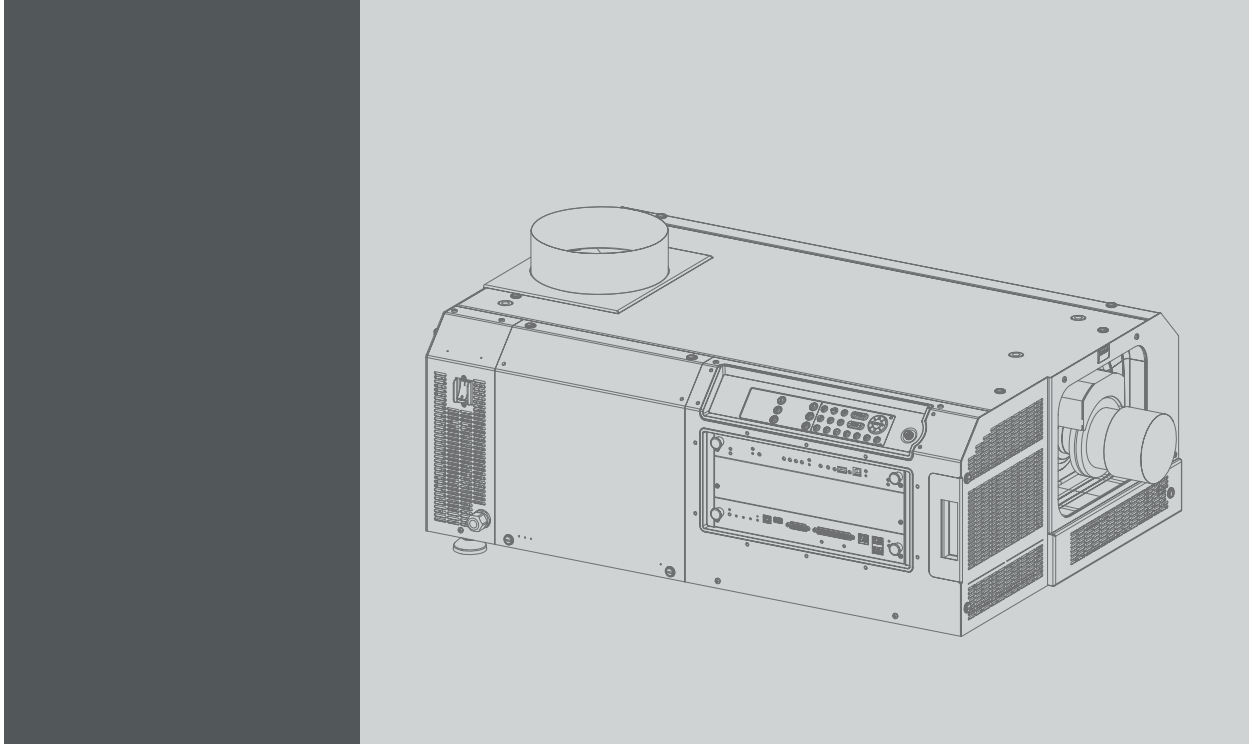


DP2K-S series



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-S series projector. Furthermore, it includes several cautions to prevent damage to the DP2K-S series projector. Ensure that you understand and follow all safety guidelines, safety instructions and warnings mentioned in this chapter before servicing the DP2K-S 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

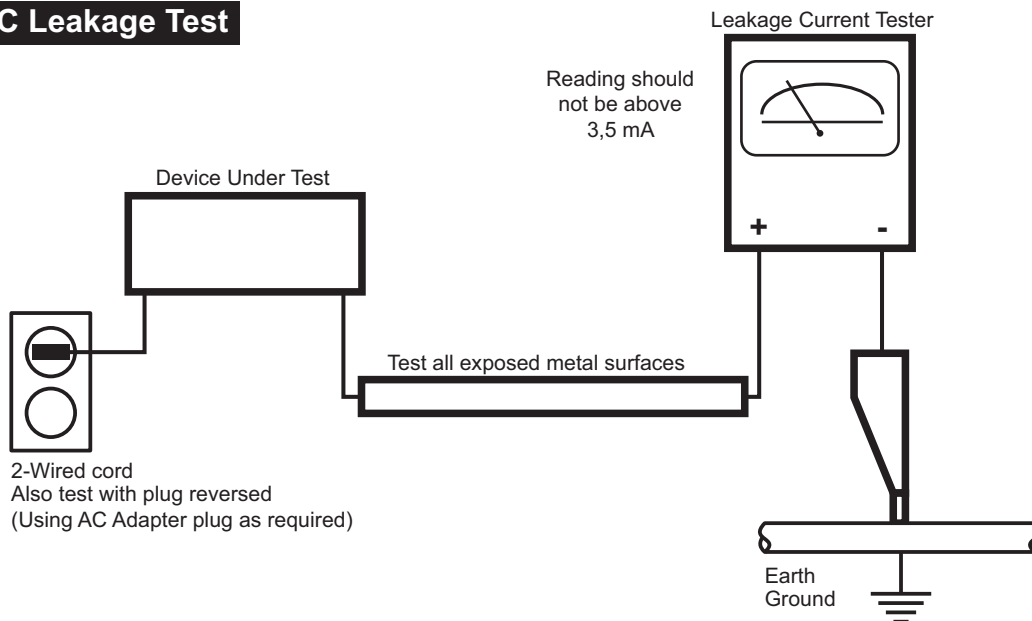


Image 1-1

- 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-S 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.

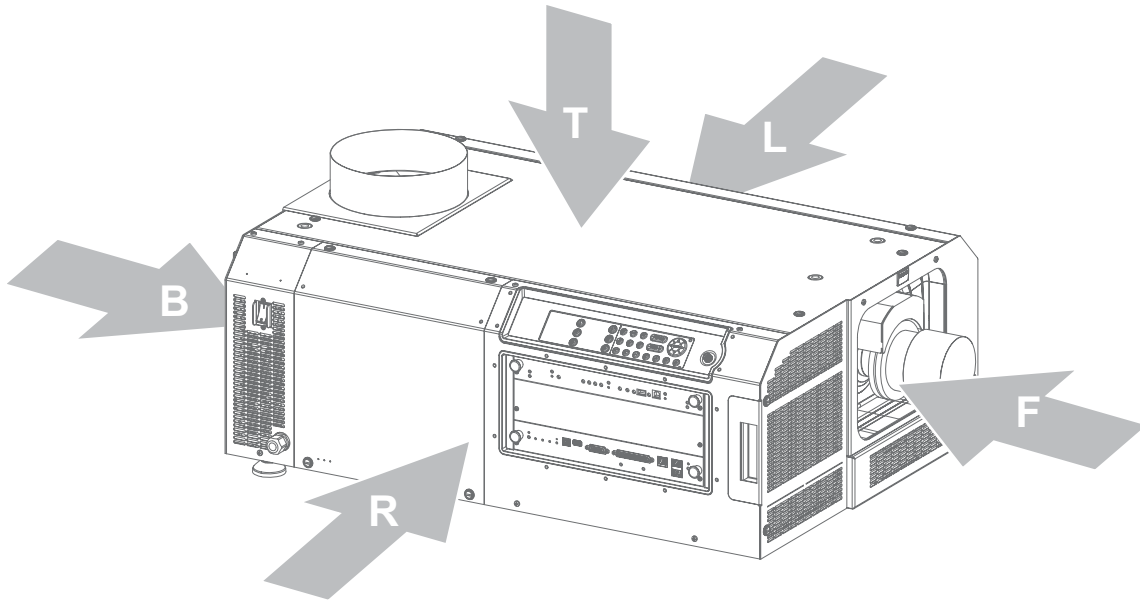


Image 2-1

- 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

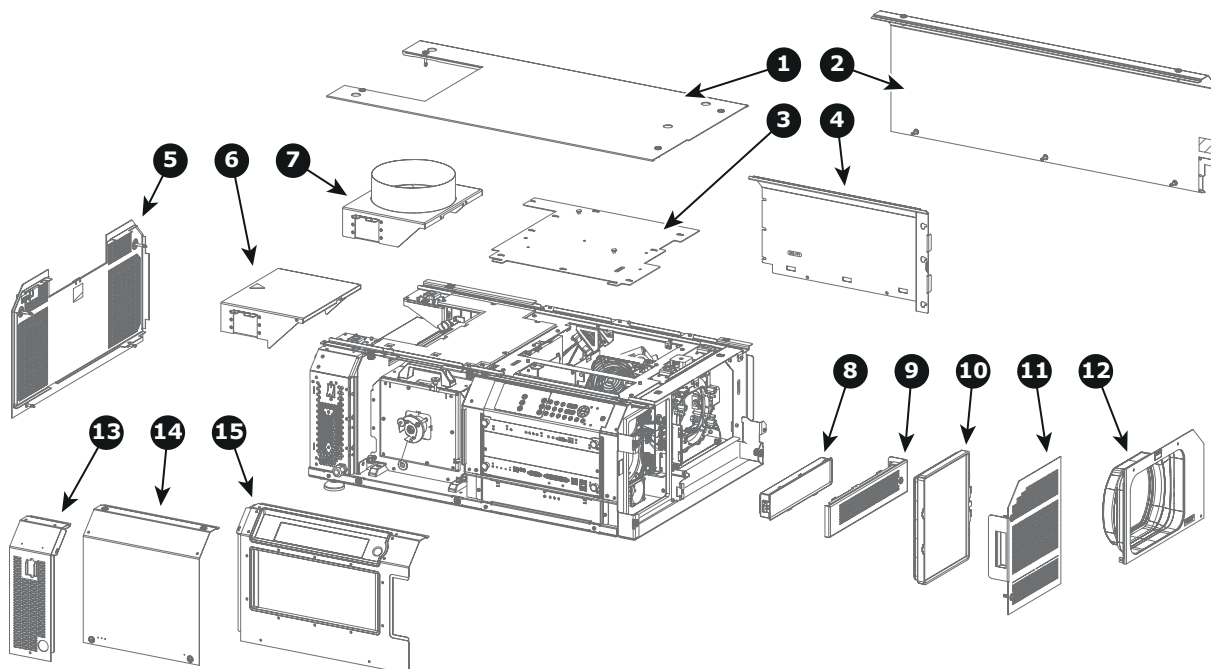


Image 2-2

- 1 Top cover.
- 2 Left side cover.
- 3 Top cover plate Light Processor compartment.
- 4 Side cover plate Light Processor compartment.
- 5 Rear cover.
- 6 Rear exhaust assembly (optional).
- 7 Top exhaust assembly (standard).
- 8 Small dust filter.
- 9 Small dust filter cover plate.
- 10 Large dust filter.
- 11 Large dust filter cover plate.
- 12 Front cover (Lens Holder cover).
- 13 ON/OFF cover.
- 14 Lamp House cover.
- 15 Card Cage cover.

Main internal components

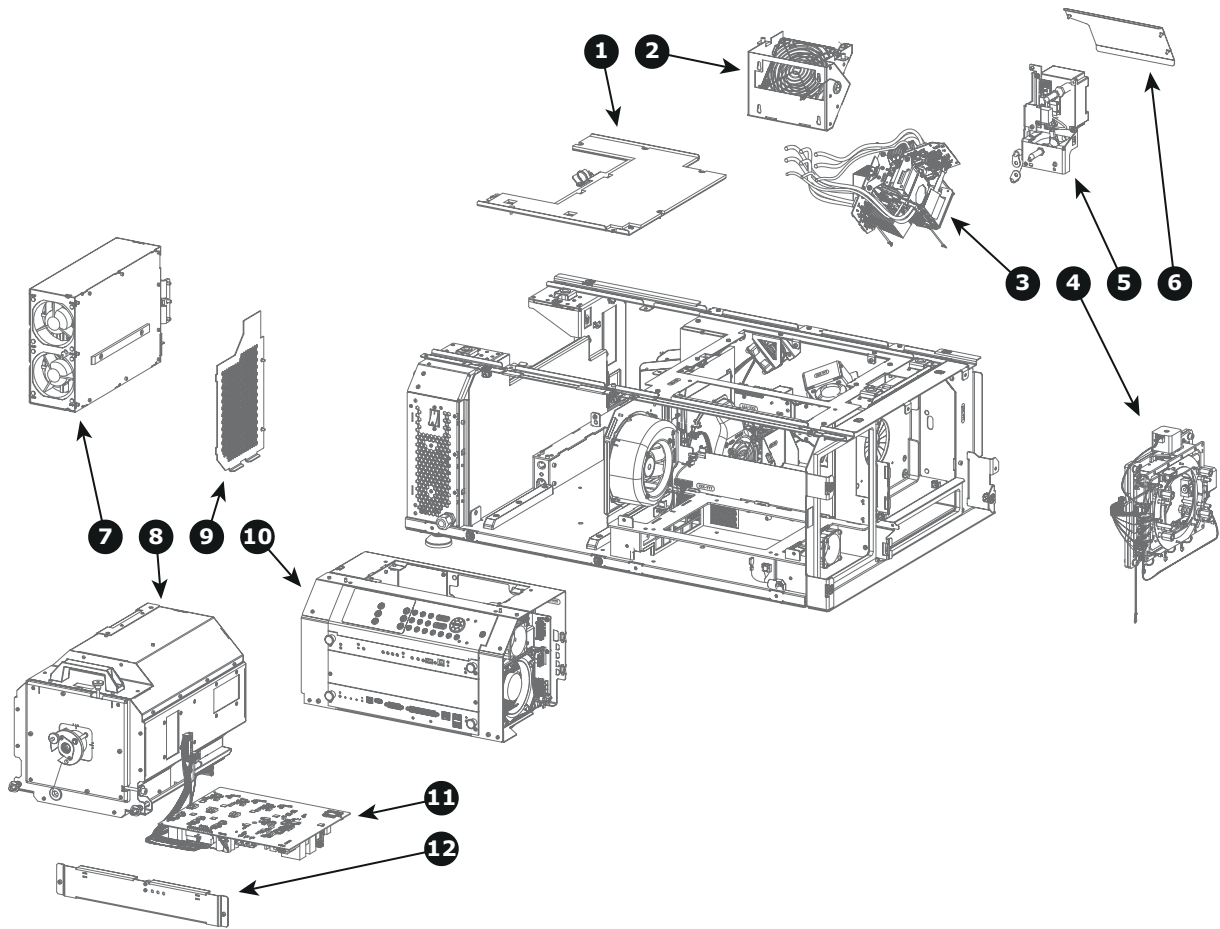


Image 2-3

- 1 Cover plate of Lamp House compartment.
- 2 Fan of Light Processor compartment.
- 3 Light Processor.
- 4 Lens Holder.
- 5 Start Pulse Generator (SPG) (Igniter).
- 6 Cover plate SPG/Cold Mirror compartment.
- 7 Lamp Power Supply (LPS).
- 8 Lamp House.
- 9 Cover plate main AC compartment.
- 10 Card Cage.
- 11 Switch Mode Power Supply (SMPS).
- 12 Cover plate SMPS compartment.

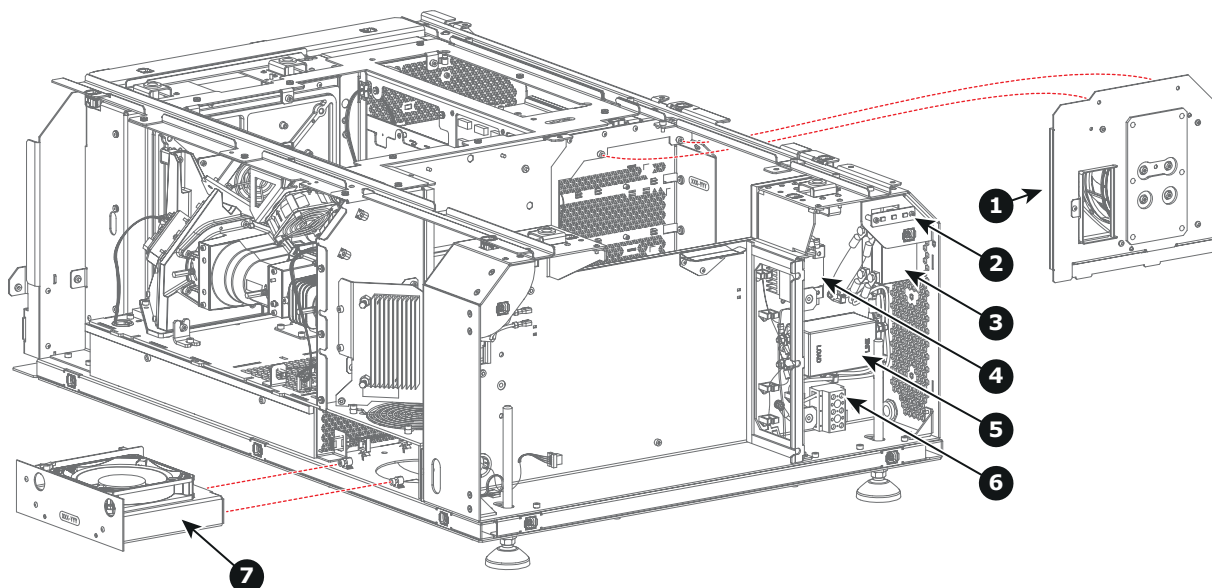


Image 2-4

- 1 Cathode Fan assembly.
- 2 Projector Status Light.
- 3 ON/OFF switch.
- 4 Solid State Relay.
- 5 Mains Input Filter.
- 6 3-slot terminal block.
- 7 Cold Mirror Fan assembly.

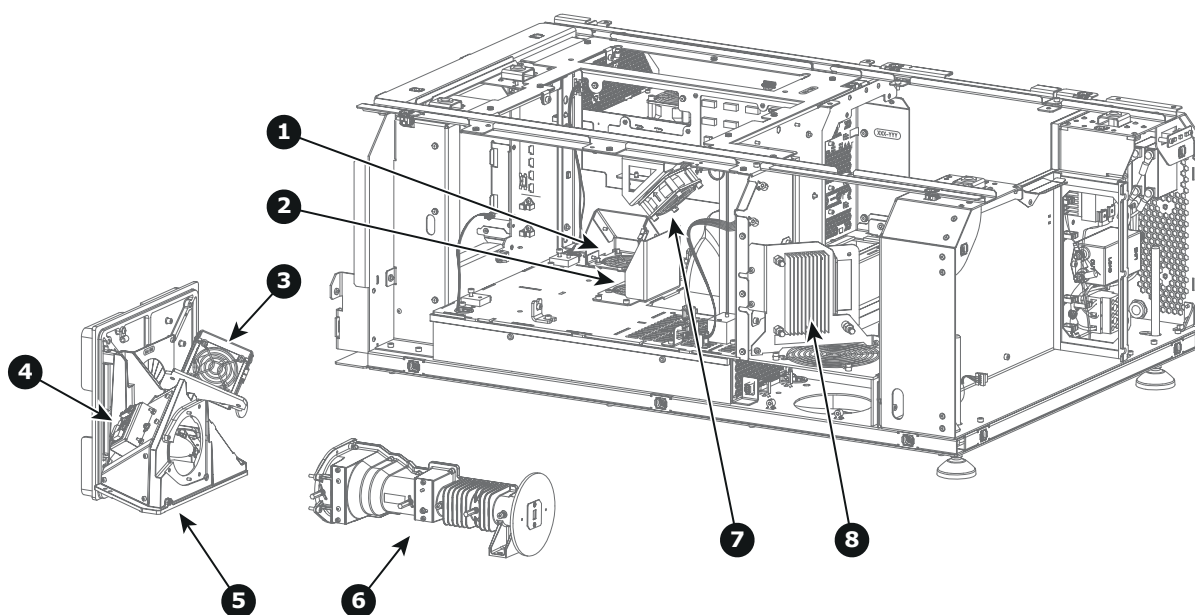


Image 2-5

- 1 Fan Red DMD.
- 2 Fan Green DMD.
- 3 Fan Blue DMD.
- 4 Light Sensor Module (CLO functionality).
- 5 Light Pipe Corner Block (contains Fold Mirror).
- 6 Light Pipe (contains Light Pipe Lenses and Rod assembly).
- 7 Fan Light Pipe entrance (Rod entrance).
- 8 Cold Mirror assembly.

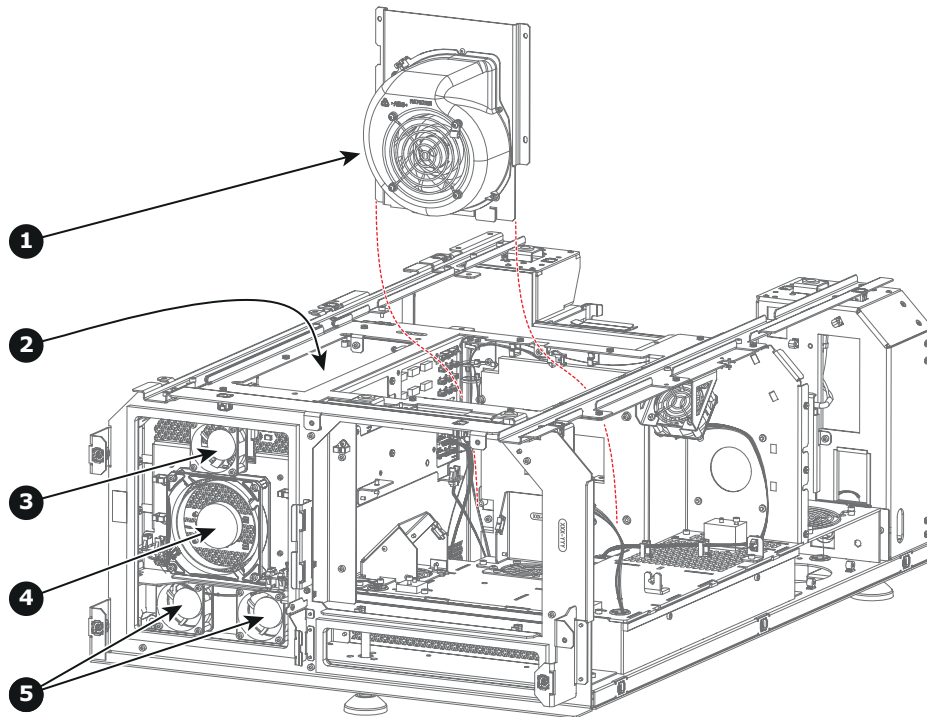


Image 2-6

- 1 Anode Fan assembly.
- 2 Fan ICP top.
- 3 Fan ICP board.
- 4 Fan Card Cage compartment.
- 5 Fans SMPS compartment.

