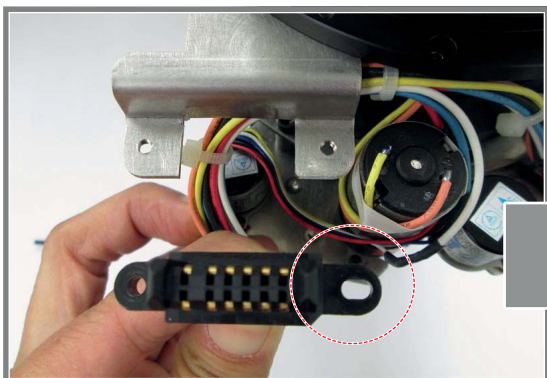
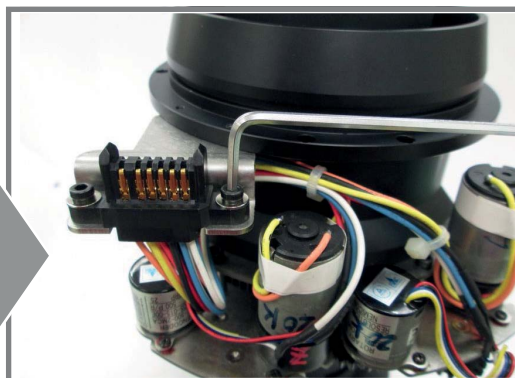


Image 15-36



7. Install the cover of the motor block. Use an Allen wrench to fasten the three screws (reference 1 image 15-32).

15.15 First Placement of the Inner Dust Rubber



This procedure assumes that the Lens Holder is removed from the projector. See procedure "Removal of the lens holder", page 185.



CAUTION: Be careful as not to damage the inner dust rubber while executing this procedure.

The Dust Rubber Kit

The Lens Holder Inner Dust Rubber kit is an improvement kit designed by Barco and fits perfectly on the Lens Holder of the DP2K-E series digital projectors. The Inner Dust Rubber helps prevent dust from entering the projector via the lens Holder.

While the most recent versions of the DP2K-E series will have the Inner Dust Rubber pre-installed, older versions may not yet have this dust rubber installed.

Necessary tools

- 13 mm nut driver or open-end wrench
- 5.5 mm nut driver or box-end wrench
- PH1 Phillips screwdriver

Necessary parts

- Lens holder cover
- Dust rubber frame
- Inner dust rubber
- 6 M3 hex nuts

How to place the Inner Dust Rubber for the first time

1. Remove the front plate from the Lens Holder. Use a 13 mm nut driver to loosen the four Scheimpflug nuts (reference 3 image 15-37) as illustrated. It's not necessary to disconnect the ground wire from the front plate. Just turn the front plate away for accessing the stepper motor.

Caution: Do not loosen the three big springs of the Scheimpflug adjustment mechanism (reference 4 image 15-37).

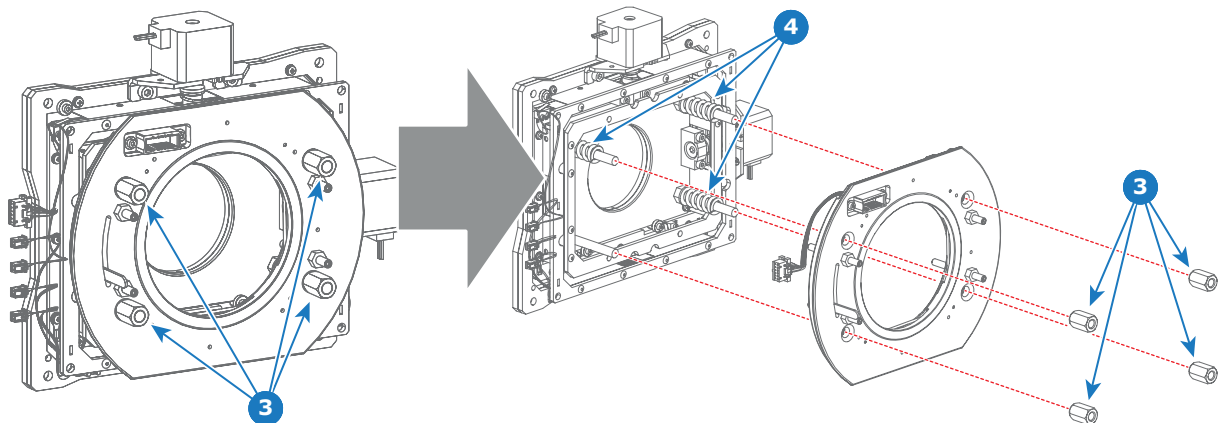


Image 15-37

2. Remove the old Lens Holder cover. Use a PH1 Phillips screwdriver to loosen the seven screws (reference 5 image 15-38) as illustrated. By doing this, you will also release the ground cable (reference 6).

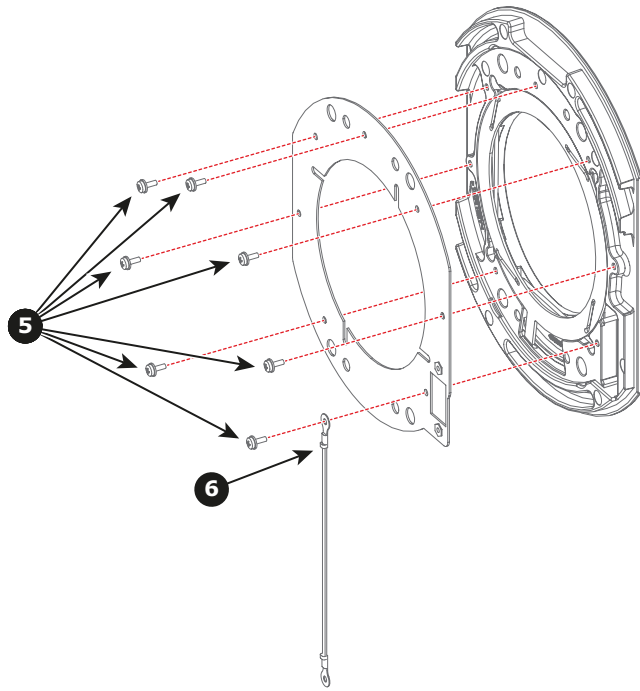


Image 15-38

3. Place the inner dust rubber (reference 9 image 15-39) over the pins of the new cover. Carefully place the frame of the dust rubber frame (reference 8) over the top of the rubber and over the pins of the new cover. Then use a 5.5 mm nut driver to tighten the dust rubber and seal with the six nuts (reference 7).

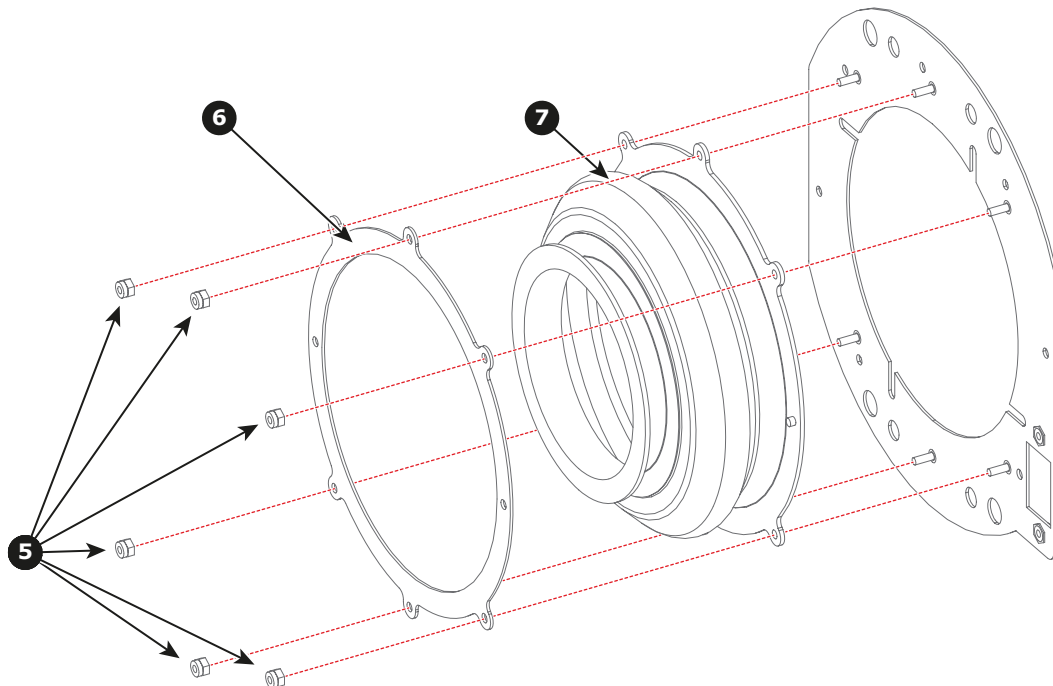


Image 15-39

4. Install the new Lens Holder Cover. Use a PH1 Phillips screwdriver to tighten the seven original screws (reference 5 image 15-40). Make sure you tighten the earth wire (reference 6) back to its original place.

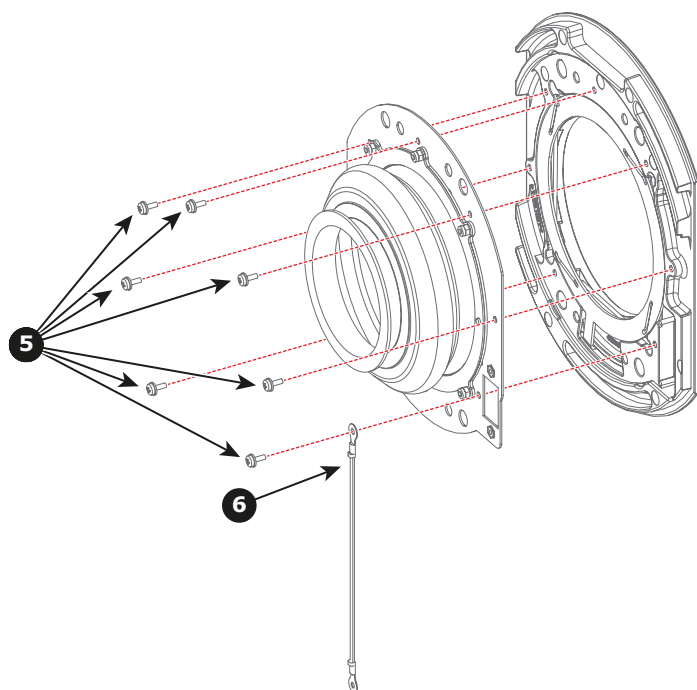


Image 15-40

5. Carefully reinstall the front plate from the Lens Holder. Help the rubber through the lens Holder onto the other side.

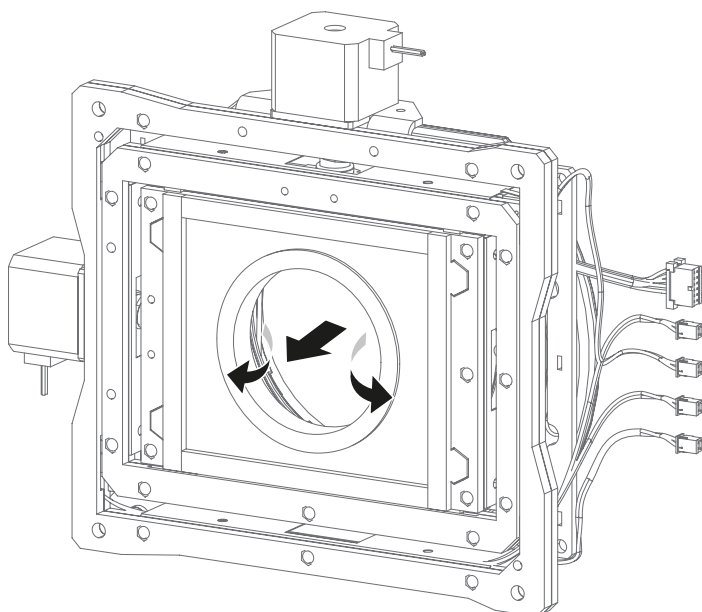


Image 15-41

6. Use a 13 mm nut driver to fasten the four Scheimpflug nuts (reference 3 image 15-42). Fasten the big nuts crosswise bit by bit. Ensure that the upper two rods and the lower left rod contain a big spring (reference 4).

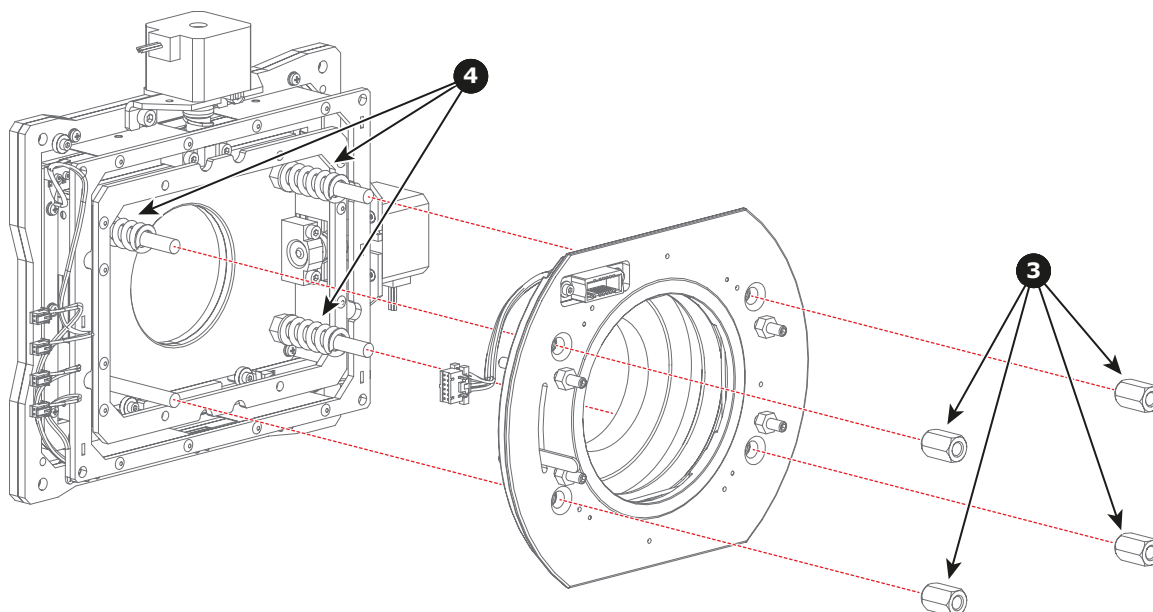


Image 15-42



Proceed with reinstalling the Lens Holder. See procedure "Installation of the lens holder", page 187.



The Lens Holder has to be adjusted after installation. See chapter "Scheimpflug", page 213.

15.16 Replacement of the Inner Dust Rubber



This procedure assumes that the Lens Holder is removed from the projector. See procedure "Removal of the lens holder", page 185.



CAUTION: Be careful as not to damage the inner dust rubber while executing this procedure.

Necessary tools

- 13 mm nut driver or open-end wrench
- 5.5 mm nut driver or box-end wrench
- PH1 Phillips screwdriver

Necessary parts

- Lens holder cover
- Dust rubber frame
- Inner dust rubber
- 6 M3 hex nuts

How to replace the Inner Dust Rubber

1. Remove the front plate from the Lens Holder. Use a 13 mm nut driver to loosen the four Scheimpflug nuts (reference 3 image 15-43) as illustrated. It's not necessary to disconnect the ground wire from the front plate. Just turn the front plate away for accessing the stepper motor.

Caution: Do not loosen the three big springs of the Scheimpflug adjustment mechanism (reference 4).

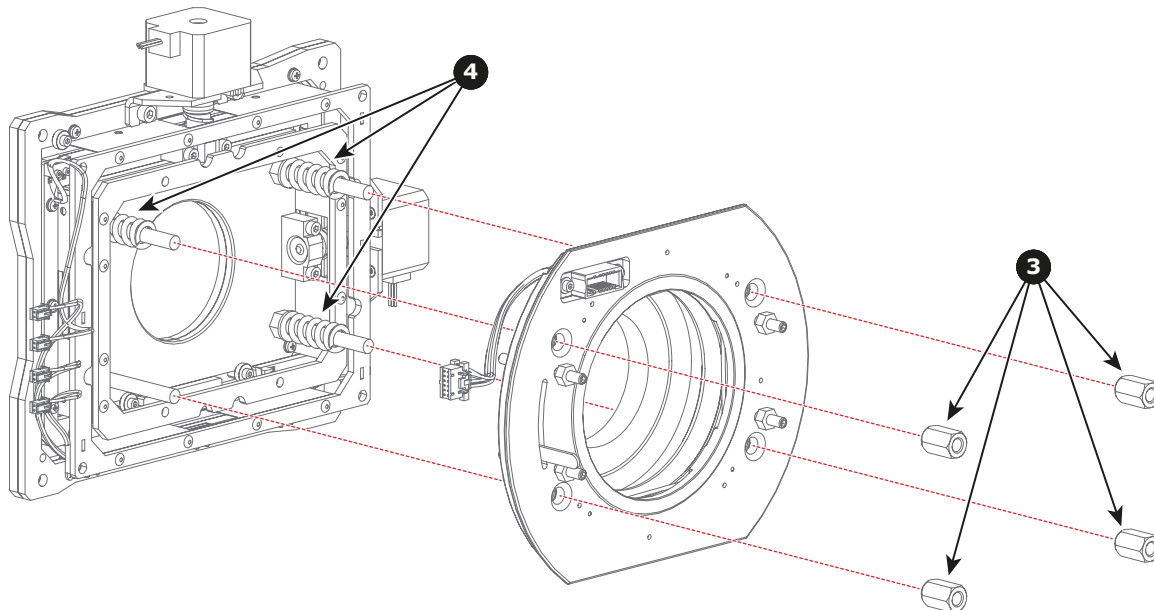


Image 15-43

2. Remove the old Lens Holder cover and inner dust rubber. Use a PH1 Phillips screwdriver to loosen the seven screws (reference 5 image 15-44) as illustrated. by doing this, you will also release the ground cable (reference 6).

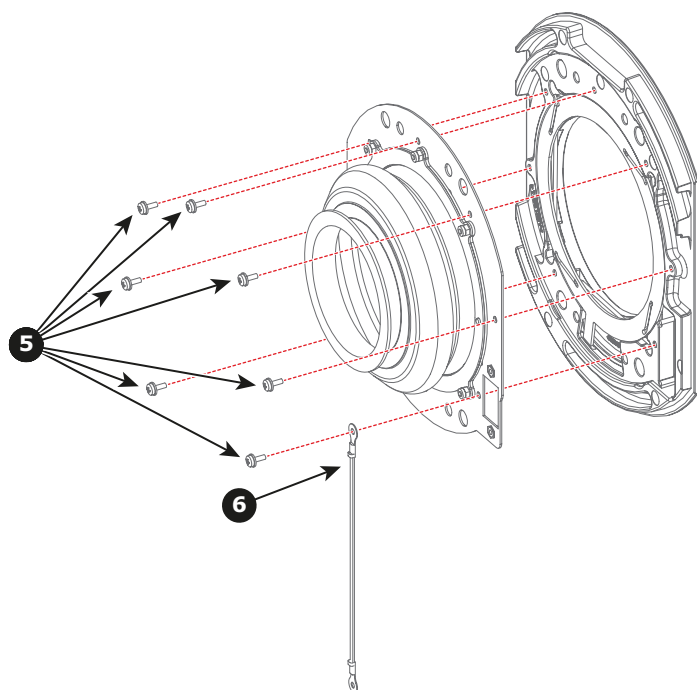


Image 15-44

3. Place the inner dust rubber (reference 9 image 15-45) over the pins of the new cover. Carefully place the dust rubber frame (reference 8) over the top of the inner dust rubber and over the pins of the new cover. Then use a 5.5 mm nut driver to tighten the dust rubber and seal with the six nuts (reference 7).

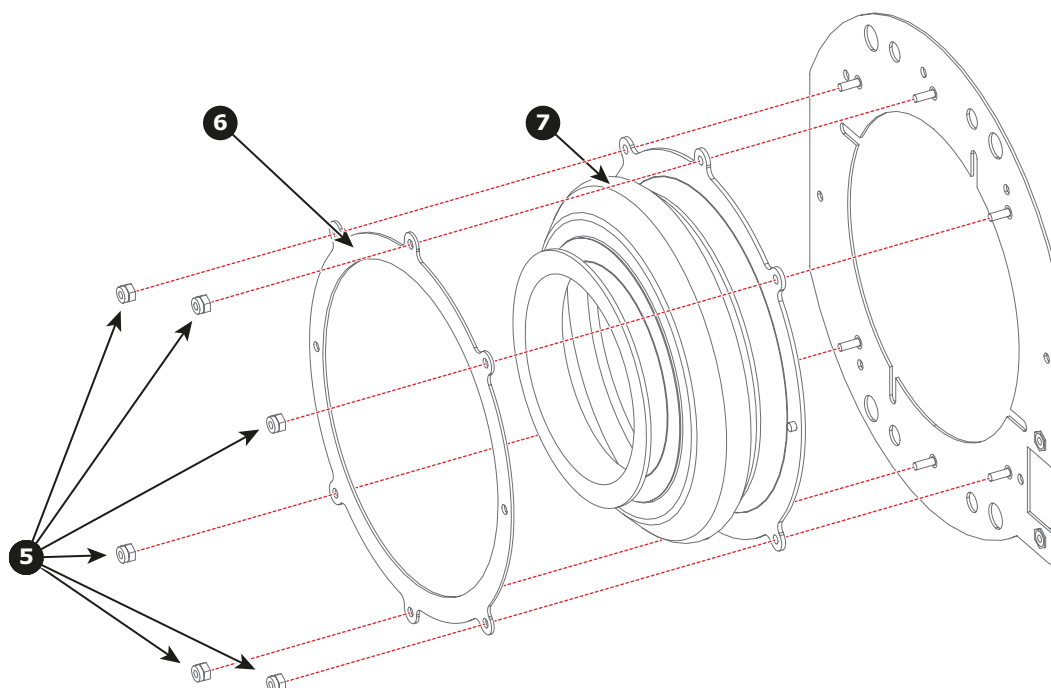


Image 15-45

4. Install the new Lens Holder Cover assembly onto the front plate. Use a PH1 Phillips screwdriver to tighten the seven original screws (reference 5 image 15-44). Make sure you tighten the earth wire (reference 6) back to its original place.
5. Carefully reinstall the front plate from the Lens Holder. Help the rubber through the lens Holder onto the other side.

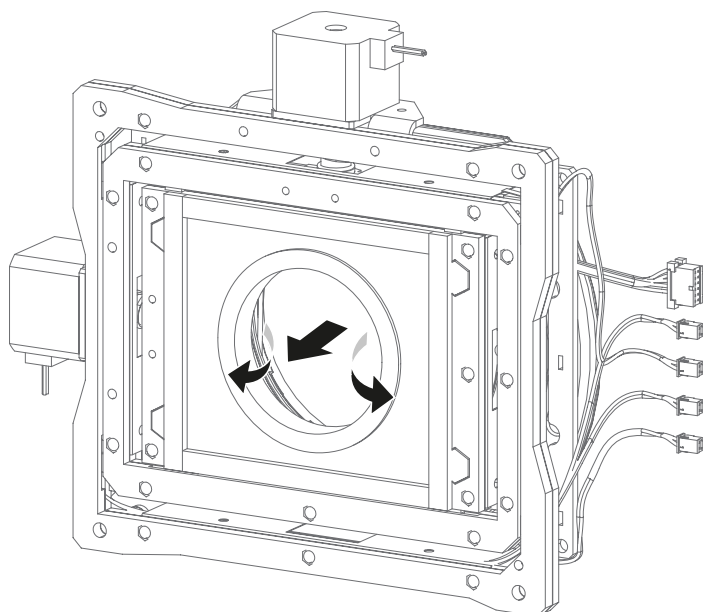


Image 15-46

6. Carefully reinstall the front plate from the Lens Holder. Use a 13 mm nut driver to fasten the four Scheimpflug nuts (reference 3 image 15-43). Fasten the big nuts crosswise bit by bit. Ensure that the upper two rods and the lower left rod contain a big spring (reference 4).



Proceed with reinstalling the Lens Holder. See procedure "Installation of the lens holder", page 187.



The Lens Holder has to be adjusted after installation. See chapter "Scheimpflug", page 213.

16. SCHEIMPFLUG

About this chapter

This chapter explains the Scheimpflug principle and when to apply Scheimpflug correction upon your DP2K-E series. In addition to the procedure for Scheimpflug adjustment the procedure to adjust the Back Focal Length is also included in this chapter.



Scheimpflug principle

The "plane of sharp focus" can be changed so that any plane can be brought into sharp focus. When the DMD plane and lens plane are parallel, the plane of sharp focus will also be parallel to these two planes. If, however, the lens plane is tilted with respect to the DMD plane, the plane of sharp focus will also be tilted according to geometrical and optical properties. The DMD plane, the principal lens plane and the sharp focus plane will intersect in a line below the projector for downward lens tilt.

Overview

- Scheimpflug introduction
- Scheimpflug adjustment
- Fixation of the Lens Holder front plate
- Back Focal Length adjustment

16.1 Scheimpflug introduction

What is Scheimpflug?

The lens holder has to be adjusted so that the "sharp focus plane" of the projected image falls together with the plane of the screen ($Fp1 \rightarrow Fp2$). This is achieved by changing the distance between the DMD plane and the lens plane ($Lp1 \rightarrow Lp2$). The closer the lens plane comes to the DMD plane the further the sharp focus plane will be. It can occur that you won't be able to get a complete focused image on the screen due to a tilt (or swing) of the lens plane with respect to the DMD plane. This is also known as Scheimpflug's law. To solve this the lens plane must be placed parallel with the DMD plane. This can be achieved by turning the lens holder to remove the tilt (or swing) between lens plane and DMD plane ($Lp3 \rightarrow Lp4$).

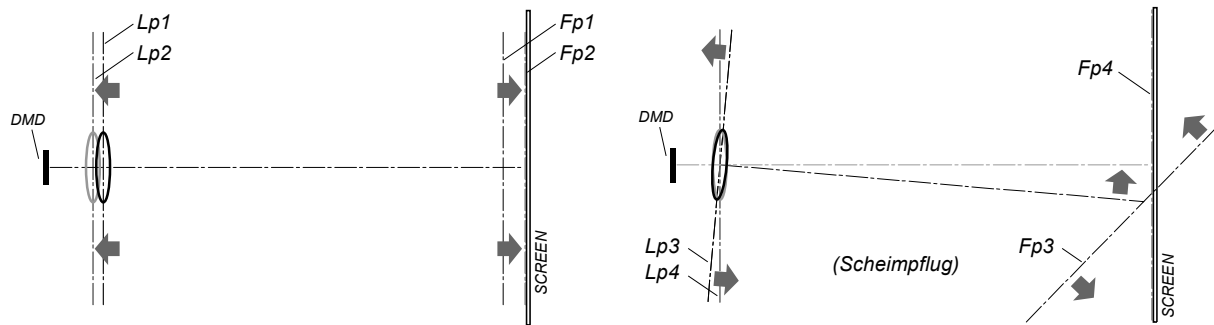


Image 16-1
Scheimpflug principle



Scheimpflug principle

The "plane of sharp focus" can be changed so that any plane can be brought into sharp focus. When the DMD plane and lens plane are parallel, the plane of sharp focus will also be parallel to these two planes. If, however, the lens plane is tilted with respect to the DMD plane, the plane of sharp focus will also be tilted according to geometrical and optical properties. The DMD plane, the principal lens plane and the sharp focus plane will intersect in a line below the projector for downward lens tilt.

Scheimpflug adjustment points

The front plate of the Lens holder is equipped with four bronze (Scheimpflug) nuts and four set screws with lock nut. These screws and nuts are used for Scheimpflug adjustment.

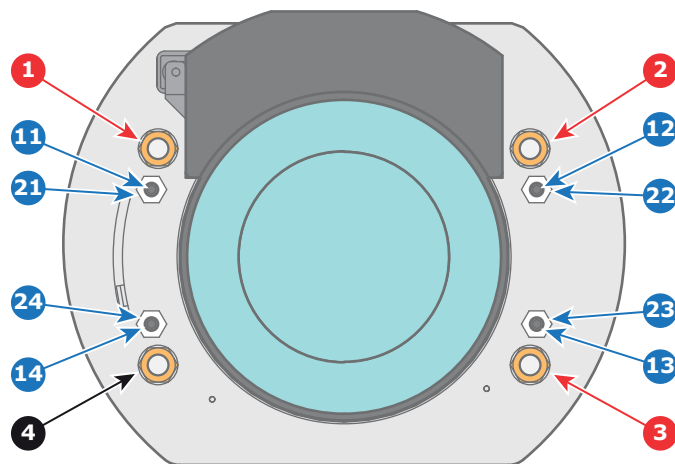


Image 16-2

- 1 Scheimpflug adjustment nuts No1: Influences the sharp focus plane in the lower left corner of the projected image.
- 2 Scheimpflug adjustment nuts No2: Influences the sharp focus plane in the lower right corner of the projected image.
- 3 Scheimpflug adjustment nuts No3: Influences the sharp focus plane in the upper right corner of the projected image.
- 4 Scheimpflug nut No 4: without adjustment functionality.
- 11 Set screw for nut No1.
- 12 Set screw for nut No2.
- 13 Set screw for nut No3.
- 14 Set screw for nut No4.
- 21 Lock nut.
- 22 Lock nut.
- 23 Lock nut.
- 24 Lock nut.



Reference 1, 2 and 3 are adjustment points. Reference 4 is a locking point and NOT used during Scheimpflug adjustment.

When to apply Scheimpflug?

Only apply a Scheimpflug correction in case the overall focus of the projected image is not equally sharp (can be caused if the projector is **NOT in parallel** with the screen or a previous misaligned Scheimpflug) . Take into account that the consequence of applying Scheimpflug correction upon a screen not in parallel with the projector is that the projected image differs from the rectangle shaped image. In other words “**distortion**” of the projected image occurs. **Masking** will be required to solve the distortion.

The disadvantage of Masking is loss of content. Therefore it is strongly **recommended** to place the projector **in parallel** with the projection screen and use the **SHIFT** functionality of the Lens Holder to match the projected image with the projection screen. In case the SHIFT range is not sufficient then the projector can be tilted and Scheimpflug can be applied.

16.2 Scheimpflug adjustment

Necessary tools

- 3mm Allen wrench.
- 13mm nut driver.
- 10mm nut driver.

Preparation steps:

1. Ensure that the throw ratio of the installed lens matches the requirements of the application (projection distance and screen size).
2. Ensure that the correct lens parameters are activated. (See user guide of the *Communicator* chapter *Installation > Advanced > Lens parameters*)

Note: Selecting the wrong lens parameters will result in an unexpected behavior of the lens when using macros for switching between FLAT and SCOPE (change in picture size and focus).

3. Perform a lens **HOME & RETURN** operation. (See user guide of the *Communicator* chapter *Installation > Advanced > Lens parameters*)
4. Project the green focus test pattern.

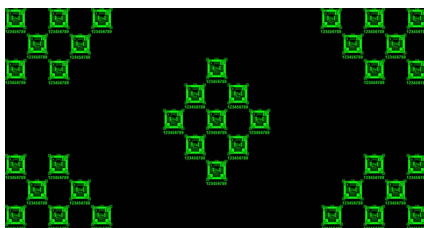


Image 16-3

5. Zoom the lens for maximum image on the screen (**WIDE**).
6. Is it possible to focus the center of the projected image?
If yes, the Back Focal Length is OK. Proceed with the next step.
If no, the Back Focal Length needs realignment. Proceed with the procedure "Back Focal Length adjustment", page 220.
7. Unlock and turn out the 4 set screws (reference 11 image 16-4) of the Lens Holder by 1 centimeter. Use a 10mm nut driver for the lock nuts (reference 21 image 16-4) and use a 3mm Allen wrench for the set screws.

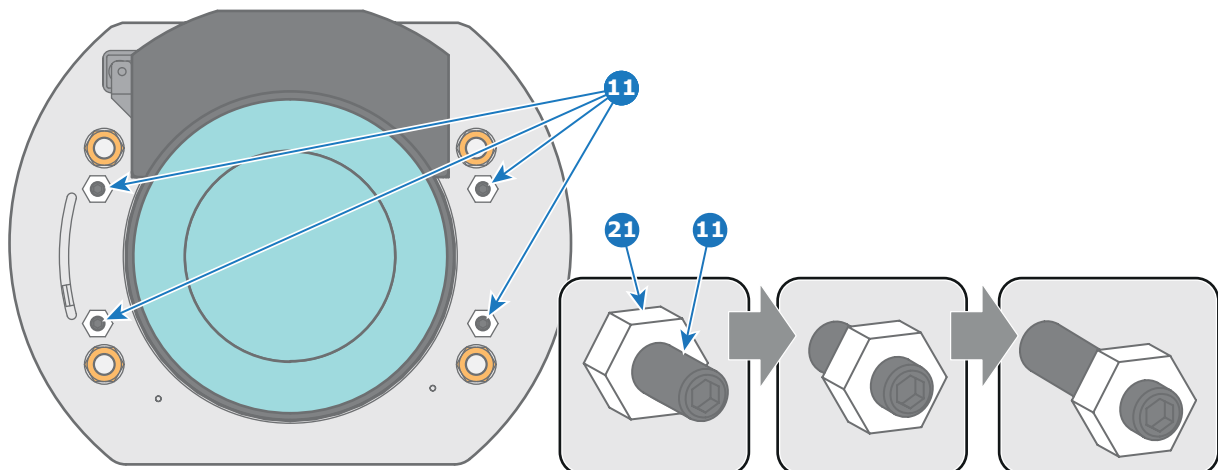


Image 16-4

8. Fully loosen the Scheimpflug nut at the lower left of the Lens Holder (reference 4 image 16-5). Use a 13mm nut driver.
9. Optimize the focus of the projected image in the center of the screen (F) using the motorized focus control (Local Keypad).