2.3 Projector Status

About the projector Status Light

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

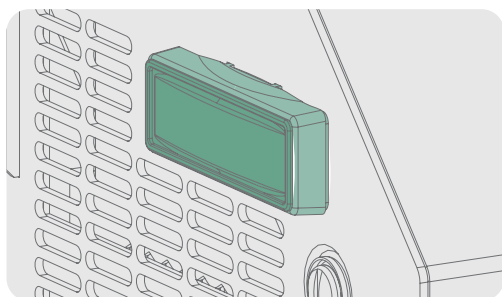


Image 2-7

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.

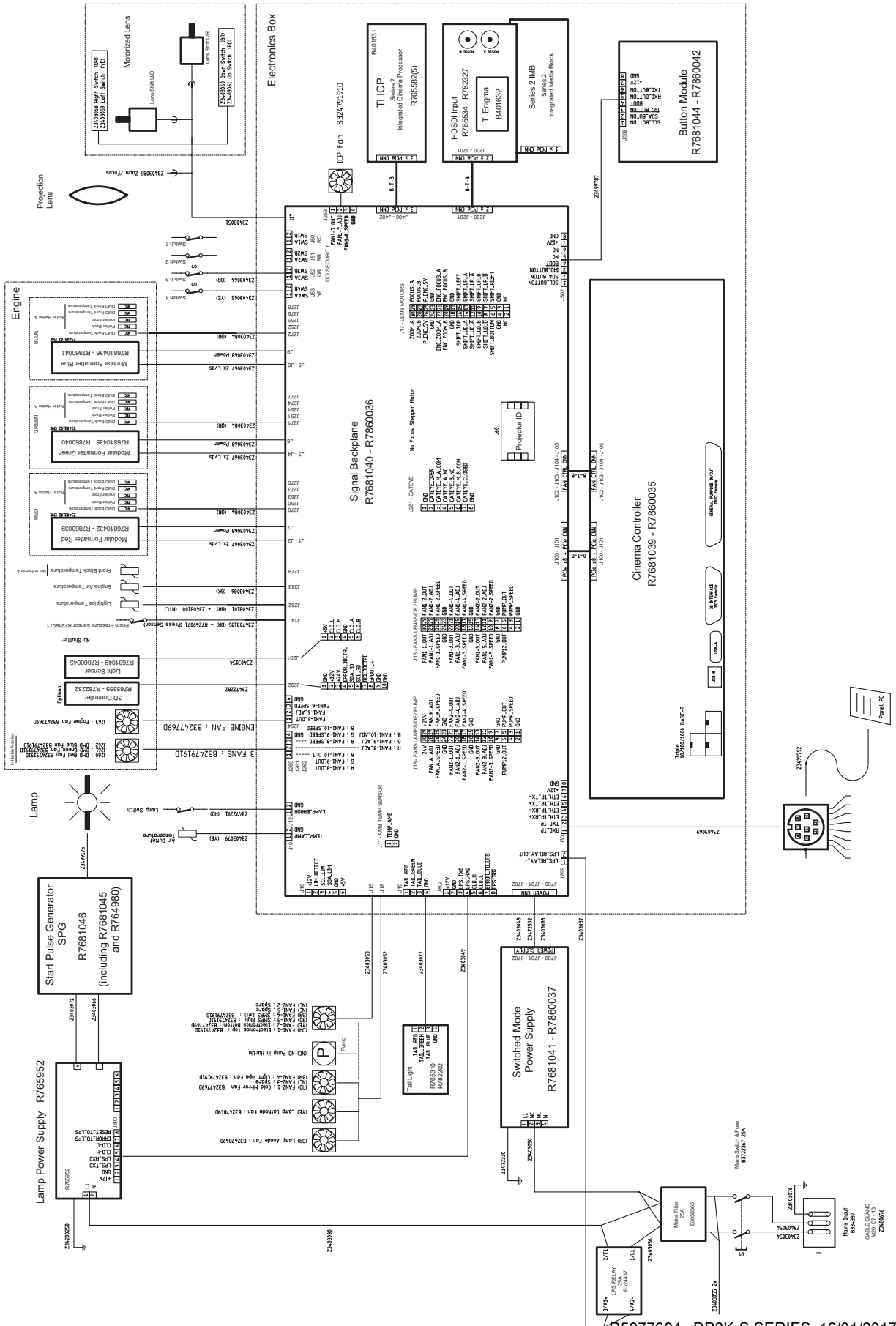


The projector always boots up in the same mode (E.g. Standby or Sleep) as it was switched OFF.

The Sleep button is disabled if the lamp is ignited.

2.4 Projector block diagram

Internal wiring diagram



2.5 Spare parts for DP2K-S series

Up to date information regarding spare parts for DP2K-S 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 going from monthly maintenance actions which can be done by a trained projectionist to annually and 4 yearly maintenance actions which must be done by certified service personnel who are familiar with potential hazards of the product and all product safety checks.

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 of the projector for dust and grease.</p> <p>Grease on the filter 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 are contaminated with dust than cleaning the filters with a vacuum cleaner should be sufficient. In case the filters feel greasy than the filters must be washed. <p>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.</p>	<p>Replace damaged filters immediately.</p> <p>See procedures "Check the large dust filter", page 334, and "Check the small dust filter", page 336.</p> <p>To speed-up drying, allow the filter(s) to dry at 50°C max in a well ventilated room.</p>
2	<p>Check the surface of the lens output side for dust. (it is not needed to remove the lens from the projector). Only clean if necessary.</p>	<p>Clean the lens output side in case dust is clearly visible upon the surface.</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 in case dust is clearly visible upon the surface. Use an optical cloth.</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/side air inlet vents of the Lamp Power Supply (LPS).	Use a vacuum cleaner.
2	Clean the housing of your projector.	Removal overall dust accumulation on 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.

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 xenon lamp.

No.	Maintenance action	Remarks
1	Check the UV blocker of the Lamp House for dust.	Only clean the UV blocker in case dust is clearly visible upon the surface of the UV blocker (both sides). Use an optical cloth.
2	Check the Reflector of the Lamp House for dust.	Only clean the Reflector in case dust is clearly visible upon the surface of the Reflector. Take the Lamp House to another room and use compressed air to blow away the dust. Use an optical cloth to remove the remaining dust.
3	Visual inspection of the lamp anode and cathode Igniter (SPG) connectors of the Lamp House.	Replace the Lamp House in case of degradation, damage, etc.
4	Visual inspection of the lamp anode and cathode cables of the Lamp House.	Replace the Lamp House 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 inside the Lamp House compartment.	Use a vacuum cleaner. Do NOT touch the Cold Mirror.
2	Dust in general	Check the Cold Mirror for dust, burn damage, degradation, cracks, etc.	Only clean the Cold Mirror in case dust is clearly visible upon the surface of the Cold Mirror. See service manual chapter "Cleaning the Cold Mirror", page 165. Replace the Cold Mirror in case of burn damage, degradation, cracks, etc. See service manual chapter "Cold Mirror", page 159.
3	Dust in general	Check the glass plate between the Cold Mirror and the Integration Rod for dust, burn damage, degradation, cracks, etc.	Only clean the glass plate in case dust is clearly visible upon the surface of the glass plate. Replace the glass plate in case of burn damage, degradation, cracks, etc.
4	Dust in general	Clean the three metal mesh grids of the Lamp House.	Use a vacuum cleaner.
5	Dust in general	Check the mask and the integrator entry for burn damage, degradation, cracks, etc. Remove the Lamp House and look at the mask and integrator entry via the Cold Mirror.	Replace the Integration Rod and mask in case of burn damage, degradation, cracks, etc. See service manual chapter "Replacing the Integration Rod", page 225.
6	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 179. Replace the complete Light Processor Unit in case of degradation, cracks, etc. See service manual chapter "Light Processor", page 169.
7	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.
8	Dust in general	Clean the projector exterior (housing).	Report on cleanliness of booth!
9	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. See service manual chapter "Integration Rod diagnostic", page 223. Replace the Integration Rod in case the Integration Rod causes the artifacts. See service manual chapter "Replacing the Integration Rod", page 225. Replace the Light Processor Unit in case the prism causes the artifacts. See service manual chapter "Light Processor", page 169.
10	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.
11	Diagnostics	Check and save TI and projector log/history files. See user guide of the Communicator software.	Note any irregularities and follow up.

3. Preventative maintenance actions

No.	Component	Maintenance action	Remarks
12	Diagnostics	Verify projector date and time and correct if required.	See Communicator software.
13	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.
14	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.
15	Electrical connections	<p>Check the torque values/general condition of all critical electrical connections and components. Use a torque wrench to verify the torque values of the critical electrical connections listed:</p> <ul style="list-style-type: none"> • Nuts (x2) of the SPG socket inside the lamp house: 9 Nm. • Hexagon socket head cap screw at the lamp cathode socket : 2.5 Nm. • Nuts of the LAMP OUT ports of each LPS unit: 4 Nm 	Do not release the nuts to check the torque. Just verify.
16	Lamp Module	Check the UV blocker of the Lamp House for dust, burn damage, degradation, cracks, etc.	<p>Only clean the UV blocker in case dust is clearly visible upon the surface of the UV blocker (both sides). See service manual chapter "Cleaning the UV blocker of the Lamp House", page 134.</p> <p>Replace the UV blocker in case of burn damage, degradation, cracks, etc. See service manual chapter "Replacement of the UV blocker", page 136.</p>
17	Lamp Module	Check the reflector of the Lamp House for dust, degradation, cracks, etc.	<p>Only clean the reflector in case dust is clearly visible upon the surface of the reflector. Take the Lamp House to another room and use compressed air to blow away the dust from the reflector. See service manual chapter "Cleaning the Reflector of the Lamp House", page 135.</p> <p>Replace the reflector in case of burn damage, degradation, cracks, etc. See service manual chapter "Replacement of the Reflector", page 137.</p>
18	Lamp Module	Visual inspection of the lamp anode and cathode connectors of the Lamp House.	Replace the lamp anode and cathode connectors in case of degradation, damage, etc. See service manual chapter "Lamp & Lamp House", page 111.
19	Lamp Module	Visual inspection of the lamp anode and cathode cables of the Lamp House.	Replace the lamp anode and cathode cables in case of degradation, damage, etc. See service manual chapter "Replacement of the cathode wire of the Lamp House", page 146.
20	Lens holder	Check the Lens Holder shift functionality (up/down & left/right).	Use the local keypad or the Communicator software to shift.
21	Lens holder	Check the positional integrity of motorized adjustments by switching Macro's.	Verify correct alignment on screen between flat and scope.
22	Lens holder	Check the focus uniformity.	Adjust the Lens Holder (Scheimpflug) ONLY if needed. See service manual chapter "Scheimpflug", page 277.
23	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 253.</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. Preventative maintenance actions

No.	Component	Maintenance action	Remarks
24	Lens	Check the lens Zoom & Focus motors.	Use the local keypad and the Communicator software to Zoom and to Focus.
25	Convergence	Check convergence.	See chapter "Convergence", page 237.
26	3D color wheel	Check the 3D color wheel for degradation of coatings/condition of glass segments. If there is degradation, then replace the 3D color wheel assembly.	Replace the 3D color wheel assembly. See installation manual of the 3D color wheel.
27	3D color wheel	Check the spinning motor and retraction mechanism of the 3D color wheel assembly.	Wheel must turn before inserted into light path.
28	3D color wheel	Check the calibration of the 3D color wheel	Calibrate if required. See Communicator software.
29	Electronic boards	Check the general condition of the electronic boards in the Card Cage: Status LED's, dust, connections, etc.	Blow out dust.
30	Security	Check the Tamper Switch Activation Report and Security Logs for security infringements.	Report if intruded.
31	Air Extraction	Check customer air extraction system for adequate extraction.	The air extraction system must be capable of removing minimum 4 m ³ /min (140 CFM) per installed DP2K-S series projector.
32	Color calibration	Measure the color coordinates of the projected image and calibrated if necessary.	See user guide of the Communicator software.
33	Documentation	Check if the projector manuals are present and up-to-date.	Download current manual version from https://My.Barco.com .
34	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). <p>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.</p> If the problem remains, replace the CLO module. See service manual chapter "Replacing the Light Sensor module (CLO)", page 219.



Image 4-1

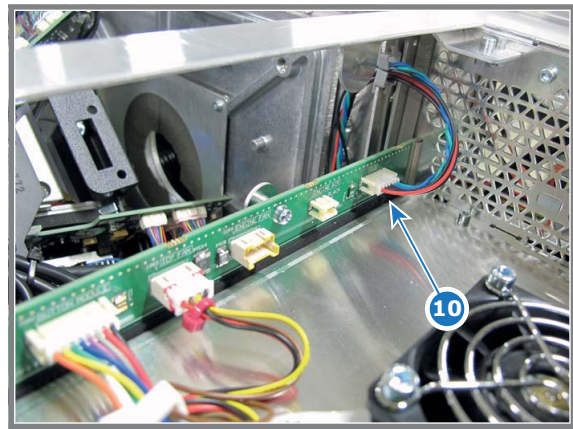


Image 4-2

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

Situation	Solution
LPS communication cable disconnected from the CTLB-IN port of the LPS unit.	Check if the LPS communication cable (reference 3 of image 4-3) is connected with the CTLB-IN port of the LPS unit.
LPS communication cable disconnected from the Signal Backplane.	Check if the LPS communication cable (reference 6 of image 4-4) is connected with the Signal Backplane.
Malfunction of the LPS module. The red LED “ERR” of the LPS module lit up. See chapter "LPS module diagnostic LED's", page 358.	Replace the malfunction LPS unit. See service manual chapter "Lamp Power Supply (LPS)", page 99.
Malfunction Barco Cinema Controller board.	Replace the malfunction Barco Cinema Controller board. See service manual chapter "Replacement of the Cinema Controller", page 299.

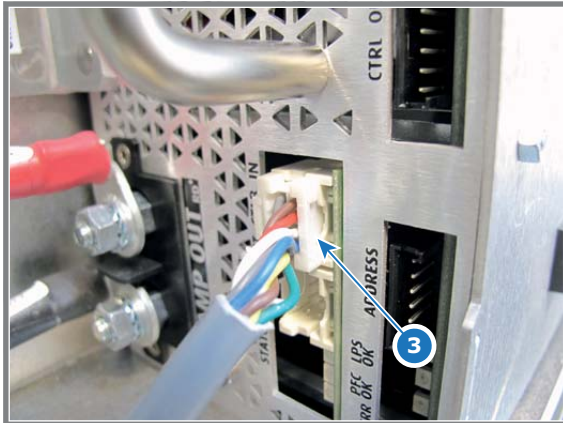


Image 4-3

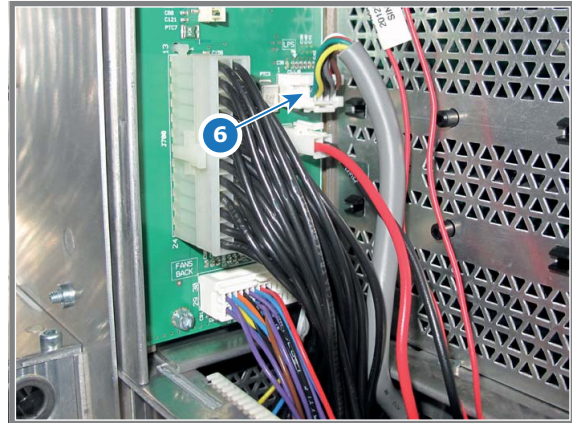


Image 4-4

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

Situation	Solution
Cinema Controller failure.	Re-seat/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 4-5). To access the SIM card socket the two upper boards in the Card Cage and the partition plate have to be removed. See procedure "Removal of the Card Cage partition plate", page 331.
Corrupt or invalid Projector ID card.	Contact Barco for further actions.

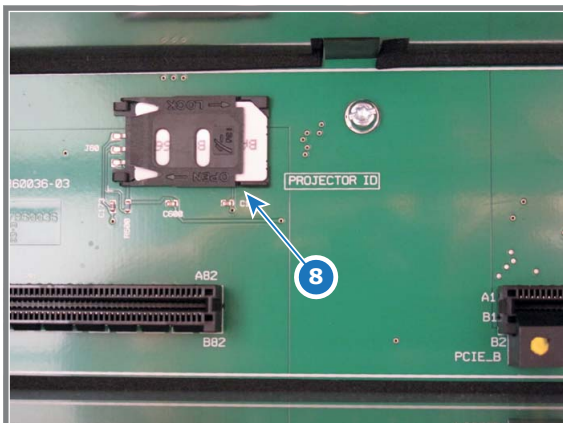


Image 4-5

Code 5042: “cold mirror fan - speed too low” (Error)

Situation	Solution
The wire of the Cold Mirror fan is disconnected from the socket inside the fan compartment.	Remove the left cover of the projector, pull out the Cold Mirror fan assembly and check the connection of the wire at the left side of the fan (reference 1 image 4-6).
Plug of the rear fan units is disconnected from the Signal Backplane.	Remove the Lamp House and Cathode Fan assembly. Check if the plug of the rear fan units is connected with the Signal Backplane (reference 2 image 4-7).
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely (reference 3 image 4-8).
Damaged wire.	Check if the wire of the fan is not damaged (reference 4 image 4-9). Repair if possible, otherwise replace with new one. See service manual chapter "Replacement of the Cold Mirror fan", page 166.
Fan end of life.	Replace the fan. See service manual chapter "Replacement of the Cold Mirror fan", page 166.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

4. Troubleshooting

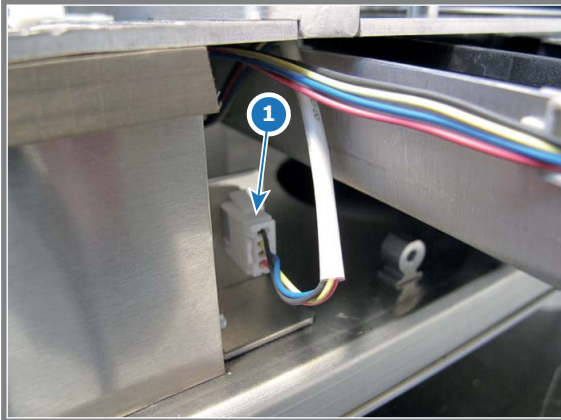


Image 4-6

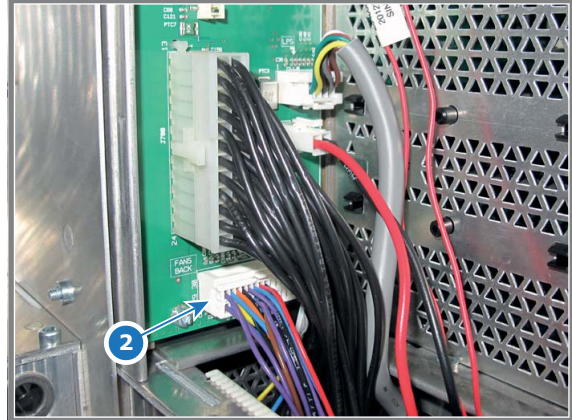


Image 4-7

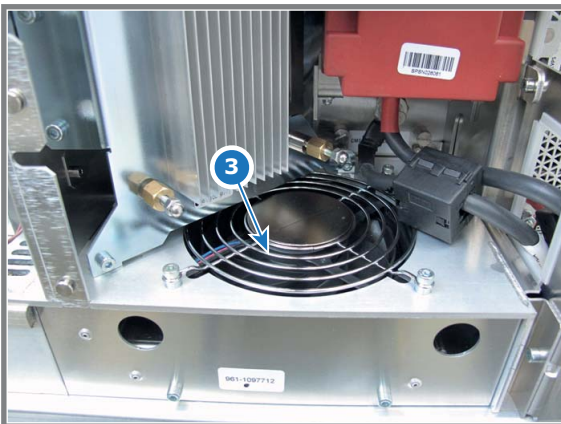


Image 4-8

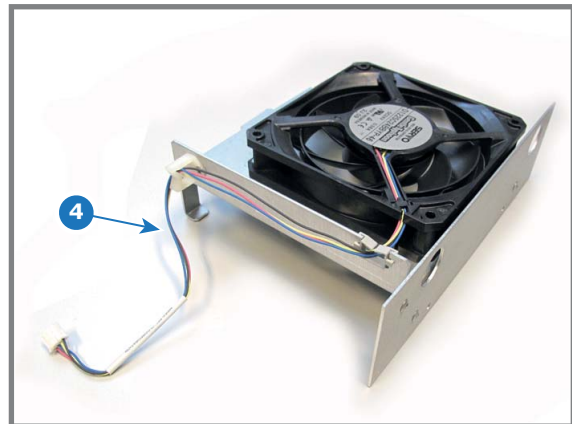


Image 4-9

Code 5043: "cold mirror fan - speed low" (Warning)

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely (reference 3 image 4-10).
Damaged wire.	Check if the wire of the fan is not damaged. Repair if possible, otherwise replace with new one (reference 4 image 4-11).
Fan end of life.	Replace the fan. See service manual chapter "Replacement of the Cold Mirror fan", page 166.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

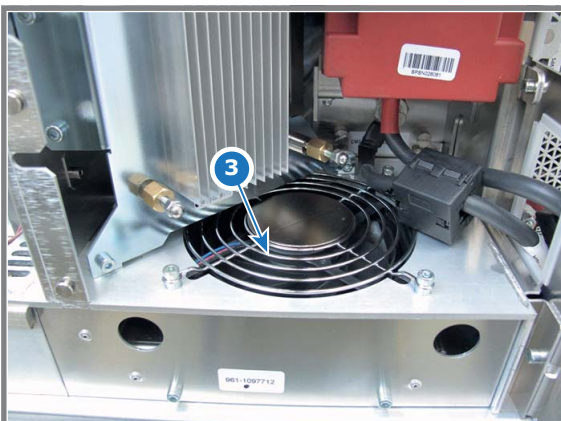


Image 4-10

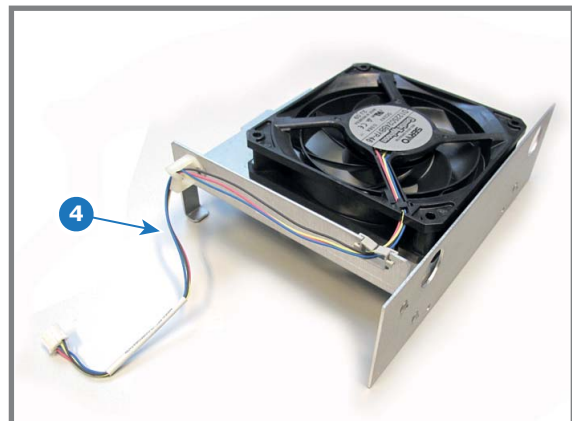


Image 4-11

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 4-12).
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 4-13).
Fan end of life.	Replace the fan. See service manual chapter "Replacement of the fan of the Light Processor compartment ", page 180.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

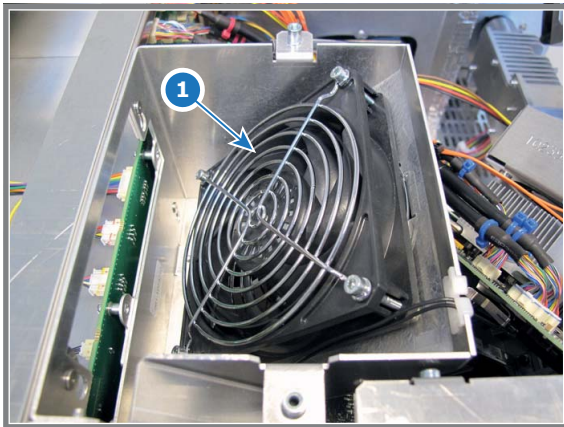


Image 4-12

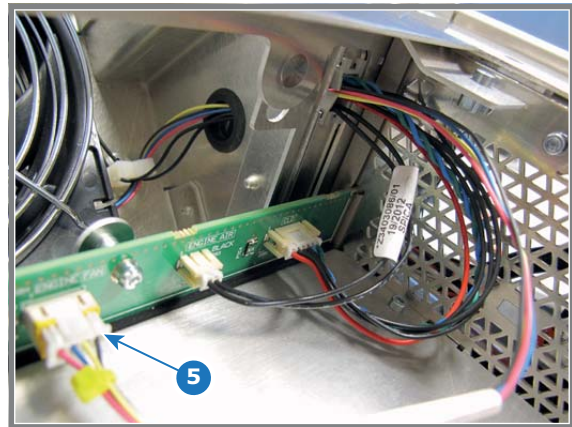


Image 4-13

Code 5072: “lamp anode fan - speed too low” (Error)

Situation	Solution
Wire of the Lamp Anode Fan is disconnected.	Remove the projector top cover and the top cover plate of the Light Processor compartment and check the connection of the Lamp Anode Fan (reference 1 image 4-14).
Wire of the rear fan units is disconnected from the Signal Backplane.	Remove the Lamp House and Lamp Cathode fan and check if the wire unit (reference 2 image 4-15) is inserted in the Signal Backplane.
Blocked Lamp Anode Fan	Check if the Lamp Anode Fan is not blocked. Ensure that the Lamp Anode Fan can turn freely. (reference 3 image 4-16).
Damaged wire.	Check if the wire of the Lamp Anode Fan is not damaged. Repair if possible, otherwise replace with new one.
Lamp Anode Fan end of life.	Replace the Lamp Anode Fan. See service manual chapter "Replacement of the Lamp Anode Fan", page 154.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

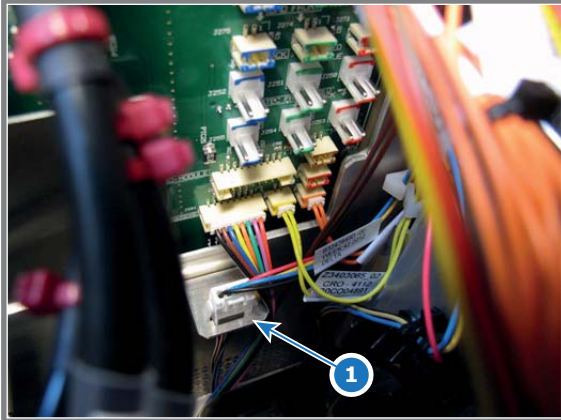


Image 4-14

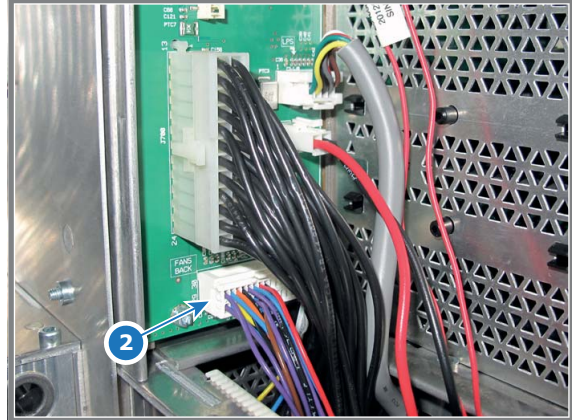


Image 4-15

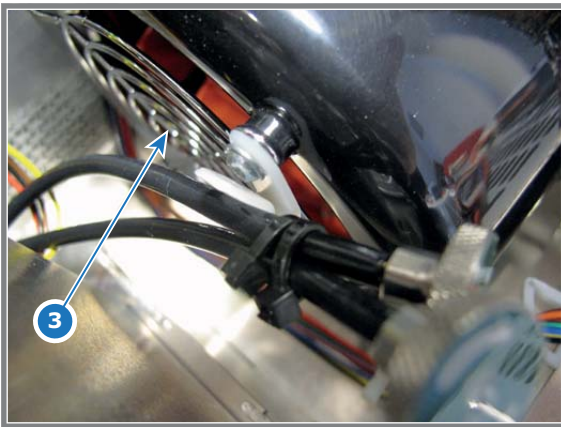


Image 4-16

Code 5073: “lamp anode fan - speed low” (Warning)

Situation	Solution
Blocked Lamp Anode Fan	Check if the Lamp Anode Fan is not blocked. Ensure that the Lamp Anode Fan can turn freely. (reference 3 image 4-16).
Damaged wire.	Check if the wire of the Lamp Anode Fan is not damaged. Repair if possible, otherwise replace with new one.
Lamp Anode Fan end of life.	Replace the Lamp Anode Fan. See service manual chapter "Replacement of the Lamp Anode Fan", page 154.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

Code 5082: “lamp cathode fan - speed too low” (Error)

Situation	Solution
Wire of the Lamp Cathode Fan is disconnected.	Remove the Lamp House and Lamp Cathode fan (reference 1 image 4-17) and check the connection of the Lamp Cathode Fan (reference 3 image 4-17).
Wire of the rear fan units is disconnected from the Signal Backplane.	Remove the Lamp House and Lamp Cathode fan and check if the wire unit (reference 2 image 4-18) is inserted in the Signal Backplane.
Blocked Lamp Cathode Fan.	Check if the Cathode Fan is not blocked. Ensure that the Cathode Fan can turn freely (reference 1 image 4-19).
Damaged wire.	Check if the wire of the Cathode Fan is not damaged. Repair if possible, otherwise replace with new one.

Situation	Solution
Lamp Cathode Fan end of life.	Replace the Lamp Cathode Fan. See service manual chapter "Replacement of the Lamp Cathode Fan", page 156.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

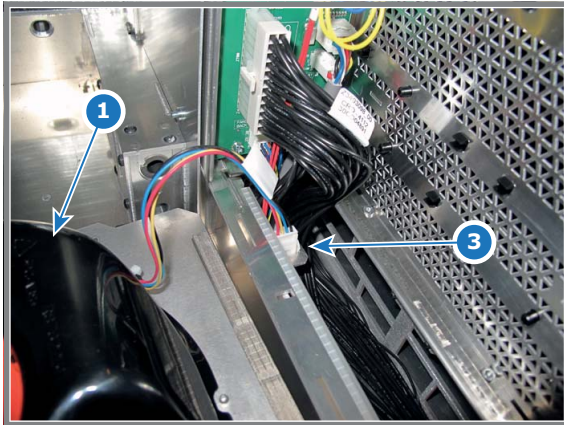


Image 4-17

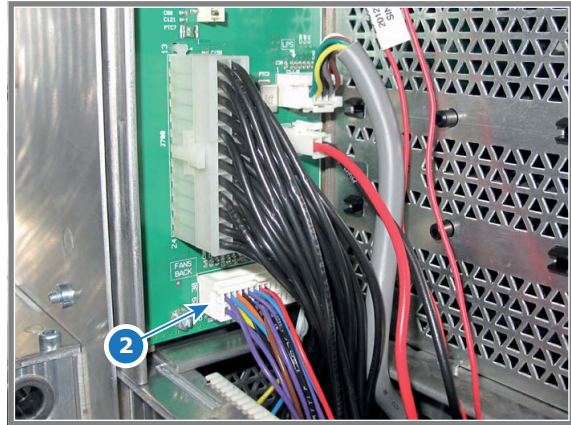


Image 4-18

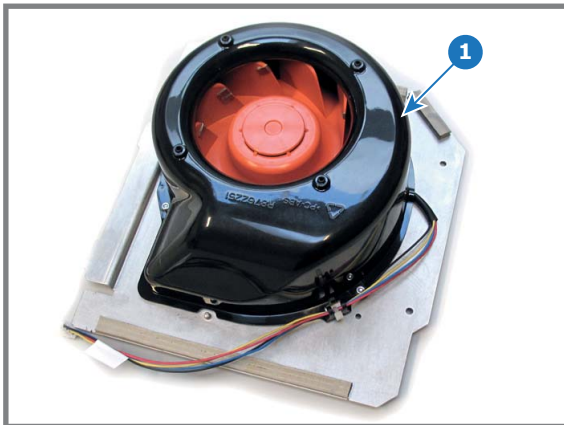


Image 4-19

Code 5083: “lamp cathode fan - speed low” (Warning)

Situation	Solution
Blocked Lamp Cathode Fan.	Remove the Lamp House and check if the Cathode Fan is not blocked. Ensure that the Cathode Fan can turn freely (reference 1 image 4-20).
Damaged wire.	Remove the Cathode Fan assembly and check if the wire of the Cathode Fan is not damaged. Repair if possible, otherwise replace with new one (reference 3image 4-21).
Lamp Cathode Fan end of life.	Replace the Lamp Cathode Fan. See service manual chapter "Replacement of the Lamp Cathode Fan", page 156.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

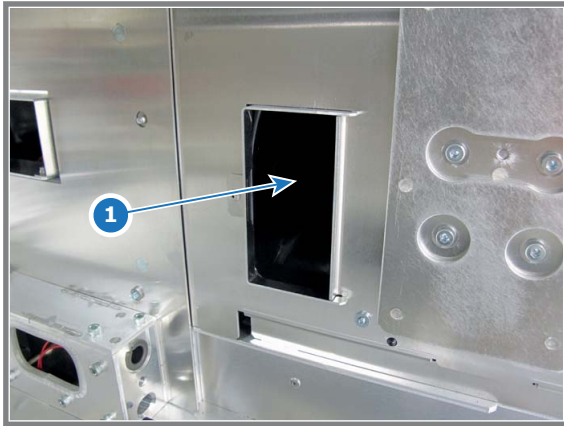


Image 4-20

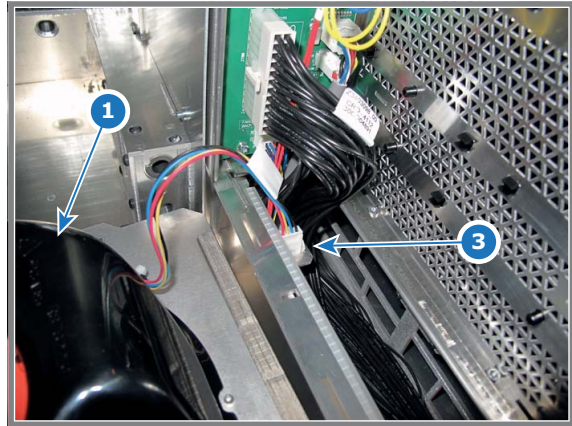


Image 4-21

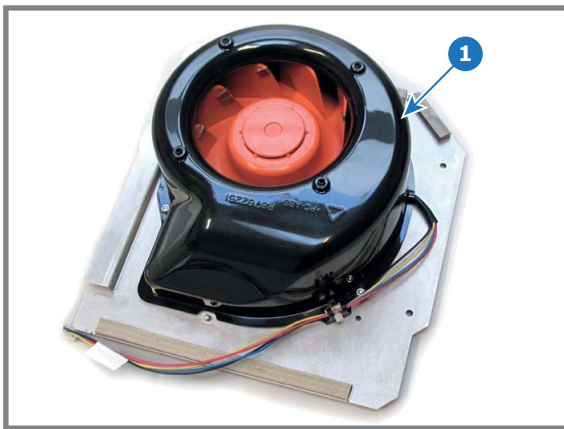


Image 4-22

Code 5103: “smps 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 4-23).
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 4-24). SMPS fan 2 is the fan which wire is marked with a red cable tie (reference 2 of image 4-24).
Fan end of life.	Replace both fans of the SMPS compartment. See service manual chapter "Replacing the fans of the SMPS compartment", page 97. 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 299.

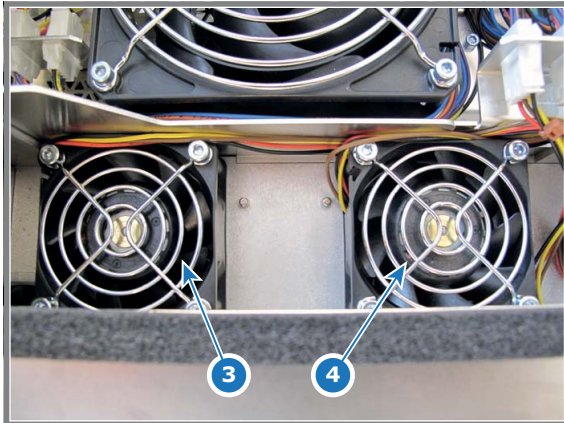


Image 4-23

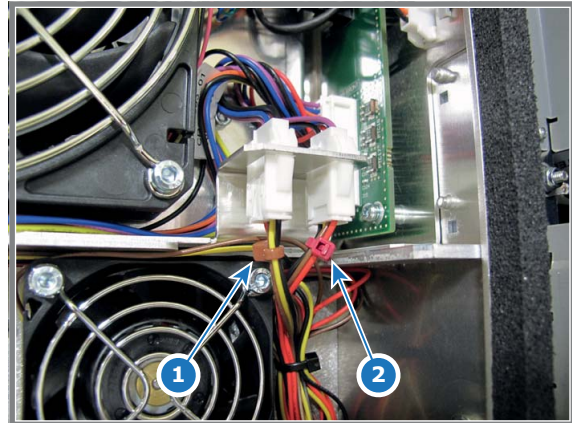


Image 4-24

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 4-25).
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 4-26). SMPS fan 2 is the fan which wire is marked with a red cable tie (reference 2 of image 4-26).
Fan end of life.	Replace both fans of the SMPS compartment. See service manual chapter "Replacing the fans of the SMPS compartment", page 97. 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 299.

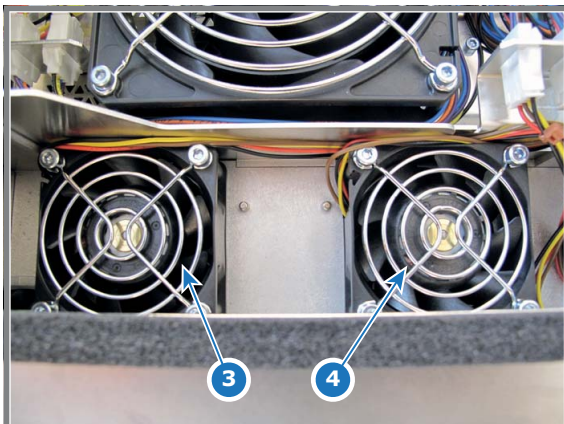


Image 4-25

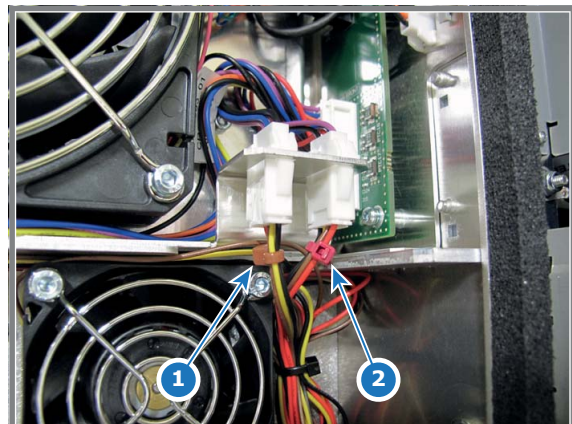


Image 4-26

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 4-27).
Damaged wire.	Remove the large dust filter from the projector and check if the wire of the Card Cage small fan is not 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 4-28). Electronics fan 2 (Card Cage large fan) is the fan which wire is marked with an orange cable tie (reference 4 of image 4-28).

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 302.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

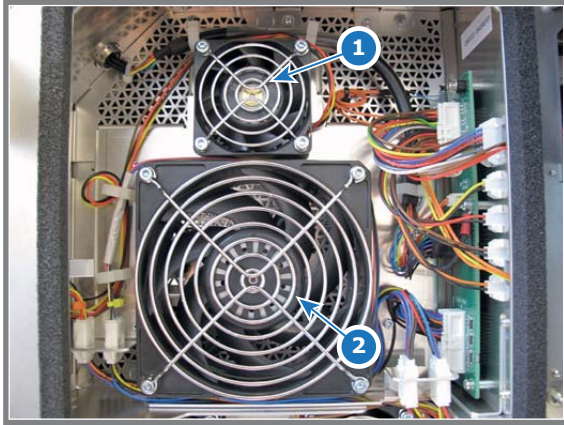


Image 4-27

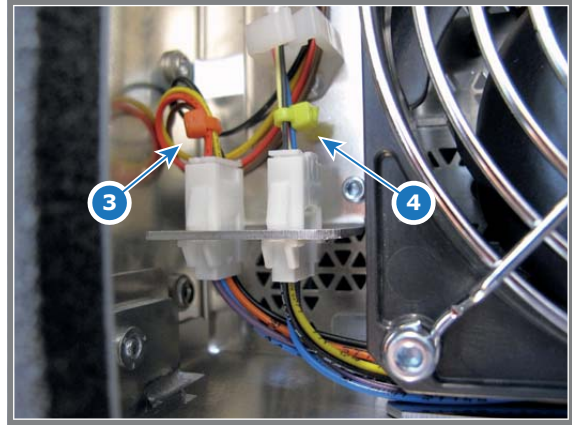


Image 4-28

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 4-29).
Damaged wire.	Remove the large dust filter from the projector and check if the wire of the Card Cage large fan is not 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 4-30). Electronics fan 2 (Card Cage large fan) is the fan which wire is marked with a orange cable tie (reference 4 of image 4-30).
Fan end of life.	Replace the Card Cage large fan. See service manual chapter "Replacement of the Card Cage large fan", page 303.
Malfunction Cinema Controller.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

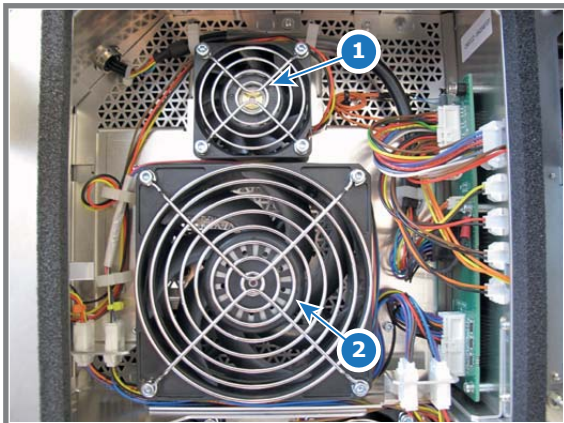


Image 4-29

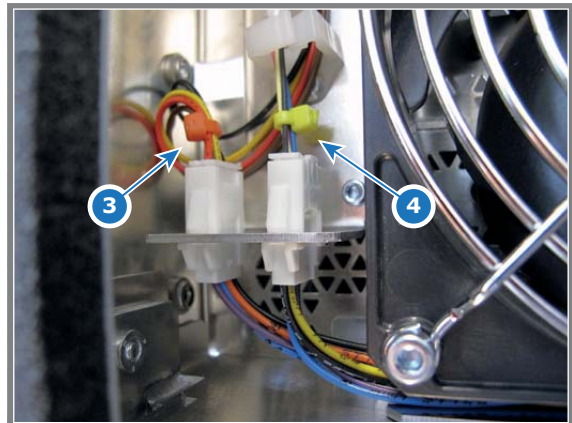


Image 4-30

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

Situation	Solution
Lamp House is not correctly installed.	Check if the Lamp House is properly installed. Make sure that both fixation screws (reference 1 image 4-31) at the base of the Lamp House are fastened. See service manual chapter "Installation of the Lamp House", page 128.
Wire of the micro switch disconnected from the Signal Backplane.	Remove the Lamp House and the lamp Cathode Fan assembly and check if the wire of the micro switch is plugged in on the Signal Backplane (reference 2 image 4-32).
Defect micro switch.	Replace the micro switch (reference 3 image 4-33).