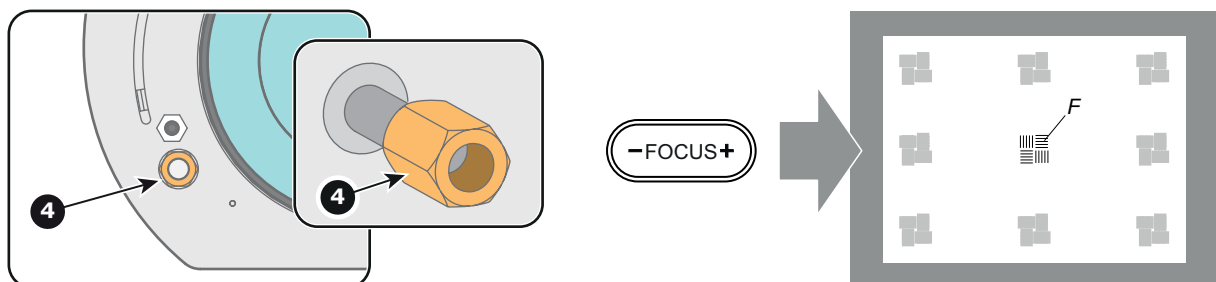


Image 16-5

Scheimpflug adjustment steps:

1. Sharpen the image at the bottom left corner of the screen by turning the upper left Scheimpflug adjustment nut (reference 1 image 16-6). As a result the focus in the center will fade a bit but that's normal.

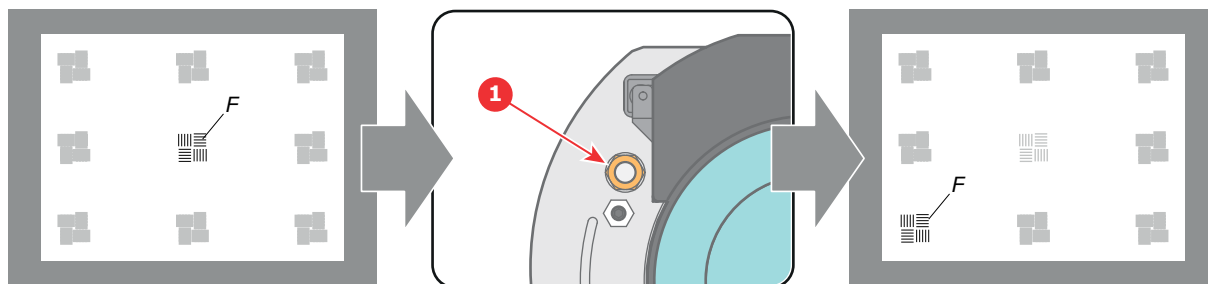


Image 16-6

2. Sharpen the image at the top right corner of the screen by turning the lower right Scheimpflug adjustment nut (reference 3 image 16-7).

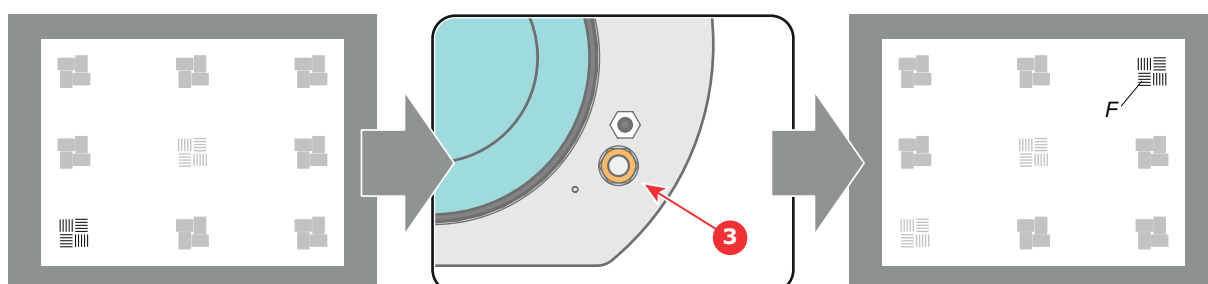


Image 16-7

3. Sharpen the image at the bottom right corner of the screen by turning the upper right Scheimpflug adjustment nut (reference 2 image 16-7).

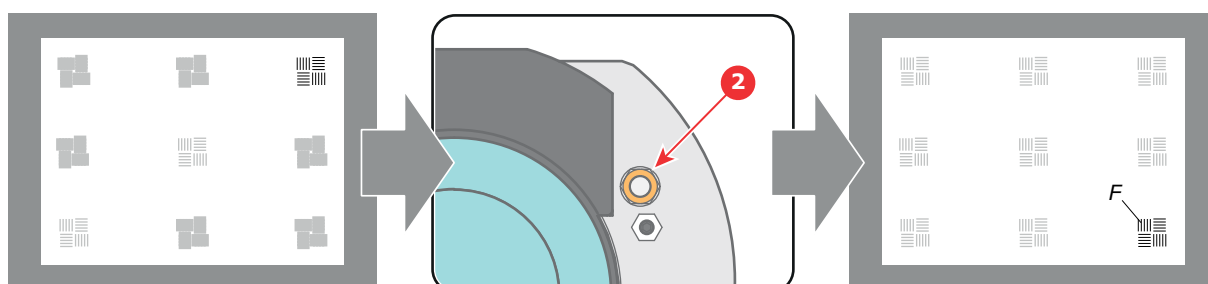


Image 16-8

4. Optimize the focus of the projected image in the center of the screen using the motorized focus control (Local Keypad).

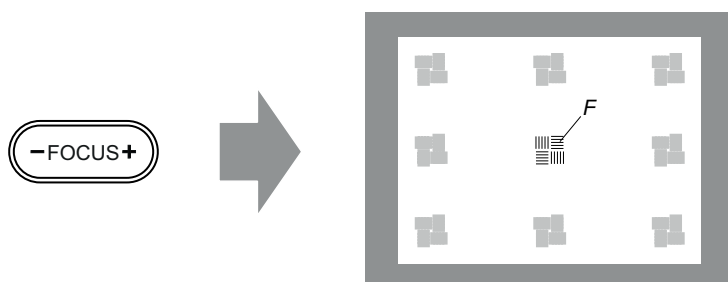


Image 16-9

5. Repeat from step 1 until the projected focus pattern is as sharp as possible in the center, left, right, top and bottom of the screen.
6. Proceed with the procedure "Fixation of the Lens Holder front plate", page 218.

16.3 Fixation of the Lens Holder front plate

When fixing the Lens Holder front plate

After performing the procedure for Scheimpflug adjustment or Back Focal Length adjustment the Lens Holder front plate must be secured in such a way that it doesn't disturb the result of the adjustment.

Necessary tools

- 10mm nut driver.
- 3mm Allen wrench.
- 13mm nut driver.

How to fix the Lens Holder front plate?

Start the fixation as follows (steps must be followed strictly) :

1. Project the framing test pattern for FLAT & SCOPE.
2. Zoom the projected image until the edges of the projected test pattern matches with the edges of the projection screen.

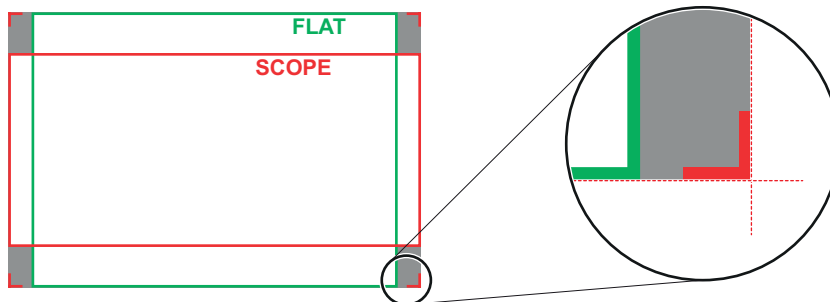


Image 16-10

3. Turn in the three set screws indicated with reference 11 image 16-11 without disturbing the projected image. Tighten lightly . Do not turn in the set screw at the lower left of the Lens Holder!
Note: Ensure that the edges of the projected test pattern remain in place on the screen. Any movement of the image will affect the Scheimpflug adjustment.
4. Fasten the lock nut (reference 21 image 16-11) of the three set screws. Use a 10mm nut driver. Ensure the image doesn't move.

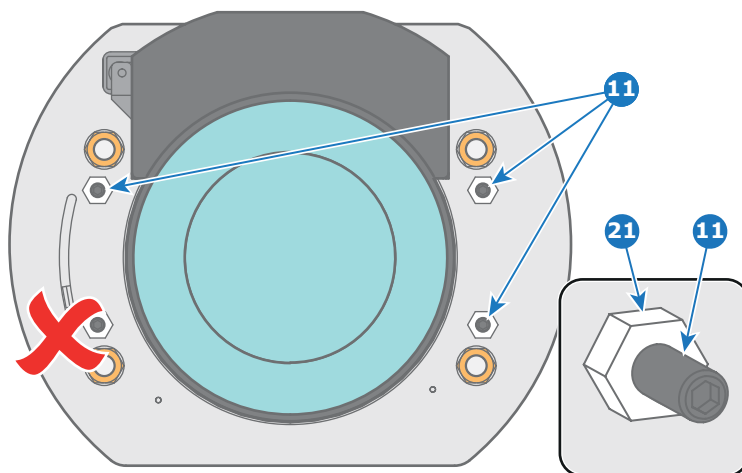


Image 16-11

5. Gently turn (by hand) the Scheimpflug adjustment nut at the lower left of the Lens Holder (reference 4 image 16-12) against the Lens Holder front plate without disturbing the projected image.
6. Turn in the set screw at the lower left of the Lens Holder (reference 14 image 16-12) without disturbing the projected image. Use a 3mm Allen wrench.
Note: Ensure that the edges of the projected test pattern remain in place on the screen. Any movement of the image will affect the Scheimpflug adjustment.
Tip: Fasten the set screw and the Scheimpflug nut alternately, without disturbing the projected image, until the Scheimpflug nut and set screw are completely tightened.

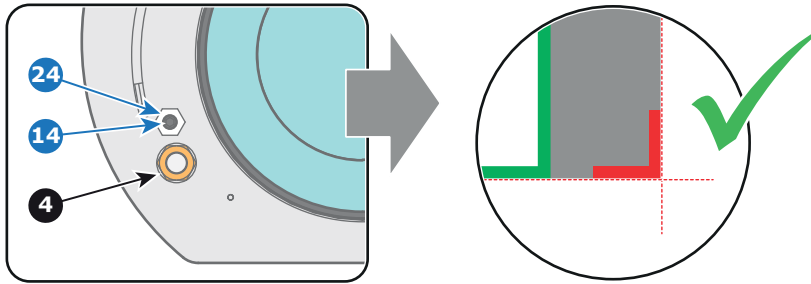


Image 16-12

7. Fasten the lock nut at the lower left of the Lens Holder. Use a 10mm nut driver.

16.4 Back Focal Length adjustment

When to adjust the Back Focal Length?

If a lens is used with a throw ratio suited for the application, (lens selection depends on projection distance and screen size) typically one would NEVER need to adjust the Back Focal Length of the projector.

A Back Focal Length adjustment is only required in case the Focus range of the installed lens does not capture the projection screen either for FLAT and/or for SCOPE. In other words, when it is impossible to focus the image on the screen for FLAT and/or for SCOPE. Note that the lenses for the DP2K-E series are varifocal. So, switching between FLAT and SCOPE (zoom action) requires a readjustment of the focus.

What is Back Focal Length adjustment?

Back Focal Length adjustment means moving the lens plane (Lp), thus the Lens Holder front plate, closer to or further from the DMD plane. The closer the lens plane to the DMD plane the further the focus range (Fr) of the lens will be.

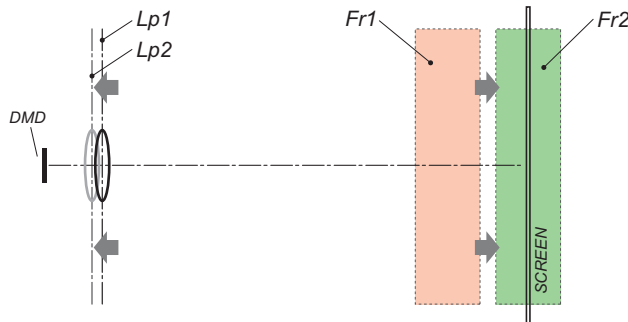


Image 16-13



Do not abuse the Back Focal Length adjustment of the Lens Holder. Neglecting this will result in loss of image quality because of the lens design. Cases requiring Back Focal Length adjustment normally indicate incorrect lens choice (throw ratio).

Necessary tools

- 10mm nut driver.
- 3mm Allen wrench.
- 13mm nut driver.

How to check the Back Focal Length?

1. Ensure that the throw ratio of the installed lens matches with the requirements of the application (projection distance and screen size).
2. Ensure that the correct lens parameters are activated. (See user guide of the *Communicator* chapter *Installation > Advanced > Lens parameters*)
Caution: *Not using the correct lens parameters could result in lens damage.*
3. Perform a lens **HOME & RETURN** operation. (See user guide of the *Communicator* chapter *Installation > Advanced > Lens parameters*)
4. Project the green focus test pattern. (screen file "no masking" or "no "crop")

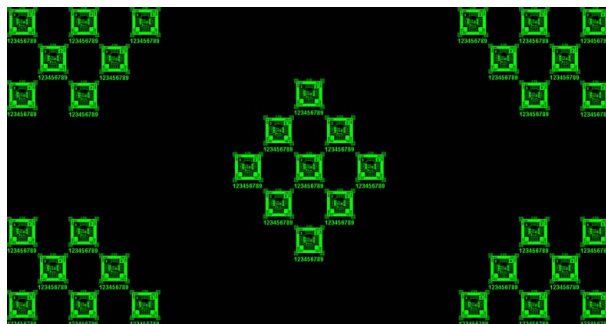


Image 16-14

5. Zoom the lens for maximum image on the screen (**WIDE**).
6. Is it possible to focus the center of the projected image?
If yes, the Back Focal Length is OK.
If no, the Back Focal Length needs realignment. Proceed with the next procedure.

How to adjust the Back Focal Length?

1. Unlock and loosen the 4 set screws (reference 11 image 16-15) of the Lens Holder by 1 centimeter. Use a 10mm nut driver for the lock nuts (reference 21 image 16-15) and use a 3mm Allen wrench for the set screws.

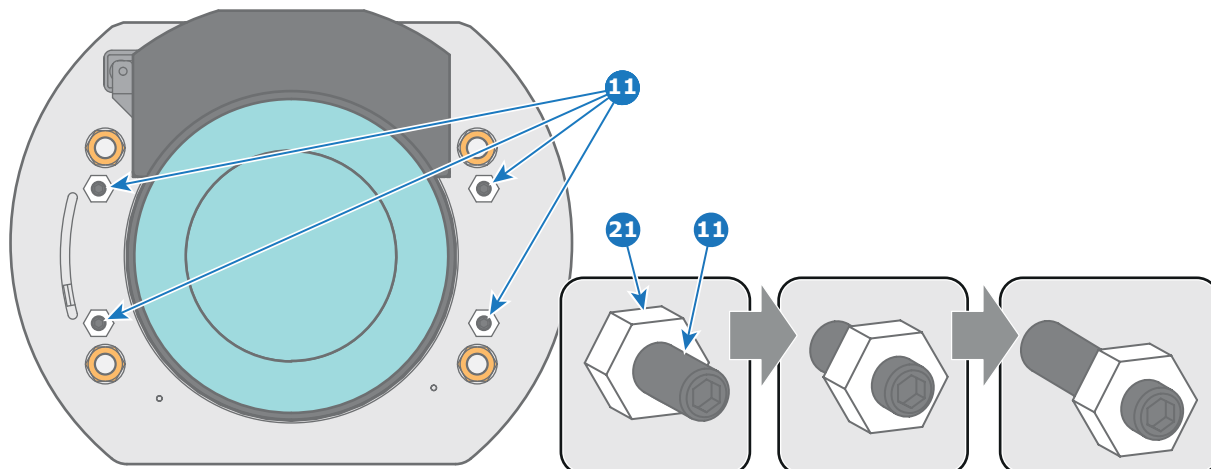


Image 16-15

2. Fully loosen the Scheimpflug nut at the lower left of the Lens Holder (reference 4 image 16-16). Use a 13mm nut driver.

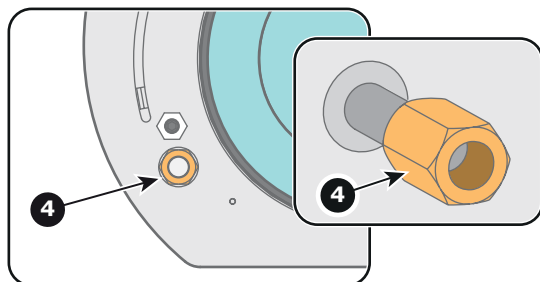


Image 16-16

3. Turn the three Scheimpflug adjustment nuts, reference 1, 2 and 3 image 16-17, until the front of the nut (reference 5 image 16-17) is equally aligned with the front of the threaded rod (reference 6 image 16-17). Use a 13mm nut driver.

Note: This is the nominal position of the Lens Holder.

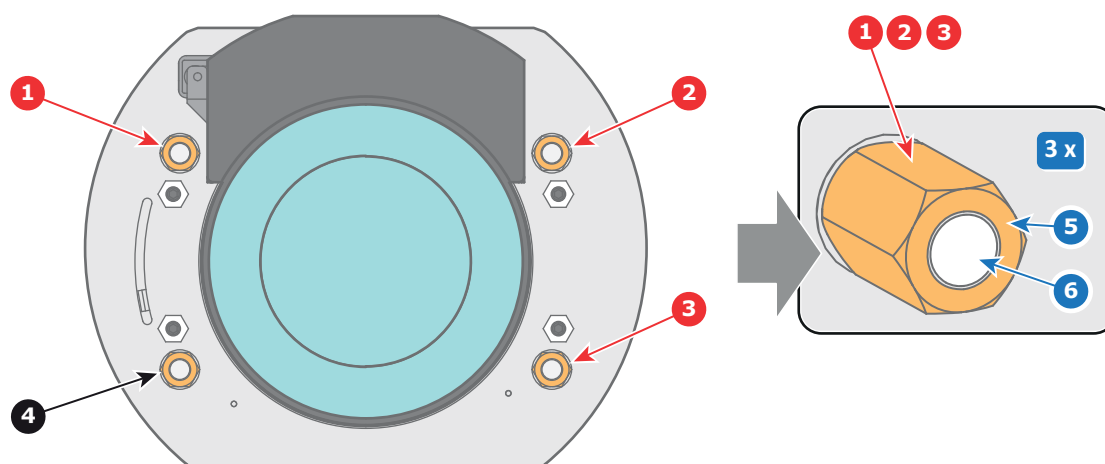


Image 16-17

4. Zoom the lens for maximum image on the screen (**WIDE**) and focus the center of the projected image using the motorized focus control (Local Keypad).

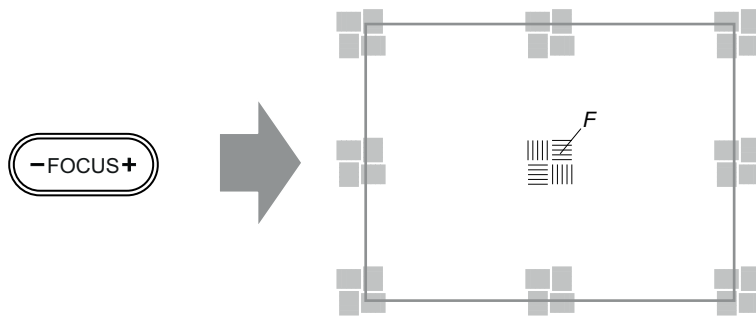


Image 16-18

5. Is it possible to focus the center of the projected image using the motorized focus control (Local Keypad) ? Ensure that the lens is zoomed for maximum image on the screen (**WIDE**).

If yes, nominal position is good for sharp focus in the middle of the projected image. Proceed with step 6.

If no, obtain the best possible focus in the center of the projected image using the motorized focus control and then turn the three Scheimpflug adjustment nuts, reference 1, 2 and 3 image 16-19, equally in or out until the center of the projected image is sharp. **Attention:** Keep in mind the turning direction of the Scheimpflug adjustment nuts for further adjustment instructions in this procedure.

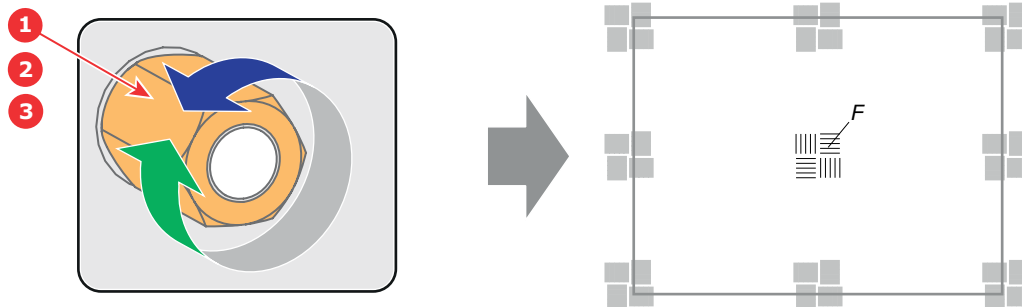


Image 16-19

6. Zoom the lens for minimum image on the screen (**TELE**) and focus the center of the projected image using the motorized focus control (Local Keypad).

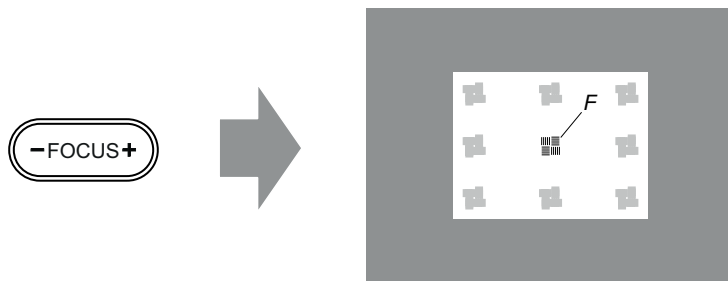


Image 16-20

7. Is it possible to focus the center of the projected image using the motorized focus control (Local Keypad) ? Ensure that the lens is zoomed for minimum image on the screen (**TELE**).

If yes, no further adjustment actions required. Proceed with step 8.

If no, obtain the best possible focus in the center of the projected image using the motorized focus control and then turn the three Scheimpflug adjustment nuts, reference 1, 2 and 3 image 16-21, equally in or out until the center of the projected image is sharp.

Note: the same turning direction as in step 4 is applicable.

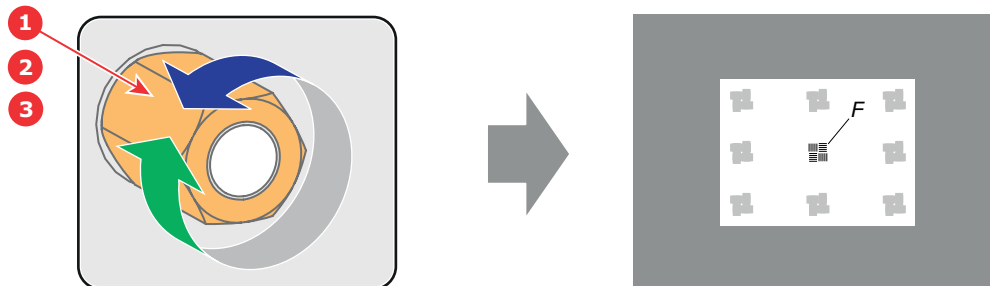


Image 16-21

8. Check if it is possible to focus the center of the projected image using the motorized focus control (Local Keypad) for **WIDE** and for **TELE**.

If yes, the Back Focal Length is correctly adjusted.

If no, repeat with step 4.

9. Is the projected image in the corners as sharp as in the middle?

If yes, proceed with the procedure "Fixation of the Lens Holder front plate", page 218.

If no, Scheimpflug adjustment is required. See procedure "Scheimpflug adjustment", page 216, prior to fixate the Lens Holder front plate. **CAUTION:** Skip the action, in the Scheimpflug adjustment procedure, to turn the three Scheimpflug adjustment nuts until the front of the nut is equally aligned with the front of the threaded rod!

17. CARD CAGE

Overview

- Introduction Card Cage
- Integrated Cinema Processor (ICP)
- Cinema Controller
- Replacement of the ICMP Board
- Replacement of the ICP board
- Replacement of the RTC battery of the ICP board
- Battery replacement on the Cinema Controller Board
- Replacement of the HDSDI board
- Replacement of the Link Decryptor
- Replacement of the Cinema Controller
- Replacement of the Card Cage small fan
- Replacement of the Card Cage large fan
- Replacement of the ICP fan
- Replacement of the Button Module
- Signal Backplane replacement process
- Removal of the Card Cage cover
- Disconnecting the Card Cage wires
- Removal of the Card Cage
- Removal of the Signal Backplane
- Installing the Signal Backplane
- Installing the Card Cage
- Connecting the Card Cage wires
- Installation of the Card Cage cover
- Removal of the Card Cage partition plate
- Replacement of the Status Light

17.1 Introduction Card Cage

Card Cage

The Card Cage is located at the right side of the projector. The upper compartment of the Card Cage contains the Button Interface and below this there are three slots wherein the Barco Cinema Controller board can fit, together with either the ICMP board, or the ICP board + the IMB or IMS board.

The Card Cage can be removed from the projector chassis as a whole.

Card Cage parts

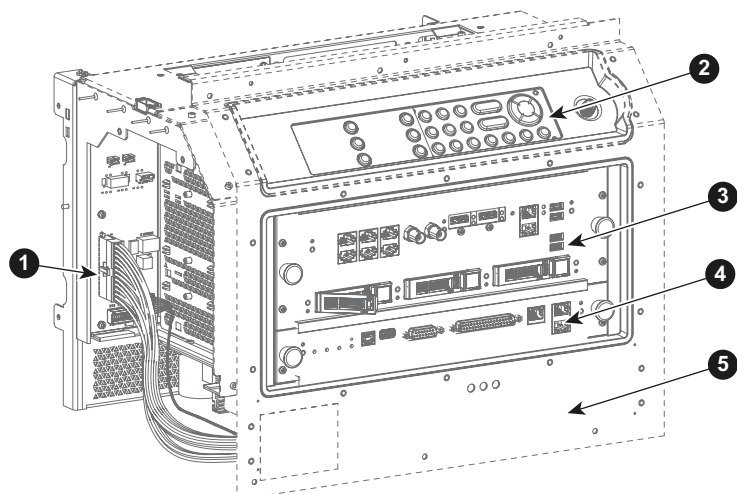


Image 17-1

- 1 Signal backplane.
- 2 Button Interface.
- 3 Slot for ICMP board
- 4 Slot for Cinema Controller board.
- 5 Card Cage cover.

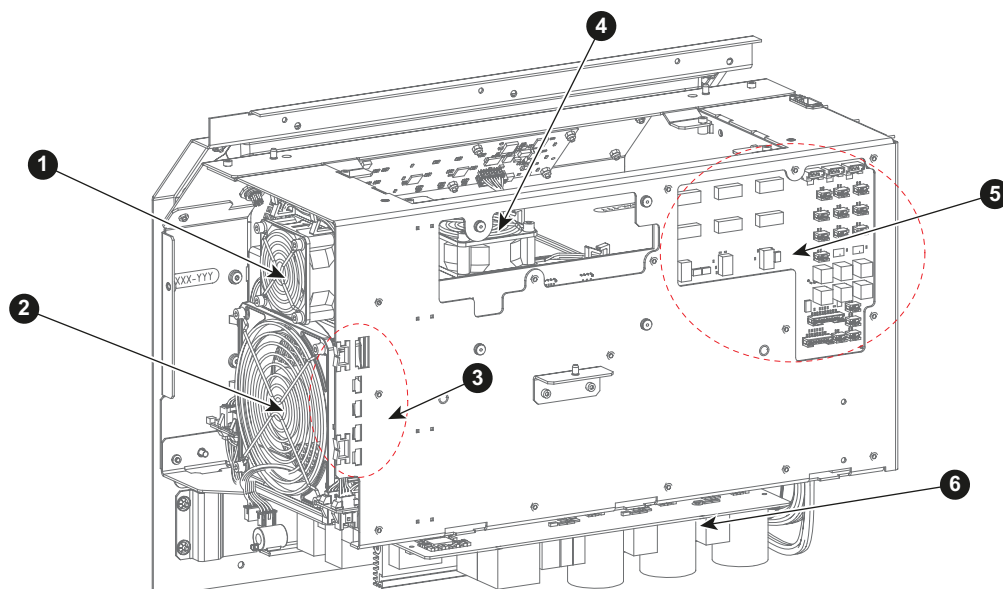


Image 17-2

- 1 Card cage top fan (small)
- 2 Card cage bottom fan (large)
- 3 Socket for Light Processor connections
- 4 Card cage ICMP fan
- 5 Socket for Lens Holder connections
- 6 SMPS

17.2 Integrated Cinema Processor (ICP)



In case the projector is equipped with a Barco ICMP no ICP board is inserted. All ICP functionality is integrated in the Barco ICMP.

LEDs and ports on the Integrated Cinema Processor

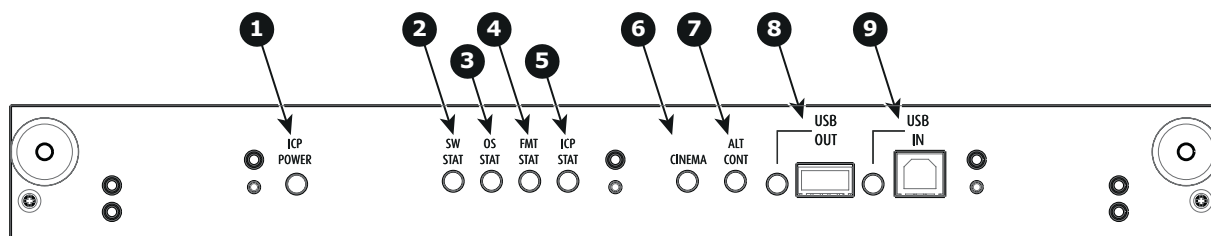


Image 17-3

- 1 ICP is powered.
- 2 ICP software state, normal operation is green blinking.
- 3 ICP operating system state, normally full green .
- 4 ICP FMT configuration state, normally full green.
- 5 ICP MAIN configuration state, normally full green.
- 6 CINEMA port selected. When on, LED 7 will be out.
- 7 ALTERNATIVE port selection. When on, LED 6 will be out. (note that this function is disabled. Led never lights up)
- 8 USB, for future use.
- 9 USB, for future use.

LED diagnostic

State description	Normal operation	Error state
Software state (LED reference 2)	flashing green	red or orange
Operating System state (LED reference 3)	green	off, red or yellow
FMT FPGA state (LED reference 4)	green	red : unable to configure the FPGA yellow : FPGA is loaded with the Boot application
ICP FPGA state (LED reference 5)	green	red : unable to configure the FPGA yellow : FPGA is loaded with the Boot application

ICP functions:

- Stores all projector files. When board is replaced; clone package must be reloaded.
- Stores and generates test patterns.
- Scaling to native resolution, re-sizing, masking, line-insertion de-interlacing, subtitle overlay, color space conversion, de-gamma, color correction
- Source Selection between alternative content and cinema content.
- Stores a Certificate and Private Key needed for Playback validation
- Contains a real time clock, which must be synchronized with the GMT/UTC time stored in the link decryptor module or Integrated Media Block (see Communicator software)
- Handles unpacking of special video formats



The ICP board spare part kit is not default programmed for a DP2K-E series projector. When using this board in a DP2K-E series projector the software must be re-installed after installation of the board.



When installing a new ICP board in a DP2K-E series projector the Spatial Color Calibration file must be reloaded and activated. See chapter .



CAUTION: Make sure not to short circuit the battery on the board. That will destroy the board completely !

17.3 Cinema Controller

Location of the communication ports

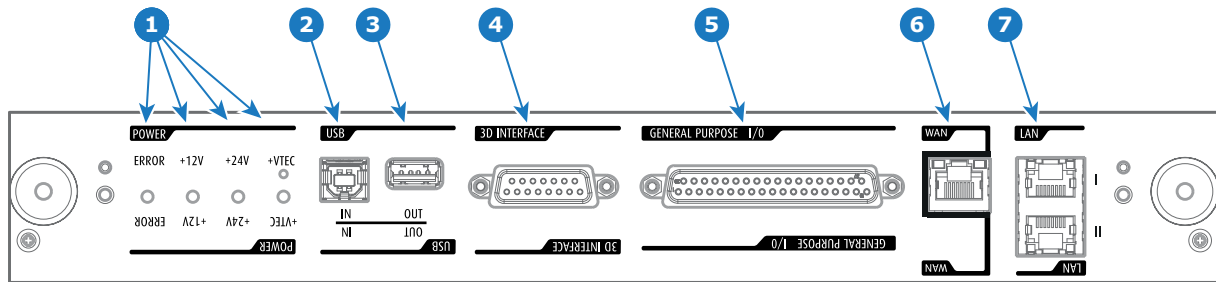


Image 17-4

Functionality

1 Diagnostic LEDs

The front plate of the Cinema Controller contains 4 diagnostic LEDs to display the status of the power supply (reference 6 image 17-4):

- +VTEC supply (not used on DP2K-E series).
- +24V supply.
- +12V supply.
- general power supply (ERROR).

2 USB IN port

The Cinema Controller is equipped with a USB port, type "B" connector, (reference 5 image 17-4) to connect upstream devices (E.g. PC). This USB port is used to communicate with the projector via RS232 commands (Virtual comport). The USB IN port remains operational in Sleep mode.

3 USB OUT port

The Cinema Controller is equipped with a USB port, type "A" connector, (reference 4 image 17-4) which can be used to power handheld devices within USB spec (MAX 500mA/5V). No other functionality supported (Future expansion). The USB OUT port remains operational in Sleep mode.

4 3D INTERFACE

3D interface port (reference 3 image 17-4). Can be used to connect external 3D devices to the projector. All signals necessary for 3D projection can be provided via this connector. The 3D interface port is disabled if the projector is in Sleep mode.

5 GENERAL PURPOSE INPUT/OUTPUT (GPIO)

This 37 pin connector (reference 2 image 17-4) can be used to send or receive trigger signals from other devices. These input/output pins can be programmed by macros created with the Communicator software. See user's guide of the Communicator, section Macro editor, for more information about this functionality. Note that the General Purpose Inputs accept 24 volt maximum. The GPIO remains operational when the projector is in Sleep mode. So, if the factory predefined macro to wake up the projector is assigned to one of the free GPI input pins the projector can be awakened via GPIO.

Enter or leave Sleep mode can also be done with GPIO via two predefined Macros (not editable).

6 Wide Area Network (WAN)

Wide Area Network (WAN: 10/100/1000 base-T). Use this Ethernet port (reference 6 image 17-4) to connect the network which contains the DHCP server.

Once connected to the WAN, users can access the projector from any location, inside or outside (if allowed) their company network using the Communicator software. This software locates the projector on the network if there is a DHCP server or the user can insert the correct IP-address to access the projector. Once accessed, it is possible to check and manipulate all the projector settings. Remote diagnostics, control and monitoring of the projector can then become a daily and very simple operation. The network connectivity allows detection of potential errors and consequently improves service time.