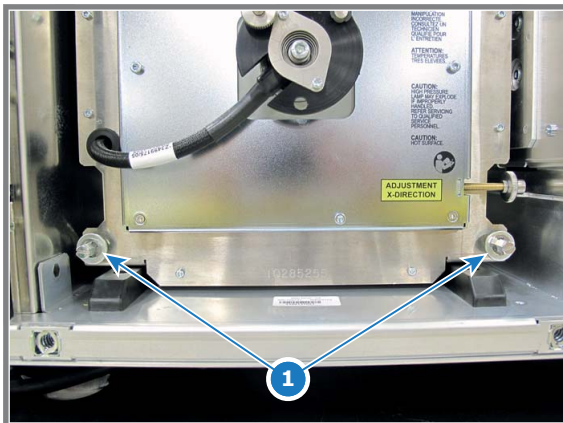


Image 4-31

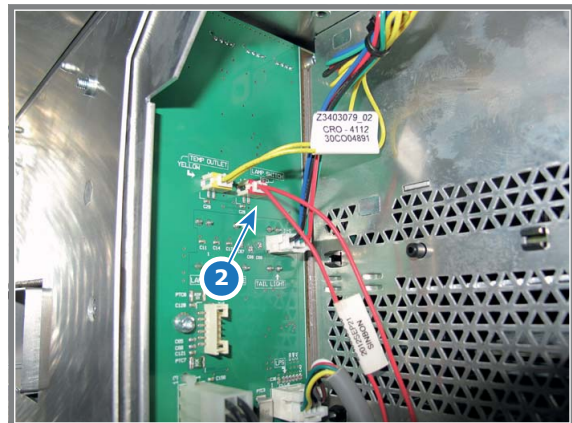


Image 4-32

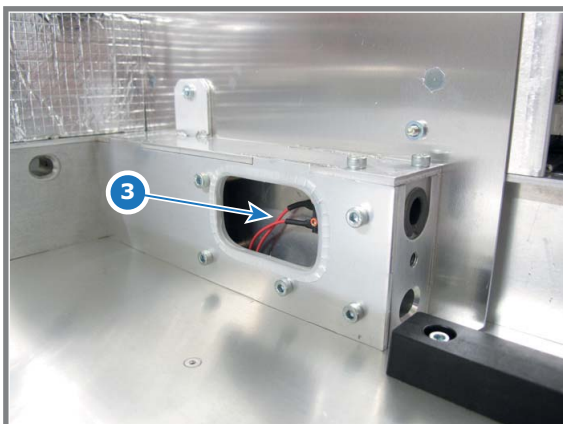


Image 4-33

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 4-34). 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 4-35 and reference 5 of image 4-36)

4. Troubleshooting

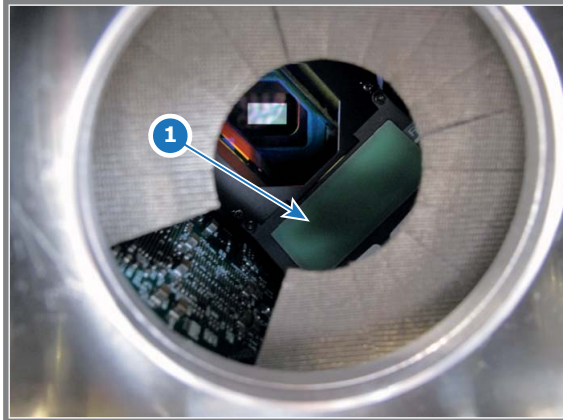


Image 4-34

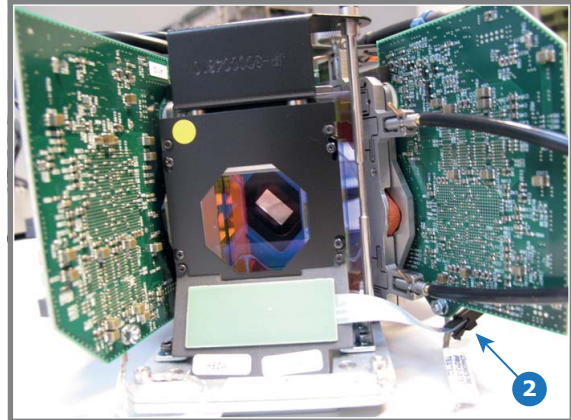


Image 4-35

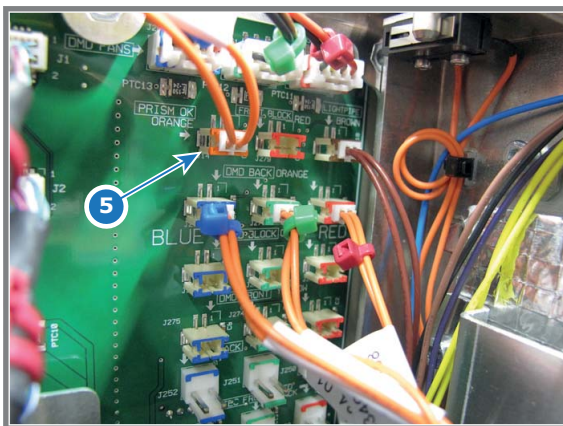


Image 4-36

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 if the lens is correctly installed. See service manual chapter "Lens installation", page 249.
The activated lens file does not correspond with the lens mounted on the projector.	Activate a lens file which corresponds with the mounted lens or mount another lens which corresponds 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. It is possible that the lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom.
The final lens position lays very close to the mechanical limits which disable the motorized lens position.	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. 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.
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 4-37)
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 4-38) is inserted in the Signal Backplane.
Broken or damaged electrical socket of the Lens Holder.	Check if the electrical socket (reference 1 image 4-39) on the Lens Holder front plate is not damaged. If damaged replace the socket. See service manual chapter "Lens Holder", page 245.

Situation	Solution
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.
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 264.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane. See service procedure "Signal Backplane replacement process", page 309.

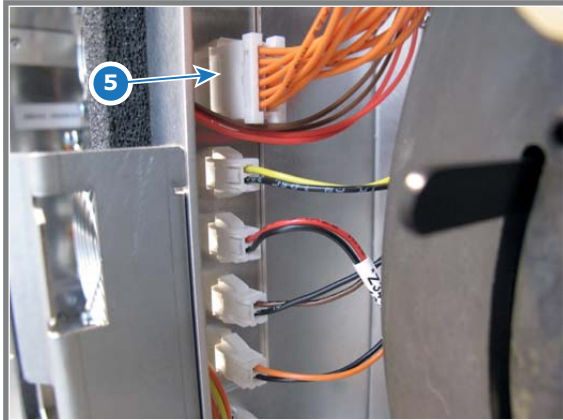


Image 4-37

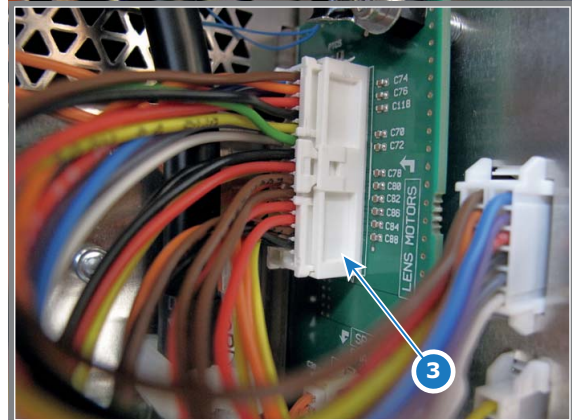


Image 4-38

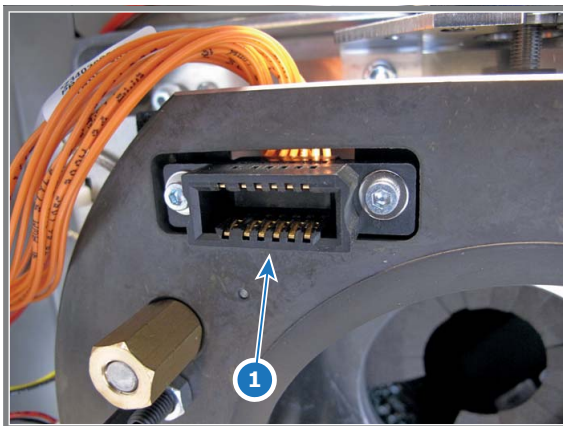


Image 4-39

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 of the lens is correctly installed. See service manual chapter "Lens installation", page 249.
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. It is possible that the lens file was originally created at the maximum or minimum zoom capabilities of the lens zoom.

4. Troubleshooting

Situation	Solution
The final lens position lays very close to the mechanical limits which disable the motorized lens position.	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. 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.
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 4-40)
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 4-41) is inserted in the Signal Backplane.
Broken or damaged electrical socket of the Lens Holder.	Check if the electrical socket (reference 1 image 4-42) on the Lens Holder front plate is not damaged. If damaged replace the socket. See service manual chapter "Lens Holder", page 245.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.
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 264.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane. See service procedure "Signal Backplane replacement process", page 309.

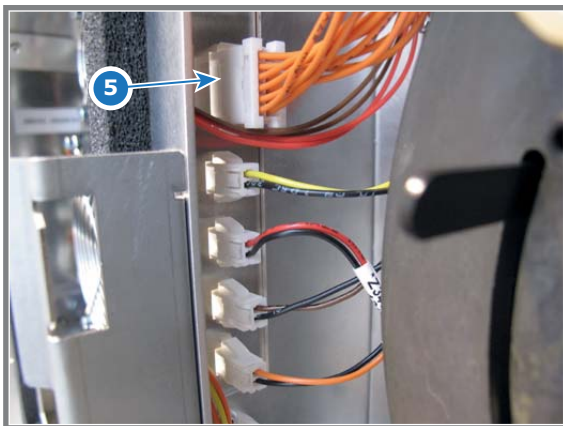


Image 4-40

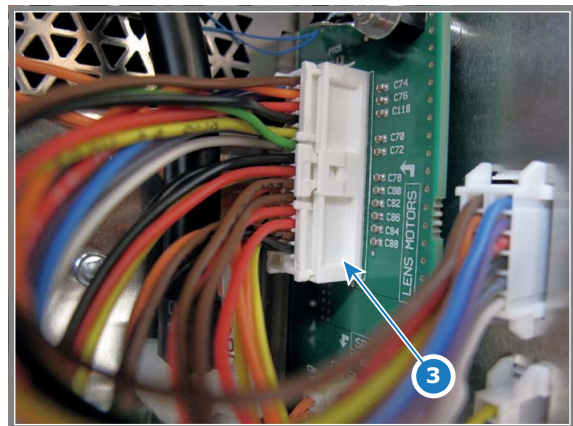


Image 4-41

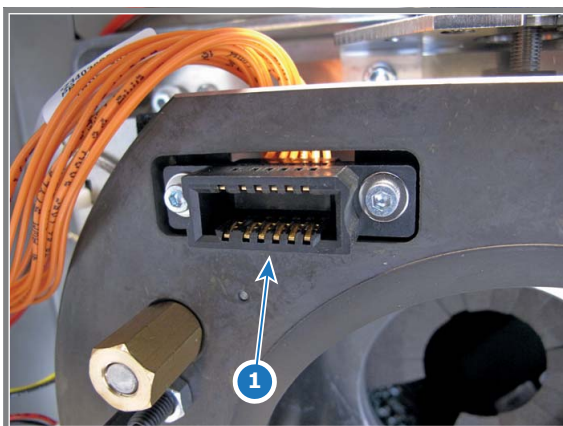


Image 4-42

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.

Situation	Solution
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 4-44) is connected with the horizontal shift motor which is located at the right side of the Lens Holder.
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 4-43) 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 4-45) is inserted in the Signal Backplane.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.
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 262.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 309.

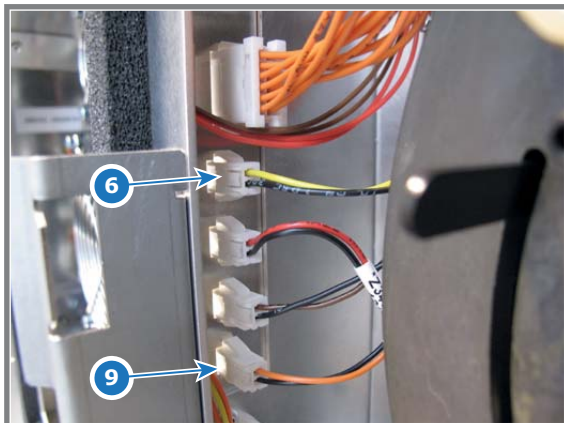


Image 4-43

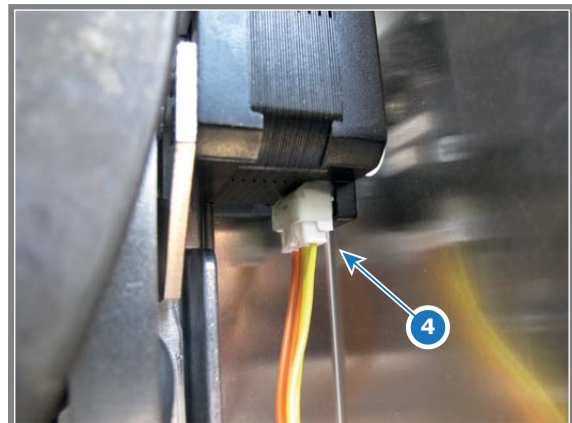


Image 4-44

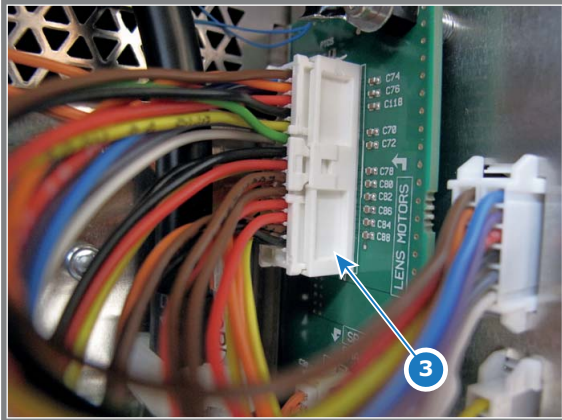


Image 4-45

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.	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 vertical shift motor	Remove the projector top cover and check if the brown/orange wire (reference 2 image 4-46) 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 4-47) 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 4-48) is inserted in the Signal Backplane.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.
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 manual chapter "Replacement of the Horizontal Shift stepper motor", page 262.
Malfunction Signal Backplane (bad connection).	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 309.

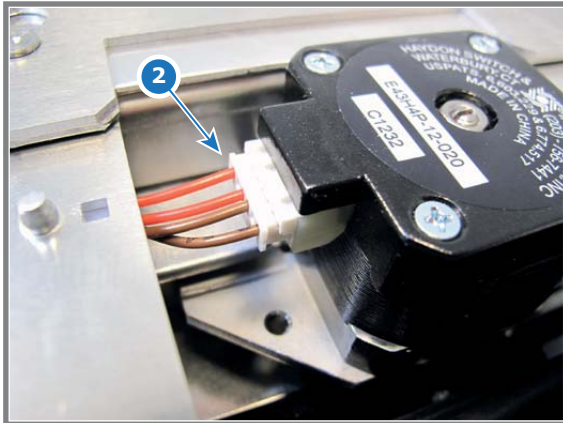


Image 4-46

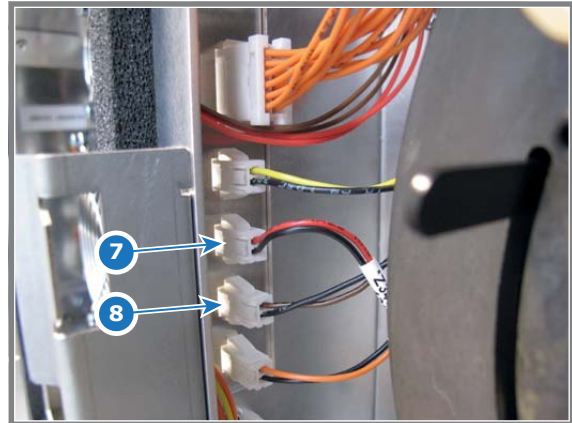


Image 4-47

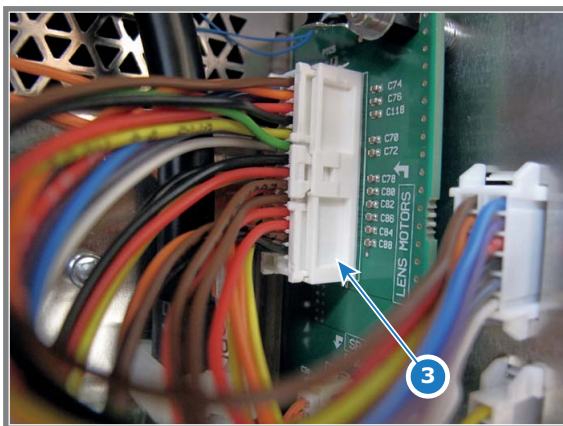


Image 4-48

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 4-49.
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 4-50. 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 183.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.
Other fans are also not spinning.	Replace the SMPS Board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91.
Defect Signal Backplane	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 309.

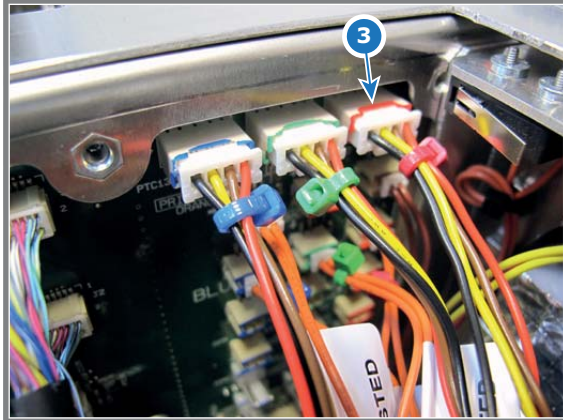


Image 4-49

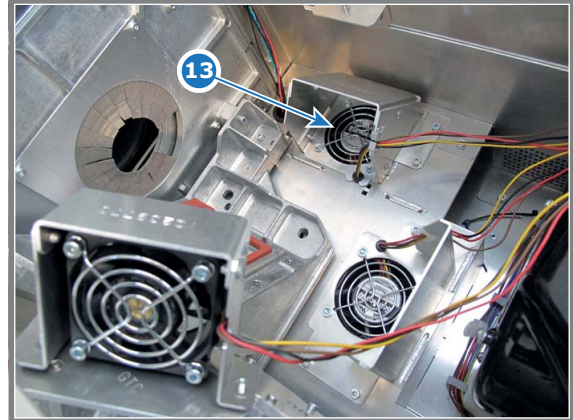


Image 4-50

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 4-51.
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 4-52. 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 183.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.
Other fans are also not spinning.	Replace the SMPS Board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91.
Defect Signal Backplane	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 309.

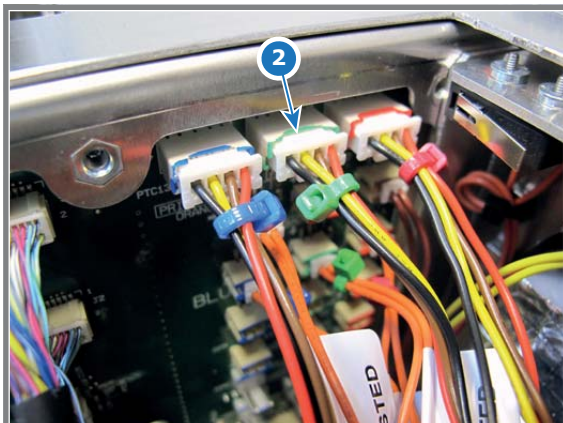


Image 4-51

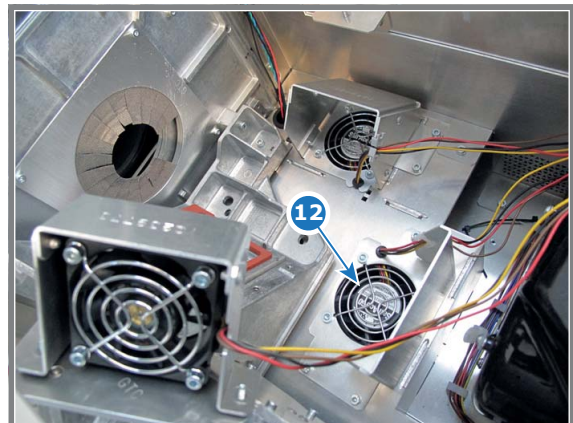


Image 4-52

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 4-53.
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 4-54. 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 Red channel", page 183.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.
Other fans are also not spinning.	Replace the SMPS Board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91.
Defect Signal Backplane	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 309.

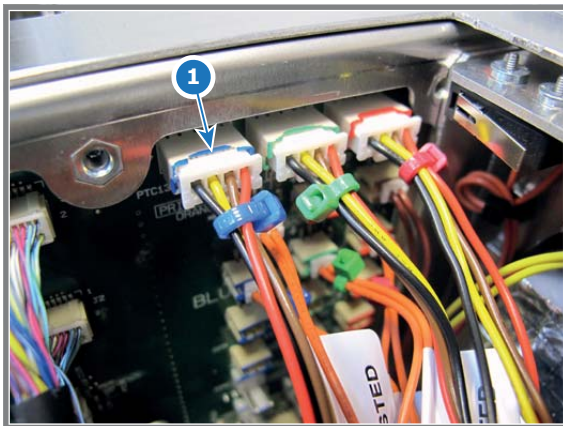


Image 4-53

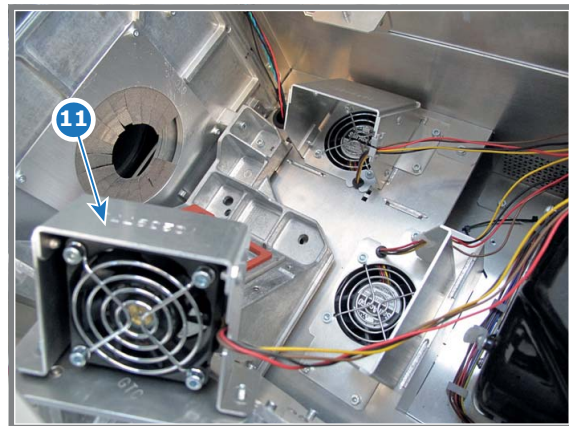


Image 4-54

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 to.

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 "Check the large dust filter", page 334.
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-S 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.
Defect temperature sensor.	Replace the ambient temperature sensor (reference 12 image 4-55).
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

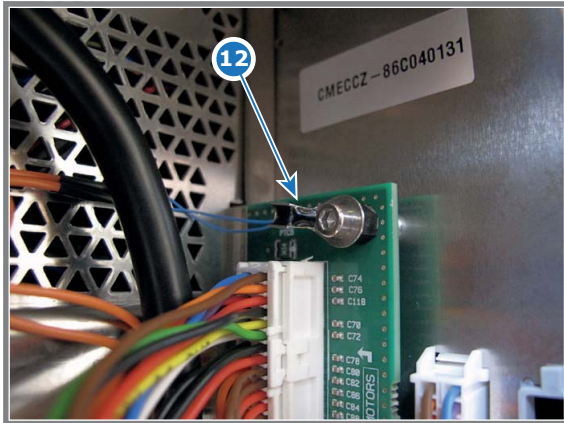


Image 4-55

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

Situation	Solution
Temperature sensor disconnected.	Check if wire (reference 14 image 4-56) of the ambient temperature sensor (NTC) is connected with the Signal Backplane.
Defect temperature sensor.	Replace the ambient temperature sensor (reference 12 image 4-57).
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.
Malfunction Signal Backplane.	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 309.