7 Local Area Network (LAN: 10/100/1000 base-T)

Local Area Network (LAN: 10/100/1000 base-T) with built-in Ethernet switch (port I and port II, reference 7 image 17-4). Use for projector control and automation. E.g. Touch Panel, content server, ... (not for content streaming!)

As there is a need to daisy chain projectors when they are on an Ethernet network, an Ethernet switch is built in. the incoming network is hereby available for the internal PC and for the next device in the chain. In this way a 'star' network interconnection can be avoided. The switch used is a stand alone 10/100/1000Mbit Ethernet switch. This assures no influence on the network speed. Furthermore, this Ethernet switch remains operational when the projector is in Standby mode.

The connectors used for these Ethernet ports are of the type RJ45, which is compatible with standard RJ45 cable connector. Straight (most common) as well as cross linked network cables can be used. The 2 ports are functionally identical. Both ports are connected via the projector switch (Auto sensing enabled).



The connectors used for all Ethernet ports are of the type RJ45, which is compatible with standard RJ45 cable connector. Straight (most common) as well as cross linked network cables can be used. The 2 ports are functionally identical. Both ports are connected via the projector switch (Auto sensing enabled).

Cinema Controller functions:

- Ethernet Communication to ICP, Media block or Link decryptor.
- Virtual COM port (RS232) to BARCO Controller on the USB-IN port.
- Standardized 3D interface on board.
- GPIO controls
- Lensholder motors (stepper motors)
- Stores lens files and lens type / Controls lens
- Lens motor drivers (DC motors)
- Controls lamp power supply
- Stores SNMP key
- Stores Barco IP address and host name
- Handles reporting of errors, version info & Barco logs to Communicator
- Controls ICP board
- Controls Dolby 3D color wheel
- Controls and monitors keypad (Button module)
- Controls and monitors status lights
- Stores Macro files, Input files, Lens files, 3D files and Light Sensor Calibration file (LSC)

Virtual comport (RS232 serial communication)

The USB-IN port of the communication interface supports RS232 serial communication. You can use the RS232 input port to connect a local PC to your DP2K-E series projector. This way you can configure and control your DP2K-E series projector from your local PC.



Do not forget to set the projector's baud rate (default = 115200) to match that of the computer.

Advantages of using RS232 serial communication:

- easy adjustment of the projector via PC (or MAC).
- wide range of control possibilities.
- sending data to the projector (update).
- copying data from the projector (backup).



RS232

An Electronic Industries Association (EIA) serial digital interface standard specifying the characteristics of the communication path between two devices using either D-SUB 9 pins or D-SUB 25 pins connectors. This standard is used for relatively short-range communications and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length and type of connector to be used. The standard specifies component connection standards with regard to computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard, and is functionally identical to the CCITT V.24 standard. Logical '0' is > + 3V, Logical '1' is < - 3V. The range between -3V and +3V is the transition zone.

17.4 Replacement of the ICMP Board

Necessary tools

PH2 Phillips screwdriver



WARNING: Disconnect the power cord of the projector from the power net and wait a few minutes (to discharge the capacitors) prior to starting this procedure.



CAUTION: Wear a wrist band which is connected to the ground while handling the electrostatic discharge sensitive parts.

How to replace the ICMP board?

1. Loosen the four retaining screws of the ICMP (reference 1 image 17-5). Use a PH2 screwdriver.
2. Carefully pull the ICMP board out of its compartment.
3. Gently reinsert the ICMP board into the compartment, making sure that the board enters the plastic guides on the side as illustrated in the detail view. Push the board in completely.
4. Install the four retaining screws of the ICMP (reference 1 image 17-5). Use a PH2 screwdriver.

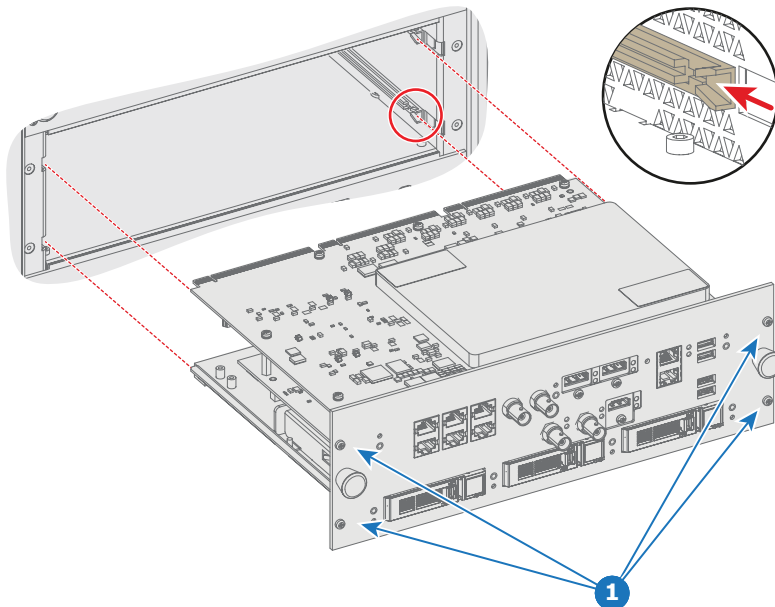


Image 17-5

5. Reconnect the power supply and switch the projector ON.
6. Check that the latest firmware for the ICMP board is installed. Upgrade firmware, if required. See Communicator User Guide for more information.
7. Is there a full backup clone or backup including the TI specific files available?
 - a) If available:
 - Reinstall the clone file. See Communicator User Guide chapter "Installation" where 'cloning' is explained.
 - Upload the LUT-SCC file into the projector file system. (e.g. 1110351581.LUT-SCC). See procedure on page 172.
 - Activate the LUT-SCC file. See procedure on page 173.
 - b) If NOT available: perform the same additional actions as for a new Light Processor (see "Light Processor replacement process", page 116).

17.5 Replacement of the ICP board



WARNING: Disconnect the power cord of the projector from the power net and wait a few minutes (to discharge the capacitors) prior to starting this procedure.



CAUTION: Wear a wrist band which is connected to the ground while handling the electrostatic discharge sensitive parts.

Necessary tools

PH2 Phillips screwdriver.

How to replace the ICP board of the projector?

1. Release the two retaining screws (reference 1) at the front of the ICP board. Use a PH2 Phillips screwdriver.
2. Pull the ICP board out of its compartment.

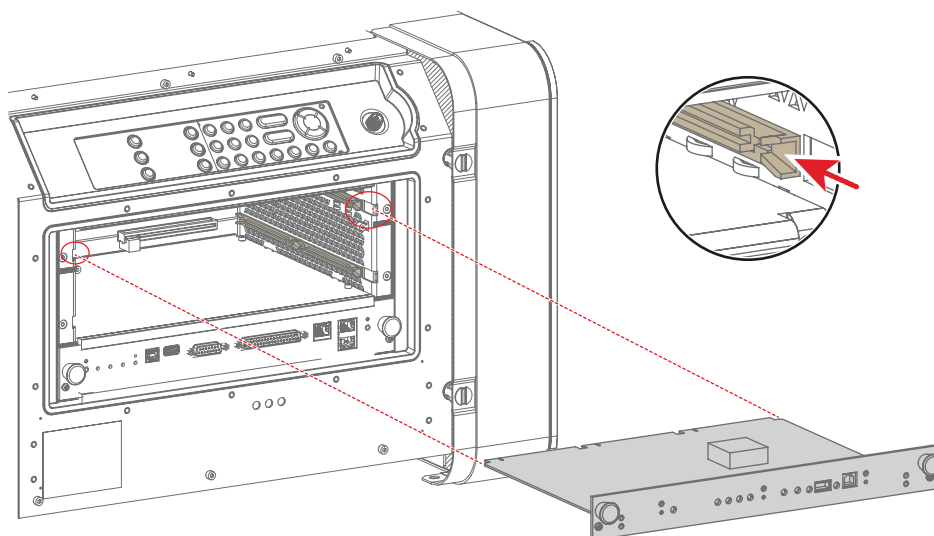


Image 17-6

3. Gently insert the ICP board in the guides of the ICP compartment as illustrated. Push it completely in.
Caution: Ensure that the both sides of the ICP board are captured by the guides inside the ICP compartment.
4. Fasten the two screws at the front side of the ICP board (reference 1). Use a PH2 Phillips screwdriver.
5. Reconnect the power cord and switch on the projector.
6. Check if the latest firmware of the ICP board is installed. If not, upgrade to the latest version. See Communicator User Guide.
7. Is there a full backup clone or backup including the TI specific files available?
 - a) If available:
 - Reinstall the clone file. See Communicator User Guide chapter "Installation" where 'cloning' is explained.
 - Upload the LUT-SCC file into the projector file system. (e.g. 1110351581.LUT-SCC). See procedure on page 172.
 - Activate the LUT-SCC file. See procedure on page 173.
 - b) If NOT available: perform the same additional actions as for a new Light Processor (see "Light Processor replacement process", page 116).

17.6 Replacement of the RTC battery of the ICP board

Necessary tools

Phillips screw driver

Necessary parts

All parts are included in kit R8766526K (battery cover, coin cell battery BR2330 and a pair of gloves).

How to replace

1. Put on the gloves.
2. Remove the ICP board from the card cage. See chapter "Removing a board in the card cage".
3. Carefully put the ICP board on a table.
4. Place the battery cover over battery 'B2' of the ICP board to protect this battery while replacing the RTC battery 'B1' which is seated in the battery holder.

Note: The battery cover can be left on the board.

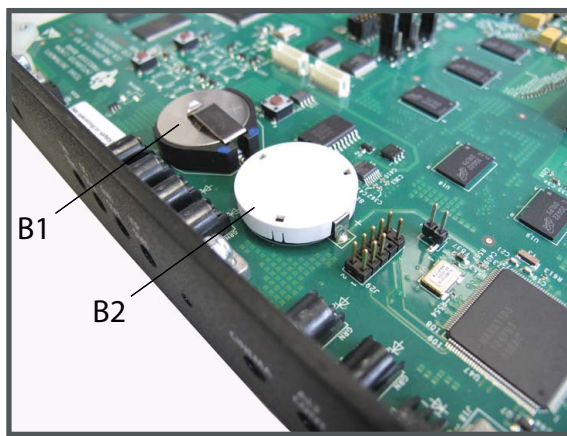


Image 17-7

5. Remove the RTC battery 'B1' from the battery holder and insert the new battery in the battery holder.

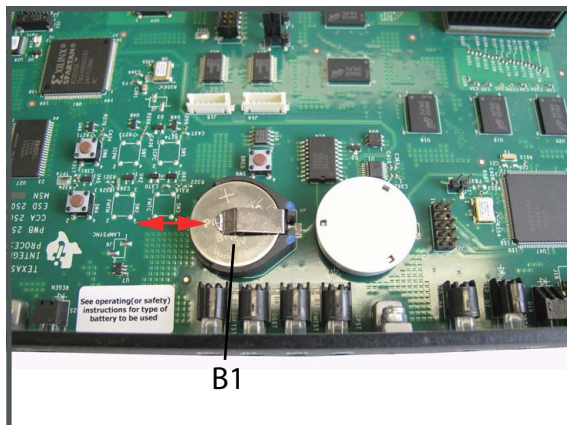


Image 17-8

6. Insert and fixate the ICP board back in the card cage. See chapter "Inserting a board in the card cage".
7. Power on the projector.
8. Clear the projector error 5800 "ti-icp - system status = fail" with error message "ICP real time clock error" by configuring the RTC (Real Time Clock) of the ICP. See user manual Communicator chapter "Set up of the ICP clock", choose the option UTC/GMT time calculated from current PC time as current time.

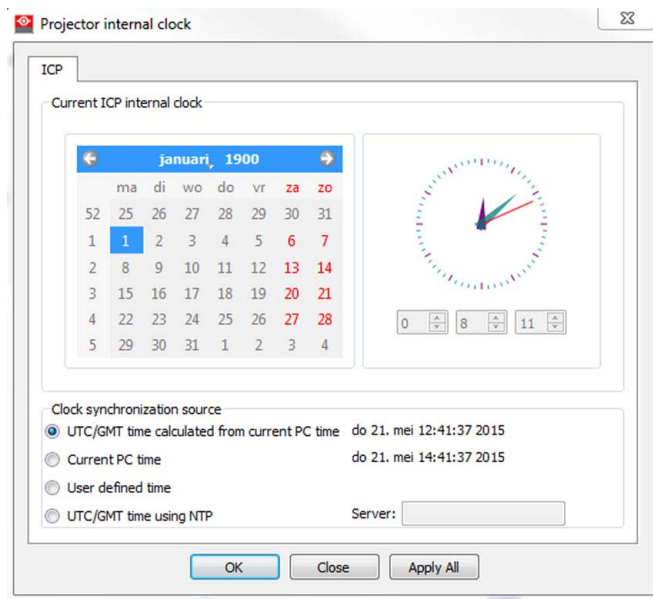


Image 17-9

9. Clear the projector error 5834 "physical marriage tamper event" by remarrying the projector. See service manual chapter "Authorization to clear security warning on the projector".

17.7 Battery replacement on the Cinema Controller Board

About an empty battery

There is no error indication in Communicator when the battery is almost empty. Only when opening the error logging after powering on the projector, you will see that some time stamps in the beginning of the list are missing or that these time stamps are still old timings. That is due to an empty battery on the Cinema Controller Board.



There is no battery kit available. The customer has to buy a new battery himself.

Battery type used : CR1220 (3V, 0.03AH, Li)

Necessary tools

PH2 Phillips screwdriver.

Necessary parts

Battery CR1220

How to replace

1. Loosen the two screws (reference 1) at the front of the Cinema Controller.
2. Pull the Cinema Controller out of its compartment.
3. Pull out the empty battery and insert a new CR1220 battery with the flat side of the battery facing to the top.

Note: No battery kit available as spare part. Buy a new one in a dedicated shop.

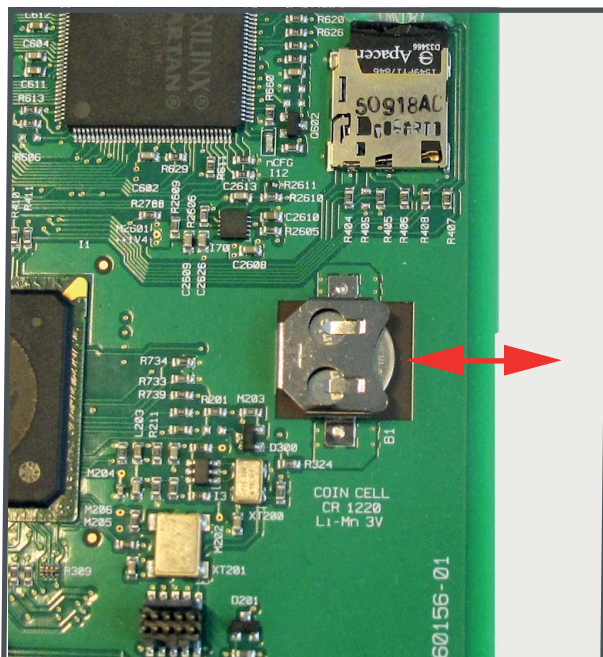


Image 17-10
Battery replacement

4. Gently insert the Cinema Controller in the guides of the Cinema Controller compartment as illustrated. Push it completely in.
Caution: Ensure that the both sides of the Cinema Controller are captured by the guides inside the Cinema Controller compartment, as shown in the detail of the illustration.
5. Fasten the two screws at the front side of the Cinema Controller (reference 1).

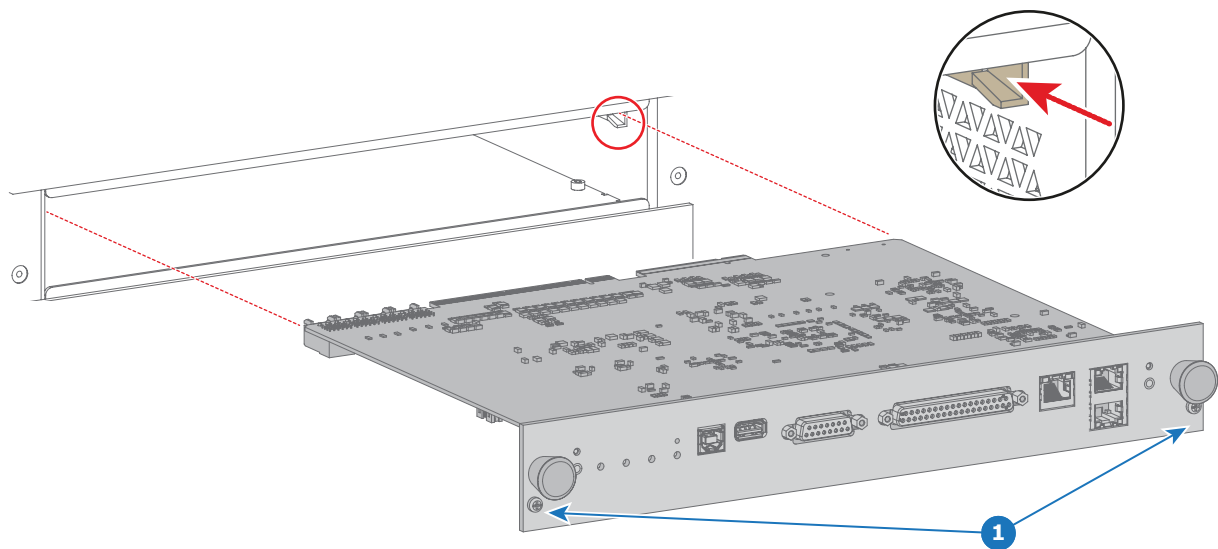


Image 17-11

17.8 Replacement of the HDSDI board



WARNING: Disconnect the power cord of the projector from the power net and wait a few minutes (to discharge the capacitors) prior to starting this procedure.



CAUTION: Wear a wrist band which is connected to the ground while handling the electrostatic discharge sensitive parts.

Necessary tools

PH2 Phillips screwdriver.

How to replace the HDSDI board of the projector?

1. Release the two retaining screws (reference 1) at the front of the HDSDI board. Use a PH2 Phillips screwdriver.
2. Pull the HDSDI board out of its compartment.

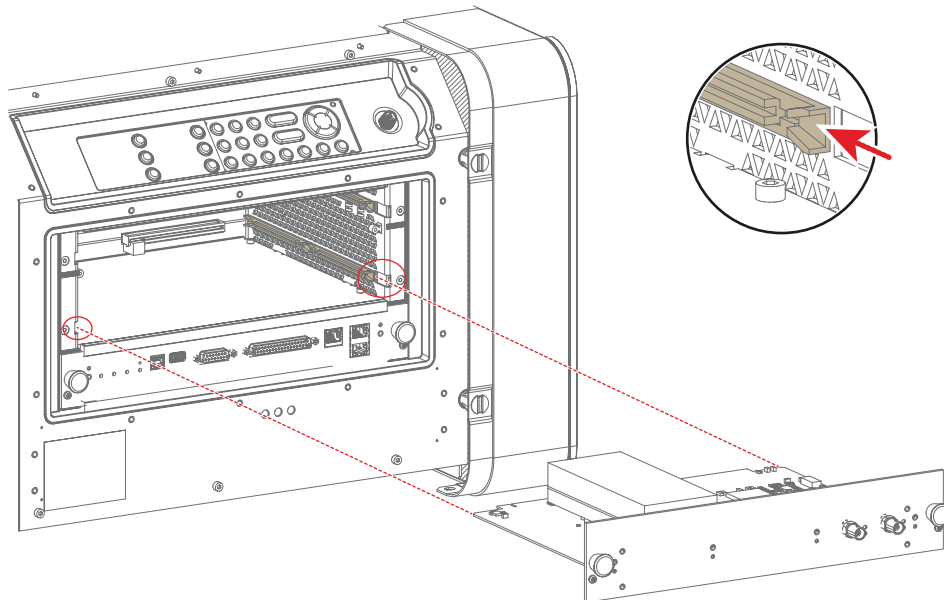


Image 17-12

3. Gently insert the HDSDI board in the guides of the HDSDI compartment as illustrated. Push it completely in.
Caution: Ensure that the both sides of the HDSDI board are captured by the guides inside the HDSDI compartment.
4. Fasten the two screws at the front side of the HDSDI board (reference 1). Use a PH2 Phillips screwdriver.
5. Reconnect the power cord and switch on the projector.
6. Clear the tamper event. See procedure "Authorization to clear security warning on the projector", page 133.

17.9 Replacement of the Link Decryptor



The Link Decryptor board is mounted on the HDSDI board. This procedure assumes that the HDSDI board is already removed from the Card Cage.

Necessary tools

T10 Torx screwdriver.

How to replace the Link Decryptor?

1. Remove the HDSDI board from the Card Cage. See "Replacement of the HDSDI board", page 236.
2. Loosen the four screws (reference 1 image 17-13) of the Link Decryptor board. Use a T10 Torx screwdriver.

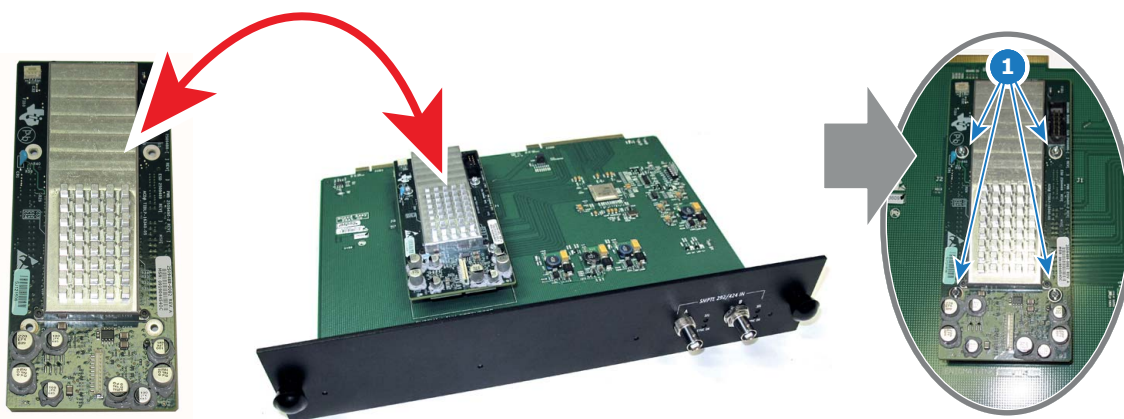


Image 17-13

3. Pull off the current mounted Link Decryptor board.
4. Unpack the new Link Decryptor board and plug it into both board-connectors on the HDSDI board at the same time. Ensure the Link Decryptor board is correctly oriented: see illustration.
5. Fasten the four screws of the Link Decryptor.
6. Install the HDSDI board in the Card Cage. See "Replacement of the HDSDI board", page 236.



A marriage between the new Link Decryptor and the ICP board must be realized. See procedure "Authorization to clear security warning on the projector", page 133.



After installation of a new Link Decryptor check for latest software version. See user guide of the Communicator.

17.10 Replacement of the Cinema Controller



WARNING: Disconnect the power cord of the projector from the power net and wait a few minutes (to discharge the capacitors) prior to starting this procedure.



CAUTION: Wear a wrist band which is connected to the ground while handling the electrostatic discharge sensitive parts.

Necessary tools

PH2 Phillips screwdriver.

How to replace the Cinema Controller of the projector?

1. Loosen the two screws (reference 1) at the front of the Cinema Controller. Use a PH2 Phillips screwdriver.
2. Pull the Cinema Controller out of its compartment.
3. Gently insert the new Cinema Controller in the guides of the Cinema Controller as illustrated. Push it completely in.
Caution: Ensure that the both sides of the Cinema Controller are captured by the guides inside the Cinema Controller compartment, as shown in the detail of the illustration.
4. Fasten the two screws at the front side of the Cinema Controller (reference 1). Use a PH2 Phillips screwdriver.

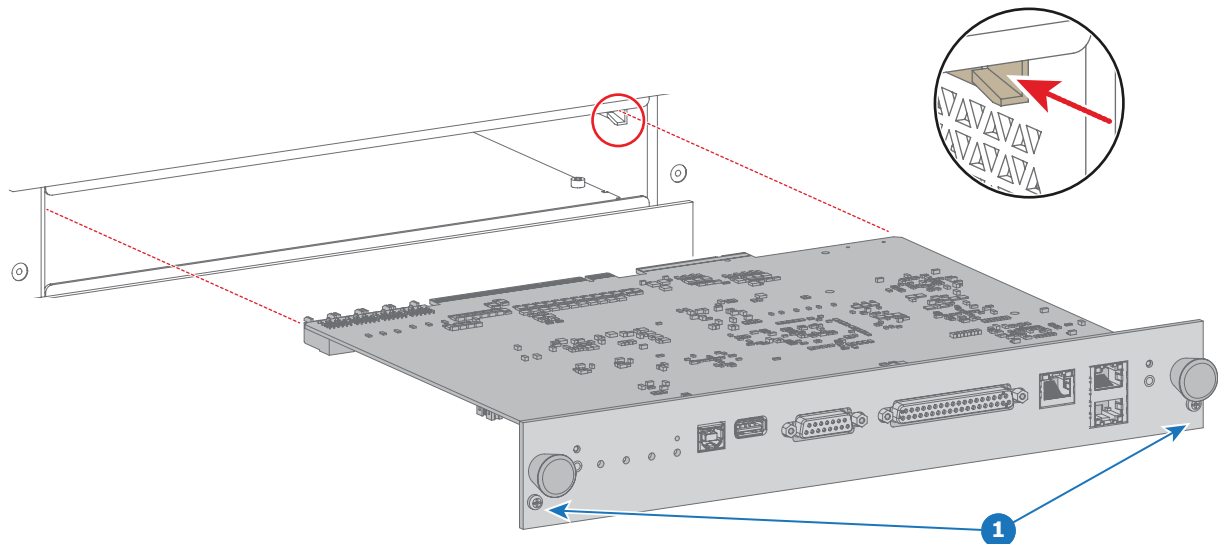


Image 17-14

5. Reconnect the power cord and switch on the projector.
6. Check if the latest firmware of the Cinema Controller is installed. If not, upgrade to the latest version. See Communicator User Guide.
7. Is there a full backup clone or backup including the Cinema Controller specific files available?
 - a) If available reinstall the clone file. See Communicator User Guide chapter "Installation" where 'cloning' is explained.
 - b) If NOT available install the base clone package for DP2K-E series and modify the Cinema Controller configuration files as desired. The base clone package can be downloaded from the secured Barco website. Make a projector clone package (full backup) after the files are modified and saved. See Communicator User Guide.

17.11 Replacement of the Card Cage small fan



This procedure assumes that the large dust filter is removed from the projector. See procedure "Dust Filters and Filter Foams", page 269

Necessary tools

3mm Allen wrench.

How to replace the small fan of the Card Cage?

1. Disconnect the wire with the orange cable tie (reference 3 image 17-15) of the small fan (reference 1 image 17-15) and release the wire from the cable clamps.

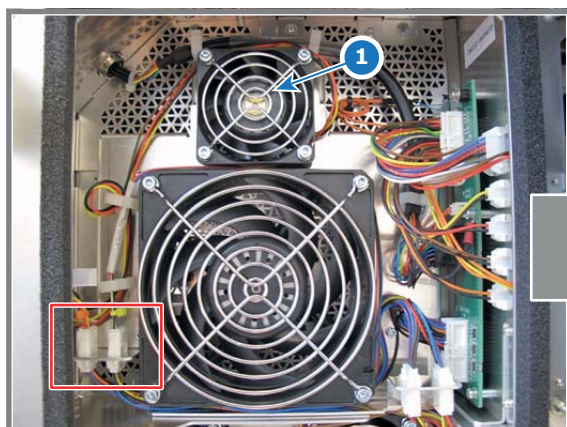
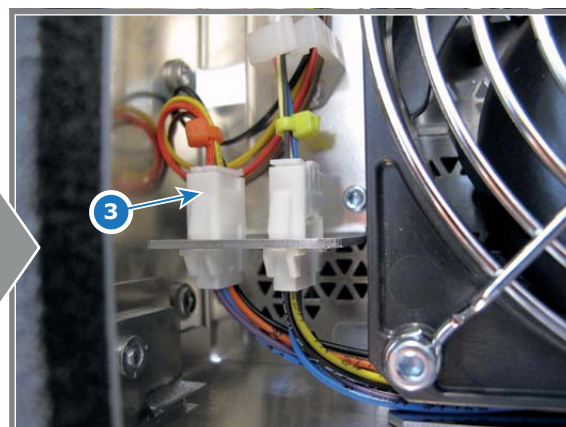


Image 17-15



2. Replace the small fan as illustrated. Use a 3mm Allen wrench to loosen/fasten the four fixation screws (reference 5 image 17-16).
Caution: Ensure to place the fan guard in front of the fan and that the airflow of the fan is towards the Card Cage.

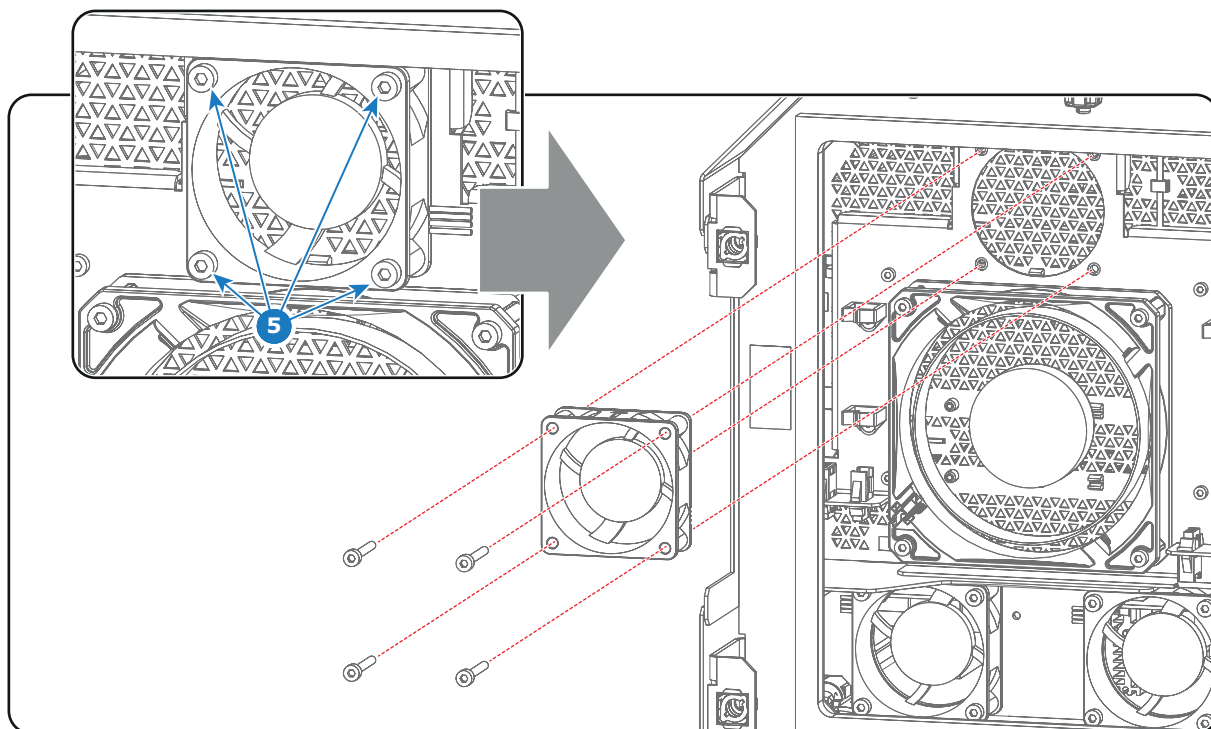


Image 17-16

3. Connect the wire of the new fan with the left socket (reference 3 image 17-15) and engage the wire in the cable clamps.

17.12 Replacement of the Card Cage large fan



This procedure assumes that the large dust filter is removed from the projector.

Necessary tools

3mm Allen wrench.

How to replace the large fan of the Card Cage?

1. Disconnect the wire with the yellow cable tie (reference 4 image 17-17) of the large fan (reference 2 image 17-17) and release the wire from the cable clamps.

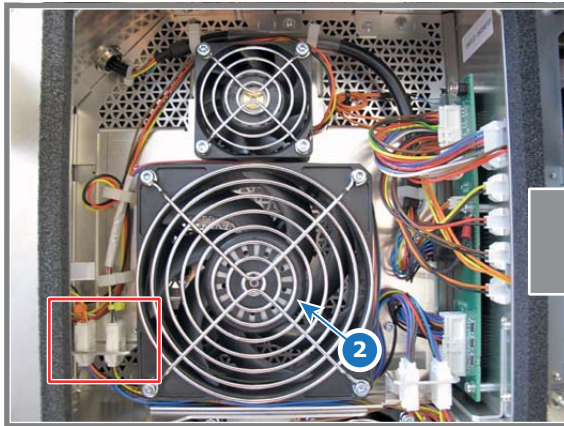
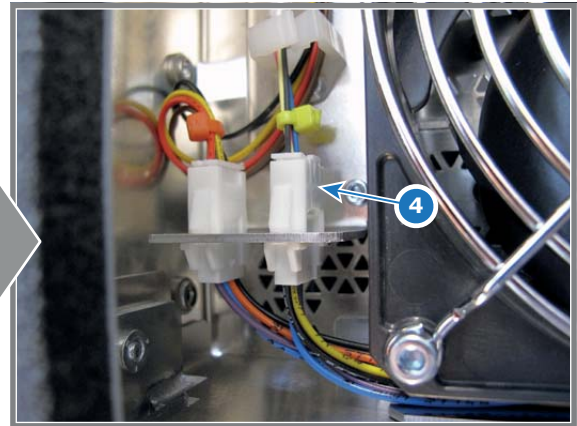


Image 17-17



2. Replace the large fan as illustrated. Use a 3mm Allen wrench to loosen/fasten the four fixation screws (reference 6 image 17-18).
Caution: Ensure to place the fan guard in front of the fan and that the airflow of the fan is towards the Card Cage.

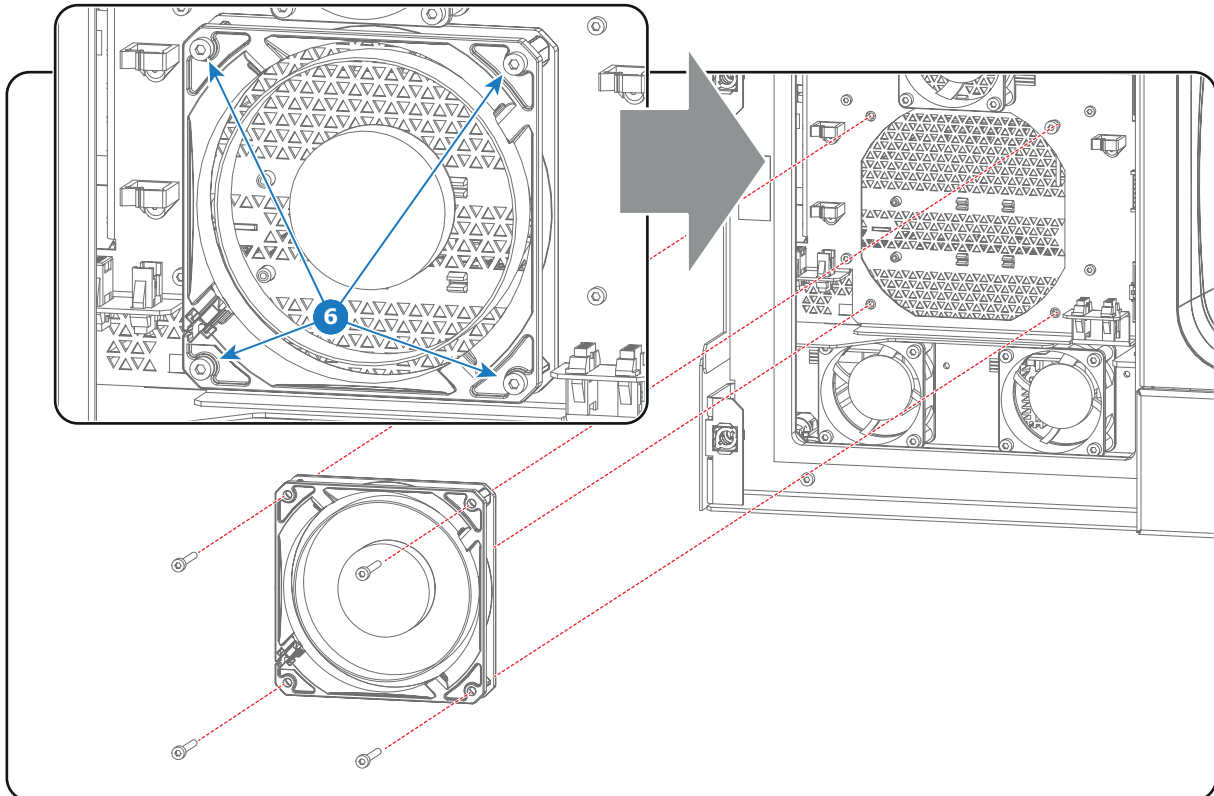


Image 17-18

3. Connect the wire of the new fan with the right socket (reference 4 image 17-17) and engage the wire in the cable clamps.

17.13 Replacement of the ICP fan



This procedure assumes that the projector top cover and top cover plate are removed from the projector.

Necessary tools

3mm Allen wrench.

How to replace the ICP fan of the Card Cage?

1. Disconnect the wire with the red cable tie (reference 1 image 17-19) from the Signal Backplane and release the wire from the cable clamp (reference 2 image 17-19).

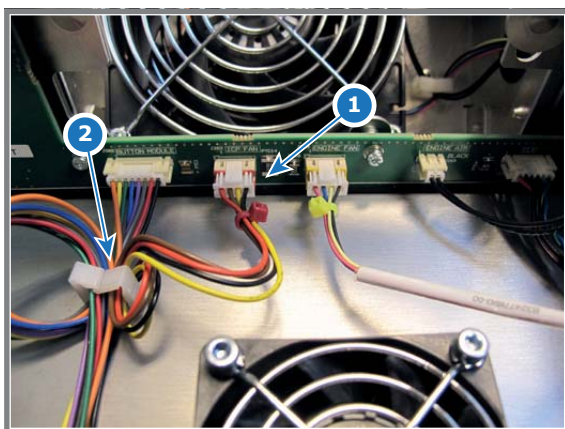


Image 17-19

2. Replace the ICP fan as illustrated. Use a 3mm Allen wrench to loosen/fasten the four fixation screws (reference 3 image 17-20).
Caution: Ensure to place the fan guard on top of the ICP fan and that the airflow of the fan is towards the Card Cage.

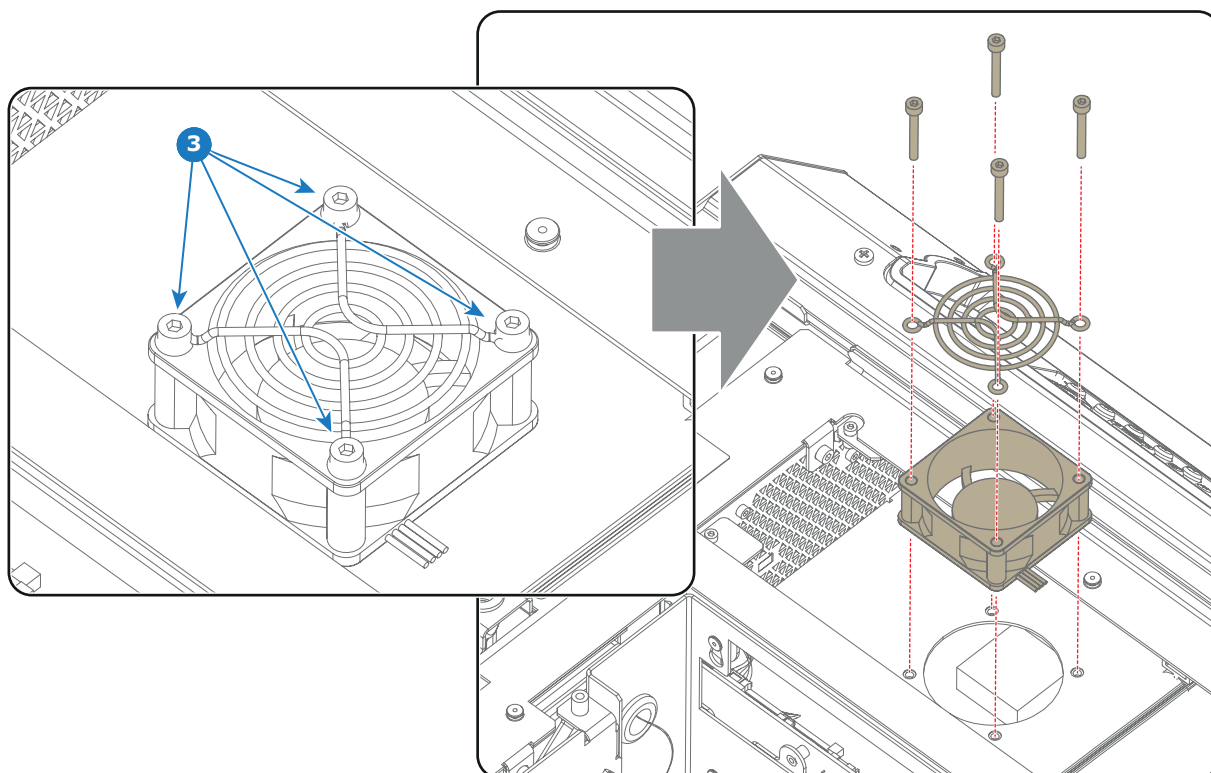


Image 17-20

3. Connect the wire of the new fan with the Signal Backplane (reference 1 image 17-19) and engage the wire in the cable clamp (reference 2 image 17-19).

17.14 Replacement of the Button Module



This procedure assumes that the Card Cage cover, projector top cover, (top) fan of the Light Processor compartment, and top cover plate are already removed from the projector.

Necessary tools

- 3 mm Allen wrench.
- 2.5 mm Allen wrench.
- 15 mm nut driver.

How to replace the Button Module of the projector?

1. Use a 3 mm Allen wrench to loosen the LED railing screws.
2. Disconnect the LED PCB cable.
3. Remove the LED railing from the projector chassis.
4. Loosen the five fixation screws (reference 1, image 17-21) of the projector top frame. Use a 3 mm Allen wrench.
Caution: Take care not to drop the screws inside the projector.

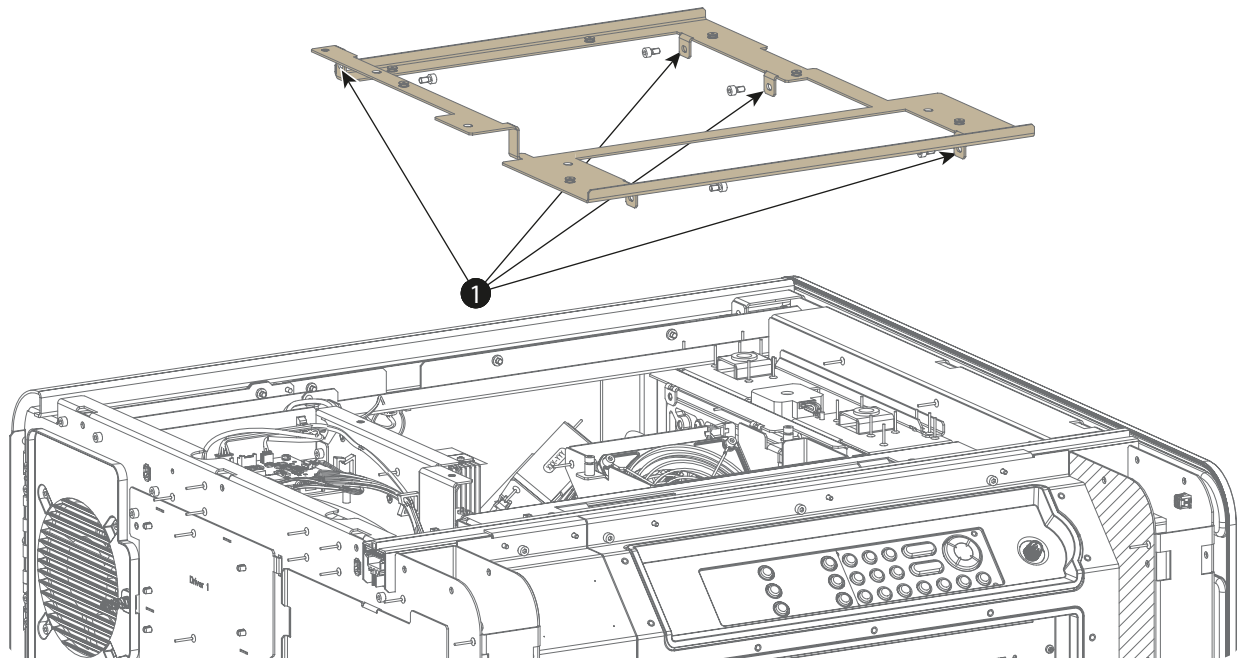


Image 17-21

5. Remove the top frame from the projector chassis.
6. Disconnect the wire of the Button Module (reference 2 image 17-22).
Note: If it is too difficult to disconnect the wire then release the wire from the two cable clamps (reference 1 image 17-22) and disconnect the wire unit in a later phase (step 6) when the Button Module is detached from the projector chassis.
7. Remove the nut (reference 3 image 17-22) from the circular connector (reference 4 image 17-22) . Use a 15 mm nut driver.

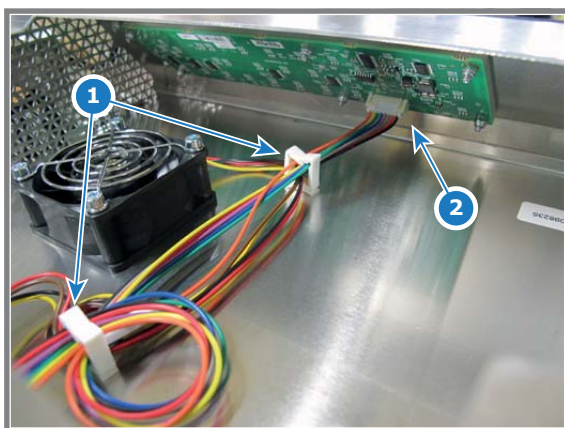
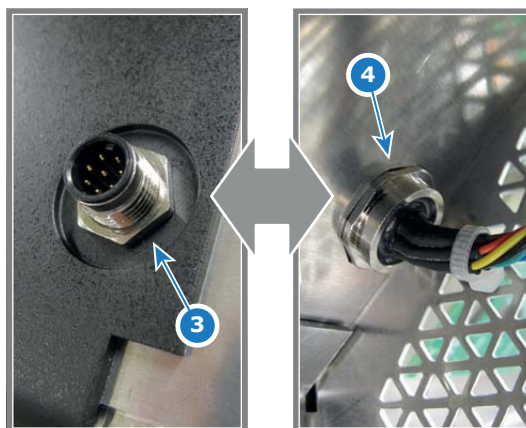


Image 17-22



8. Replace the Button Module. Use a 2.5 mm Allen wrench to loosen/fasten the four screws (reference 1, image 17-23).

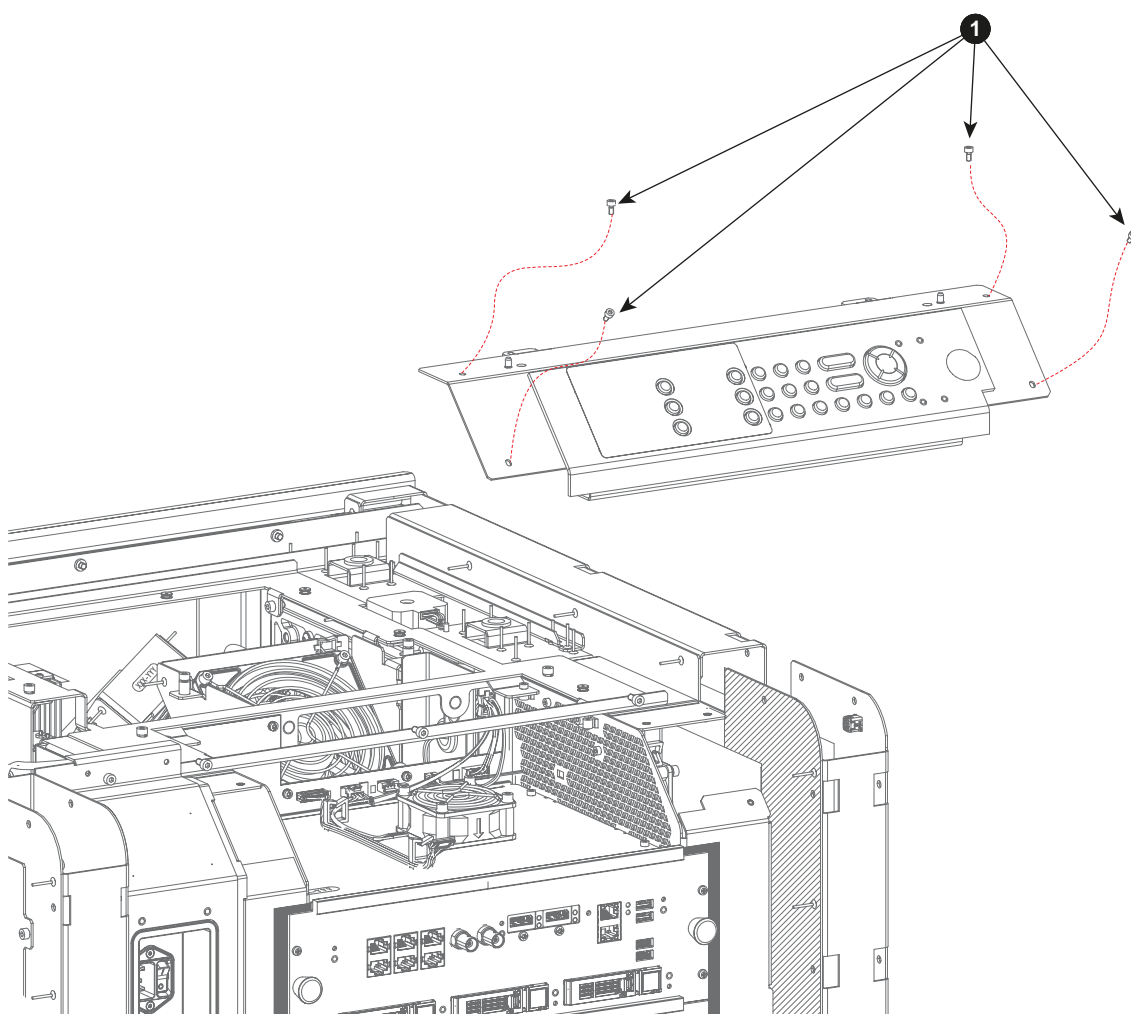


Image 17-23

9. Reconnect the wire (reference 2 image 17-22) with the Button Module and engage the wire into the two cable clamps (reference 1 image 17-22).
10. Install the circular connector (reference 4 image 17-22) and fasten the nut (reference 3 image 17-22).
11. Install the projector top frame and fasten the screws (reference image 17-21). Use a 3 mm Allen wrench.
Caution: Take care not to drop the screws inside the projector.
12. Install the LED rail on the top of the projector as illustrated. Use a 3 mm Allen wrench to fasten the screws.
13. Reconnect the LED PCB cable.
14. Install all projector covers.

17.15 Signal Backplane replacement process



The process described below is a high level process for the replacement of the Signal Backplane. Most stages refer to a detailed step-by-step procedure included in this document.



WARNING: Disconnect the power cord of the projector from the power net and wait a few minutes (to discharge the capacitors) prior to starting this procedure.

Replacement process

1. Switch off the projector and disconnect the power cord of the projector from the power net. Wait a few minutes (to discharge the capacitors) before starting the next stage of this process.
2. Remove the large dust filter from the projector front. See "Dust Filters and Filter Foams", page 269.
3. Remove the projector top cover. See "Removal of the top cover", page 276.
4. Remove the top cover plate. See "Removal of the top cover plate of the Light Processor compartment", page 280.
5. Remove the Card Cage cover. See "Removal of the Card Cage", page 249.
6. Disconnect the Card Cage wires. See "Disconnecting the Card Cage wires", page 246.
7. Remove the Card Cage from the projector. See "Removal of the Card Cage", page 249.
8. Remove the Signal Backplane from the Card Cage. See "Removal of the Signal Backplane", page 252.
9. Install the new Signal Backplane into the Card Cage. See "Installing the Signal Backplane", page 255.
Note: Ensure to install the SIM card, containing the projector ID, from the old Signal Backplane into the new Signal Backplane.
10. Install the Card Cage into the projector. See "Installing the Card Cage", page 258.
11. Connect the Card Cage wires. See "Connecting the Card Cage wires", page 261.
12. Install the Card Cage cover. See "Installation of the Card Cage cover", page 265.
13. Install the top cover plate. See "Installation of the top cover plate of the Light Processor compartment", page 283.
14. Install the projector top cover. See "Installation of the top cover", page 287.
15. Install the large dust filter from the projector front. See "Dust Filters and Filter Foams", page 269.
16. Connect the power cord of the projector with the power net and switch on the projector.

17.16 Removal of the Card Cage cover

Necessary tools

3 mm Allen key.



This procedure assumes that the projector right side cover and top cover are already removed.

How to remove the Card Cage cover?

1. Loosen the 9 fixation screws, illustrated in image 17-24 of the Card Cage and Mains Input cover. Use a 3 mm Allen key.

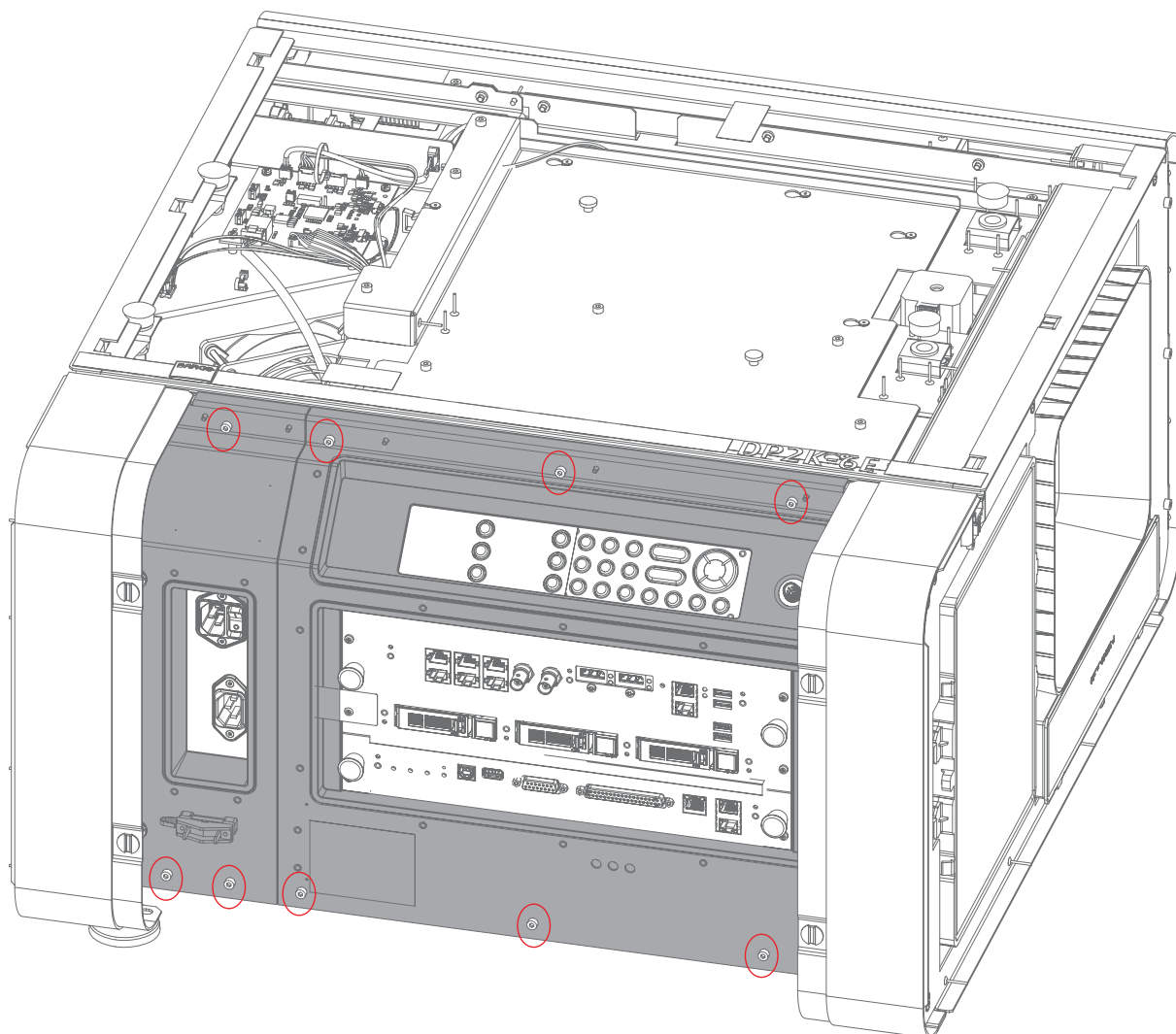


Image 17-24

2. Remove the Card Cage cover from the projector.

17.17 Disconnecting the Card Cage wires



This procedure assumes that the top cover, top cover plate, large dust filter, Light Processor top fan and all Card Cage boards are removed from the projector.

Disconnecting the Card Cage wires

1. Disconnect the wire of both SMPS fans (reference 1 & 2 image 17-25).

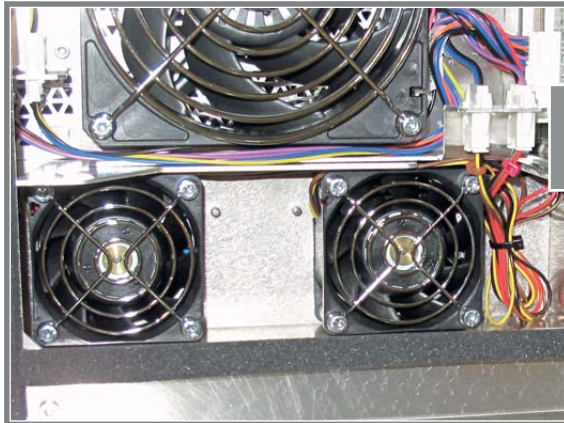
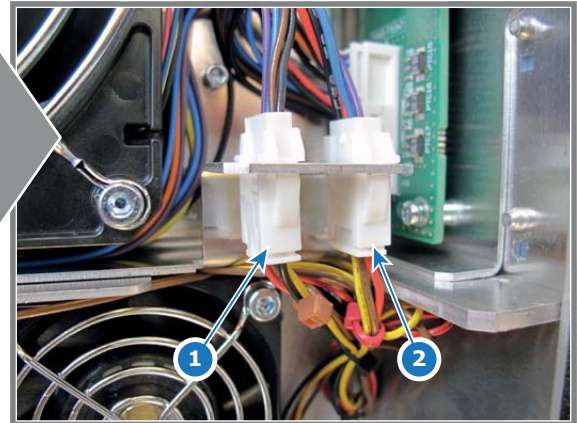


Image 17-25



2. Disconnect the 5 wires of the lens motors (reference 5, 6, 7, 8 & 9 image 17-26) from the sockets at the left side of the Lens Holder compartment.

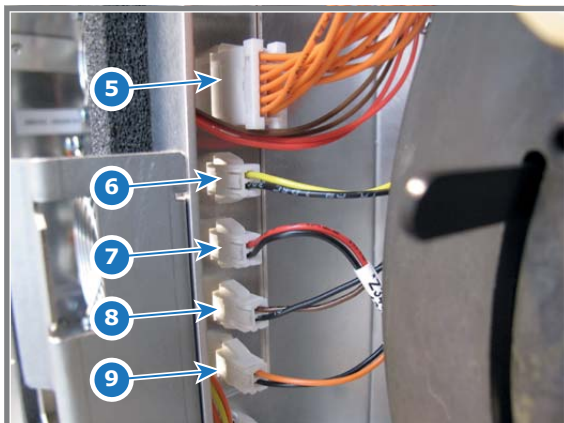


Image 17-26

3. Disconnect the big wire plug (reference 3 image 17-27) of the lens motors from the Signal Backplane and disengage the five wire sockets (reference 4 image 17-27) from the projector chassis as illustrated.

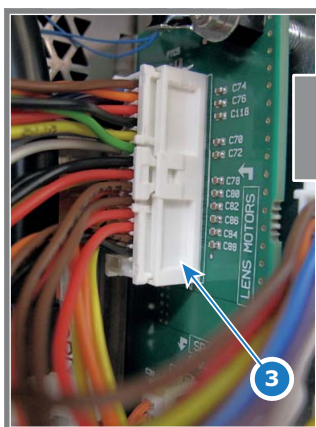
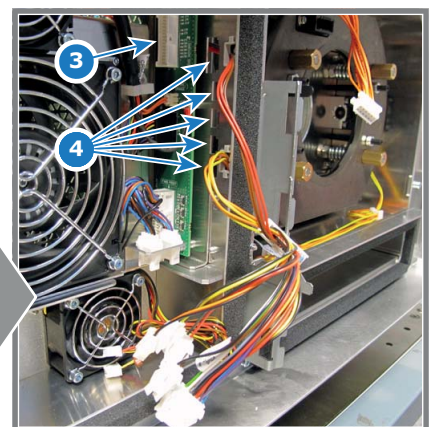
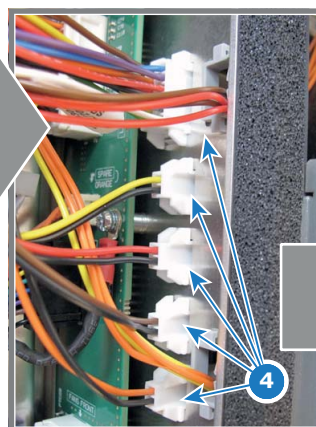


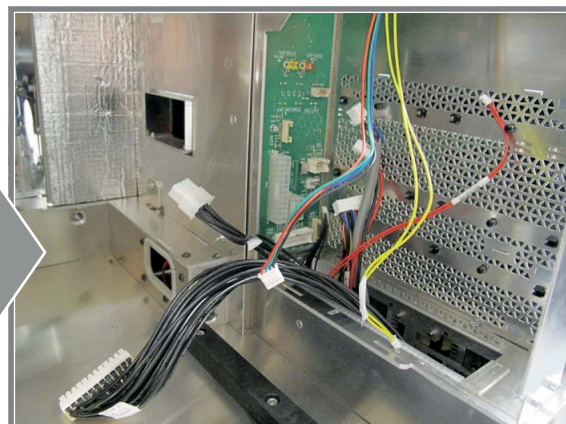
Image 17-27



4. Disconnect all seven wires from the left side of the Signal Backplane.



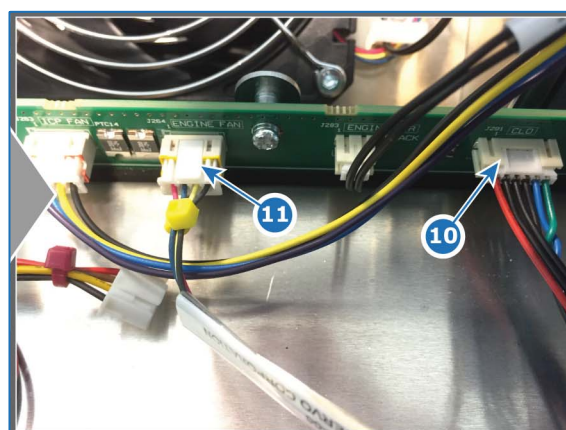
Image 17-28



5. Disconnect the CLO wire (reference 10) and the engine fan wire (reference 11 image 17-29) from the top of the Card Cage.



Image 17-29



6. Disconnect the nine RGB connectors (reference 3 image 17-30) from the Signal Distribution board. Push the little tab (reference 4 image 17-30) down with your fingernail and then pull the connector gently out of its socket. The connector should come out easily from its socket.

Caution: Always push-in the little tab of the connector to remove the connector from its socket. Neglecting this will result in irreversible damage of the socket.

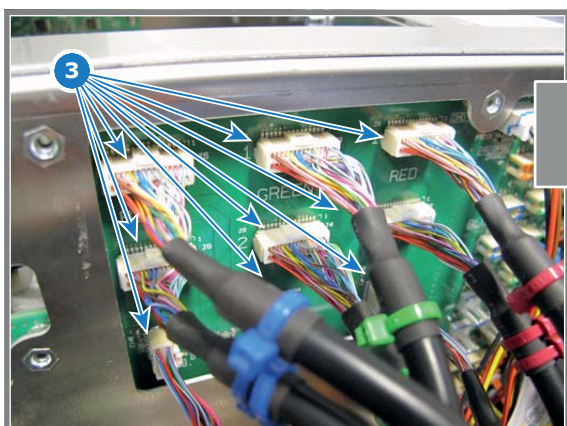
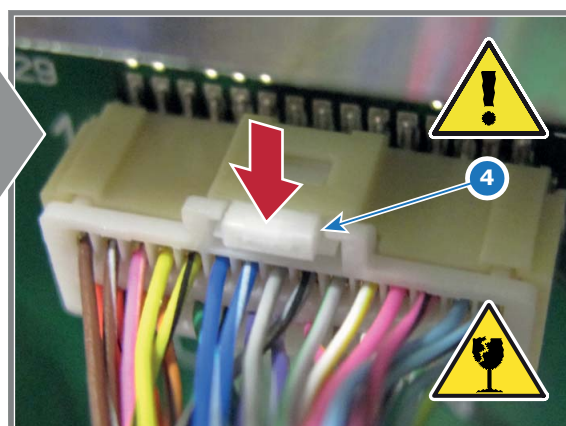


Image 17-30



7. Disconnect all other wires from the rear side of the Signal Backplane.

- Start with the three wires at the top (reference 1, 2 & 3),
- then the brown wire and the four orange wires in the middle (reference 4, 5, 6, 7 and 8),
- and finally the three remaining wires at the bottom (reference 9, 10 & 11).

17. Card Cage

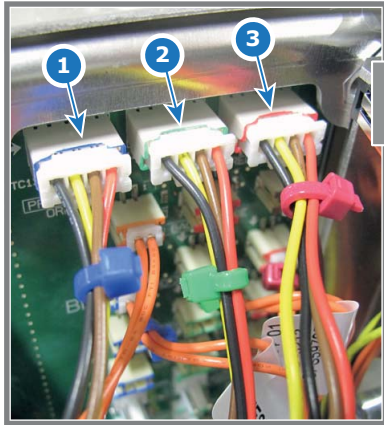
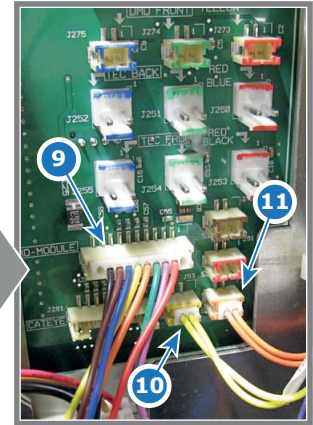
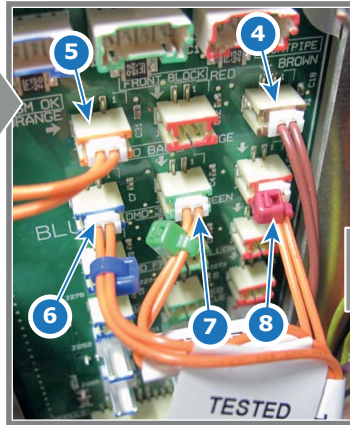


Image 17-31



17.18 Removal of the Card Cage



This procedure assumes that all wires of the Card Cage are disconnected. See procedure "Disconnecting the Card Cage wires", page 246.

Necessary tools

3 mm Allen wrench.

How to remove the Card Cage from the projector?