Image 4-56

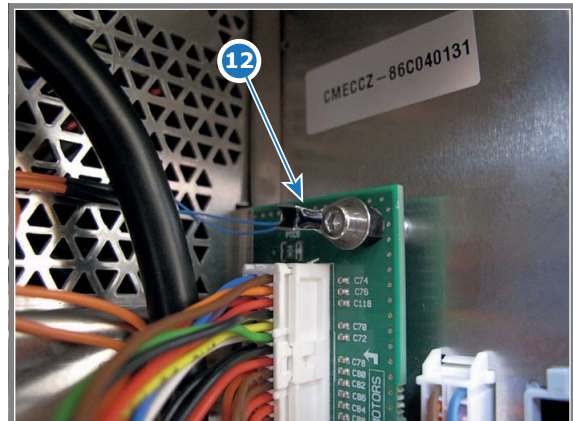


Image 4-57

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 4-56) 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 4-57). 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 12 image 4-57) which measures the ambient temperature. When disconnecting the wire of the temperature sensor from the Signal Backplane (reference 14 image 4-56) the error code is changed to “ambient - temperature sensor open”.	Replace the temperature sensor (reference 12 image 4-57) 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 "Check the large dust filter", page 334.
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter "Check the small dust filter", page 336.
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 m ³ /min (140 CFM) per installed DP2K-S 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.
Defect temperature sensor.	Replace the temperature sensor (reference 16 image 4-58) 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 299.
Malfunction Light Processor.	Replace the whole Light Processor Unit. See service manual chapter "Light Processor replacement process", page 172. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

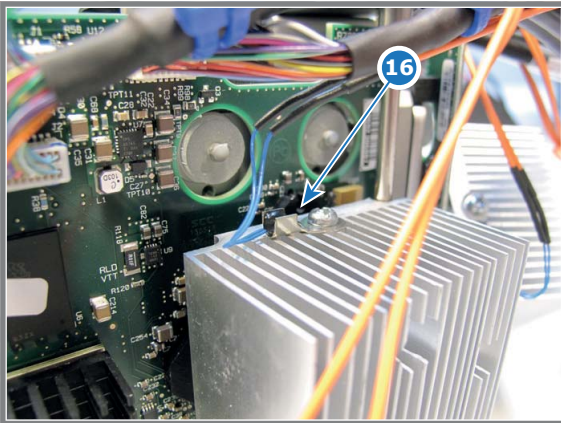


Image 4-58

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 than 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 4-58) 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 4-59) 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 4-60) . 2. If not repairable, replace the temperature sensor.
Defect temperature sensor.	Replace the temperature sensor (reference 16 image 4-60) which measures the heat sink temperature of the blue channel.

4. Troubleshooting

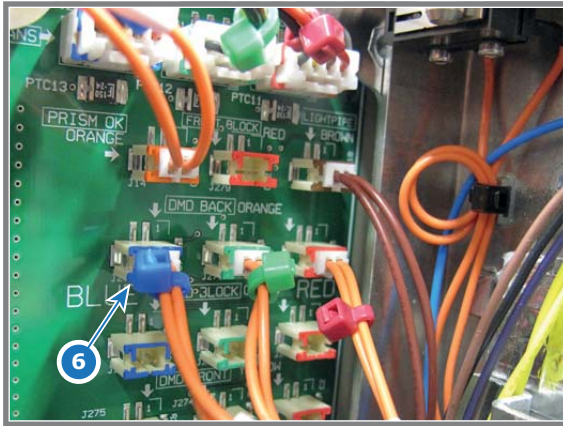


Image 4-59

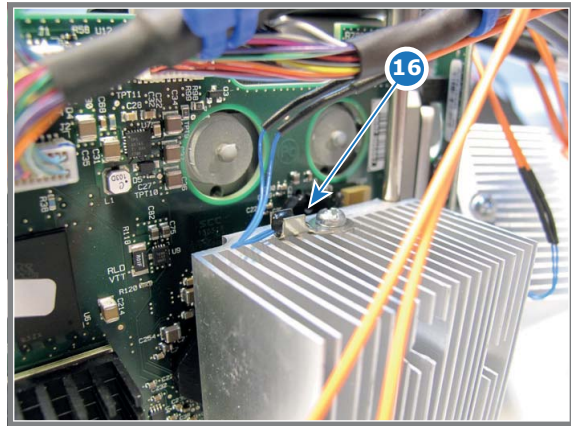


Image 4-60

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 4-59) 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 4-60). 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 16 image 4-60) 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 4-59) the error code is changed to “dmd blue - temperature sensor open”.	Replace the temperature sensor (reference 16 image 4-60) 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 “Check the large dust filter”, page 334.
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter “Check the small dust filter”, page 336.
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.	<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-S 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>
Defect temperature sensor.	Replace the temperature sensor (reference 17 image 4-61) 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 299.
Malfunction Light Processor.	Replace the whole Light Processor Unit. See service manual chapter “Light Processor replacement process”, page 172. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

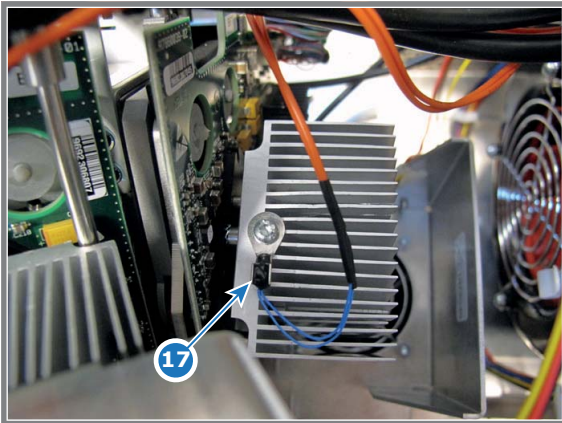


Image 4-61

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 than 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 4-61) 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 4-62) 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 4-63) . 2. If not repairable, replace the temperature sensor.
Defect temperature sensor.	Replace the temperature sensor (reference 17 image 4-63) which measures the heat sink temperature of the green channel.

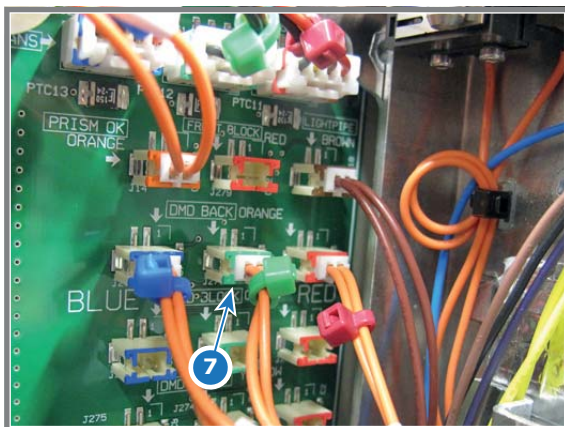


Image 4-62

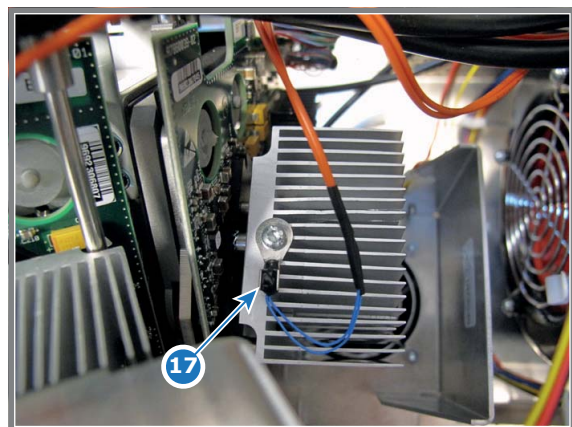


Image 4-63

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 4-62) 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 4-63) . 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 17 image 4-63) 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 4-62) the error code is changed to “dmd green - temperature sensor open”.	Replace the temperature sensor (reference 17 image 4-63) 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 to.

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 “Check the large dust filter”, page 334.
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter “Check the small dust filter”, page 336.
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-S 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 lamp anode fan or lamp cathode fan.	Check the speed and voltage of the lamp anode and lamp cathode fan. See User Guide Communicator. Replace any malfunction fan. See service manual chapter “Replacement of the Lamp Cathode Fan”, page 156, and chapter “Replacement of the Lamp Anode Fan”, page 154.

Code 5314: “lamp - temperature sensor open” (Error)

Situation	Solution
Disconnected wire of the temperature sensor.	<p>Check if the wire (reference 9 image 4-64) of the temperature sensor is plugged into its socket on the Signal Backplane.</p> <p>Note: To access the socket on the Signal Backplane the Lamp Cathode has to be removed. See service manual chapter “Replacement of the Lamp Cathode Fan”, page 156.</p>
Damaged wire of the temperature sensor.	<ol style="list-style-type: none"> 1. Repair the wire (reference 29 image 4-65) of the temperature sensor which measures the temperature at the lamp outlet (reference 19 image 4-66) . 2. If not repairable, replace the temperature sensor.
Defect temperature sensor.	<p>Replace the temperature sensor (reference 19 image 4-66) which measures the heat sink temperature of the green channel.</p> <p>Note: To access the temperature sensor of the lamp outlet channel the air outlet duct of the projector has to be uncoupled from the external air extraction system.</p>

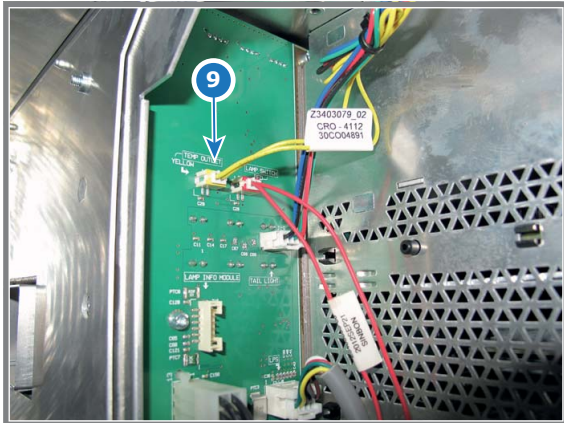


Image 4-64

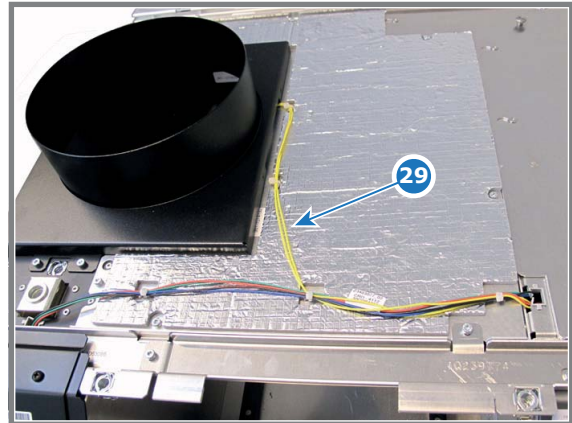


Image 4-65

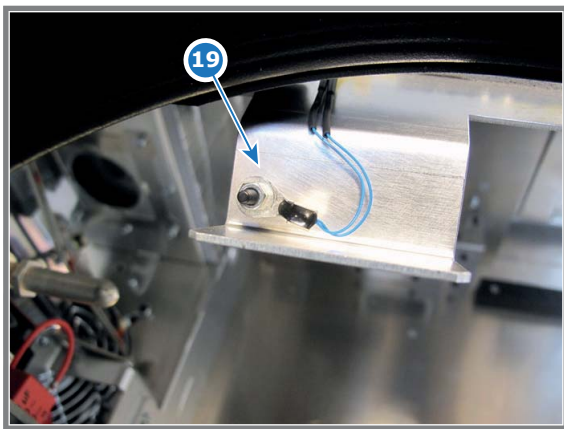


Image 4-66

Code 5315: “lamp - temperature sensor short ” (Error)

Situation	Solution
<p>Damaged insulation of the temperature sensor wires (reference 19 image 4-66 & reference 29 image 4-65), which measures the temperature in the channel of the air outlet of the Lamp House. When disconnecting the wire of the temperature sensor from the Signal Backplane (reference 9 image 4-64) the error code is changed to “lamp - temperature sensor open”.</p>	<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.
<p>Defect temperature sensor (reference 19 image 4-66), which measures the temperature in the channel of the air outlet of the Lamp House. When disconnecting the wire unit of the temperature sensor from the Signal Backplane (reference 9 image 4-64) the error code is changed to “lamp - temperature sensor open”.</p>	<p>Replace the temperature sensor.</p>

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 House not connected.	<ol style="list-style-type: none"> 1. Ensure that all temperatures are within range (Light Processor, Lamp House, ambient, etc. See projector log files) 2. Check if the Lamp House is properly installed. Make sure that both fixation screws at the base of the Lamp House 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 299.

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 to.

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 "Check the large dust filter", page 334.
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter "Check the small dust filter", page 336.
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.	<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-S 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>
Defect temperature sensor.	Replace the temperature sensor (reference 18 image 4-67) 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 299.
Malfunction Light Processor.	Replace the whole Light Processor Unit. See service manual chapter "Light Processor replacement process", page 172. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

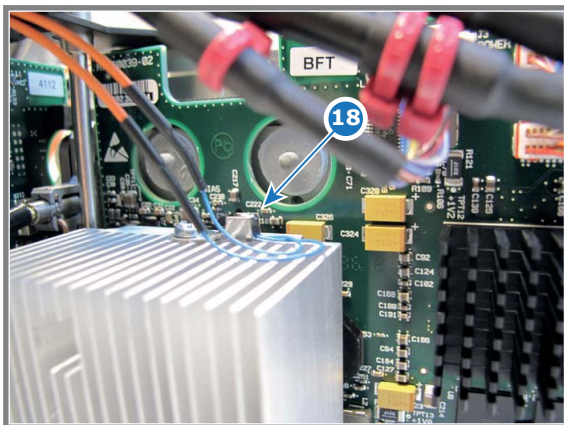


Image 4-67

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 than 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 4-67) 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 4-68) 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 4-69) . 2. If not repairable, replace the temperature sensor.
Defect temperature sensor.	Replace the temperature sensor (reference 18 image 4-69) which measures the heat sink temperature of the red channel.

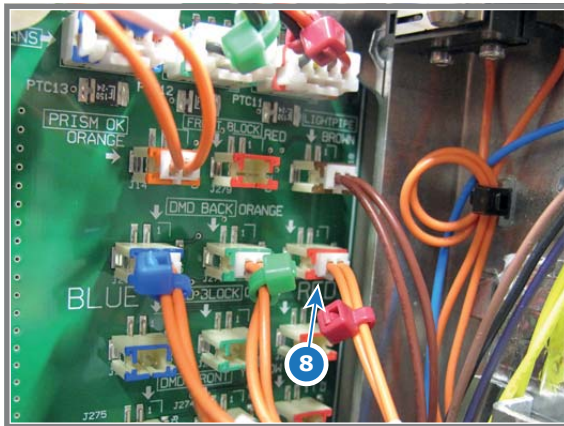


Image 4-68

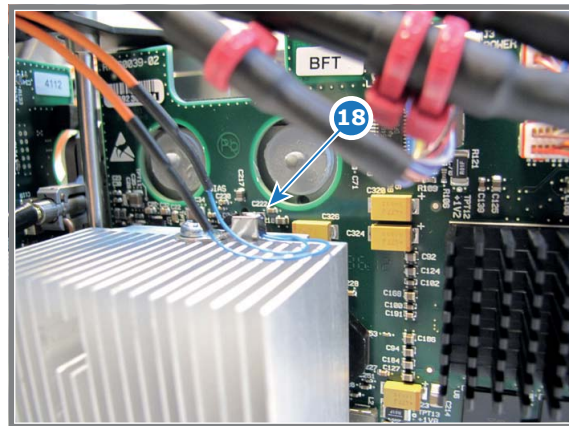


Image 4-69

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 4-68) 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 4-69). 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 18 image 4-69) 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 4-64 the error code is changed to “dmd red - temperature sensor open”.	Replace the temperature sensor (reference 18 image 4-69) 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 "Check the large dust filter", page 334.
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-S 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 91.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

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 "Check the large dust filter", page 334.
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-S 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 91.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

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 91.

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 91.

Code 5640: “lamp power supplies - zero lamp power supplies detected” (Error)

Situation	Solution
LPS communication wire disconnected from the Lamp Power Supply.	Reconnect the LPS wire (reference 3 image 4-70) with the LPS module.
LPS communication wire disconnected from Signal Backplane.	Reconnect the LPS wire (reference 4 image 4-71) with the Signal Backplane. Note: To access the socket on the Signal Backplane the Lamp Cathode has to be removed. See service manual chapter "Replacement of the Lamp Cathode Fan", page 156.

Situation	Solution
Malfunction LPS module. The orange LED (Heartbeat) of the LPS is not blinking.	Replace the whole LPS module. See service manual chapter "Lamp Power Supply (LPS)", page 99.
Defect Signal Backplane.	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 309.

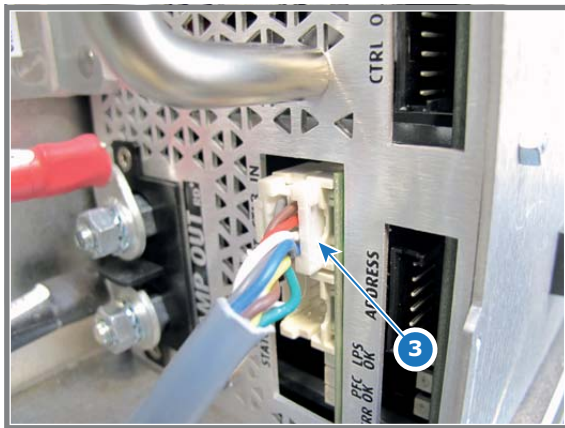


Image 4-70

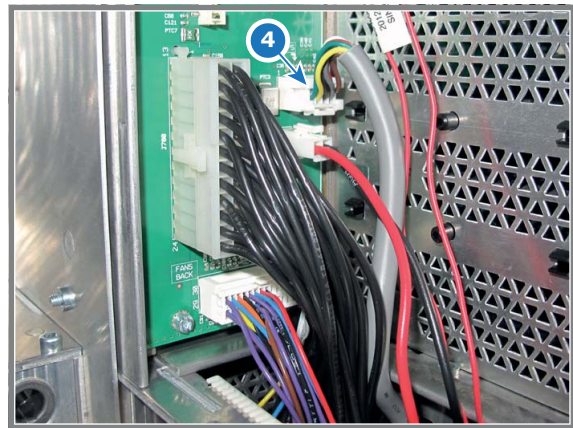


Image 4-71

Code 5642: "lamp power supplies - at least one lamp power supply could not be detected" (Error)

Situation	Solution
LPS wire disconnected from the Lamp Power Supply.	Reconnect the LPS wire (reference 3 image 4-70) with the LPS module.
LPS wire disconnected from Signal Backplane.	Reconnect the LPS wire (reference 4 image 4-71) with the Signal Backplane. Note: To access the socket on the Signal Backplane the Lamp Cathode has to be removed. See service manual chapter "Replacement of the Lamp Cathode Fan", page 156.
Malfunction LPS module. The orange LED (Heartbeat) of the LPS is not blinking.	Replace the whole LPS module. See service manual chapter "Lamp Power Supply (LPS)", page 99.
Defect Signal Backplane.	Replace the Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 309.

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

Situation	Solution
Lamp exhausted.	Install a new lamp. See service manual chapter "Lamp replacement process", page 115.
Power cables disconnected from the Mains Input sockets of the LPS units.	Check if the power wires (reference 1 of image 4-72) are connected with the LPS unit.
LPS communication cable disconnected from the CTLB-IN port of the LPS unit.	Check if the LPS communication cable (reference 3 of image 4-73) is connected with the CTLB-IN port of the LPS unit.
LPS communication cable disconnected from the Signal Backplane.	Check if the LPS communication cable (reference 6 of image 4-74) is connected with the Signal Backplane.

4. Troubleshooting

Situation	Solution
Malfunction of the LPS module. The red LED "ERR" of the LPS module lit up. See chapter "LPS module diagnostic LED's", page 358.	Replace the malfunction LPS unit. See service manual chapter "Lamp Power Supply (LPS)", page 99.
The lamp goes out immediately after the ignition or does not go on at all. SMPS and LPS seems to work normally. This situation can be the result of a bad lamp or SPG module.	<ul style="list-style-type: none"> • Install another xenon lamp in case the voltage on the "LAMP OUT" pins is 110 volt and you hear the SPG module clicking to ignite the lamp. See service manual chapter "Lamp replacement process", page 115. • Replace the SPG module in case the voltage value on the "LAMP OUT" pins is 110 volt and you do NOT hear the SPG module clicking to ignite the lamp. See service manual chapter "Start Pulse Generator", page 105. • Replace the LPS module in case the voltage value on the "LAMP OUT" pins is below 110 volt and the lamp is not ignited. <p>Note: The ambient noise must be low to hear the SPG clicking in an attempt to ignite the lamp.</p>
Malfunction Barco Cinema Controller board.	Replace the malfunction Barco Cinema Controller board. See service manual chapter "Replacement of the Cinema Controller", page 299.

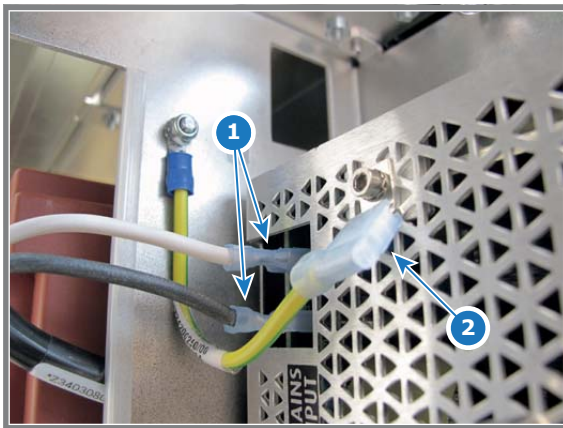


Image 4-72

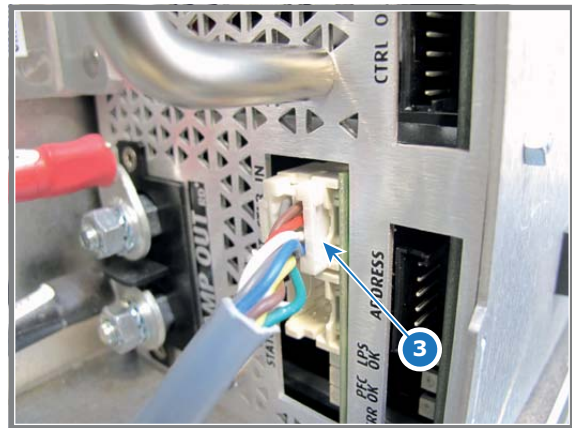


Image 4-73

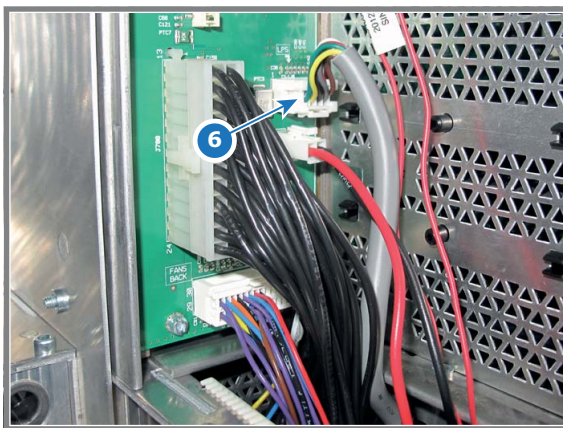


Image 4-74

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 79.
Malfunction Lamp Power Supply (LPS).	Replace the Lamp Power Supply unit. See service manual chapter "Lamp Power Supply (LPS)", page 99.