1. Remove the 4 screws at the rear and side of the projector, as illustrated in image 17-32.

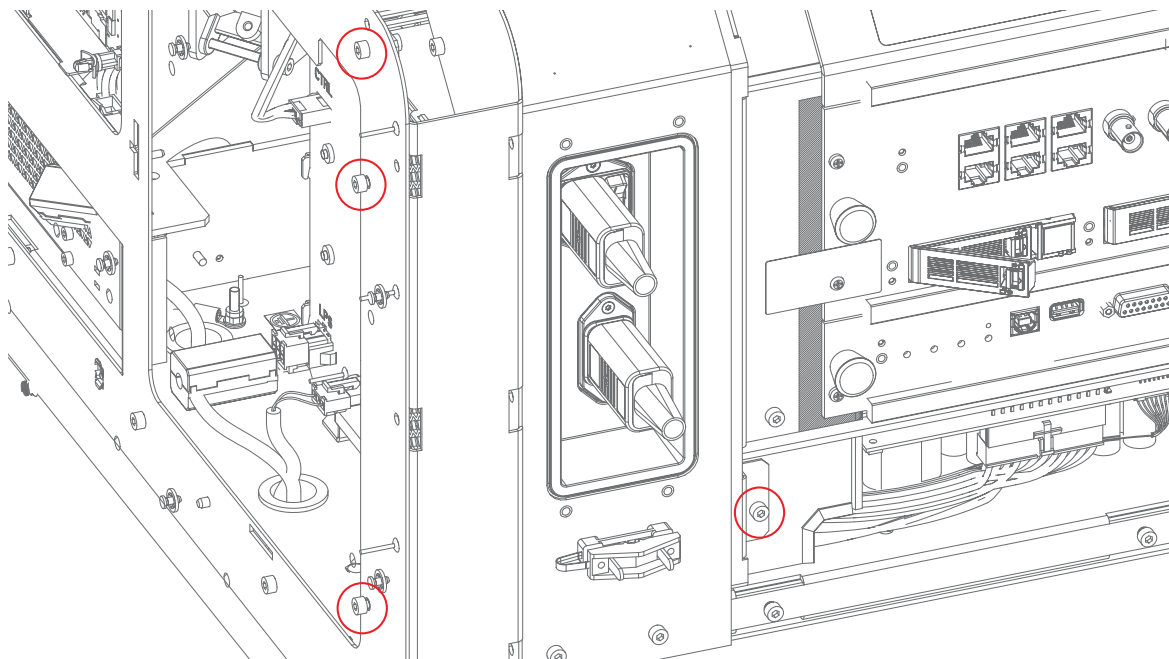


Image 17-32

2. Remove the LED railing. See service manual chapter "Replacement of the Status Light", page 267
3. Loosen the five fixation screws (reference 1 image 17-33) of the projector top frame. Use a 3 mm Allen wrench. Remove the top frame from the projector chassis.
Caution: Take care not to drop the screws inside the projector.

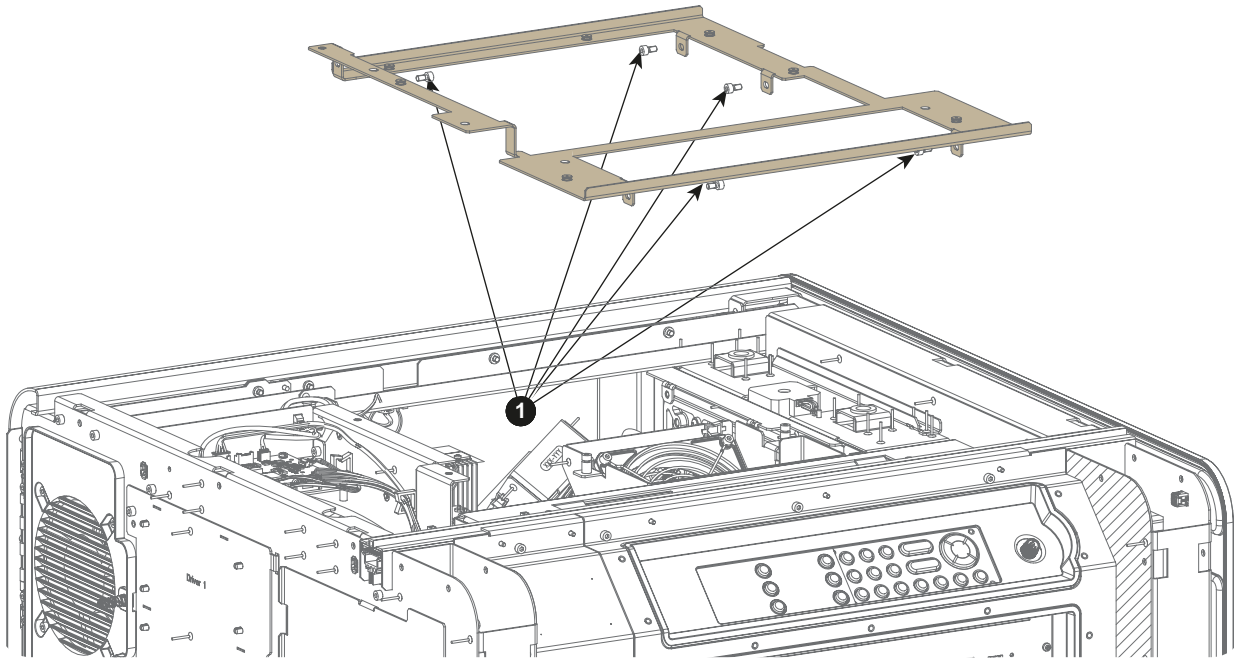


Image 17-33

4. Loosen the fixation screw at the front of the projector, next to the big dust filter (reference 1, image 17-34).

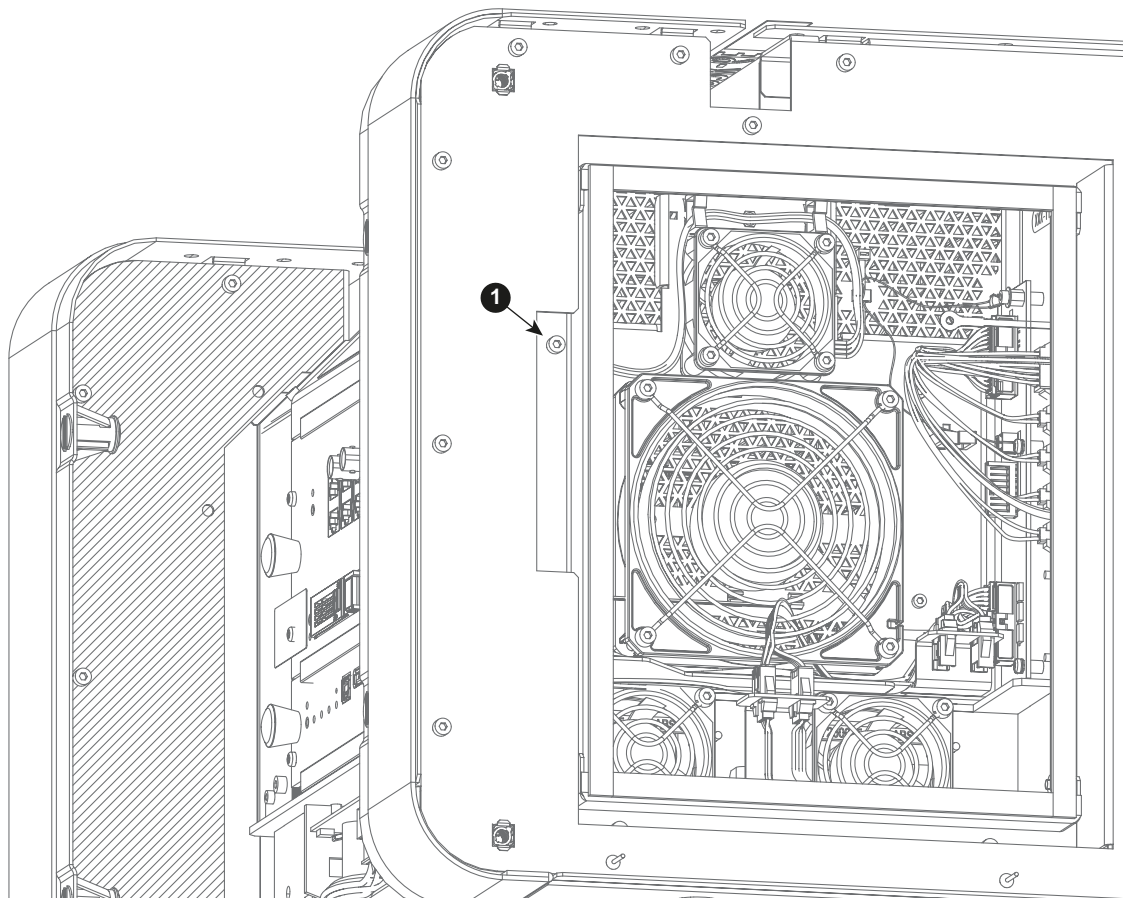


Image 17-34

5. Remove the Card Cage from the projector chassis. Do this by first pulling the Card Cage a few mm forward and then lifting the Card Cage out of its compartment.

Note: The rear bottom of the Card Cage is engaged into the projector chassis with three horizontal slots (reference A1 and A2, image 17-35). The front bottom of the Card Cage is engaged into the projector chassis with two vertical slots (reference B1 and B2, image 17-35).

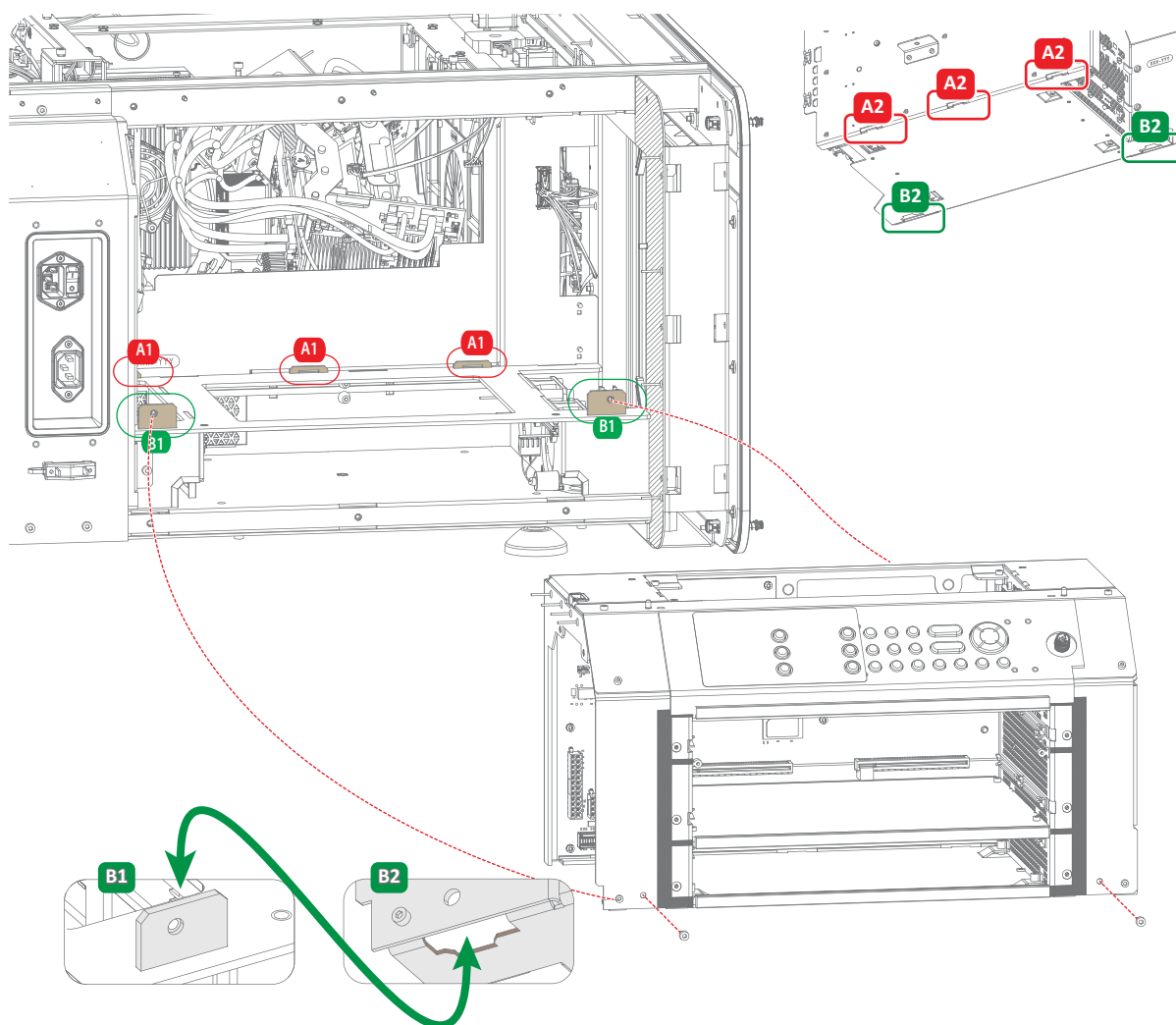


Image 17-35

Caution: The right side of the Card Cage contains two cable clamps (reference 1 image 17-36) which capture two wires from the Lens Holder. First remove the Card Cage a few centimeters and release the wires from the clamps prior to remove the Card Cage completely away from the projector chassis.

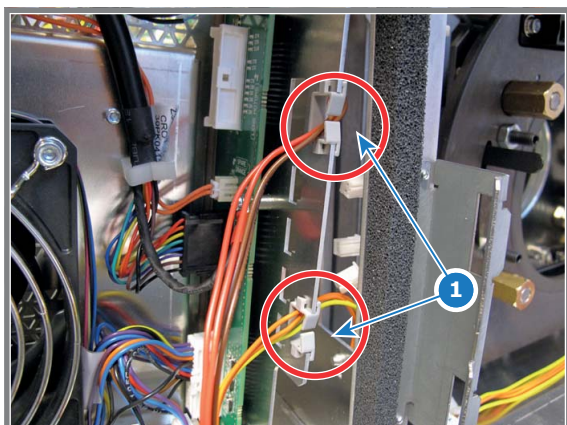


Image 17-36

17.19 Removal of the Signal Backplane



This procedure assumes that the Card Cage as a whole is removed from the projector chassis.

Necessary tools

- 2.5mm Allen wrench.
- TX10 Torx screwdriver.
- 5.5mm nut driver.

How to remove the Signal Backplane board from the Card Cage?

1. Disconnect the wire of the Button Module (reference 10 image 17-37), the wire of the ICP fan (reference 11 image 17-37), the wire of the Engine Fan (reference 12), the wire of the Engine Blower (reference 13) and the wire of the CLO (reference 14) from the Signal Backplane.
2. Remove the temperature sensor (reference 12) from the Signal Backplane. Use a 2.5mm Allen wrench to release the screw.

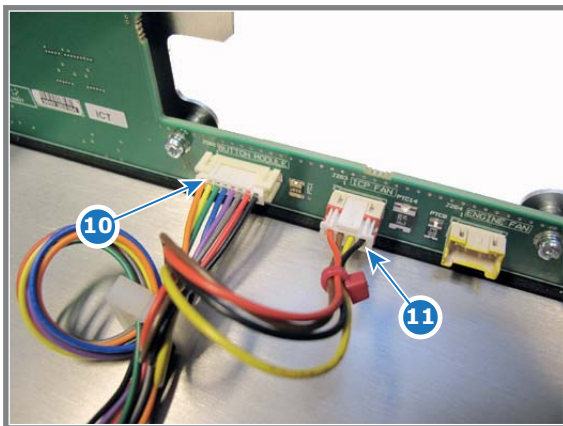
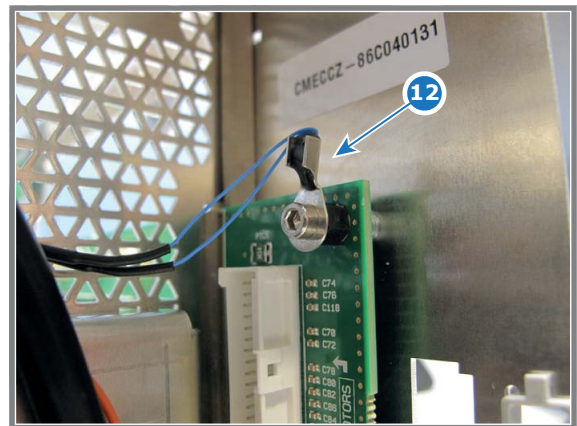


Image 17-37



3. Disconnect the touch panel wire (reference 13 image 17-38) and the orange wire (reference 14 image 17-38) from the Signal Backplane.
4. Disconnect the black PE wire (reference 15 image 17-38) from the Signal Backplane. Use a T10 Torx screw driver.
5. Disconnect the wire plug of the front fans (reference 16 image 17-38) from the Signal Backplane.

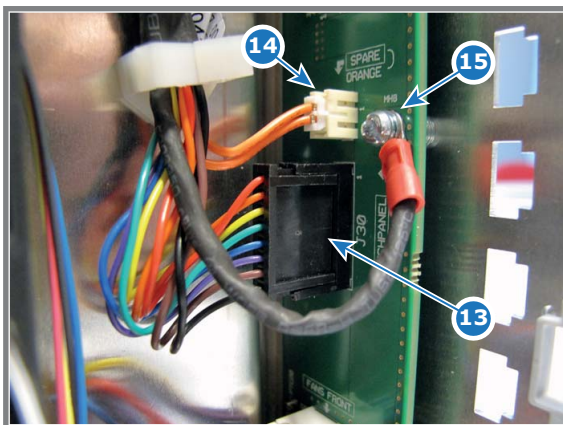
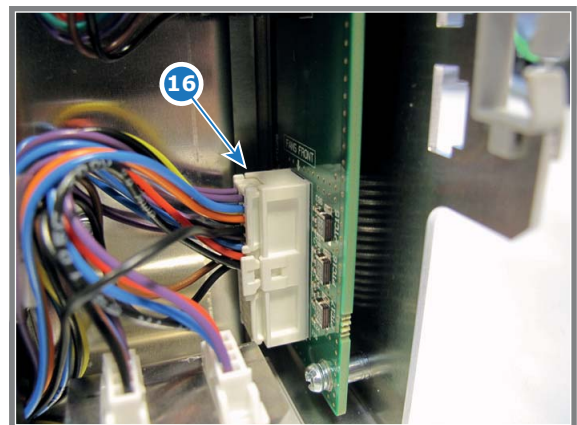


Image 17-38



6. Remove the rear sub-assembly from the Card Cage as illustrated. Use a 2.5mm Allen wrench to loosen all twelve screws (reference 1, 2, 3, 4 and 5 image 17-39) as indicated on the drawing.

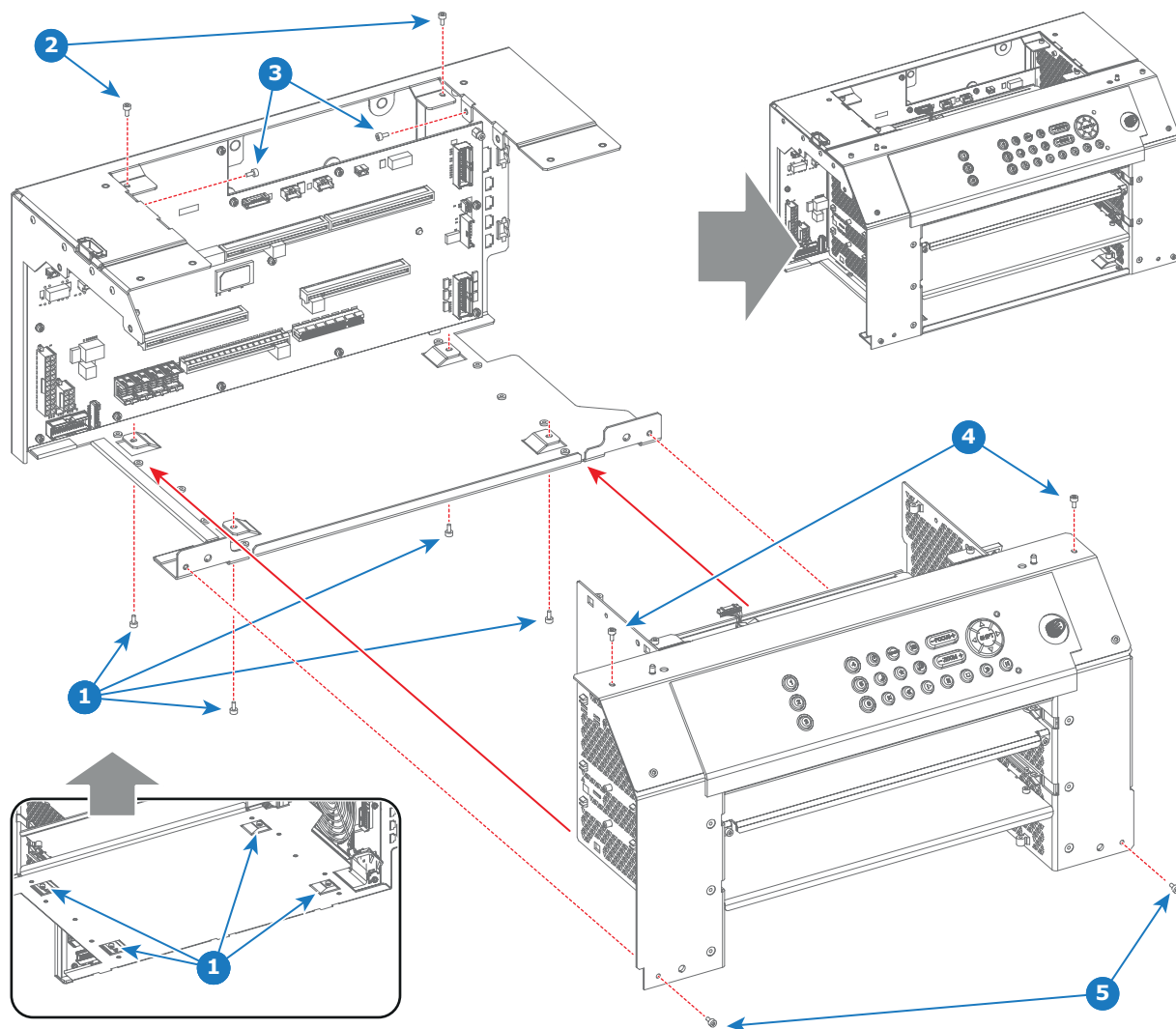


Image 17-39

7. Remove the Signal Backplane board from the sub-assembly. Use a T10 Torx driver to loosen the 14 screws (reference 6 image 17-40) and use a 5.5 mm nut driver to loosen the plastic spacer (reference 7 image 17-40)

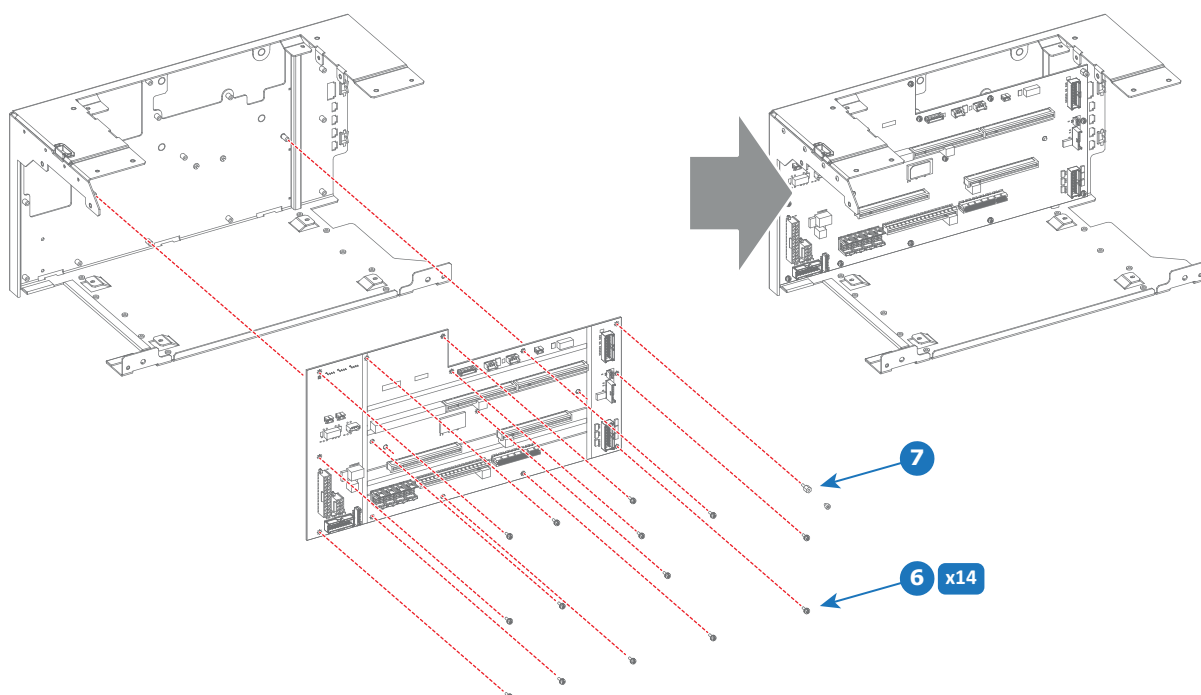


Image 17-40

17. Card Cage

8. Remove the SIM card (reference 8 image 17-41) from the Signal Backplane.

Note: The Projector ID is stored on the SIM card. For that, the SIM card has to be reused and inserted into the new Signal Backplane.

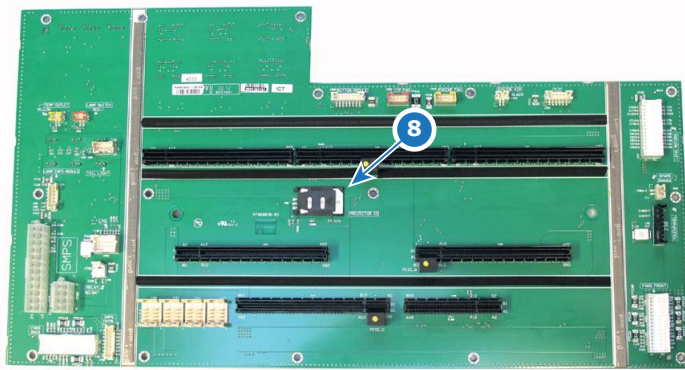
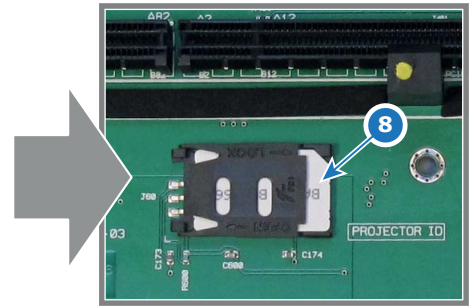


Image 17-41



17.20 Installing the Signal Backplane

Necessary tools

- 2.5mm Allen wrench.
- TX10 Torx screwdriver.
- 5.5mm nut driver.

How to install the Signal Backplane board into the Card Cage?

1. Install the SIM card (reference 8 image 17-42) in SIM card socket on the Signal Backplane.

Note: The Projector ID is stored on the SIM card. For that, the SIM card has to be reused and inserted into the new Signal Backplane.

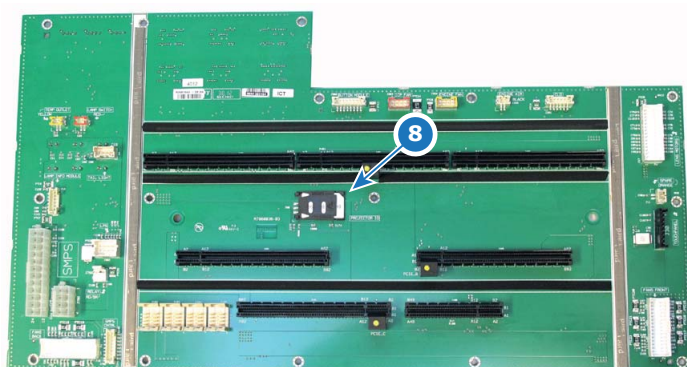
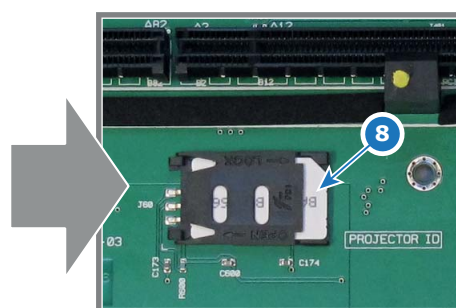


Image 17-42



2. Install the Signal Backplane board onto the sub-assembly. Use a T10 Torx driver to fasten the 14 screws (reference 6 image 17-43) and use a 5.5 mm nut driver to fasten the plastic spacer (reference 7 image 17-43)

Note: The plastic spacer is needed at the upper right corner of the Signal Backplane to mount the temperature sensor afterwards.

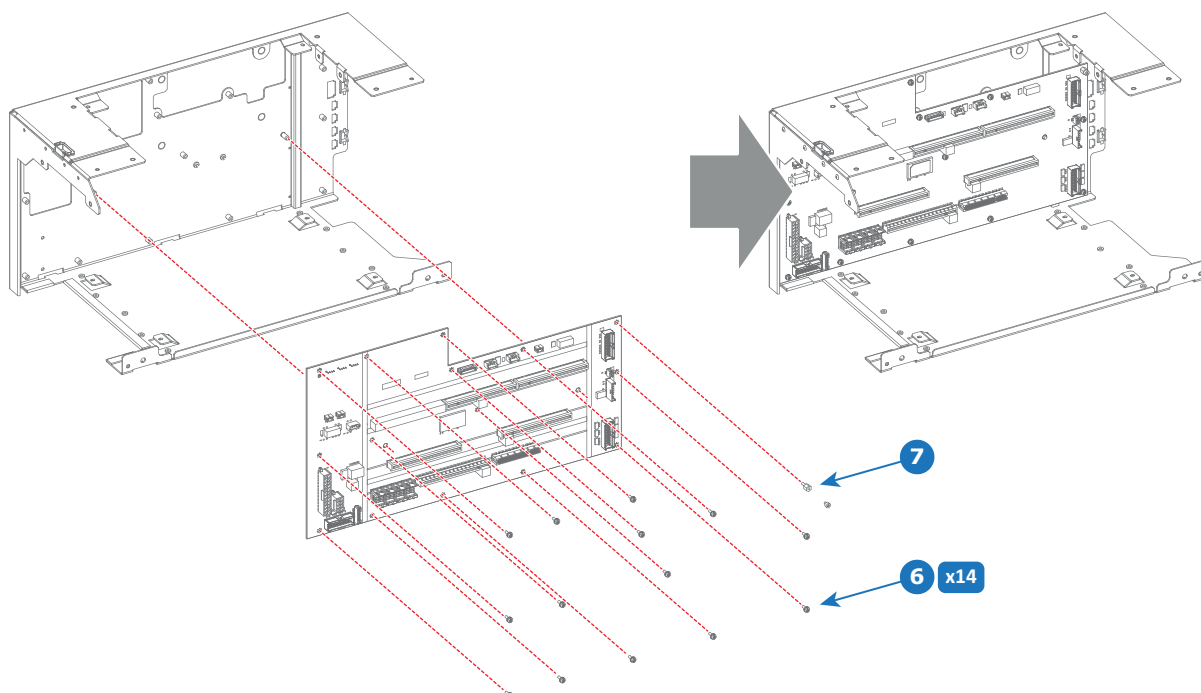


Image 17-43

3. Assemble the Card Cage as illustrated. Use a 2.5mm Allen wrench to fasten all twelve screws (reference 1, 2, 3, 4 and 5 image 17-44) as indicated on the drawing.

17. Card Cage

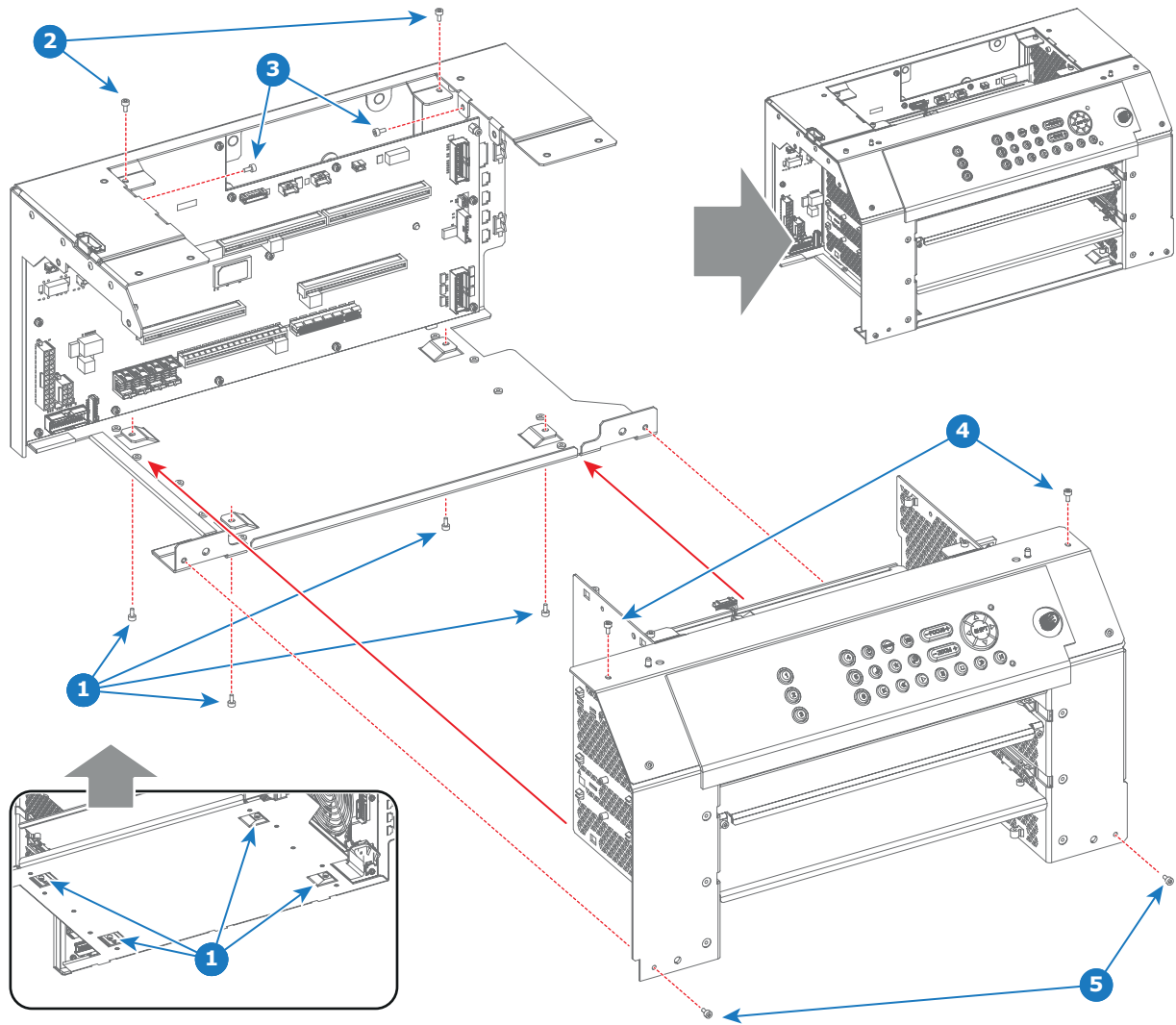


Image 17-44

4. Connect the touch panel wire (reference 13 image 17-45) and the orange wire (reference 14 image 17-45) with the Signal Backplane.
5. Connect the black PE wire (reference 15 image 17-45) with the Signal Backplane as illustrated. Use a T10 Torx screw driver.
6. Connect the wire plug of the front fans (reference 16 image 17-45) with the Signal Backplane.

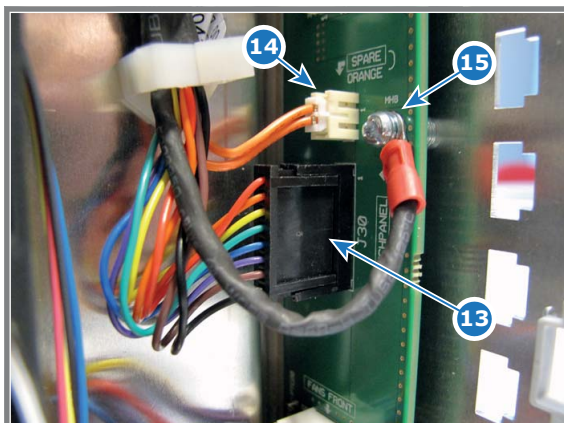
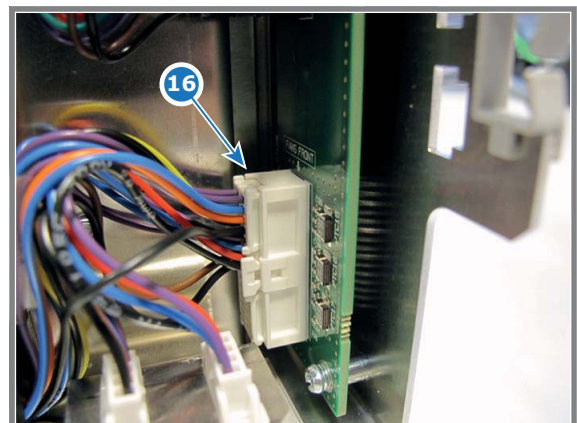


Image 17-45



7. Connect the wire of the Button Module (reference 10 image 17-46) and the wire of the ICP fan (reference 11 image 17-46) with the Signal Backplane.
8. Install the temperature sensor (reference 12 image 17-46) onto the plastic spacer at the upper right corner of the Signal Backplane. Use a 2.5mm Allen wrench to fasten the screw.

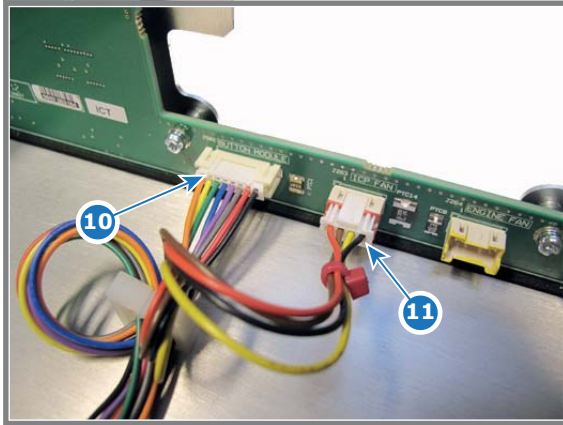
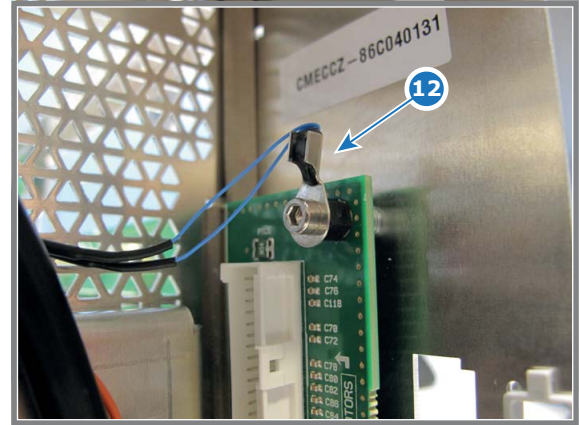


Image 17-46



17.21 Installing the Card Cage

Necessary tools

3mm Allen wrench.

How to install the Card Cage into the projector?

1. The right side of the Card Cage contains two cable clamps (reference 1 image 17-47) which must capture the two wires from the Lens Holder. Bring the Card Cage near by its final position on the projector chassis and guide the orange wire through the upper cable clamp and the yellow wire through the lower cable clamp.

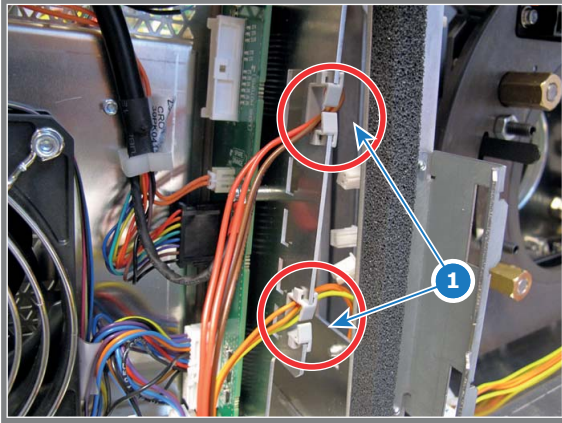


Image 17-47

2. Place the Card Cage in its final position on the projector chassis. Approach the final location from above, leave a few mm between the rear side of the Card Cage and the projector chassis, lower the Card Cage completely, ensure that both front slots (B1) are engaged. Then push the Card Cage with its rear side against the projector chassis to engage the three slots at the bottom rear (A1).

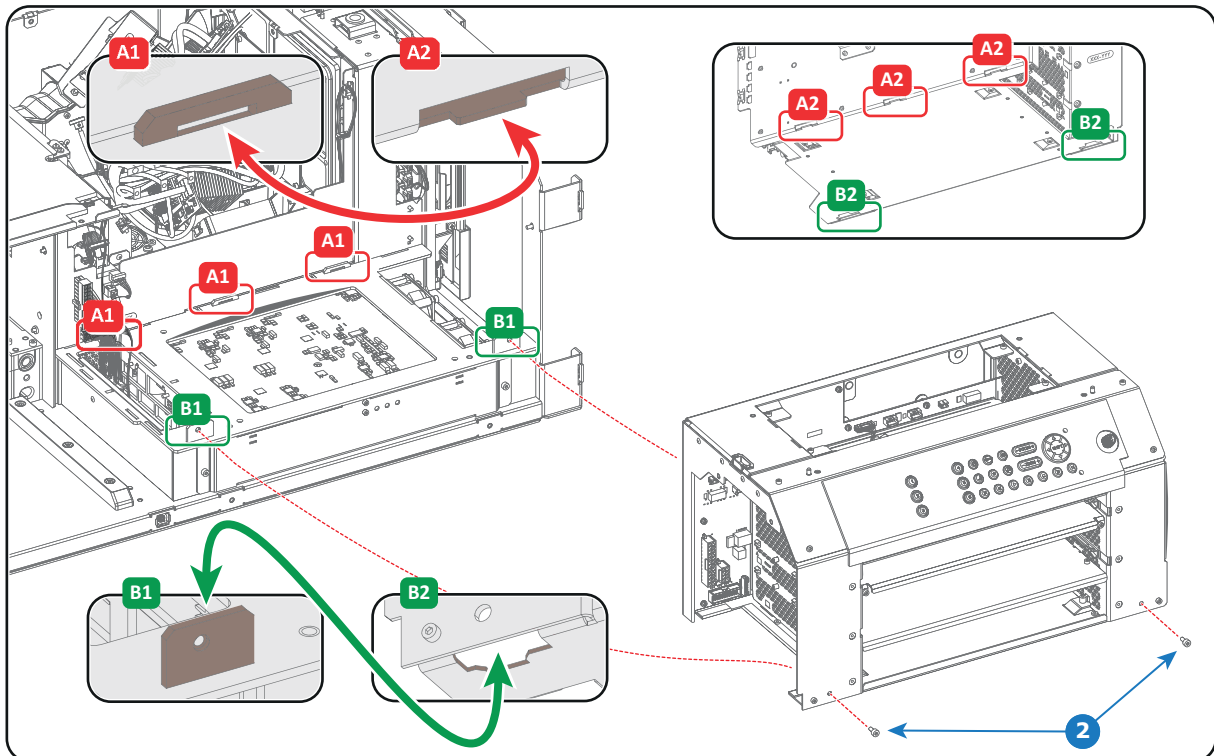


Image 17-48

Note: The rear bottom of the Card Cage is engaged into the projector chassis with three horizontal slots (reference A1 and A2 image 17-48). The front bottom of the Card Cage is engaged into the projector chassis with two vertical slots (reference B1 and B2 image 17-48).

3. Secure the Card Cage with two screws at the base of the Card Cage (reference 2 image 17-48). Use 3mm Allen wrench.
4. Install the Card Cage and Mains Input covers to the chassis. Use a 3mm Allen key to fasten the screws (reference 1 and 2, image 17-49).

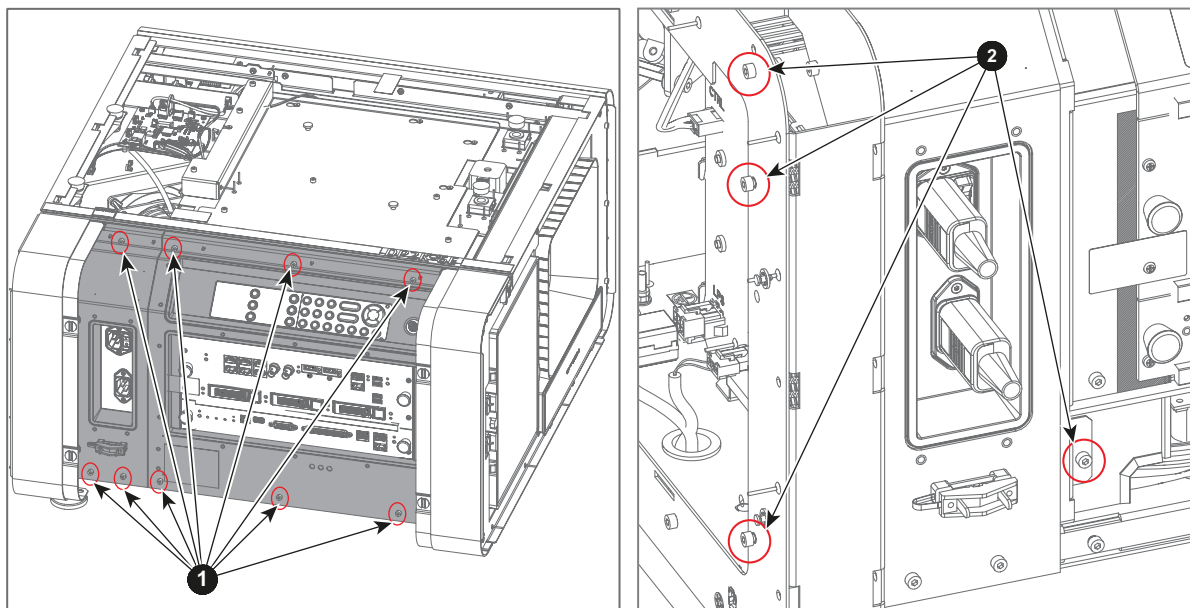


Image 17-49

5. Install the fixation screw at the front of the projector (reference 1, image 17-50).

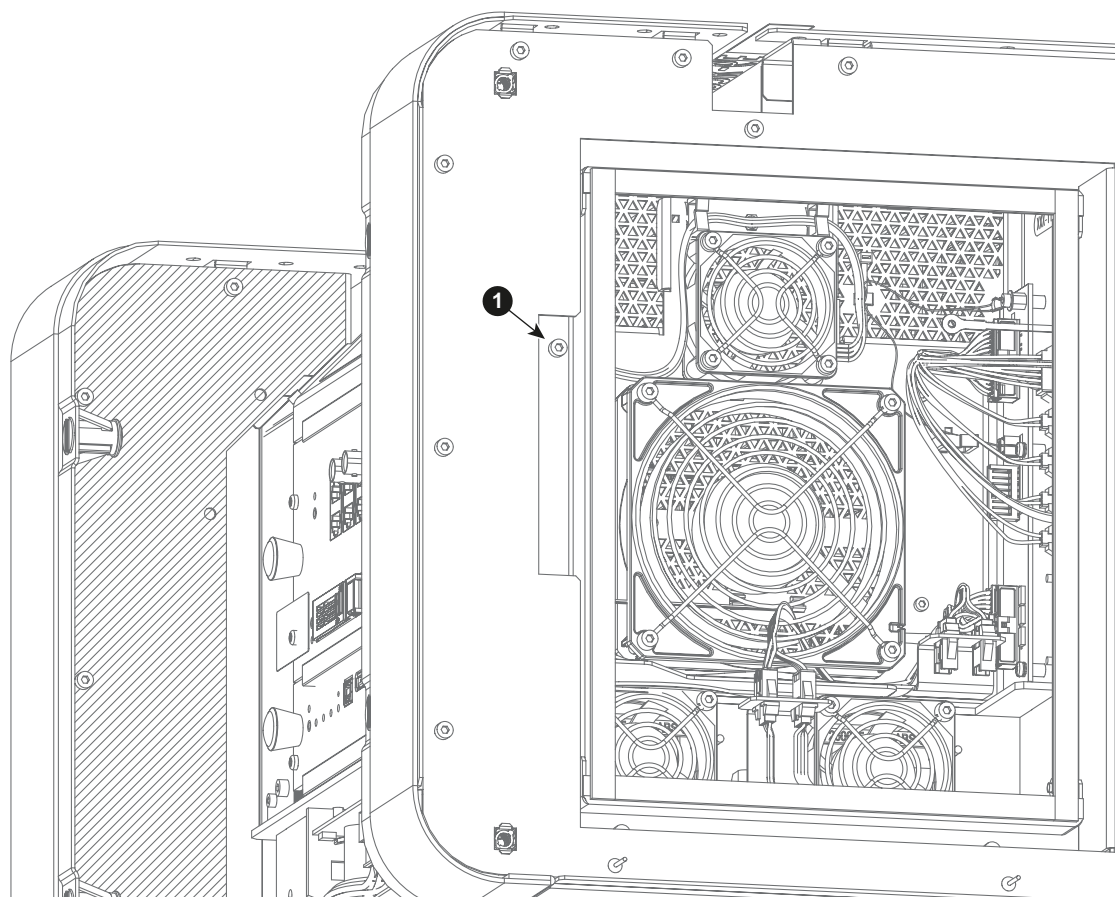


Image 17-50

6. Place the top frame in its position on top of the projector and install the five fastening screws. Use a 3mm Allen key.
Caution: Take care not to drop the screws inside the projector.
7. Install the LED rail on the top of the projector. Use a 3mm Allen wrench to fasten the screws.
8. Reconnect the LED bar connector (for details see procedure "Replacement of the Status Light", page 267).



After the Card Cage is installed the electrical connections between Card Cage and other projector components has to be established. See procedure "Connecting the Card Cage wires", page 261.

17.22 Connecting the Card Cage wires

Connecting the Card Cage wires

1. Connect the three wires (reference 9, 10 and 11 image 17-51) with the rear-base side of the Signal Backplane.
 - Reference 11 - two pins plug with orange wires from security switch.
 - Reference 10 - two pins plug with yellow wires from security switch.
 - Reference 9 - ten pins plug with 8 wires from 3D-module.
2. Connect the four orange wires of the Light Processor and the brown wire with the Signal Distribution board as illustrated in image 17-51.
 - Reference 8 - two pins plug with orange wires and red cable tie from temperature sensor red channel.
 - Reference 7 - two pins plug with orange wires and green cable tie from temperature sensor green channel.
 - Reference 6 - two pins plug with orange wires and blue cable tie from temperature sensor blue channel.
 - Reference 5 - two pins plug with orange wires from Prism Sensor.
 - Reference 4 - two pins plug with brown wires from Temperature Sensor Light Pipe.
3. Connect the three wires (reference 1, 2 and 3 image 17-51) of the DMD fans with the Signal Backplane.
 - Reference 3 - four pins plug with red cable tie from fan DMD Red channel.
 - Reference 2 - four pins plug with green cable tie from fan DMD Green channel.
 - Reference 1 - four pins plug with blue cable tie from fan DMD Blue channel.

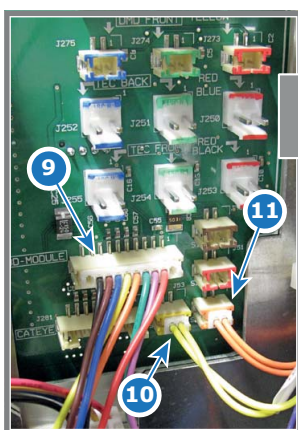
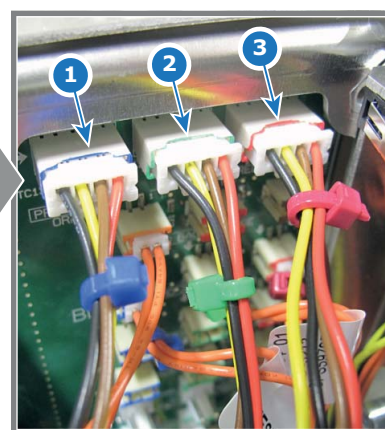
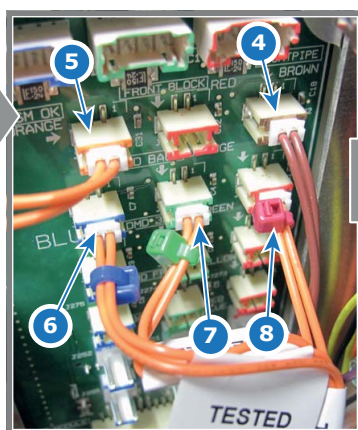


Image 17-51



4. Connect the nine RGB connectors (reference 1 to 9 of image 17-52) with the Signal Backplane as illustrated.
 - Reference 1 - small connector with blue cable tie.
 - Reference 2 - small connector with green cable tie.
 - Reference 3 - small connector with red cable tie.
 - Reference 4 - connector with two blue cable ties.
 - Reference 5 - connector with two green cable ties.
 - Reference 6 - connector with two red cable ties.
 - Reference 7 - connector with one blue cable tie.
 - Reference 8 - connector with one green cable tie.
 - Reference 9 - connector with one red cable tie.

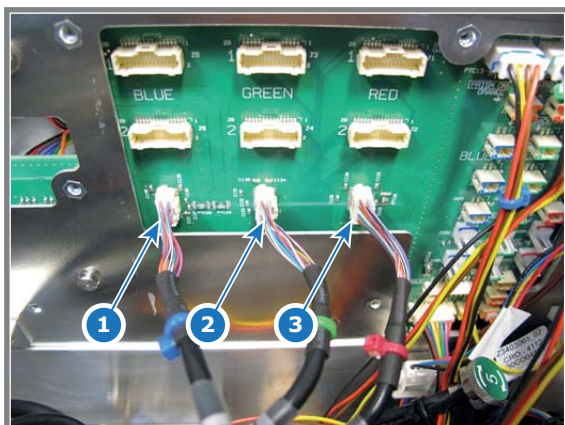
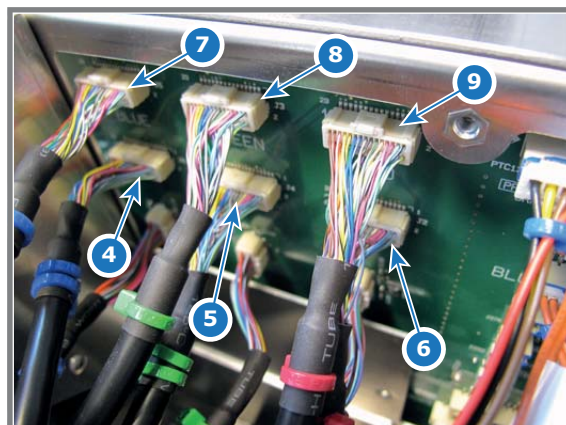


Image 17-52



17. Card Cage

5. Connect the CLO wire (reference 10) and engine fan wire (reference 11) with the Signal Backplane.

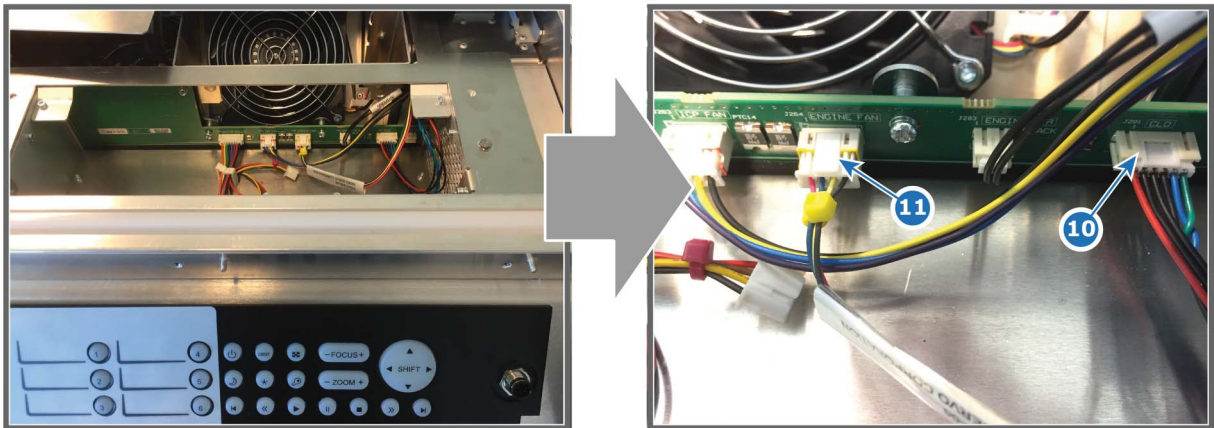


Image 17-53

6. Connect the four wires (reference 1, 2, 3 and 4 image 17-54) with Signal Backplane at the lower left side of the Card Cage as illustrated:
 - Reference 1 - SMPS CTRL plug (10 pins, black wires)
 - Reference 2 - FANS BACK plug (multi pins, different colored wires)
 - Reference 3 - Power plug RELAY (2 pins, red/black wire)
 - Reference 4 - ULCB plug (8 pins, different colored wires)
7. Connect the two SMPS plugs with black wires with the Signal Backplane. First insert the small plug (reference 5 image 17-54) then insert the larger plug (reference 6 image 17-54).

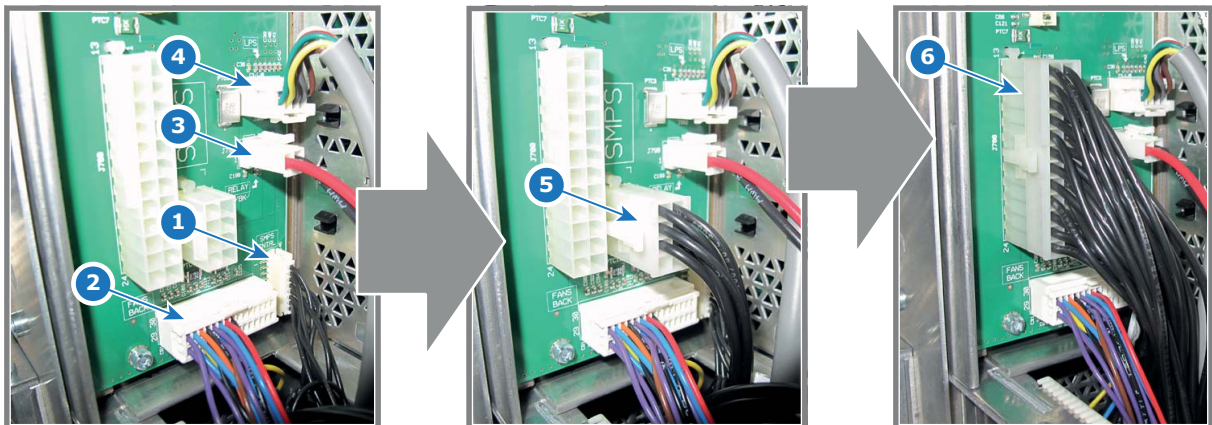


Image 17-54

8. Connect the three wires (reference 7, 8 and 9 image 17-54) with Signal Backplane at the upper left side of the Card Cage as illustrated:
 - Reference 7 - TAIL LIGHT plug (4 pins, different colored wires)
 - Reference 8 - LAMP SWITCH plug (2 pins, red wires)
 - Reference 9 - TEMP OUTLET plug (2 pins, yellow wires)

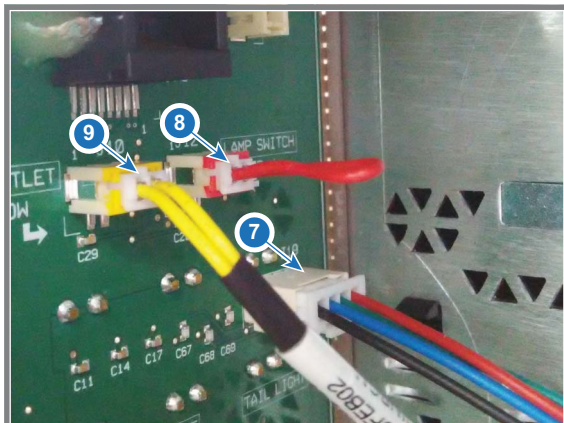


Image 17-55

9. Connect the big wire plug (reference 3 image 17-56) of the lens motors with the Signal Backplane.
10. Engage the five wire sockets (reference 5, 6, 7, 8 and 9 image 17-56) into the projector chassis as illustrated. The sockets must be ordered from top to bottom as follows:
 - Reference 5 - Lens wires (zoom & focus) (**orange wires**).
 - Reference 6 - Horizontal-Left end loop wires (**yellow/black**).
 - Reference 7 - Vertical-Top end loop wires (**red/black**).
 - Reference 8 - Vertical-Bottom end loop wires (**brown/black**).
 - Reference 9 - Horizontal-Right end loop wires (**orange/black**).

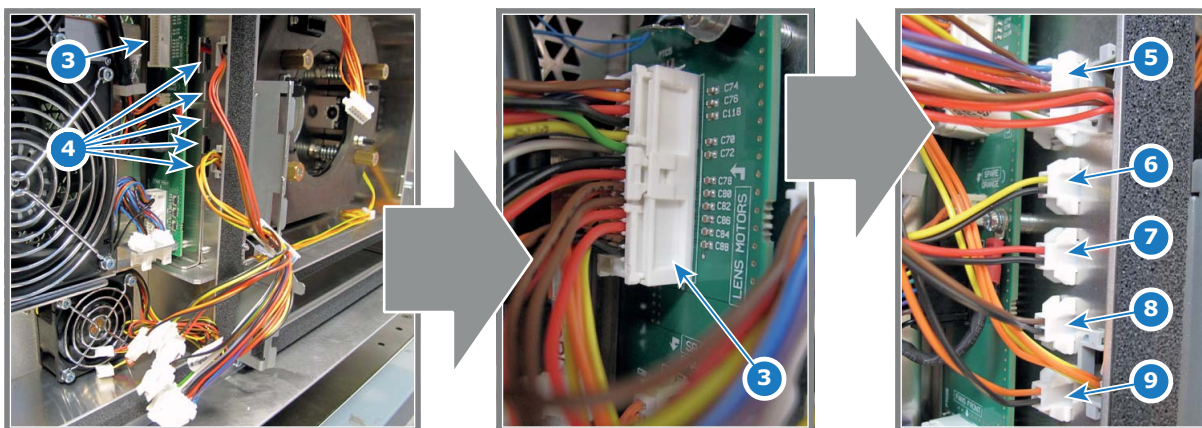


Image 17-56

11. Connect the 5 wires (reference 5, 6, 7, 8 and 9 image 17-57) with the sockets in the chassis at the left side from the Lens Holder as illustrated. The plugs must be ordered from top to bottom as follows:
 - Reference 5 - Lens wires (zoom & focus) (**orange wires**).
 - Reference 6 - Horizontal-Left end loop wires (**yellow/black**).
 - Reference 7 - Vertical-Top end loop wires (**red/black**).
 - Reference 8 - Vertical-Bottom end loop wires (**brown/black**).
 - Reference 9 - Horizontal-Right end loop wires (**orange/black**).

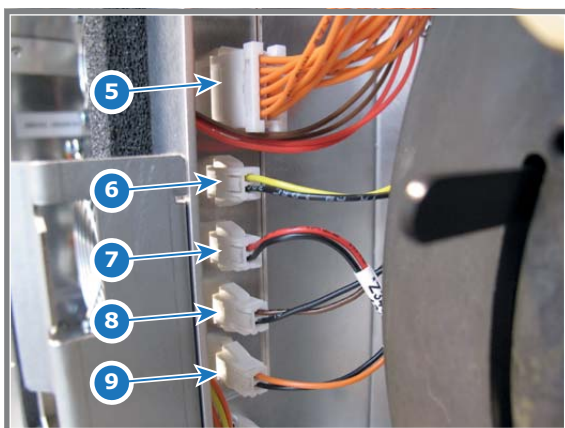


Image 17-57

12. Connect the wire of both SMPS fans (reference 1 & 2 image 17-58).

17. Card Cage

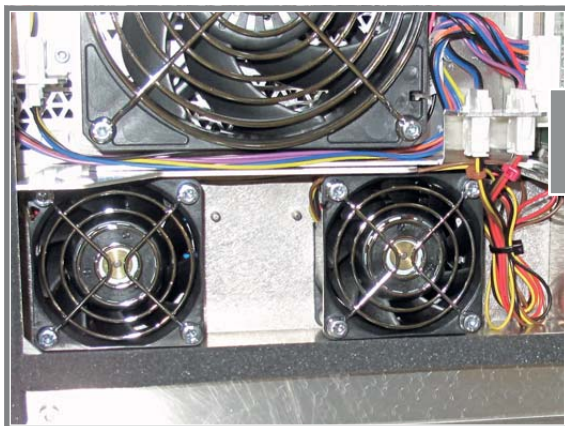
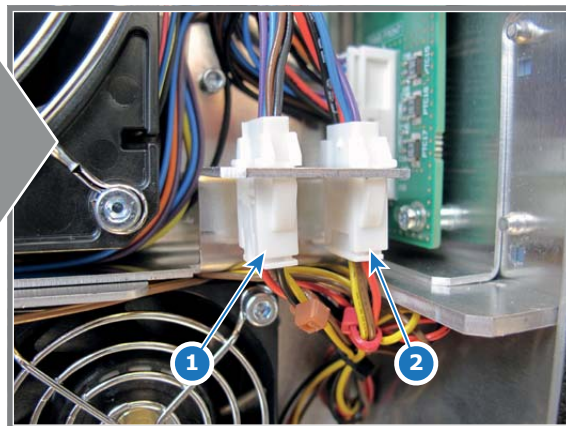


Image 17-58



Once that all wires are connected with the Signal Backplane, all components that were removed can be re-installed such as : Card Cage cover, Lamp Anode Fan, Lamp House and cover, top cover plate of the Light Processor compartment, large dust filter, and finally the projector top cover.

17.23 Installation of the Card Cage cover

Necessary tools

3 mm Allen key.

How to Install the Card Cage cover onto the projector?

1. Position the Card Cage cover as illustrated.
2. Fasten the six fixation screws (reference 1 image 17-59) of the Card Cage cover. Use a 3 mm Allen key.

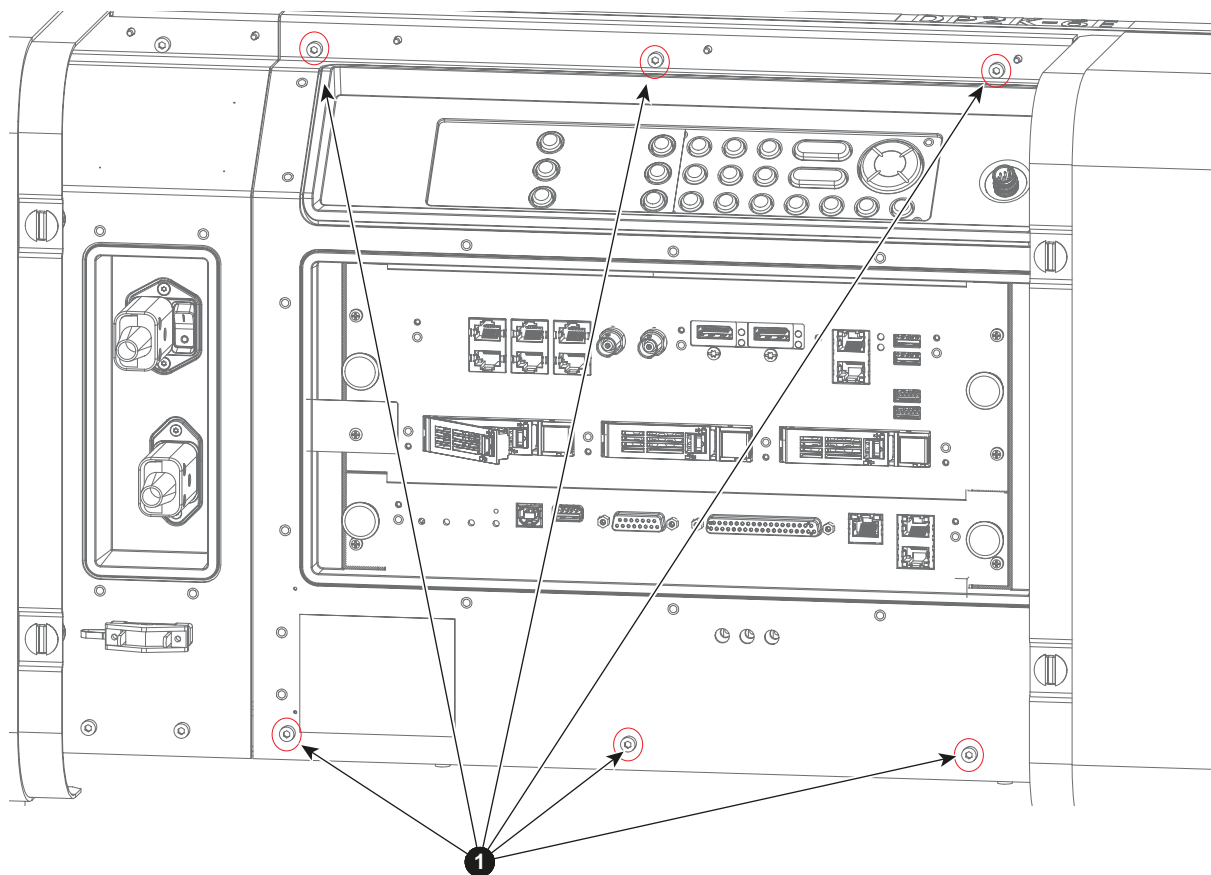


Image 17-59

17.24 Removal of the Card Cage partition plate

When removing the Card Cage partition plate?