Situation	Solution
Lamp House not correctly installed.	Check if the Lamp House is properly installed. Make sure that both fixation screws at the base of the Lamp House are fastened. See service manual chapter "Installation of the Lamp House", page 128.
Fan problems.	Check for Fan errors/warnings (Cold Mirror Fan, Lamp Anode Fan, Lamp Cathode Fan, ...) in the projector log files and try to solve them.

Code 5657: "lamp run time - exceeds maximum" (Notification)

Situation	Solution
The lamp inside the lamp house has exceeded its maximum run time.	Replace the lamp and reset hours and bulb type. See service manual chapter "Lamp replacement process", page 115.

Code 5659: "lamp run time - warning" (Warning)

Situation	Solution
The lamp inside the lamp house is about to exceed its maximum run time.	Replace the lamp as soon as possible. See service manual chapter "Lamp replacement process", page 115.

Code 5800: "ti-boards - system status = fail" (Error)

This is a generic TI error. Use the Communicator to make a detailed analysis. Go to Diagnostics > Actual > Cinema Front End Status > Detailed status > Error Messages. Possible error messages are:

Situation	Solution
Malfunction software.	Reboot the projector.
ICP board is not correctly seated.	Reseat the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
ICP self test - ICP frame memory test failed	Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
ICP self test - ICP data path signature test failed	Check the connections to the Formatter boards on the Light Processor. Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
ICP Normal Configuration Error	Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
ICP Boot Configuration Error	Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
FMT Normal Configuration Error	Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
FMT Boot Configuration Error	Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
FMT Satellite Configuration Error	Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
1.20V Supply out of range	Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
1.80V Supply out of range	Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
2.50V Supply out of range	Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
3.30V Supply out of range	Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
ICP FPGA Temperature out of range	Temperature on ICP is too high. Current active fans have errors. Solve the fan problem first. For a correct airflow, check if all covers are closed. Ambient temperature is too high. Reduce the ambient temperature.

4. Troubleshooting

Situation	Solution
ICP FMT FPGA Temperature out of range	Temperature on ICP is too high. Current active fans have errors. Solve the fan problem first. For a correct airflow, check if all covers are closed. Ambient temperature is too high. Reduce the ambient temperature.
ICP Flash Update Error	Replace the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
ICP real time clock error	<ol style="list-style-type: none"> Clear the 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 current time. If the error stays: <ul style="list-style-type: none"> replace the RTC (Real Time Clock) battery of the ICP board. See "Replacement of the RTC battery of the ICP board", page 295. 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 current time. 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". If problem remains, replace the ICP board. See "Replacement of the ICP board", page 294
Satellite Hardware Mismatch	Replace the Light Processor assembly. See service manual chapter "Light Processor replacement process", page 172.

Other possible causes of this error code:

Situation	Solution
<p>The TI system status failure is caused by the projector which is too cold. The DMD's should not be operated at a temperature lower than 10°C (50°F). The projector has some protections for that. Below that temperature, the engine is switched of, and the result is a TI system status failure.</p> <p>This situation can occurs when the projector is recently installed and did not had the time to acclimate to the normal room temperature. There is also a message that the temperatures are too low. See log files.</p>	Make sure that the ambient temperature is within specs. Let the projector acclimate to the normal room temperature which should be higher than 10°C (50°F) and lower than 35°C (95°F). Do not ignite the lamp, otherwise there is a risk for condensation.

Code 5801: "ti-link-decryptor - service door tamper event " (Error)

Situation	Solution
The top cover plate and or the side cover plate of the Light Processor compartment has been removed.	Clear the security warning. See service manual chapter "Authorization to clear security warning on the projector", page 189. Brief procedure to clear the security warning: <ol style="list-style-type: none"> Ensure the top cover plate of the Light Processor compartment is properly installed. Ensure the side cover plate of the Light Processor compartment is properly installed. Ensure that all modules are properly installed into the Card Cage. Start up the projector. Initiate authorization by pushing the Key button on the Local Keypad. Enter the pin code within 5 seconds.
Defect security switches.	Replace DCI security switches of the Light Processor compartment (reference 1 image 4-75 & 2 image 4-76)
Malfunction Signal Backplane	If switch replacement cures nothing then replace Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 309.

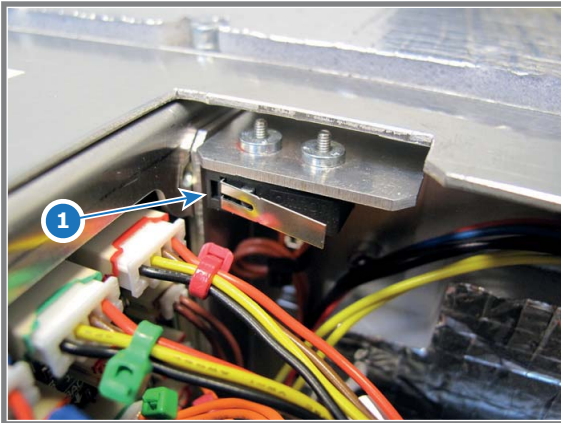


Image 4-75

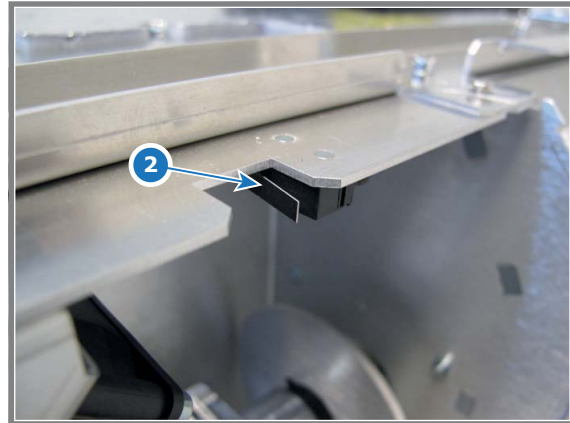


Image 4-76

Code 5807: “ti-icp - read system status failed” (Error)

The Barco controller can not read the status of the ICP.

Situation	Solution
Malfunction software.	Reboot the projector.
ICP board is not correctly seated.	Reseat the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
ICP board is not correctly inserted	Insert the ICP board properly. See service manual chapter "Replacement of the ICP board", page 294.
ICP crash. The most left LED is not blinking	Restart the projector.
ICP is being upgrading	Wait until projector reset after the upgrade.

Code 5812: “ti-icp - read satellite info failed” (Error)

Situation	Solution
Malfunction software.	Reboot the projector.
ICP board is not correctly seated.	Reseat the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
One of the wire units of the Satellite boards on the Light Processor is not correctly connected with the Signal Backplane.	Check if all data wires of the Satellite boards are connected with the Signal Backplane (reference 3 image 4-77). For detail instructions see service manual chapter "Installing the Light Processor", page 176.
One or more of the data wires are disconnected from the Satellite boards of the Light Processor.	<p>Check the data connections on the Satellite boards of the Light Processor.</p> <p>See image 4-78 for the Satellite board of the RED channel.</p> <p>See image 4-79 for the Satellite board of the GREEN channel.</p> <p>See image 4-80 for the Satellite board of the BLUE channel.</p> <p>Note: The wires are marked with cable ties in the same color as the channel color. The wires with reference 4, 5 & 6 are marked with two cable ties.</p> <p>Note: To access the three wires on the RED Satellite board the Light Processor has to be removed from the projector.</p>

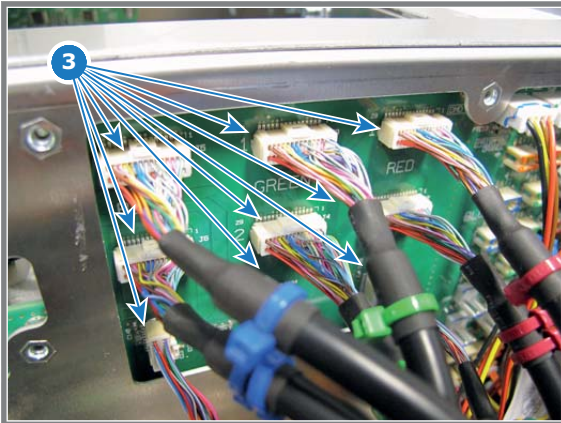


Image 4-77

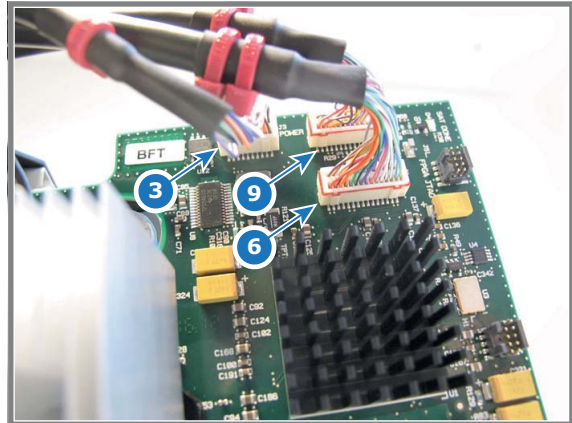


Image 4-78

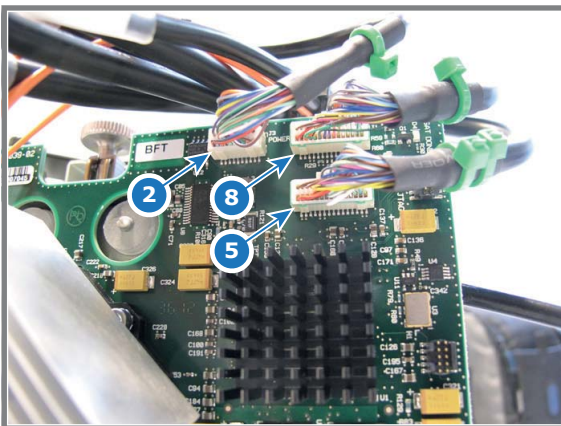


Image 4-79

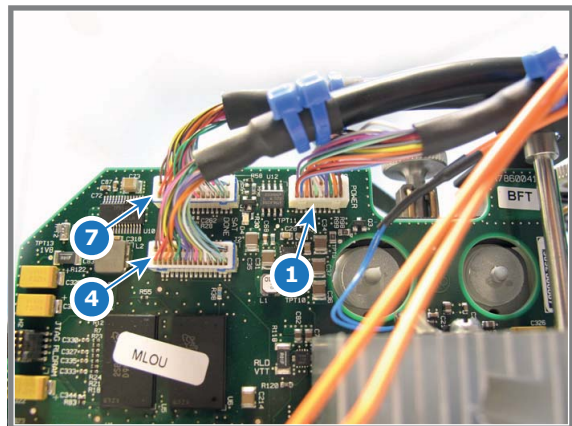


Image 4-80

Code 5813: “ti-icp - satellite firmware mismatch” (Error)

This error can occur when you move ICP boards between projectors which have a different DMD configuration. (E.g. switching an ICP between a 1.2 and 0.98 inch system)

Situation	Solution
Malfunction software.	Reboot the projector.
ICP board is not correctly seated.	Reseat the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
Installed firmware for the DMDs on the ICP board is not correct for the current DMD configuration.	Reinstall the ICP software. Use the “DC Update Companion”. See user guide of the Communicator software. Note: First upload the ICP package to a slot, then install from slot.

Code 5814: “ti-icp - self test = fail” (Error)

Situation	Solution
Malfunction software.	Reboot the projector.
ICP board is not correctly seated.	Reseat the ICP board. See service manual chapter "Replacement of the ICP board", page 294.

Situation	Solution
One of the wire units of the Satellite boards on the Light Processor is not correctly connected with the Signal Backplane.	Check if all data wires of the Satellite boards are connected with the Signal Backplane (reference 3 image 4-77). For detail instructions see service manual chapter "Installing the Light Processor", page 176.
One or more of the data wires are disconnected from the Satellite boards of the Light Processor.	<p>Check the data connections on the Satellite boards of the Light Processor.</p> <p>See image 4-78 for the Satellite board of the RED channel.</p> <p>See image 4-79 for the Satellite board of the GREEN channel.</p> <p>See image 4-80 for the Satellite board of the BLUE channel.</p> <p>Note: The wires are marked with cable ties in the same color as the channel color. The wires with reference 4, 5 & 6 are marked with two cable ties.</p> <p>Note: To access the three wires on the RED Satellite board the Light Processor has to be removed from the projector.</p>

Code 5815: "ti-icp - certificate error" (Error)

Situation	Solution
New ICP software version installed but no reboot of projector has happen.	Reboot the projector.
Malfunction software.	Reboot the projector.
ICP board is not correctly seated.	Reseat the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
Error remains occurring after different boot cycles.	Replace ICP board. See service manual chapter "Replacement of the ICP board", page 294.

Code 5816: "ti-icp - key error" (Error)

Situation	Solution
New ICP software version installed but no reboot of projector has happen.	Reboot the projector.
Malfunction software.	Reboot the projector.
ICP board is not correctly seated.	Reseat the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
Error remains occurring after different boot cycles.	Replace ICP board. See service manual chapter "Replacement of the ICP board", page 294.

Code 5817: "ti-icp - icp board not detected" (Error)

Situation	Solution
Malfunction software.	Reboot the projector.
There is no ICP board installed.	Install an ICP board. See service manual chapter "Replacement of the ICP board", page 294.
ICP board is not correctly seated.	Reseat the ICP board. See service manual chapter "Replacement of the ICP board", page 294.
ICP board not correctly inserted.	Re-install the ICP board. See service manual chapter "Replacement of the ICP board", page 294.

Code 5830: "ti-link-decryptor - no communication" (Error)

Situation	Solution
Exceptional software failure.	Reboot the projector.
Link decryptor is not correctly seated.	<p>Reseat the link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.</p> <p>If problem remains, replace the link decryptor.</p>

Code 5831: "ti-link-decryptor - system error" (Error)

With the Communicator, go to *Diagnostics* → *Actual* → *Link Decryptor status* → *Error messages*

4. Troubleshooting

The following errors can occur:

Error	Solution
Link decryptor - User loader integrity error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - Main application integrity error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - RNG hardware integrity error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - DRNG hardware integrity error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - RSA algorithm integrity error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - AES algorithm integrity error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - HMAC algorithm integrity error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - SHA algorithm integrity error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - TLS integrity error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - FPGA configuration integrity error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - FPGA cinelink 2 decryption integrity error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - Real time clock error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - FPGA configuration error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - FPGA temperature out of range	Temperature on the link decryptor is too high. Check for other fan or temperature error messages. Check if the front cover of the HDSDI module is closed.
Link decryptor - RNG Hardware duplicate output error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - DRNG Hardware duplicate output error	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - 1.20V supply out of range	Replace SMPS. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91. Replace Signal backplane. See service manual chapter "Signal Backplane replacement process", page 309. Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - 1.80V supply out of range	Replace SMPS. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91. Replace Signal backplane. See service manual chapter "Signal Backplane replacement process", page 309. Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - 2.50V supply out of range	Replace SMPS. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91. Replace Signal backplane. See service manual chapter "Signal Backplane replacement process", page 309. Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.

Error	Solution
Link decryptor - 3.30V regulator out of range	<p>Replace SMPS. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91.</p> <p>Replace Signal backplane. See service manual chapter "Signal Backplane replacement process", page 309.</p> <p>Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.</p>
Link decryptor - Security tamper	The link decryptor has been tampered. Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - Top side security enclosure open	The top side enclosure has been tampered. Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - Bottom side security enclosure open	The bottom side enclosure has been tampered. Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - Software command Zeroization	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.
Link decryptor - Physical marriage tamper	The ICP and/or link decryptor have been removed and inserted again. You need to remarry both. Start the clear security warning procedure. See service manual chapter "Authorization to clear security warning on the projector", page 189.
Link decryptor - Logical marriage tamper	The ICP and link decryptor are not a couple. This means one of both has been replaced. You need to marry both. Start the clear security warning procedure. See service manual chapter "Authorization to clear security warning on the projector", page 189.
Link decryptor - Service door tamper	<p>The Card Cage cover has been removed. Clear the security warning. See service manual chapter "Authorization to clear security warning on the projector", page 189.</p> <p>The cover plate of the Light Processor compartment has been removed. Clear the security warning. See service manual chapter "Authorization to clear security warning on the projector", page 189.</p> <p>Defect security switches. If all compartments and devices are installed and security error will not authorize, replace DCI security switches.</p> <p>Malfunction Signal Backplane. If switch replacement is not the solution, then replace Signal Backplane.</p>
Link decryptor - Service log error	<p>The Security Log Error indicates that there is no more room to write log entries in the link decryptor log file.</p> <p>When this error is active, the DCI compliant Server needs to extract the log data (via ASM/TLS session) from the link decryptor Security Log. Reads of the security log by any other entity/means will not impact this error. This error will remain active until the Server reads enough log entries to create room for 512 log entries. This can take some time. Playback will be prohibited (black image) as long as this error is active.</p>
Link decryptor - Security battery low warning	The battery of the link-decryptor is low. Leave the projector on for some time to recharge the battery.
Link decryptor - Security log warning	<p>The security log warning indicates that there are less than 512 log entry locations available in the link decryptor log before the log is full. The attached server needs to read the log which will clear the log of the projector.</p> <p>When this warning is active, the DCI compliant server needs to extract the log data (via ASM/TLS session) from the link decryptor Security Log. This can take some time. Reads of the security log by any other entity/means will not impact this warning.</p>

Code 5832: "ti-link-decryptor - security tamper event" (Error)

Situation	Solution
The link decryptor has been tampered.	Replace link decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.

Code 5833: “ti-link-decryptor - logical marriage tamper event” (Error)

Situation	Solution
The ICP and Link Decryptor are not a couple.	<p>This means one of both has been replaced. You need to marry both. Start the clear security warning procedure. See service manual chapter "Authorization to clear security warning on the projector", page 189.</p> <p>Together with this error you will always have an error “<i>ti-link-decryptor physical marriage tamper event</i>”.</p> <p>Brief procedure to clear the security warning:</p> <ol style="list-style-type: none"> 1. Ensure the top cover plate of the Light Processor compartment is properly installed. 2. Ensure the side cover plate of the Light Processor compartment is properly installed. 3. Ensure that all modules are properly installed into the Card Cage. 4. Start up the projector. 5. Initiate authorization by pushing the Key button on the Local Keypad. 6. Enter the pin code within 5 seconds.

Code 5834: “ti-link-decryptor - physical marriage tamper event” (Error)

Situation	Solution
The ICP and/or link decryptor have been removed and inserted again.	<p>You need to marry both. Start the clear security warning procedure. See service manual chapter "Authorization to clear security warning on the projector", page 189.</p> <p>Brief procedure to clear the security warning:</p> <ol style="list-style-type: none"> 1. Ensure the top cover plate of the Light Processor compartment is properly installed. 2. Ensure the side cover plate of the Light Processor compartment is properly installed. 3. Ensure that all modules are properly installed into the Card Cage. 4. Start up the projector. 5. Initiate authorization by pushing the Key button on the Local Keypad. 6. Enter the pin code within 5 seconds.

Code 5835: “ti-link-decryptor - security log is almost full” (Error)

Situation	Solution
<p>The security log is almost full indicates that there are less than 512 log entry locations available in the Link Decryptor log before the log is full.</p> <p>The attached server needs to read the log which will clear the log of the projector.</p>	<p>When this warning is active, the DCI compliant server needs to extract the log data (via ASM/TLS session) from the Link Decryptor Security Log. This can take some time. Reads of the security log by any other entity/means will not impact this warning.</p>

Code 5836: “ti-link-decryptor - security log is full” (Error)

Situation	Solution
The Security Log Error indicates that there is no more room to write log entries in the Link Decryptor log file.	<p>When this error is active, the DCI compliant Server needs to extract the log data (via ASM/TLS session) from the link decryptor Security Log. Reads of the security log by any other entity/means will not impact this error. This error will remain active until the Server reads enough log entries to create room for 512 log entries. This can take some time. Playback will be prohibited (black image) as long as this error is active.</p>

Code 5837: “ti-link-decryptor - read system status failed ” (Error)

Situation	Solution
Link Decryptor is not correctly seated.	<p>Reseat the Link Decryptor. See service manual chapter "Replacement of the Link Decryptor", page 298.</p> <p>If problem remains, replace Link Decryptor.</p>

Code 5850: “imb - no communication” (Error)

Situation	Solution
Exceptional software failure.	Reboot the projector.
No communication with media block	<p>Check if the media block is well seated.</p> <p>Replace the media block.</p>

Code 5851: “imb - service door tamper event” (Error)

Situation	Solution
The top cover plate and or the side cover plate of the Light Processor compartment has been removed.	Clear the security warning. See service manual chapter "Authorization to clear security warning on the projector", page 189. Brief procedure to clear the security warning: <ol style="list-style-type: none"> 1. Ensure the top cover plate of the Light Processor compartment is properly installed. 2. Ensure the side cover plate of the Light Processor compartment is properly installed. 3. Ensure that all modules are properly installed into the Card Cage. 4. Start up the projector. 5. Initiate authorization by pushing the Key button on the Local Keypad. 6. Enter the pin code within 5 seconds.
Defect security switches.	Replace DCI security switches of the Light Processor compartment (reference 1 image 4-81 & 2 image 4-82)
Malfunction Signal Backplane	If switch replacement cures nothing then replace Signal Backplane. See service manual chapter "Signal Backplane replacement process", page 309.