The Card Cage partition plate is located inside the Card Cage just under the ICP board. This partition plate needs to be removed in case the projector has to be upgraded with the Barco ICMP module.



This procedure assumes that the ICP board and the board below the ICP board (IMB board, IMS board, HDSDI board or others) are removed from the Card Cage.

Necessary tools

2.5mm Allen wrench.

How to remove the partition plate from the Card Cage?

1. Release the two screws (reference 1 image 17-60) as illustrated. Use a 2.5mm Allen wrench.

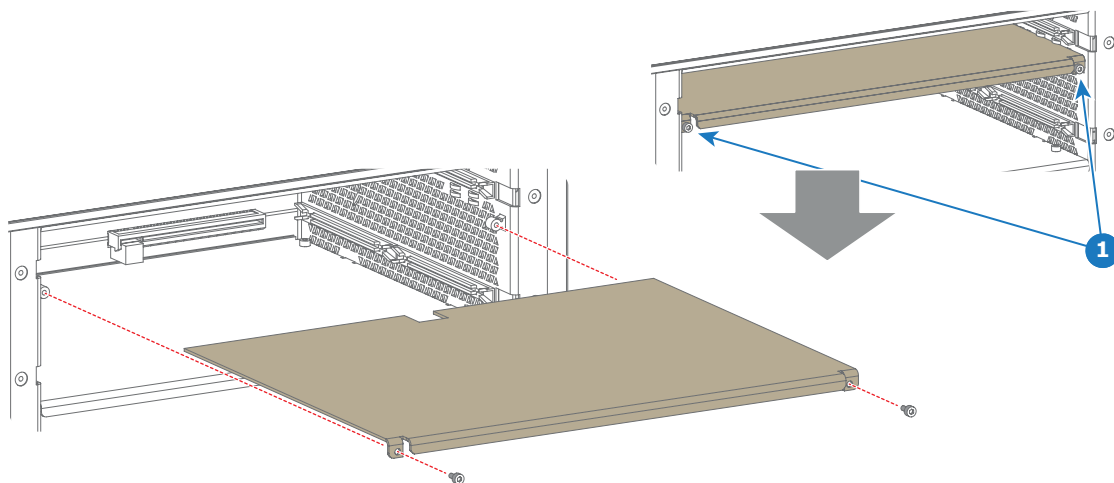


Image 17-60

2. Pull the partition plate out of the Card Cage.

17.25 Replacement of the Status Light



This procedure assumes that the projector top cover and rear cover are removed.

Necessary tools

2.5 mm Allen wrench.

How to replace the Status Light of the projector?

1. Slide the protective plastic insert (reference 1, image 17-61) out of the LED railing.
2. Loosen the two screws (reference 2, image 17-61) of the status light board. Use a 2.5 mm Allen wrench to release/fasten the screws.
Caution: Take care not to drop the screws or washers in the projector chassis.
3. Carefully lift the status light board a few centimeters until you can disconnect the wires from the status light board.
4. Replace the Status Light board.
5. Replace the protective plastic insert (reference 1, image 17-61).

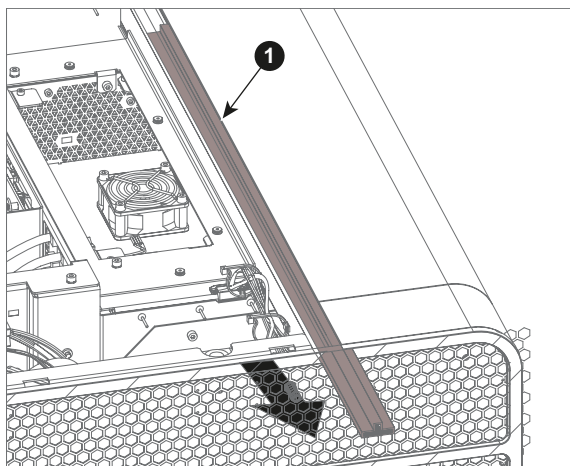
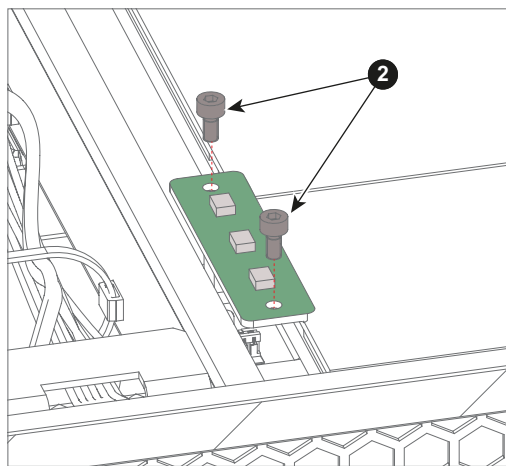


Image 17-61



18. DUST FILTERS AND FILTER FOAMS

About this chapter

This chapter describes how to check, clean, and replace the dust filters and filter foams of the projector.

Overview

- Check the dust filters and foams
- Vacuum cleaning of the dust filters and filter foams
- Washing and drying the dust filters

18.1 Check the dust filters and foams

How to check the dust filters and foams?

1. Remove the front cover. See "Removal of the front cover", page 274.
2. Click away out the big (1) & small (2) dust filter assembly from the front cover.
3. Remove the big (3) and small (4) foam filters from between the dust filter and front cover.
4. **Check** the "air in" side of the dust filters for **dust** and/or **grease**. Then check the foam filters for **dust** and/or **grease**.
In case one of the filters or foams contains dust but doesn't feel greasy then vacuum clean it. See procedure "Vacuum cleaning of the dust filters and filter foams", page 271.
In case one of the filters or foams is contaminated with grease, wash and dry it. See cleaning procedure "Washing and drying the dust filters", page 272.
Note: Grease on the filters and foams can build up after several months in an environment contaminated with greasy air. Note that areas where popcorn is consumed are subject to greasy air.
Tip: Take into account that the time needed to dry the dust filters and filter foams may be 24 hours or more. For that, it's recommended to have a second set of dust filters and filter foams which can be used while cleaning the first set.
5. Place the big (3) and small (4) dust foam onto the front cover.
6. Click the big (1) & small (2) dust filter assembly onto the front cover. Make sure you don't crush the foam while doing so.
Caution: UNDER NO CIRCUMSTANCES SHOULD WET FILTERS BE INSTALLED BACK INTO THE PROJECTOR. THIS CAN HAVE SERIOUS SAFETY CONSEQUENCES AS WELL AS JEOPARDIZE THE INTERNAL OPTICS OF THE SYSTEM.

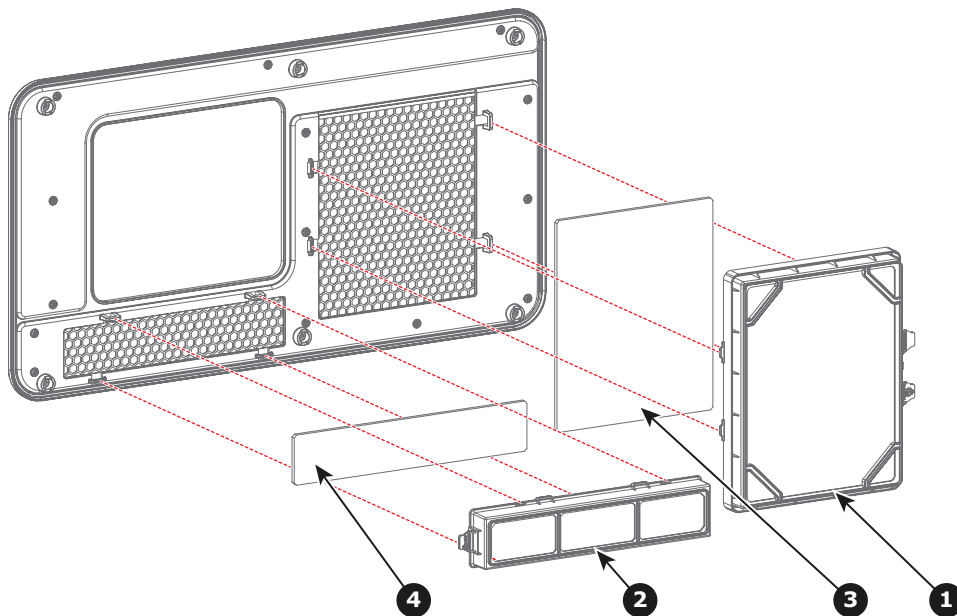


Image 18-1

7. Install the front cover. See "Removal of the front cover", page 274.



Both the dust filter and filter foam are cleanable. The cleaning methods for the filters and foams are identical. See the cleaning procedures for correct cleaning and drying instructions.

Even if only the filter or the foam needs to be cleaned, due to them being tied together to the front cover it's useful to clean both at the same time.

18.2 Vacuum cleaning of the dust filters and filter foams

When to vacuum the dust filters and foams?

The dust filters and foams of the projector should be checked every month. If any of the filters or foams are contaminated with dust then cleaning the filter and foam with a vacuum cleaner should be sufficient. In case the filter or foam feels greasy, they must be washed instead. See cleaning procedure "Washing and drying the dust filters", page 272.



Grease on the filters and foams can build up after several months in an environment contaminated with greasy air. Note that areas where popcorn is consumed are subject to greasy air.



This procedure assumes that the dust filters and foams are removed from the projector. For removal and installation of the filters and foams, see procedures "Check the dust filters and foams", page 270.

Necessary tools

Vacuum cleaner with soft brush suction nuzzle.

How to vacuum-clean the dust filter?

1. Carefully vacuum the air inlet side of the dust filter. Use a vacuum cleaner with a soft brush suction nuzzle. The air inlet side of the dust filter is the side which is surrounded with a glue edge.

Tip: *Lightly tap the filter on its dusty side to expel heavy dust contamination.*

Tip: *Compressed air is also permitted to clean the filters but take care not to damage them.*

Caution: *Do not damage the dust filter. Replace damaged dust filters immediately.*

How to vacuum-clean the filter foam?

1. Carefully vacuum the filter foam. Use a vacuum cleaner with a soft brush suction nuzzle.

Caution: *Do not damage the filter foam. Replace damaged foams immediately.*

18.3 Washing and drying the dust filters

About filter washing and drying

For environments where popcorn grease and such can contaminate the filters, Barco advises the client to purchase one extra set of filters to cover drying time, as well as taking following extra precautions and instructions pertaining to filter cleaning and drying.

Cleansing agent

To clean sticky, greasy dust filters we suggest usage of **Sodium carbonate** crystals (Na_2CO_3). Sodium carbonate (Often called **washing soda**, **soda crystals**, or **sal soda** in the detergent section of stores) is widely used to effectively remove oil, grease, alcohol stains ... The product itself is relatively safe, sodium carbonate is used in toothpastes and as a food additive (E500). Potential Hazards are described in the section "Hazards", page 300.



Image 18-2
Sodium carbonate crystals.



This cleaning procedure assumes that the filters are already removed from their slots.



Take into account that the time needed to dry the dust filters may be 24 hours or more. For that, it's recommended to have a second set of dust filters which can be used while cleaning the first set.

Necessary tools

- Bucket with hot water.
- Sodium carbonate, 30 gram (handful) per liter hot water.

How to wash and dry the dust filters?

1. Make a solution with a ratio of 30 gram (a handful) sodium carbonate to 1 liter **hot water**.
2. Soak the dust filters in the solution for **30 to 60 minutes**. The grease should be dissolved after 1 hour.
3. If the dust filter is still clogged repeat this procedure from step 1.
4. Rinse the dust filters with clean water to flush all grease residue away.
5. Shake out all excess liquid by repeatedly swinging the filter to-and-fro in a centrifugal action.
6. Then allow the filters to **dry thoroughly**. Typically this can take up to 24h and more, depending on the drying conditions.
Note: Drying time of the dust filters can be up to 24h or more. Drying time can be shorter when being done in a well-ventilated area.
Tip: To speed-up drying, allow the filter(s) to dry at 50°C max in a well ventilated room.



CAUTION: UNDER NO CIRCUMSTANCES SHOULD WET FILTERS BE INSTALLED BACK INTO THE PROJECTOR. THIS CAN HAVE SERIOUS SAFETY CONSEQUENCES AS WELL AS JEOPARDIZE THE INTERNAL OPTICS OF THE SYSTEM.



CAUTION: Do not install/use damaged dust filters. Replace damaged dust filters immediately with new dust filters of the same type. See <https://my.barco.com> for replacement part

19. REMOVAL AND INSTALLATION OF THE PROJECTOR COVERS

About this chapter

Most installation, maintenance and service procedures demand removing one or more of the projector covers to gain access to the parts to maintain or to service. To avoid redundancy, all procedures about cover removing or installing are grouped together in this chapter. The maintenance and servicing procedures also refer to this chapter if required. The procedures in this chapter describe, with detailed step by step actions and illustrations, how to remove or install the projector covers. Note that the covers may only be removed by qualified service personnel.



WARNING: All procedures described in this chapter may only be performed by **TRAINED PROJECTIONISTS** or qualified **SERVICE PERSONNEL**.



WARNING: Always switch off the projector and unplug the power cord before removing one of the covers, unless otherwise stated.

Overview

- Removal of the front cover
- Removal of the rear cover
- Removal of the top cover
- Removal of the left side cover
- Removal of the right side cover
- Removal of the top cover plate of the Light Processor compartment
- Removal of the side cover plate of the Light Processor compartment
- Installation of the side cover plate of the Light Processor compartment
- Installation of the top cover plate of the Light Processor compartment
- Installation of the right side cover
- Installation of the left side cover
- Installation of the top cover
- Installation of the rear cover
- Installation of the front cover

19.1 Removal of the front cover

Necessary tools

7 mm flat screwdriver

How to remove the front cover?

1. Unscrew the six captive screws (reference 1, image 19-1) from the front cover. Use a 7 mm flat screwdriver.

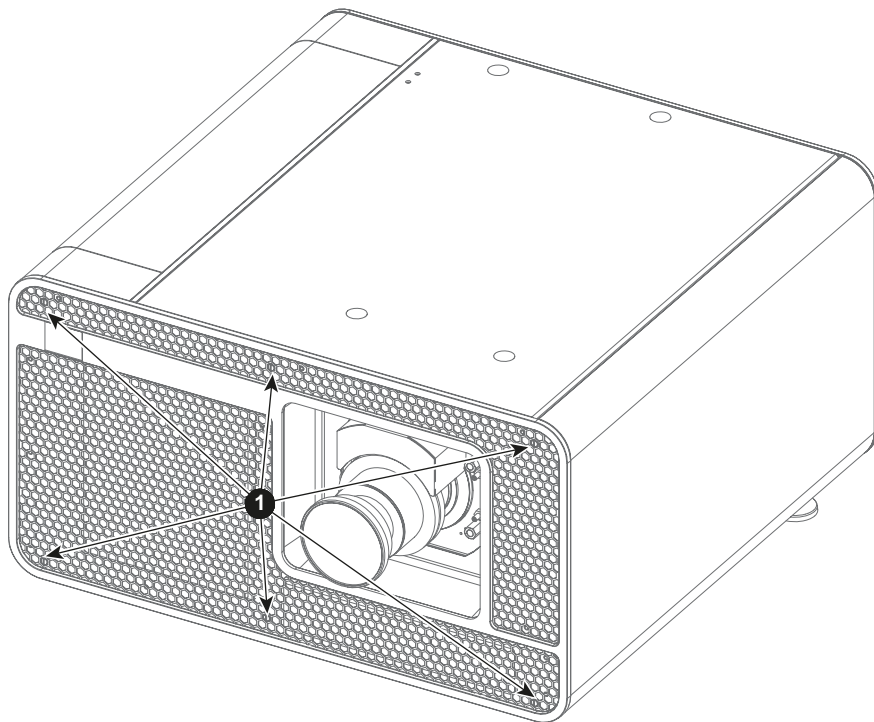


Image 19-1

2. Remove the front cover.

19.2 Removal of the rear cover



WARNING: Switch off the projector prior to start with this procedure, unless otherwise specified in the procedure.

Necessary tools

7 mm flat screwdriver.

How to remove the rear cover?

1. Loosen the five captive screws (reference 1image 19-2) of the rear cover using a 7 mm flat screwdriver.

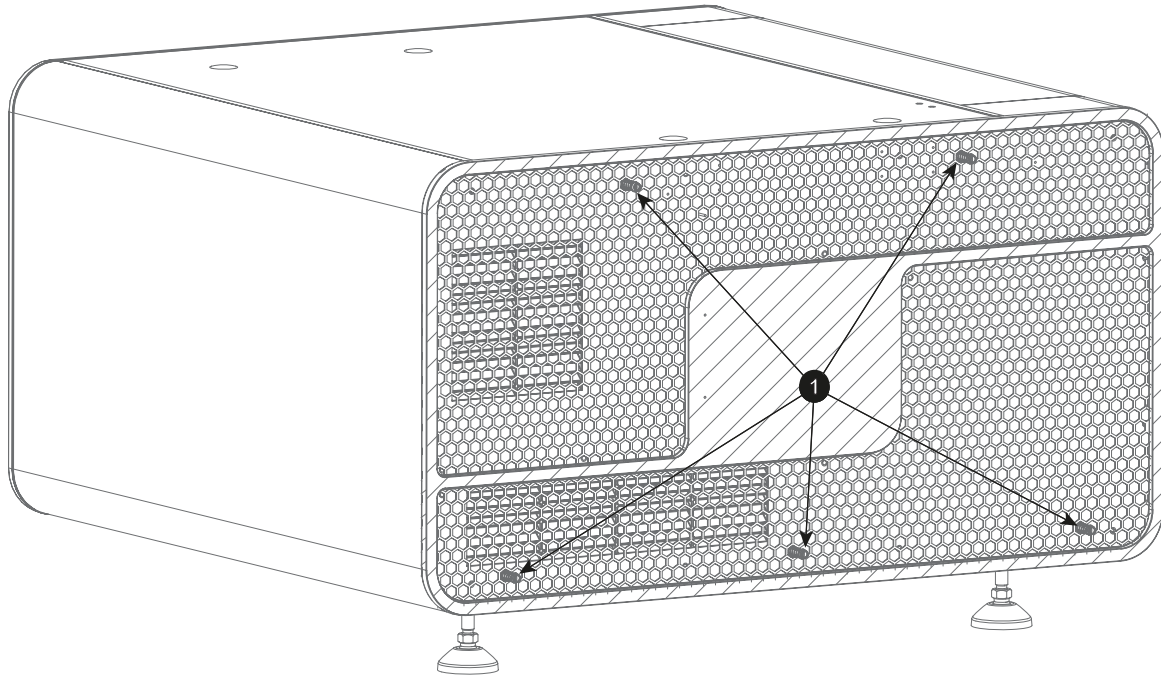


Image 19-2

2. Remove the rear cover from the projector.

19.3 Removal of the top cover



WARNING: Switch off the projector prior to start with this procedure, unless otherwise specified in the procedure.



To remove the top cover from the projector the front and back covers must be first removed. This procedure assumes that the front and back covers are already removed.

Necessary tools

3 mm Allen key.

How to remove the top cover?

1. Loosen the three screws at the front and the three screws at the back (reference 1, image 19-3) using a 3 mm Allen key.

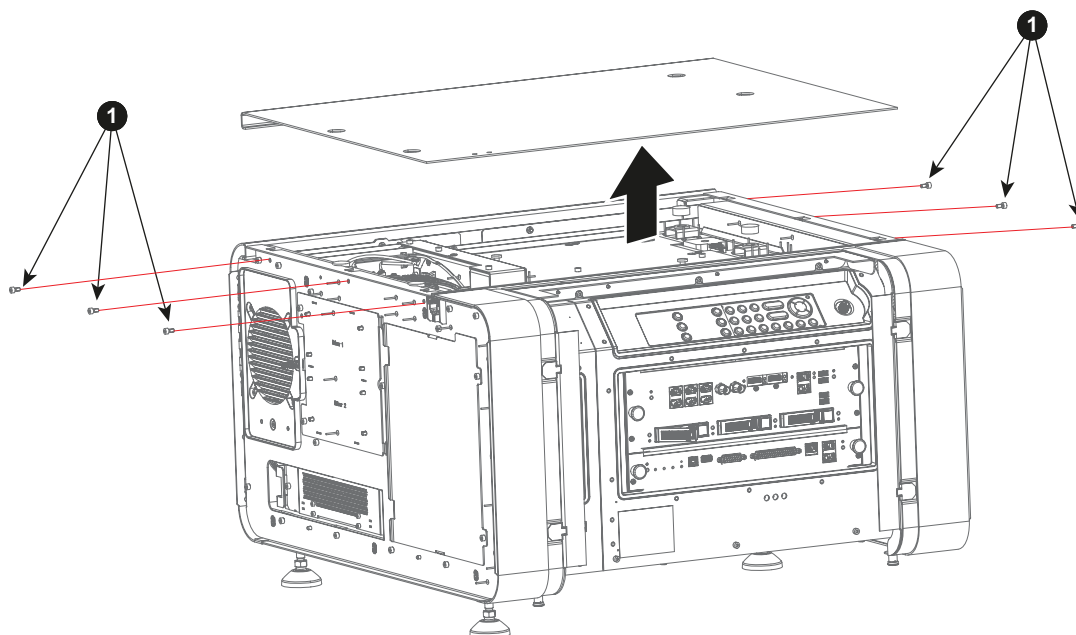


Image 19-3

2. Remove the top cover from the projector.

19.4 Removal of the left side cover



WARNING: Switch off the projector prior to starting with this procedure, unless otherwise specified in the procedure.



The back and front cover must be removed before the left side cover can be removed. This procedure assumes that the back and front cover are already removed.

Necessary tools

3 mm Allen Key (Hex key)

How to remove the left side cover?

1. Loosen and remove the three screws at front of the projector (reference 1, image 19-4) and the three screws at the back of the projector (reference 1, image 19-5). Use a 3 mm Allen Key.

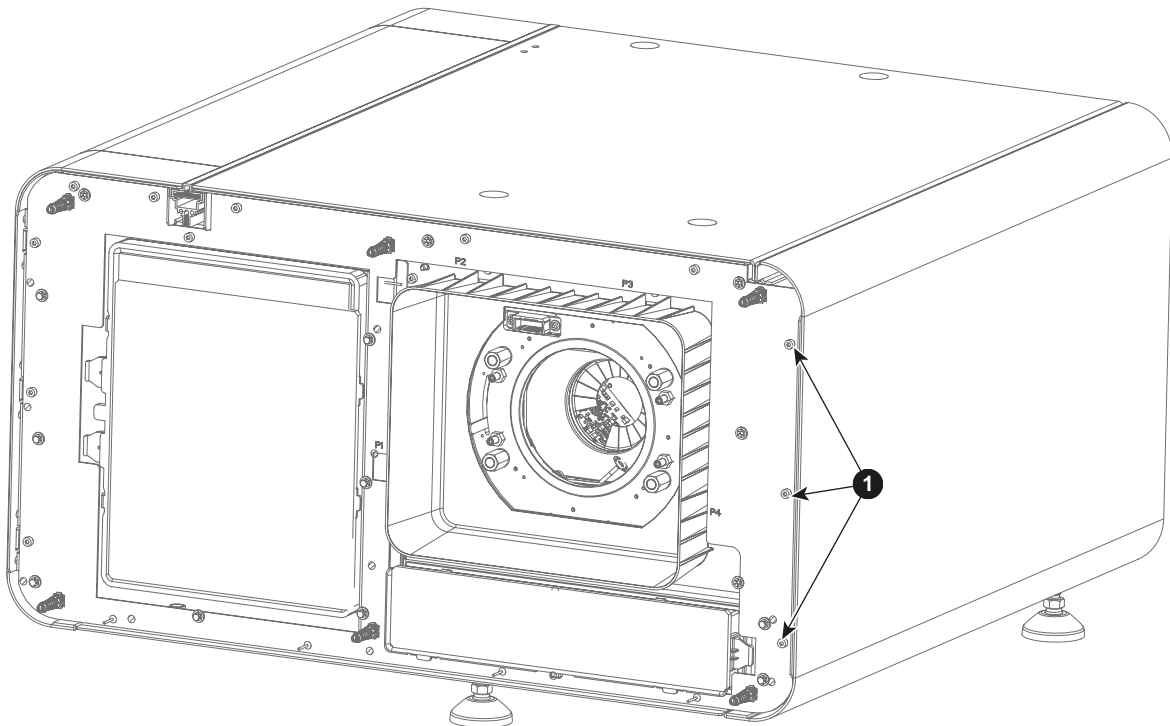


Image 19-4

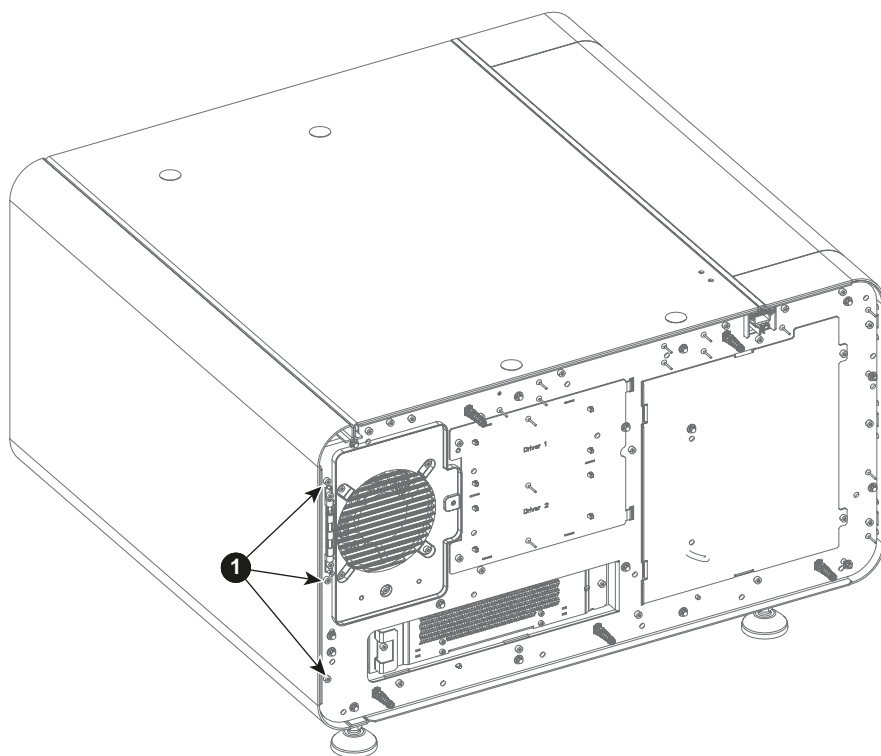


Image 19-5

2. Remove the left side cover.

19.5 Removal of the right side cover

How to remove the right side cover

1. Pull down and quarter clockwise turn the two push turn fasteners at the bottom of the right side cover (reference 1, image 19-6).

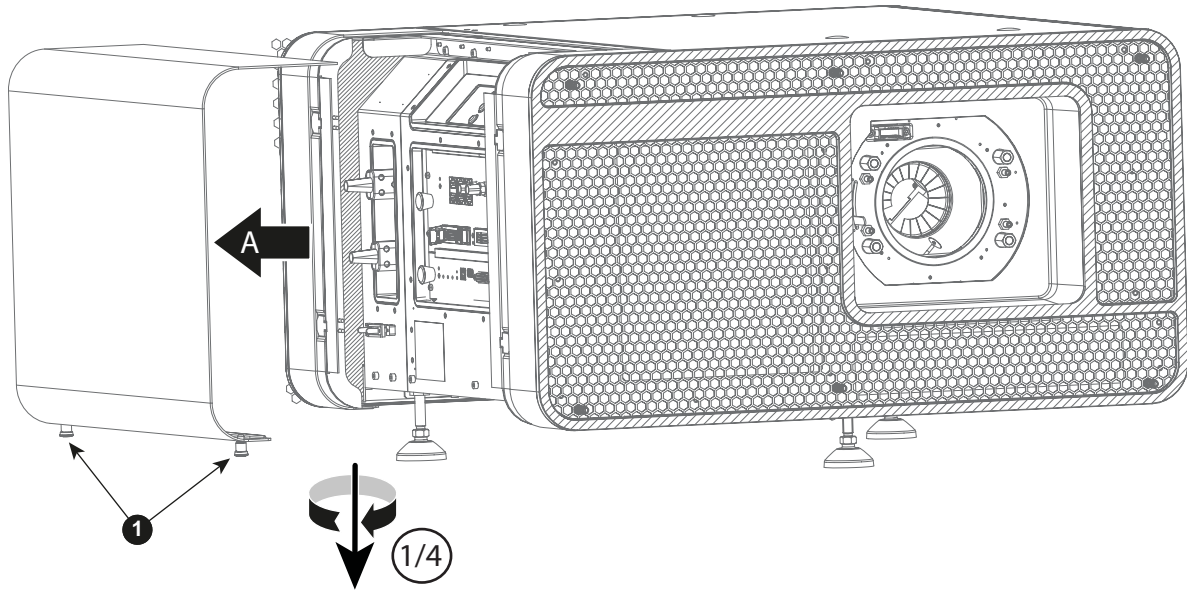


Image 19-6

2. Remove the cover by pulling it straight out. Do not lift or tilt the cover while removing it.

19.6 Removal of the top cover plate of the Light Processor compartment



To access the top cover plate of the Light Processor compartment the projector top cover has to be removed first. This procedure assumes that the projector top cover is already removed.



CAUTION: Opening the Light Processor compartment by removing the top cover plate or side cover plate will result in a tamper event. An authorization to clear the security warning on the projector, after closing off the Light Processor compartment, will be needed!

Necessary tools

3mm Allen wrench.

How to remove the top cover plate from the Light Processor compartment?

1. Remove the seven screws (reference 1, image 19-7) of the top cover plate. Use a 3 mm Allen key.

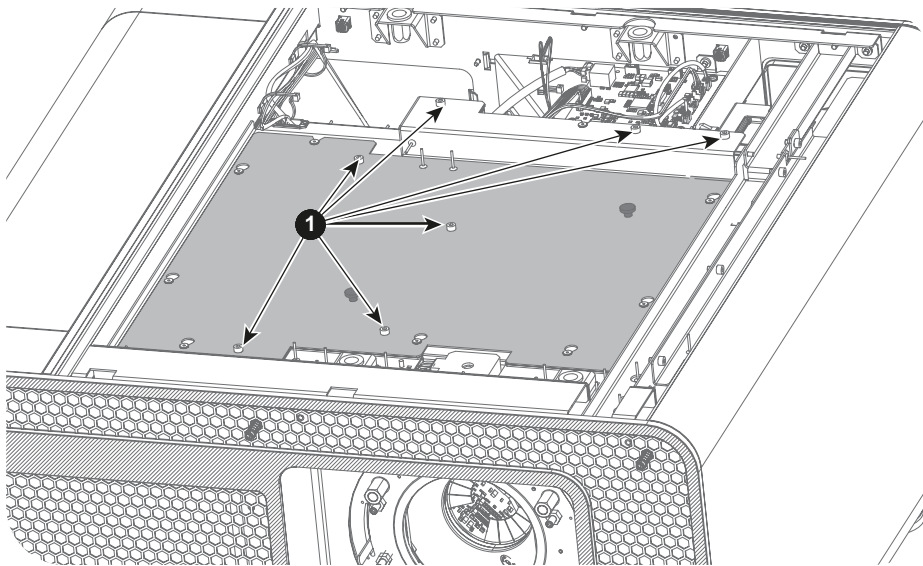


Image 19-7

2. Grip the 2 handles (reference 2, image 19-8) and slide the cover towards the front of the projector until the 8 cover latches (reference 3, image 19-8) are free.

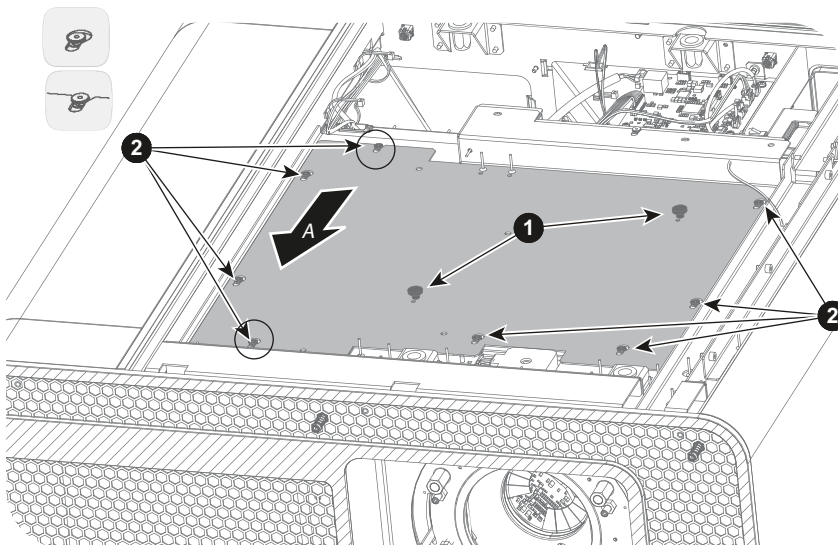


Image 19-8

3. Remove the top cover plate.

19.7 Removal of the side cover plate of the Light Processor compartment



To access the side cover plate of the Light Processor compartment, the projector left side cover must first be removed. This procedure assumes that the projector left side cover is already removed.



CAUTION: Opening the Light Processor compartment by removing the top cover plate or side cover plate will result in a tamper event. An authorization to clear the security warning on the projector, after closing off the Light Processor compartment, will be needed!

Necessary tools

3 mm Allen wrench.

How to remove the side cover plate from the Light Processor compartment?

1. Remove the four screws at the top of the cover plate and the two screws at the bottom of the cover plate (reference 1, image 19-9). Use a 3 mm Allen wrench.
2. Slide the side cover plate left to disengage the cover, and then remove it.

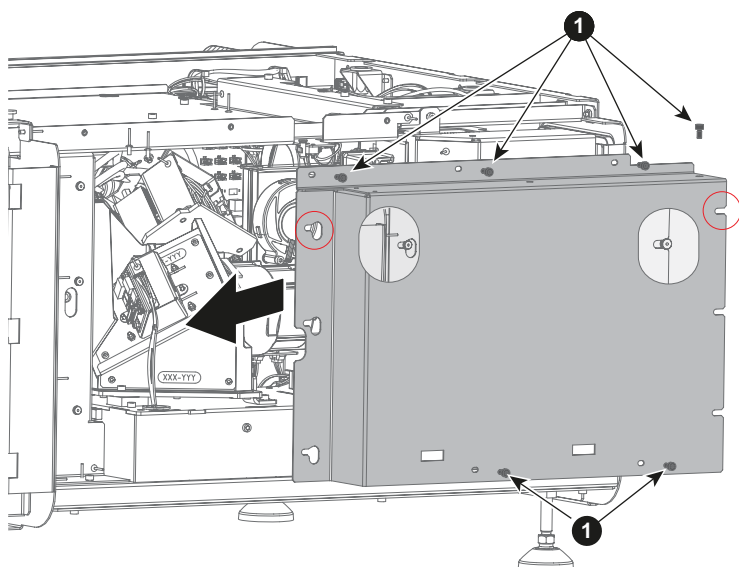


Image 19-9

19.8 Installation of the side cover plate of the Light Processor compartment

Necessary tools

3 mm Allen key.

How to install the side cover plate from the Light Processor compartment?

1. Place the side cover plate into position and slide to the right until all slots of the side cover plate are correctly engaged.

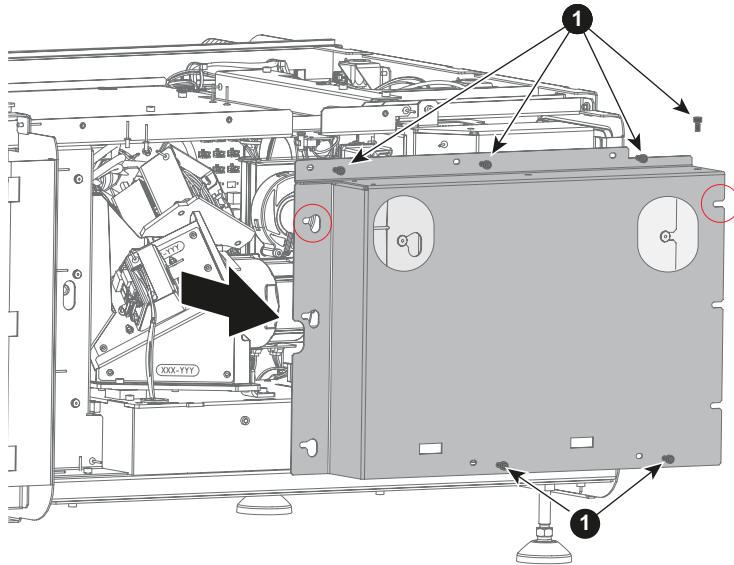


Image 19-10

2. Fasten the side cover plate into place with four screws at the top and two screws at the bottom (reference 1, image 19-10). Use a 3 mm Allen key.



CAUTION: Opening the Light Processor compartment by removing the top cover plate or side cover plate will result in a tamper event. An authorization to clear the security warning on the projector, after closing off the Light Processor compartment, will be needed!

19.9 Installation of the top cover plate of the Light Processor compartment

Necessary tools

3 mm Allen key

How to install the top cover plate from the Light Processor compartment?

1. Install the top cover plate as follows:
 - a) Position yourself on the right side of the projector, and place the cover on an angle as shown.
 - b) Lower the top cover plate completely.
 - c) Slide the top cover plate towards the back of the projector until all slots of the top cover plate are properly engaged (reference image 19-11).

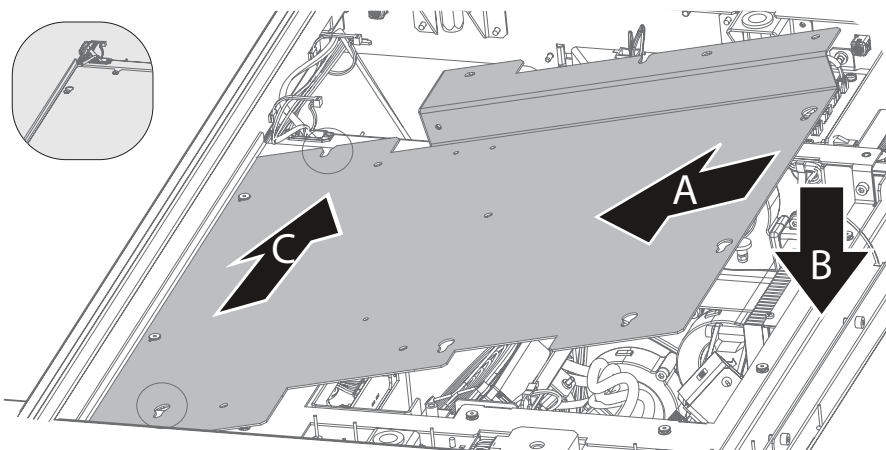


Image 19-11

2. Install the seven screws (reference 1, image 19-12). Use a 3 mm Allen Key.

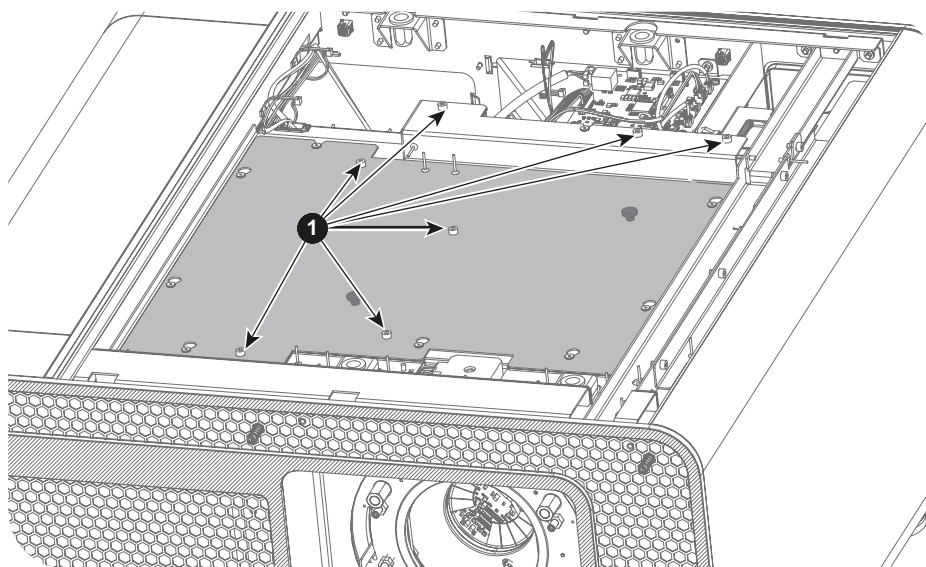


Image 19-12



CAUTION: Opening the Light Processor compartment by removing the top cover plate or side cover plate will result in a tamper event. An authorization to clear the security warning on the projector, after closing off the Light Processor compartment, will be needed!

19.10 Installation of the right side cover

Necessary tools

3 mm Allen key.

How to install the right side cover?

1. Position the right side cover on the projector on an angle as shown (reference A, image 19-13). The magnetic clips will snap into position.

Tip: Before positioning the cover into place, guide the cables (1) (power cables and data cables) underneath the projector. When the cables are guided well, they won't obstruct the cover when installing.

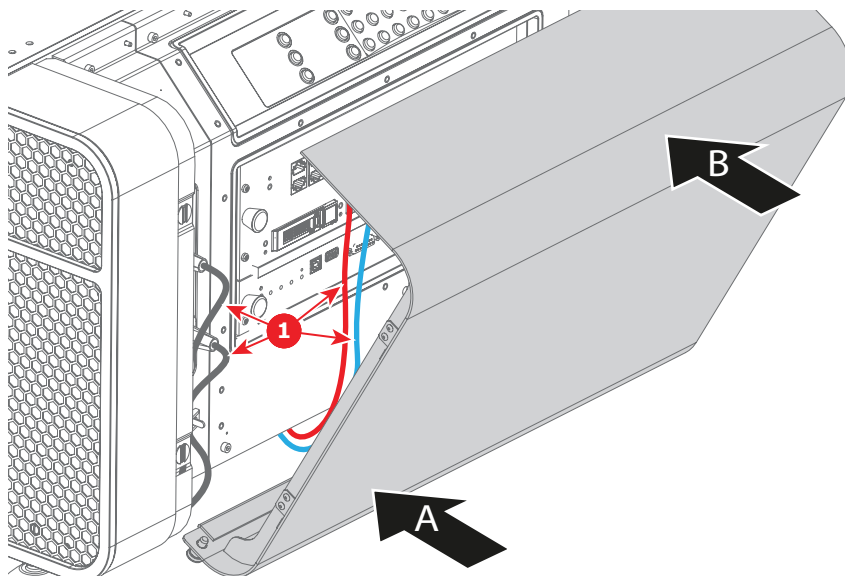


Image 19-13

2. Close the cover by pushing the top firmly into place.

19.11 Installation of the left side cover



The back and front cover must be removed before the left side cover can be installed. This procedure assumes that the back and front cover are already removed.

Necessary tools

3 mm Allen key.

How to install the left side cover?

1. Position the left side cover on the projector.
2. Fasten the 3 screws at the front left side of the projector (reference 1, image 19-14) and the 3 screws at the back left side of the projector (reference 1, image 19-15). Use a 3 mm Allen key.

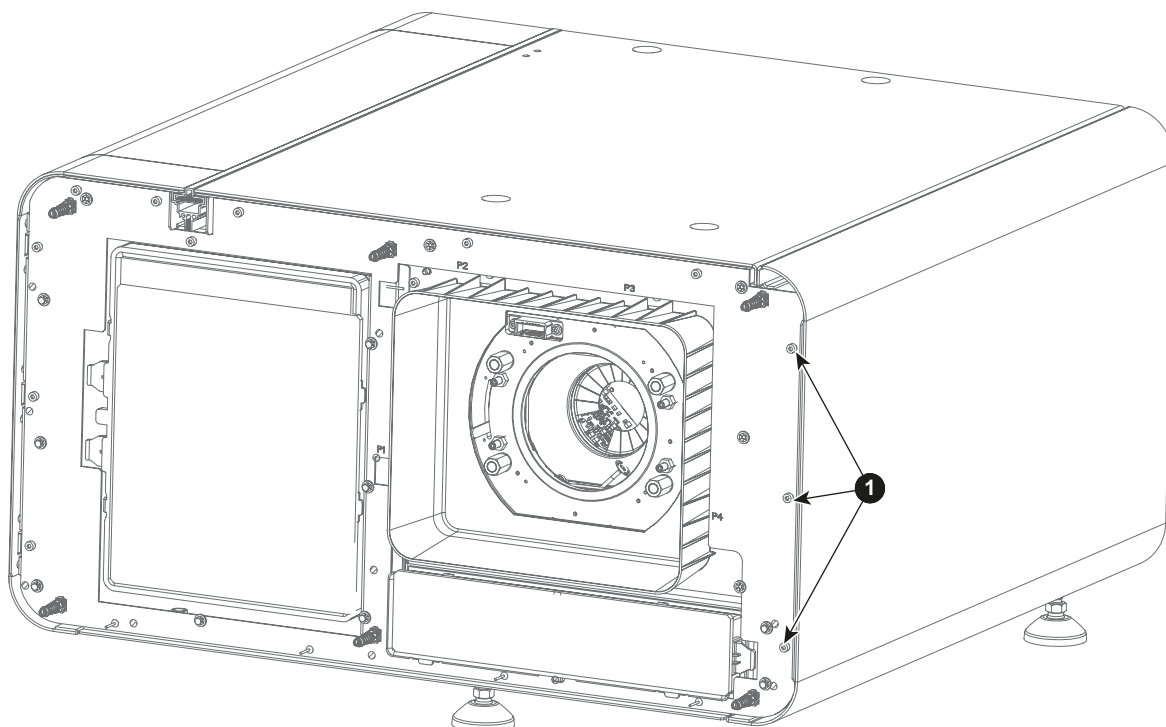


Image 19-14

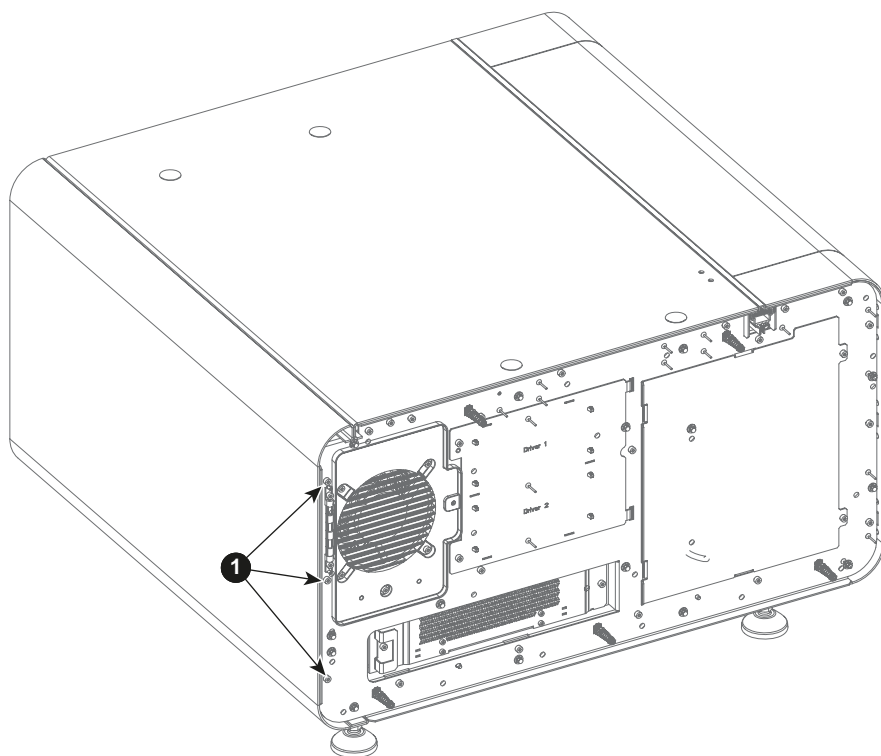


Image 19-15

19.12 Installation of the top cover

Necessary tools

3 mm Allen key.



To install the top cover, the front and back covers must be removed. This procedure assumes the front and back covers are already removed.

How to install the top cover?

1. Position the top cover on the projector.
2. Fasten the three screws at the front and the three screws at the back (reference 1, image 19-16). Use a 3 mm Allen key.

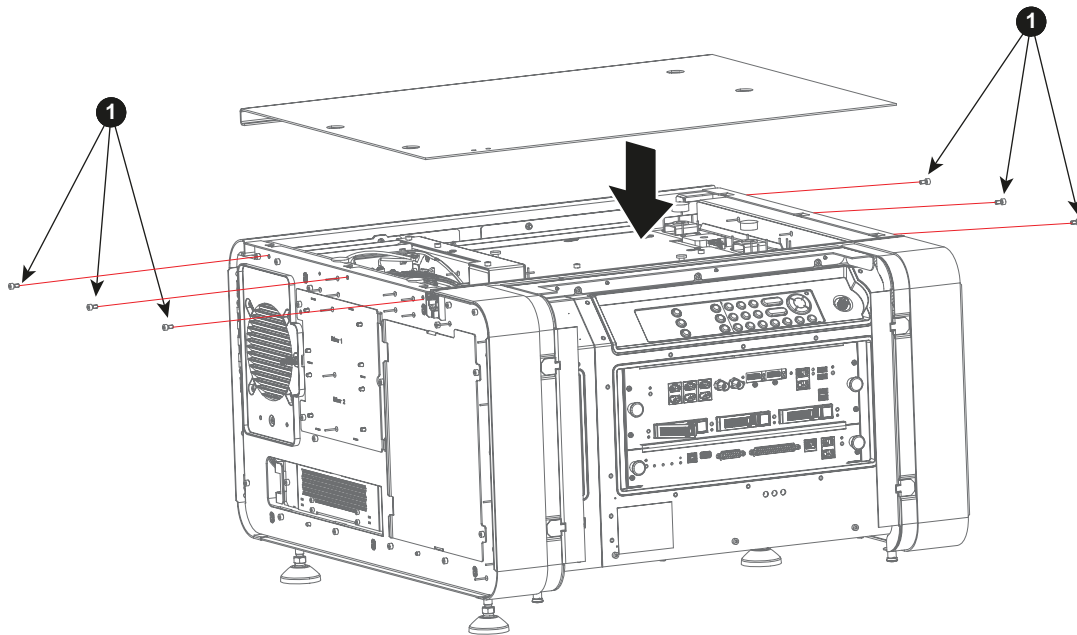


Image 19-16

19.13 Installation of the rear cover

Necessary tools

7 mm flat screwdriver.

How to install the rear cover?

1. Position the rear cover on the projector.
2. Fasten the five captive screws (reference 1, image 19-17) of the rear cover using a 7 mm flat screwdriver.

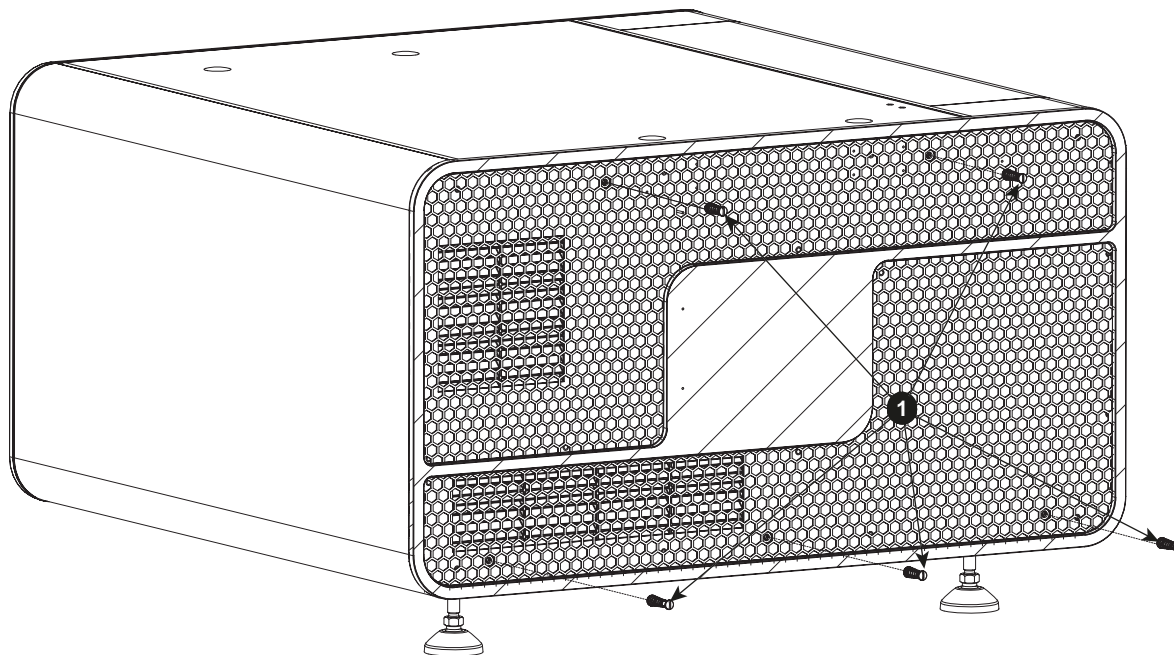


Image 19-17

19.14 Installation of the front cover

Necessary tools

7 mm flat screwdriver

How to install the front cover?

1. Position the front cover on the projector.
2. Install the six captive screws (reference 1, image 19-18).

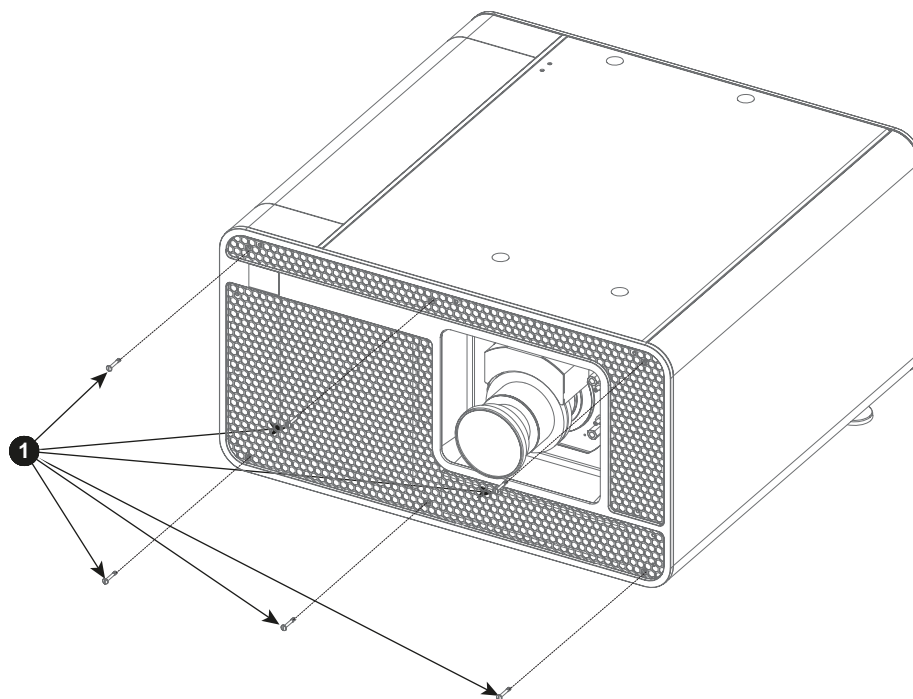


Image 19-18

20. PROJECTOR CLEANING

About this chapter

This chapter describes in chronological order the overall cleaning process of the projector. Starting with the light source, following the light path up to the porthole of the installation booth. Furthermore, the airflow channels and compartments (non optical parts) are also taken into account. Extra attention is paid to critical and/or fragile components which need special treatment.

To access the components for cleaning, several parts of the projector have to be disassembled. For detailed disassembly and assembly instructions this chapter refers where relevant to other chapters in this service manual.

Purpose of projector cleaning

Projectors are not used in 100% ideal circumstances and due to that they might get contaminated by particles in the environment air. Due to this contamination the light output can be reduced or overheating may occur which may also lead to a projector shutdown during operation.

To keep the projector in a good shape, it is advised to clean the projector as suggested in the preventative maintenance section. Dust filter cleaning, cover cleaning and projection lens cleaning can be done by the operator of the projector. **The inside cleaning of the light path must be done by a trained and certified service engineer.**

Overview

- Necessary tools, products and tips
- General cleaning procedure for optical components
- Cleaning process for the optical path
- Cleaning procedures for the optical path
- Cleaning non-optical components

20.1 Necessary tools, products and tips

Tools

The tools, tips and information in this section are focused on cleaning procedures only. Any tools or procedures needed to disassemble or get access to components of the projector are given in the relevant replacement procedures elsewhere in this service manual.

Tools required for carrying out these cleaning procedures are:

- Micro-fiber lens cleaning cloth, e.g. Toraysee® cloth (R379058)
- Vacuum cleaner with brush attachment
- Brush
- Clean soft fabric cloth
- Compressed air

Products

Products required for carrying out these cleaning procedures are:

- Lens cleaner spray, e.g. Carl Zeiss, Purasol Optical or a similar water-based lens cleaner spray

Tips

Before beginning any cleaning tasks, ensure there is sufficient lighting available in the area. If necessary, add extra lighting.

Make sure that the environmental conditions of the cleaning area correspond to those given in the projector user and installation manual.

Always limit the number of wipe movements used when cleaning the optical coatings. It is better to wipe off the dust with one good movement than with 10 softer wipe movements.

Wherever possible, use a lens cleaner spray in combination with a micro-fiber cloth to improve results and reduce the risk of scratching the surface. Lens cleaner sprays are designed to break the molecular bond that adhere dust, grime, and dirt to the surface, making cleaning much more effective. These lens cleaners can also remove finger marks without streaks.

Always use a clean cloth! If a smear appears when cleaning the optics, replace the cloth immediately. Smears are the first indication of a dirty cloth.

Never use cloths that leave particles on the surface.

Do not use compressed air to remove dust from components still installed in the projector chassis. Remove them first, and then clean with the compressed air.

Clean the light processor and light pipe in a dust-free environment, preferably a clean room.

20.2 General cleaning procedure for optical components

Necessary tools

- Vacuum cleaner with brush attachment
- Lens cleaner spray, e.g. Carl Zeiss cleaner or Purasol® Optical or any water based lens cleaner
- Dry, clean micro-fiber cloths, e.g. Toraysee® cloths

General cleaning procedure

1. Use a vacuum cleaner and/or to remove dust.
2. Use lens cleaner spray and a clean micro-fiber lens cleaning cloth to remove the dust and contamination.
Tip: Limit the number of wipe movements. This to protect the optical coating. It is better to wipe off the dust with one good wipe movement than with 10 soft wipe movements.
3. Use a dry, clean micro-fiber lens cloth to remove any remaining streaks or liquid. Polish using small, circular motions.
4. If there are still fingerprints visible on the surface, repeat steps 2 and 3 (above) until the optics are clean.



CAUTION: This is a general procedure; actual cleaning procedures may differ for specific components. Always read the full cleaning procedure before cleaning any components.

20.3 Cleaning process for the optical path

Recommended process

1. Optimize the Z-axis of the lamp for the highest light output.
2. Measure the light output of your projector before starting the cleaning procedure.
3. Clean the complete optical path as per the sequence described below.
4. Measure the light output when the cleaning procedure is finished. Compare to original results.

Tips

- Measure always in the same environmental conditions. Place your measuring device in a fixed position and always measure from this position.
- Always write down your measurement results and remarks, along with date, time and environmental conditions during measuring.
- Consult the projector's service manual to see how to remove/access any optical part.
- Clean the outside covers of the projector before starting cleaning of the optic

Optical path cleaning order

1. Lamp module
 - a) Lamp module outside cabinet
 - b) Lamp module reflector
 - c) Lamp module UV blocker
2. Light Pipe
 - a) Compartment interior
 - b) Compartment window (Light Pipe side)
 - c) Rod inlet
 - d) Notch Filter
 - e) Light Pipe Lenses Nos. 1, 2 and 3
 - f) Light Pipe Fold Mirrors
3. Light Processor
 - a) Compartment interior
 - b) Light Pipe Lens No. 4
 - c) Prism inlet and outlet
4. Projection lens and porthole
 - a) Projection lens inlet
 - b) Projection lens outlet
 - c) Porthole (boot side)
 - d) Porthole (audience side)



Normally the optics of the Light Pipe (3) and Light Processor (4) require less frequent cleaning than the optics of the Lamp modules (1), Projection lens and porthole (5). This should be taken into account to avoid unnecessary opening of the Light Pipe and removing of the Light Processor.



For optimal results, reliability and control measure and notate the light output value after completing each every sub-step, for example, cleaning the Lamp modules. If this is not possible, measure and notate the light output before and after the cleaning procedure.

20.4 Cleaning procedures for the optical path

Lamp Modules

1. Remove the lamp modules from the projector chassis. See procedure "Removal of the Lamp Module", page 103
2. Use a vacuum cleaner to remove dust and other contamination from the exterior surfaces. Make sure that the air inlet and outlet grids are dust-free.
3. Wipe over the surface exterior with a clean micro-fiber cloth to remove any remaining dust or contaminants.

Lamp Module UV blocker

1. Use compressed air to blow away any excess dust. Do this on both sides.
2. Follow the general cleaning procedure for optical parts to clean both sides, see "General cleaning procedure for optical components", page 293, or see .
3. Install the lamp module. See "Installation of the Lamp Module", page 105.
Caution: *When the UV blocker is cracked or damaged, replace with a new one.*

Light Pipe Compartment

1. Use a vacuum cleaner with brush attachment to remove all dust from the light pipe compartment.
Caution: *Cleaning of the Light Pipe is a critical action and shall only be done when absolutely necessary. Before attempting to clean the Light Pipe, all other optical components should be properly cleaned and the projector re-tested. If the result of re-testing does not meet the proper specifications for operations, change the lamps, and then test output levels again. In the event that results are still poor, even after the optical components have been cleaned and both lamps have been changed, proceed with cleaning of the Light Pipe as described in the following sections.*

Compartment window (Light Pipe side)

1. In order to clean the compartment window, first remove the Light Pipe from the projector. See "Removal of the Light Pipe", page 138
2. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 293.

Rod Inlet

1. Remove the Light Pipe assembly from the projector, if necessary.
2. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 293.
Caution: *Fragile glass! Handle the rod inlet with extreme care at all times. Do not apply pressure to the Rod Inlet, in particular, always handle the edges very carefully.*

Notch filter

1. Remove the notch filter from the Light Pipe.
2. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 293 or see "Cleaning the Notch Filter", page 158
Caution: *Handle carefully! Applying too much pressure on the Notch filter may cause the mirror to come loose.*
3. Install the clean Notch filter and adjust/align as necessary.
Note: *The Notch filter must be adjusted and/or realigned each time it is reinstalled in the projector.*



See Service Manual Chapter, "Light Pipe", page 135, for removal and replacement procedures for the Light Pipe and its components.

Light Pipe Lenses Nos 1,2, and 3

1. Remove the Light Pipe from the projector, if necessary.
2. Use a vacuum cleaner with brush attachment, or a can of compressed air, to remove any dust or contamination from the outside of the Light Pipe.
Caution: *Do not touch the Rod Inlet and Lens No. 3 outlet of the Light Pipe.*
3. Remove the cover from the Light Pipe.
Caution: *Opening and cleaning of the Light Pipe shall only be done a trained service engineer in a clean room.*
4. Remove Lenses 1, 2 and 3 from the Light Pipe. See procedures:
 - "Replacing Light Pipe lens No. 1 (focus lens)", page 143
 - "Replacing Light Pipe lens No. 2", page 145
 - "Replacing Light Pipe lens No. 3 (zoom lens)", page 147
5. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 293 when cleaning the Lenses.

6. Replace the Lenses in the Light Pipe.
7. Install the cover of the Light Pipe.
8. Install the Light Pipe.

Light pipe fold mirrors

1. Remove the side cover plate and the Light Sensor assembly from the Corner Block.
2. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 293.
Caution: *Fragile glass — may crack! Do not apply force when positioning or handling!*
3. Replace the light sensor assembly and side cover plate onto the corner block.

Light processor compartment interior

1. Remove the lens from the projector.
2. Remove the Light Processor from the projector. See service manual chapter "Light Processor replacement process", page 116
3. Use a vacuum cleaner with brush attachment to remove all dust from the compartment. Ensure that the lamps and lamp grids in the compartment are dust-free.

Light Pipe Lens No. 4

1. Remove Lens No. 4 from the corner block. See "Replacing Light Pipe lens No4", page 149.
2. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 293 when cleaning the Lenses.
3. Install Lens No. 4 onto the corner block.

Light Processor Prism, inlet and outlet

1. Remove the light processor from the projector. See "Light Processor replacement process", page 116
2. Use compressed air to remove dust from the exterior of the light processor.
3. Clean the prism inlet according to the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 293.
4. Clean the prism outlet according to the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 293.
5. Install the light processor.

Projection lens inlet and outlet

1. Remove the lens from the projector, if necessary.
2. Clean the lens inlet and outlet according to the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 293.
3. Install the lens.

Porthole

1. Clean both the booth side and audience side of the porthole according to the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 293.

20.5 Cleaning non-optical components

Components to clean

- Outlet fan assembly

Outlet fan assembly

1. Use a vacuum cleaner with brush attachment to remove dust from the fan assembly, paying special attention to the metal mesh grids.

Card cage fan

1. Remove the projector large dust cover.
2. Use a vacuum cleaner to remove dust from the fan assembly, paying special attention to the metal mesh grids.
Caution: Do not use compressed air to avoid dust contamination within the card cage.

Card cage interior

1. Remove the projector top cover and top cover plate of the light processor compartment.
2. Remove all the boards from the card cage.
Caution: Wear a wrist band which is connected to the ground whenever handling parts sensitive to electrostatic discharge.
3. Use a vacuum cleaner with brush attachment to remove dust from the ICP fan mounted on top of the card cage.
4. Clean the boards with compressed air, being careful not to damage components.
5. Install all boards.
6. Install the top cover plate of the light processor compartment.

SMPS Compartment

1. Remove the card cage cover.
2. Remove the cover of the SMPS compartment.
3. Remove the SMPS board.
4. Use a vacuum cleaner with brush attachment to remove dust from the mesh grid and fan grid inside the SMPS compartment.
5. Install the SMPS board and cover.
6. Install the Card Cage cover.

Lamp drivers fan

1. Remove the lamp drivers unit.
2. Remove the mains input cover.
3. Use a vacuum cleaner with brush attachment to remove dust from the mesh grid and fan grid of the lamp drivers fan.
4. Install the mains input cover.
5. Install the lamp driver unit.

Projector external covers

1. Switch off the projector, and unplug from the mains power net.
2. Clean the projector housing with a clean, damp cloth. Use a damp cloth with a small amount of mild detergent solution to remove any stubborn stains.

Projector dust filters

1. Follow the cleaning procedure described in "Dust Filters and Filter Foams", page 269.

A. APPENDIX

Overview

- Hazards

A.1 Hazards

Safety notice Sodium Carbonate (Na_2CO_3)

According to the Material Safety Data Sheet (MSDS), Sodium Carbonate could cause the following hazards:

- Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation (lung irritant).
- Potential Chronic Health Effects: Slightly hazardous in case of skin contact (sensitizer). The substance may be toxic to upper respiratory tract, skin, eyes. Repeated or prolonged exposure to the substance can produce target organ damage.

More info about the product can be found on website of "unep" or the link below:

<http://www.chem.unep.ch/irptc/sids/oecd/sids/Naco.pdf>

GLOSSARY

RS232

An Electronic Industries Association (EIA) serial digital interface standard specifying the characteristics of the communication path between two devices using either D-SUB 9 pins or D-SUB 25 pins connectors. This standard is used for relatively short-range communications and does not specify balanced control lines. RS-232 is a serial control standard with a set number of conductors, data rate, word length and type of connector to be used. The standard specifies component connection standards with regard to computer interface. It is also called RS-232-C, which is the third version of the RS-232 standard, and is functionally identical to the CCITT V.24 standard. Logical '0' is $> +3V$, Logical '1' is $< -3V$. The range between $-3V$ and $+3V$ is the transition zone.

Scheimpflug principle

The "plane of sharp focus" can be changed so that any plane can be brought into sharp focus. When the DMD plane and lens plane are parallel, the plane of sharp focus will also be parallel to these two planes. If, however, the lens plane is tilted with respect to the DMD plane, the plane of sharp focus will also be tilted according to geometrical and optical properties. The DMD plane, the principal lens plane and the sharp focus plane will intersect in a line below the projector for downward lens tilt.

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