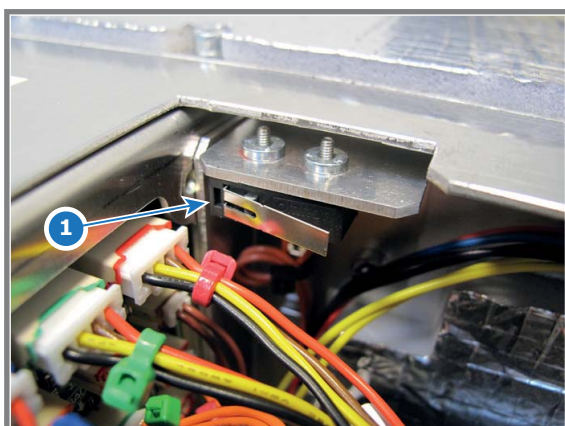


Image 4-81

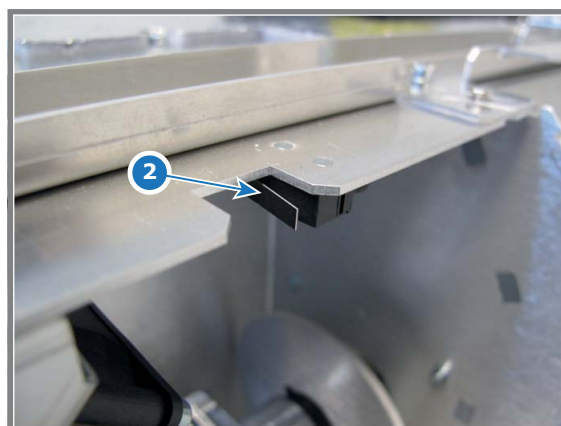


Image 4-82

Code 5853: “imb - logical marriage tamper event” (Error)

Situation	Solution
The ICP and Mediablock are not a couple.	This means one of both has been replaced. You need to marry both. Start the clear security warning procedure. See service manual chapter "Authorization to clear security warning on the projector", page 189. Together with this error you will always have an error “imb - physical marriage tamper event”. Brief procedure to clear the security warning: <ol style="list-style-type: none"> 1. Ensure the top cover plate of the Light Processor compartment is properly installed. 2. Ensure the side cover plate of the Light Processor compartment is properly installed. 3. Ensure that all modules are properly installed into the Card Cage. 4. Start up the projector. 5. Initiate authorization by pushing the Key button on the Local Keypad. 6. Enter the pin code within 5 seconds.

Code 5854: “imb - physical marriage tamper event” (Error)

Situation	Solution
The ICP and/or Mediablock have been removed and inserted again.	You need to marry both. Start the clear security warning procedure. See service manual chapter "Authorization to clear security warning on the projector", page 189. Brief procedure to clear the security warning: <ol style="list-style-type: none"> 1. Ensure the top cover plate of the Light Processor compartment is properly installed. 2. Ensure the side cover plate of the Light Processor compartment is properly installed. 3. Ensure that all modules are properly installed into the Card Cage. 4. Start up the projector. 5. Initiate authorization by pushing the Key button on the Local Keypad. 6. Enter the pin code within 5 seconds.

Code 5880: “dolby 3d key-server - read status failed” (Warning)

Situation	Solution
Exceptional software failure.	Reboot the projector.
Corrupt Dolby 3D key server program. Unable to read the “Version Info” from the “Dolby 3D key server program” via the Communicator software.	Reinstall the “Dolby 3D key server program” on the projector. Use the Projector Toolset.

Code 5881: “dolby 3d key-server - status = locked” (Warning)

Situation	Solution
The content server does not support Dolby 3D.	Check if the projector is connected with a Dolby 3D certified server.
Malfunction content server.	Check the Dolby certified content server. As a temporally solution unlock the 3D key-server by pressing the button “Manual unlock” in the “3D integrated color wheel” menu of the Communicator software. Note that in this case the 3D key-server remains unlocked for 24 hours.

Code 5882: “3d module - read status failed” (Warning)

Situation	Solution
Exceptional software failure.	Reboot the projector.
There is no Dolby 3D color wheel installed in the projector but the flag for Dolby 3D is set in the Communicator software.	Either install the Dolby 3D color wheel unit or disable the Dolby 3D option in the Communicator software.
The Dolby 3D color wheel unit is disconnected from the Signal Backplane.	Check the connection between the Dolby 3D color wheel unit (reference 22 image 4-83) and the Signal Backplane (reference 21 image 4-84) .
Malfunction electronic board of the Dolby 3D color wheel unit. The color wheel can be rotated by hand (spinning motor OK) and be moved back and forward by hand (retraction mechanism OK). Note that to move the color wheel manually you have to remove the light processor unit from the projector.	Replace the electronic board of the Dolby 3D color wheel unit.
Malfunction of the Dolby 3D color wheel unit.	Replace the whole Dolby 3D color wheel unit. Send the malfunction unit back to Barco. For correct instructions see installation manual of the Dolby 3D color wheel unit.

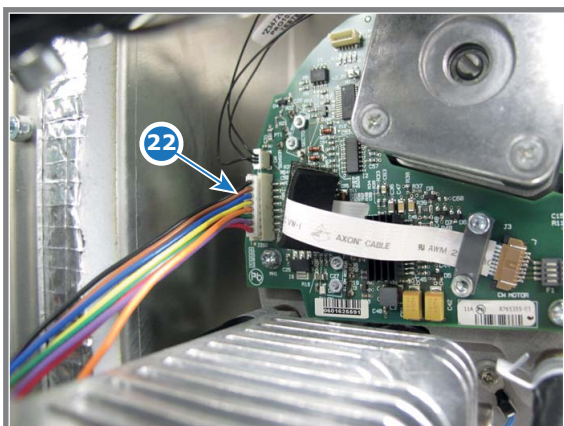


Image 4-83

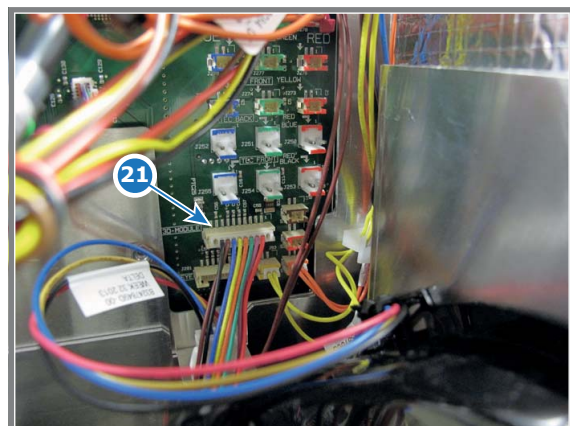


Image 4-84

Code 5884: “3d module - change status failed due to dolby 3d key-server lock” (Error)

Situation	Solution
Exceptional software failure.	Reboot the projector.
Corrupt Dolby 3D key server program. Unable to read the “Version Info” from the “Dolby 3D key server program” via the Communicator software.	Reinstall the “Dolby 3D key server program” on the projector. Use the Projector Toolset.
The content server does not support Dolby 3D.	Check if the projector is connected with a Dolby 3D certified server.
Malfunction content server.	Check the Dolby certified content server. As a temporally solution unlock the 3D key-server by pressing the button “Manual unlock” in the “3D integrated color wheel” menu of the Communicator software. Note that in this case the 3D key-server remains unlocked for 24 hours.

Code 5885: “3d module - change status failed due to communication error” (Error)

Situation	Solution
Exceptional software failure.	Reboot the projector.
There is no Dolby 3D color wheel installed in the projector but the flag for Dolby 3D is set in the Communicator software.	Either install the Dolby 3D color wheel unit or disable the Dolby 3D option in the Communicator software.
The Dolby 3D color wheel unit is disconnected from the Signal Backplane.	Check the connection between the Dolby 3D color wheel unit (reference 22 image 4-83) and the Signal Backplane (reference 21 image 4-84) Replace wire if damaged.
Malfunction electronic board of the Dolby 3D color wheel unit. The color wheel can be rotated by hand (spinning motor OK) and be moved back and forward by hand (retraction mechanism OK). Note that to move the color wheel manually you have to remove the light processor unit from the projector.	Replace the electronic board of the Dolby 3D color wheel unit.
Malfunction of the Dolby 3D color wheel unit.	Replace the whole Dolby 3D color wheel unit. Send the malfunction unit back to Barco. For correct instructions see installation manual of the Dolby 3D color wheel unit.

Code 5890: “3d module - color wheel spin failed” (Error)

Situation	Solution
Spinning motor disconnected.	Check the connection (reference 25 image 4-85) of the spinning motor. Replace wire if damaged.
Feedback circuit of the spinning motor disconnected.	Check the connection (reference 24 image 4-86) of the feedback circuit. Replace wire if damaged.
Blocked color wheel.	Check if the Dolby 3D color wheel can turn freely. No mechanics preventing wheel to turn.
Malfunction Dolby 3D color wheel board.	Replace the electronic board of the Dolby 3D color wheel unit.
Malfunction spinning motor.	Replace the whole Dolby 3D color wheel unit. Send the malfunction unit back to Barco. For correct instructions see installation manual of the Dolby 3D color wheel unit.

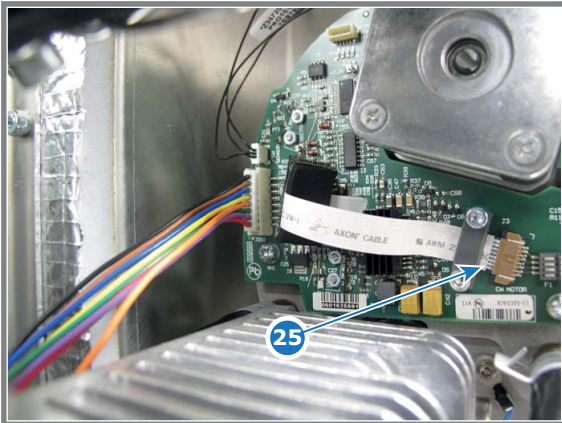


Image 4-85

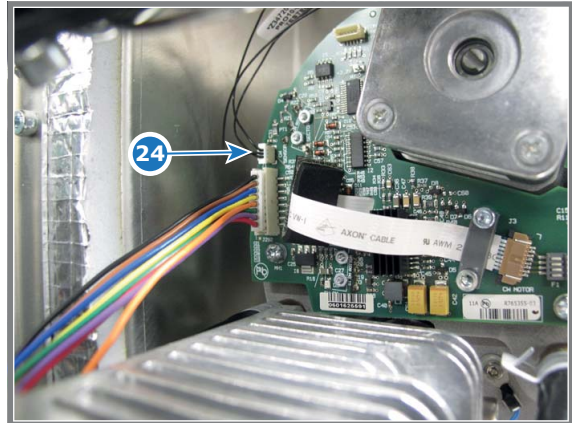


Image 4-86

Code 5891: “3d module - color wheel in failed” (Error)

Situation	Solution
Exceptional software failure.	Reboot the projector.
Retraction motor disconnected.	Check if the wire (reference 23 image 4-87) of the retraction motor is well inserted. Replace wire unit if damaged.
Defect micro switch.	Replace the electronic board of the Dolby 3D color wheel unit.
Mechanical mechanism is blocked. The color wheel can not be moved back and forward by hand. Note that to move the color wheel manually you have to remove the light processor unit from the projector.	Replace the whole Dolby 3D color wheel unit in case you can not unlock the color wheel. Send the blocked unit back to Barco. For correct instructions see installation manual of the Dolby 3D color wheel unit.
Malfunction retraction motor.	Replace the whole Dolby 3D color wheel unit. Send the malfunction unit back to Barco. For correct instructions see installation manual of the Dolby 3D color wheel unit.

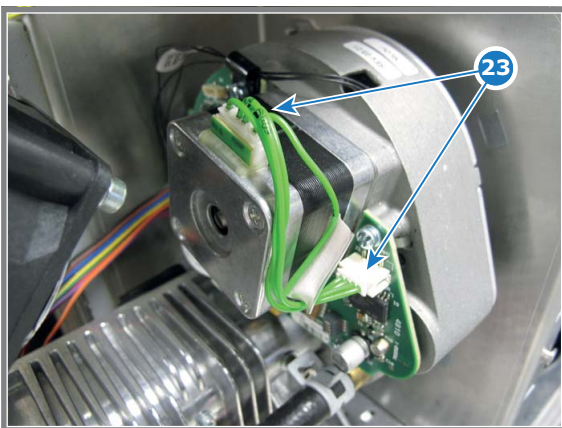


Image 4-87

Code 5892: “3d module - color wheel out failed” (Error)

Situation	Solution
Exceptional software failure.	Reboot the projector.
Retraction motor disconnected.	Check if the wire (reference 23 image 4-87) of the retraction motor is well inserted. Replace wire unit if damaged.
Defect micro switch.	Replace the electronic board of the Dolby 3D color wheel unit.

Situation	Solution
Mechanical mechanism is blocked. The color wheel can not be moved back and forward by hand. Note that to move the color wheel manually you have to remove the light processor unit from the projector.	Replace the whole Dolby 3D color wheel unit in case you can not unlock the color wheel. Send the blocked unit back to Barco. For correct instructions see installation manual of the Dolby 3D color wheel unit.
Malfunction retraction motor.	Replace the whole Dolby 3D color wheel unit. Send the malfunction unit back to Barco. For correct instructions see installation manual of the Dolby 3D color wheel unit.

Code 5893: “3d module - color wheel temperature too high” (Error)

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 "Check the large dust filter", page 334.
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-S 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.
Jammed wire unit of the spinning motor.	Check the condition of the flat wire (reference 25 image 4-88) of the spinning motor.
Malfunction Dolby 3D color wheel board.	Replace the electronic board of the Dolby 3D color wheel unit.
Malfunction spinning motor.	Replace the whole Dolby 3D color wheel unit. Send the malfunction unit back to Barco. For correct instructions see installation manual of the Dolby 3D color wheel unit.

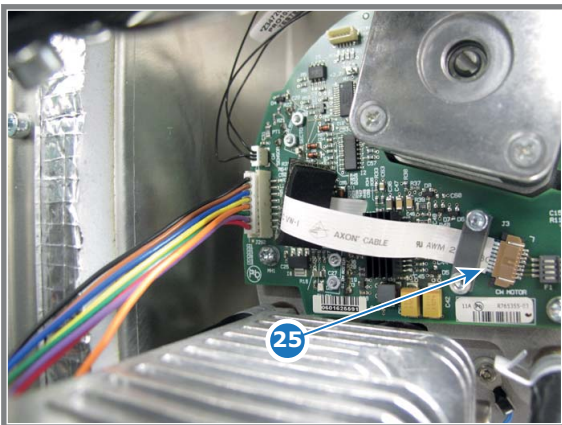


Image 4-88

Code 5894: “3d module - color wheel speed not ok (not locked)” (Error)

Situation	Solution
Wrong 3D settings on the Dolby 3D content server.	Check the 3D settings on the Dolby 3D content server. See Dolby documentation. The locking frequency for the Dolby 3D color wheel must be in the range of 48 and 72 Hz. You can verify the locking frequency via the Communicator software menu “3D settings - integrated color wheel”.
Feedback circuit of the spinning motor disconnected.	Check the connection (reference 24 image 4-89) of the feedback circuit.
Spinning motor disconnected.	Check the connection (reference 25 image 4-93) of the spinning motor.
Malfunction Dolby 3D color wheel board.	Replace the electronic board of the Dolby 3D color wheel unit.
Malfunction spinning motor	Replace the whole Dolby 3D color wheel unit. Send the malfunction unit back to Barco. For correct instructions see installation manual of the Dolby 3D color wheel unit.

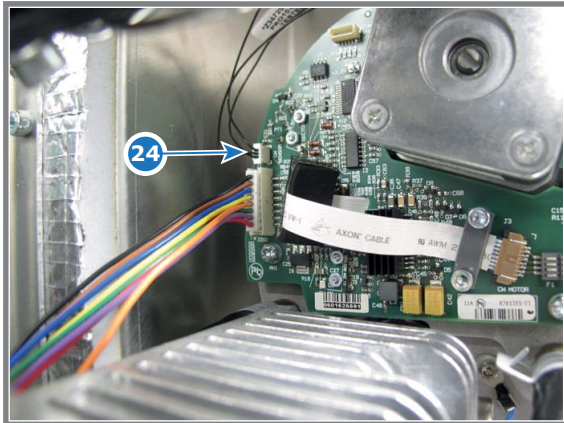


Image 4-89

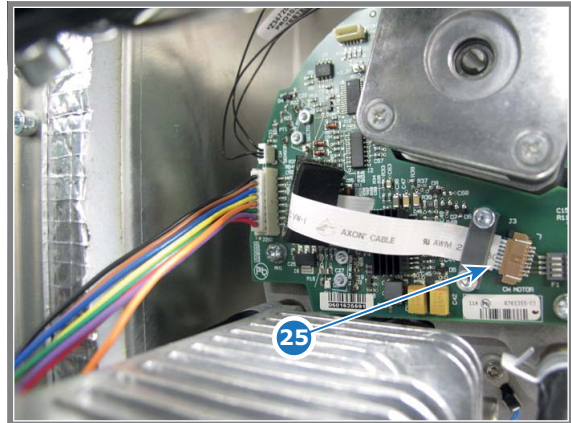


Image 4-90

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 to.

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 "Check the large dust filter", page 334.
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter "Check the small dust filter", page 336.
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-S 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.
Defect temperature sensor.	Replace the temperature sensor (reference 3 image 4-91) on the heatsink of the Light Pipe entrance. In case a 3D color wheel is installed, replace the temperature sensor of the 3D assembly (reference 4 image 4-92).
Misalignment of the lamp inside the lamp house.	1. Readjust the Z-alignment of the lamp. See service manual chapter "Realignment of the lamp in its reflector", page 132. 2. Replace the lamp house with a new lamp house. See service manual chapter "Lamp & Lamp House", page 111.
Misalignment of the cold mirror.	Readjust the cold mirror. See service manual chapter "Adjusting the Cold Mirror", page 163.

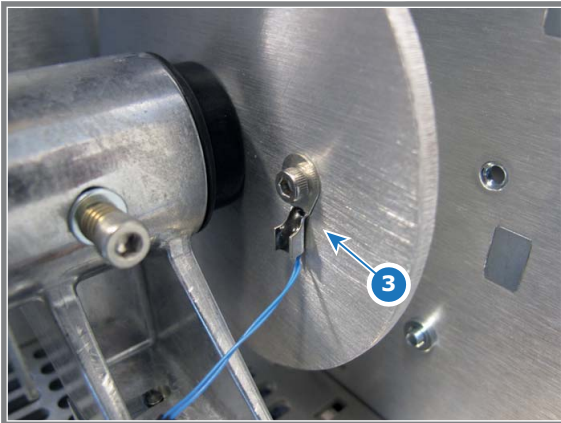


Image 4-91

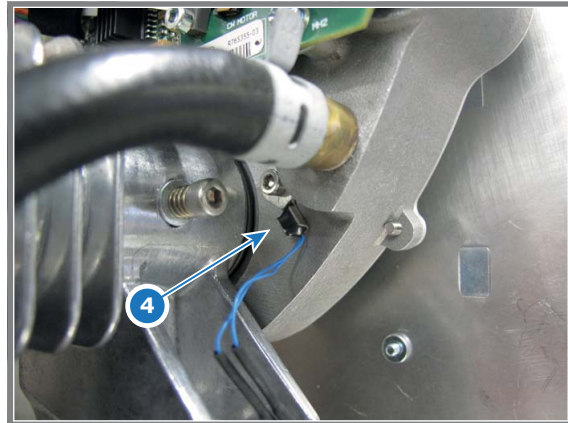


Image 4-92

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

Situation	Solution
Disconnected wire of the temperature sensor.	<ol style="list-style-type: none"> 1. Check if the wire (reference 1 image 4-93) of the temperature sensor is plugged into its socket. 2. Check if the wire (reference 2 image 4-94) 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 Light Pipe (reference 3 image 4-91) or (if installed) the temperature sensor of the 3D color wheel assembly (reference 4 image 4-92). 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 image 4-91) or (if installed) the temperature sensor of the 3D color wheel assembly (reference 4 image 4-92).
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.

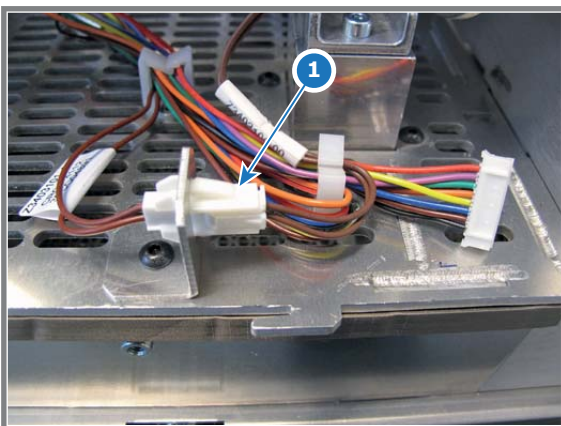


Image 4-93

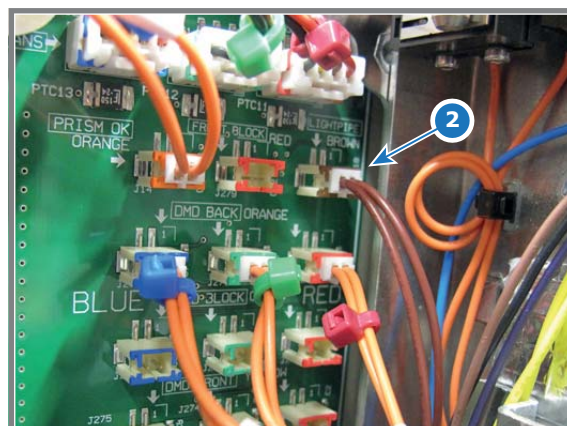


Image 4-94

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 4-93) or from the Signal Backplane (reference 2 image 4-94) 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 4-95, or in case a 3D color wheel is installed: reference 4 image 4-96). 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 18 image 4-69) 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 4-64) the error code is changed to “light pipe - temperature sensor open”.	Replace the temperature sensor which measures the temperature of Light Pipe entrance (reference 3 image 4-95, or in case a 3D color wheel is installed: reference 4 image 4-96).

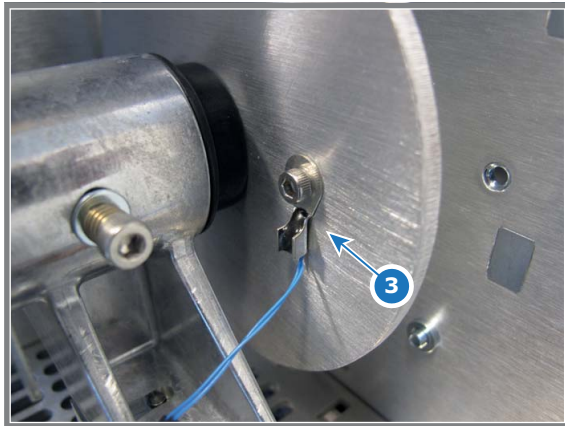


Image 4-95

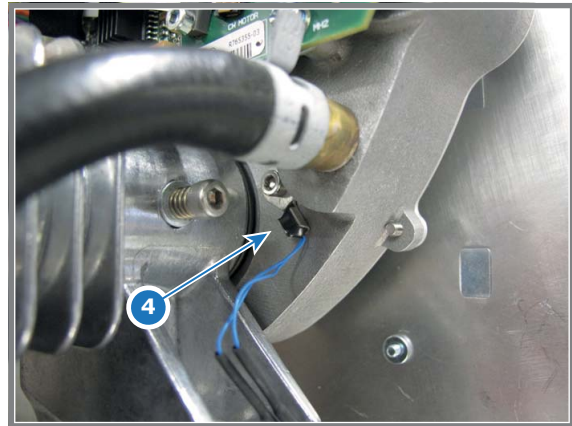


Image 4-96

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 “Check the large dust filter”, page 334.
Blocked small dust filter.	Clean the small dust filter or replace with new one. See service manual chapter “Check the small dust filter”, page 336.
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.	<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-S 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>
Defect temperature sensor.	Replace the temperature sensor (reference 16 image 4-97) 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 299.



Image 4-97

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

Situation	Solution
Disconnected wire of the temperature sensor.	Check if the wire (reference 6 image 4-98) 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 4-97). 2. If not repairable, replace the temperature sensor.
Defect temperature sensor.	Replace the temperature sensor (reference 16 image 4-97) which measures the ambient temperature inside the Light Processor compartment.

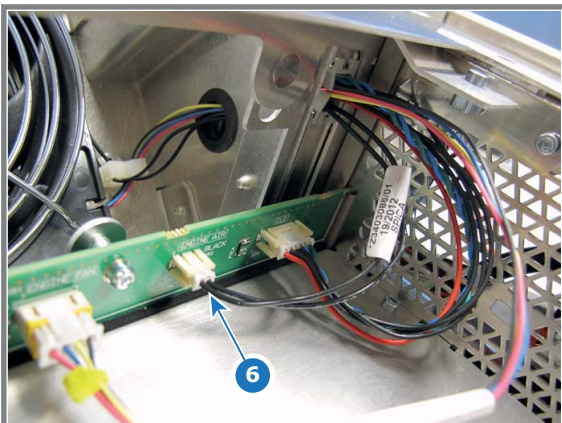


Image 4-98

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 4-99) 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 4-100). 2. If not repairable, replace the temperature sensor and wiring.
Defect temperature sensor (reference 16 image 4-100) 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 4-99) the error code is changed to “engine air - temperature sensor open”.	Replace the temperature sensor (reference 16 image 4-100) which measures the ambient temperature of the Light Processor compartment.

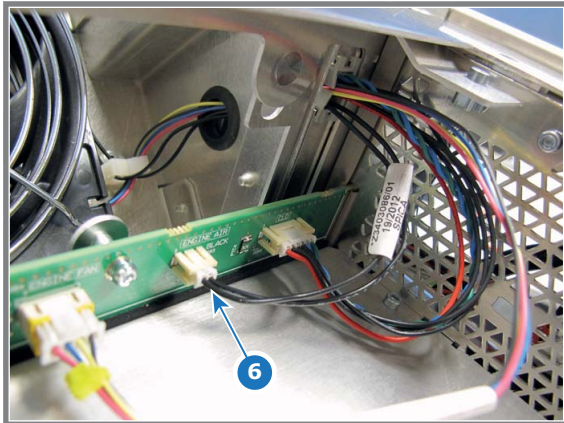


Image 4-99



Image 4-100

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 than 10°C (50°F) and lower than 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, ...

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 House and the Lamp Cathode Fan assembly to access the Signal Backplane connections with the SMPS wires (reference 6 image 4-101). 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 4-101.</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 299. Otherwise replace the SMPS board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91.</p> <p>Note: To remove the Lamp House see service manual chapter "Removal of the Lamp House", page 117. To remove the Lamp Anode Fan assembly see service manual chapter "Replacement of the Lamp Cathode Fan", page 156.</p> <p>Note: The projector must be in Stand-By mode otherwise no voltages are generated by the SMPS board.</p>

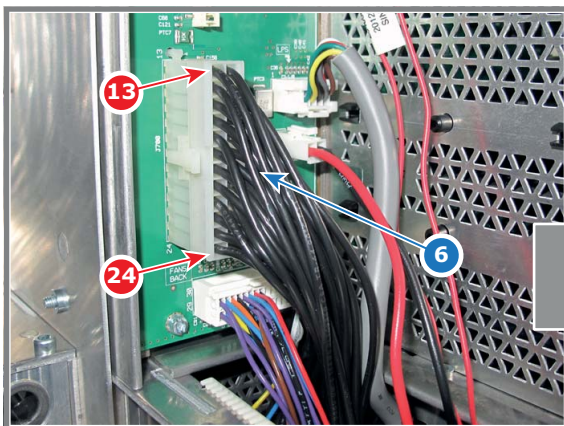
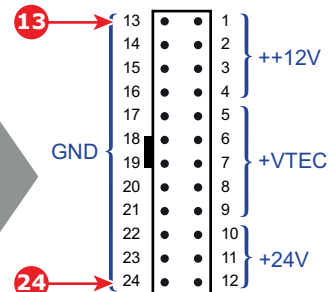


Image 4-101



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 House and the Lamp Cathode Fan assembly to access the Signal Backplane connections with the SMPS wires (reference 6 image 4-101). 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 4-101.</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 299. Otherwise replace the SMPS board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91.</p> <p>Note: To remove the Lamp House see service manual chapter "Removal of the Lamp House", page 117. To remove the Lamp Anode Fan assembly see service manual chapter "Replacement of the Lamp Cathode Fan", page 156.</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"> 1. Check the Signal Backplane for bad connections. Ensure that all wires are well connected (reference 6 image 4-101). (Note that the +24V supply is generated on the SMPS board and enters the Cinema Control board via the Signal Backplane) 2. Check the wiring (reference 1 image 4-102) of the Lamp Anode Fan for short circuits. 3. Check the wiring (reference 3 image 4-103) of the Lamp Cathode Fan for short circuits. <p>Note: To access the SMPS connections with the Signal Backplane the Lamp House and Lamp Cathode Fan assembly (reference 1 image 4-103) has to be removed from the projector.</p>

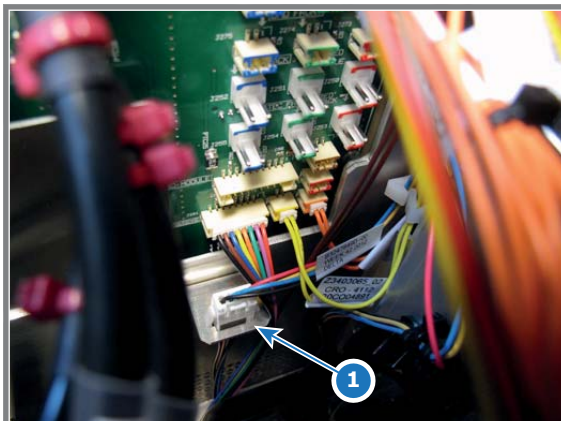


Image 4-102

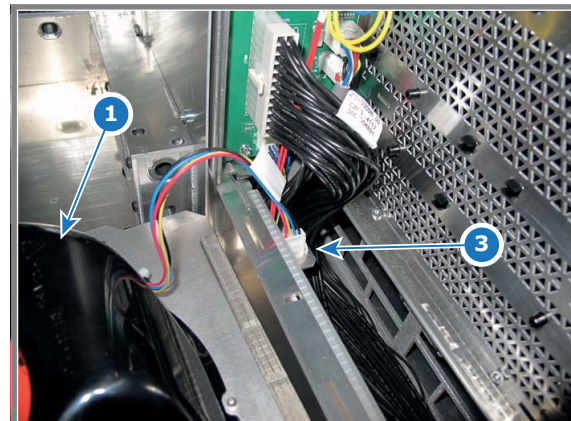


Image 4-103

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 House and the Lamp Cathode Fan assembly to access the Signal Backplane connections with the SMPS wires (reference 6 image 4-104). 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 4-104.</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 299. Otherwise replace the SMPS board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91.</p> <p>Note: To remove the Lamp House see service manual chapter "Removal of the Lamp House", page 117. To remove the Lamp Anode Fan assembly see service manual chapter "Replacement of the Lamp Cathode Fan", page 156.</p> <p>Note: The projector must be in Stand-By mode otherwise no voltages are generated by the SMPS board.</p>

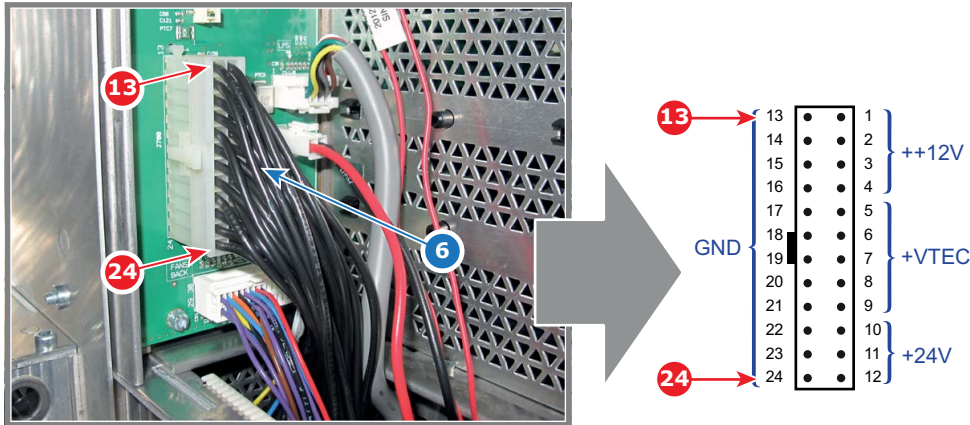


Image 4-104

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 House and the Lamp Cathode Fan assembly to access the Signal Backplane connections with the SMPS wires (reference 6 image 4-104). 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 4-104.</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 299. Otherwise replace the SMPS board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91.</p> <p>Note: To remove the Lamp House see service manual chapter "Removal of the Lamp House", page 117. To remove the Lamp Anode Fan assembly see service manual chapter "Replacement of the Lamp Cathode Fan", page 156.</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 House and Lamp Cathode Fan assembly (reference 1 image 4-103) 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 House and the Lamp Cathode Fan assembly to access the Signal Backplane connections with the SMPS wires (reference 6 image 4-105). 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 4-105.</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. reset the Cinema Control board. See "Replacement of the Cinema Controller", page 299. 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 4-102) of the Lamp Anode Fan for short circuits. 3. Check the wiring (reference 3 image 4-103) of the Lamp Cathode Fan for short circuits. 4. replace the SMPS board. See service manual chapter "Switch Mode Power Supply (SMPS)", page 91. <p>Note: To remove the Lamp House see service manual chapter "Removal of the Lamp House", page 117. To remove the Lamp Anode Fan assembly see service manual chapter "Replacement of the Lamp Cathode Fan", page 156.</p>

Situation	Solution
	Note: The projector must be in Stand-By mode otherwise no voltages are generated by the SMPS board.

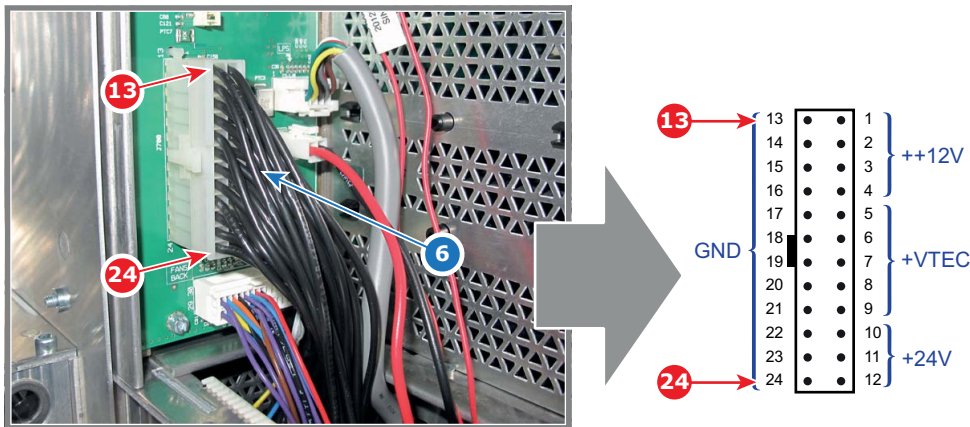


Image 4-105

Code 6123: “icp fan - speed low” (Warning)

Situation	Solution
Wire of the ICP fan disconnected from the Signal Backplane.	Remove the projector top cover and top cover plate. Look inside the compartment above the Card Cage to check if the wire unit (reference 1 image 4-106) is inserted in the Signal Backplane.
Blocked ICP fan.	Remove the projector top cover and top cover plate. Look inside the compartment above the Card Cage to check if the ICP fan is not blocked (reference 2 image 4-106). Unblock the fan. Ensure that the fan can turn freely.
Damaged wire.	Remove the projector top cover and top cover plate. Look inside the compartment above the Card Cage to check the wire of the ICP fan. Repair if possible, otherwise replace with new one. See service manual chapter "Replacement of the ICP fan", page 304.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.
Fan end of life.	Replace the ICP fan. See service manual chapter "Replacement of the ICP fan", page 304.

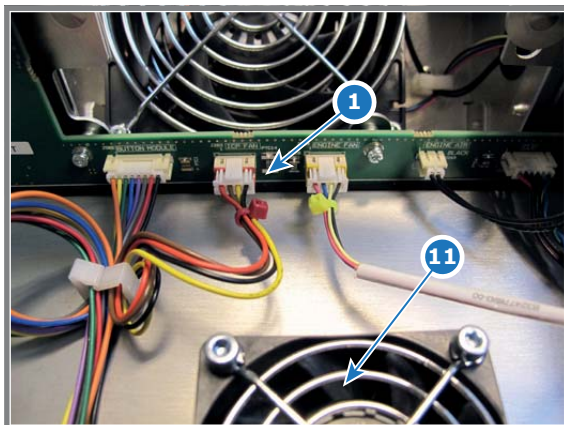


Image 4-106

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

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

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

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

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

Situation	Solution
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely (reference 2image 4-107).
Damaged wire.	Check the wire (reference 1image 4-108) of the fan. Repair if possible, otherwise replace with new one. See service manual chapter "Replacement of the Light Pipe fan", page 220.
Fan end of life.	Replace the fan. See service manual chapter "Replacement of the Light Pipe fan", page 220.
Malfunction Cinema Control board.	Replace the Cinema Control board. See service manual chapter "Replacement of the Cinema Controller", page 299.



Image 4-107

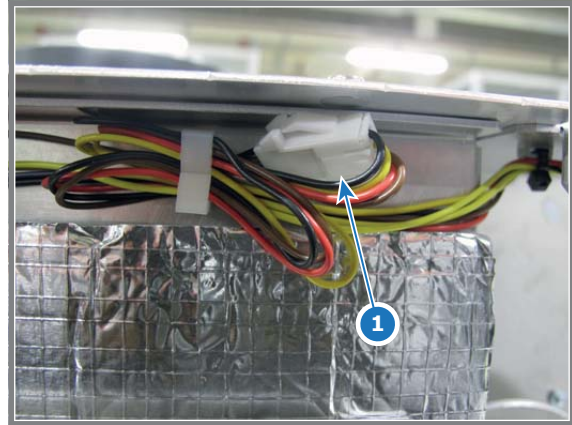


Image 4-108

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'
```

4. Troubleshooting

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 <= APPL <= TPPL <= 8191
- 288 <= ALPF <= TLPF <= 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-S 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-S series Mains Input

Introduction

The Mains Input consist in a terminal block, an ON/OFF switch, a mains input filter and a solid state relay. The Mains Input compartment is located at the rear right side of the projector.

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

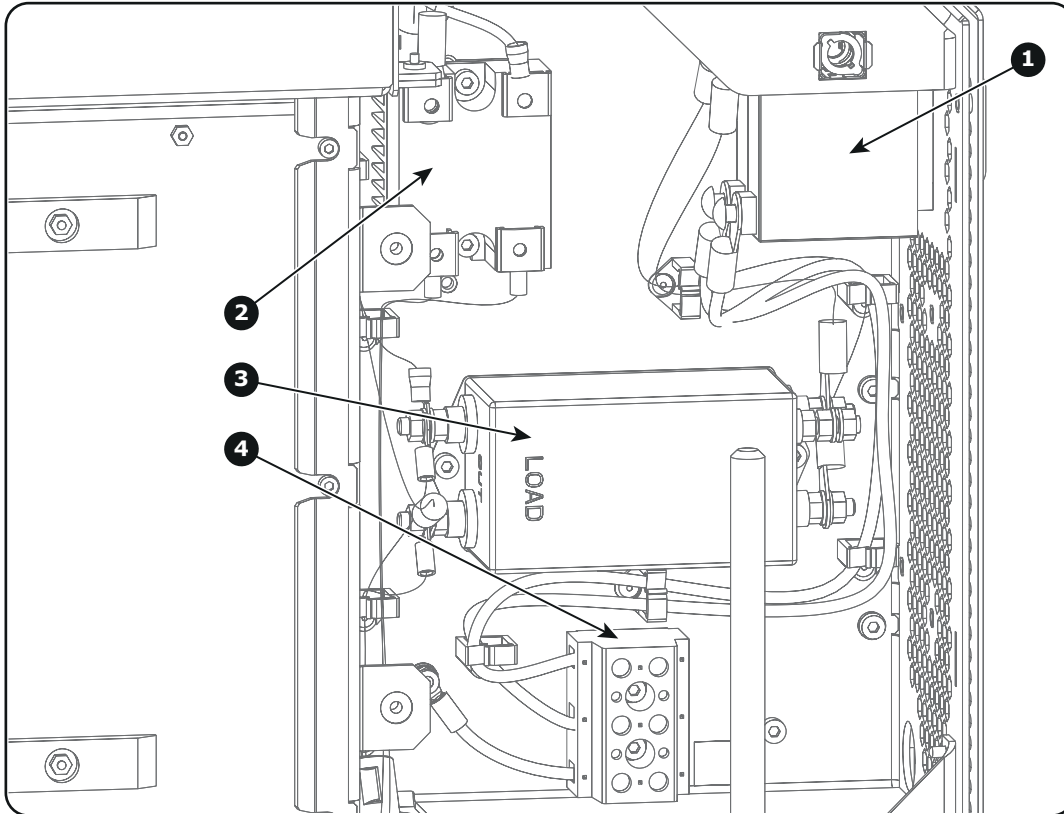


Image 5-1

- 1 ON/OFF switch.
- 2 Solid state relay.
- 3 Mains filter.
- 4 Terminal block.

Interconnection diagram Mains Input

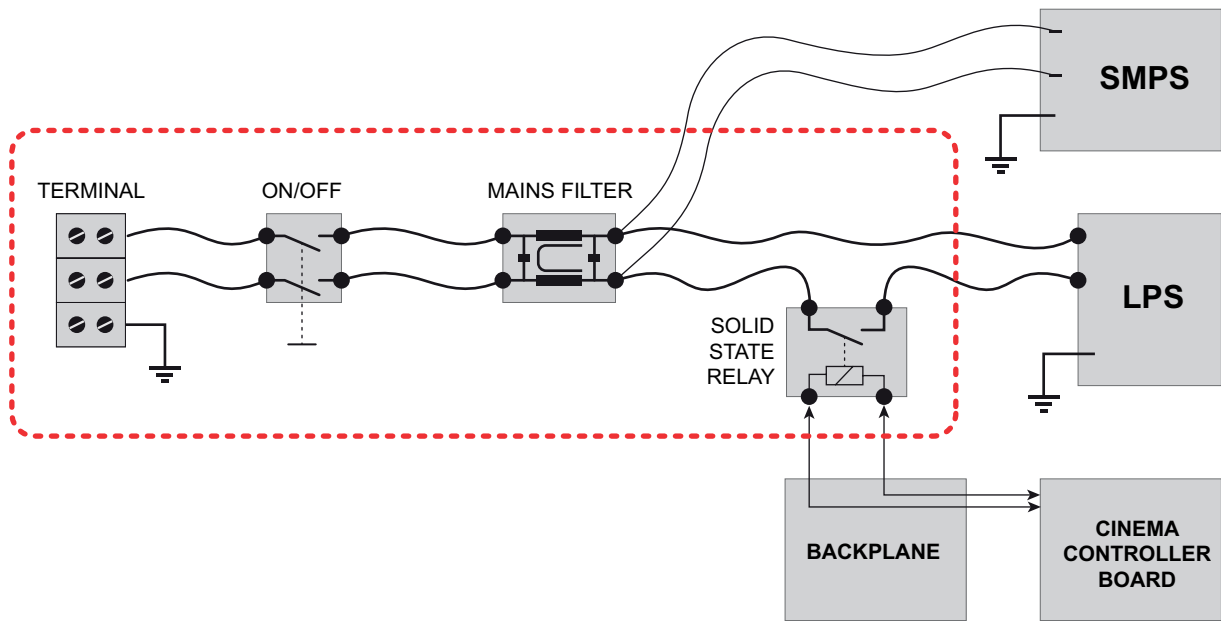


Image 5-2

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

Large size flat screw driver (8mm x 150mm).

How to access the compartment of the Mains Input?

1. Remove the rear cover of the projector. See procedure "Removal of the rear cover", page 363.
2. Remove the cover of the Mains Input compartment by releasing the two captive thumb screws (reference 1 image 5-3) .

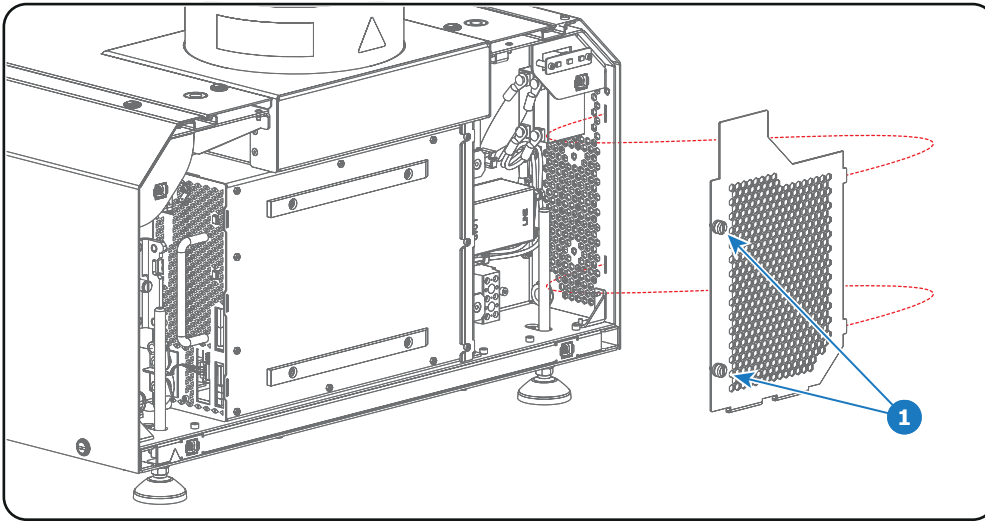


Image 5-3

How to close the Mains Input compartment?

1. Install the cover of the Mains Input compartment. Fasten the two captive thumb screws (reference 1 image 5-4).

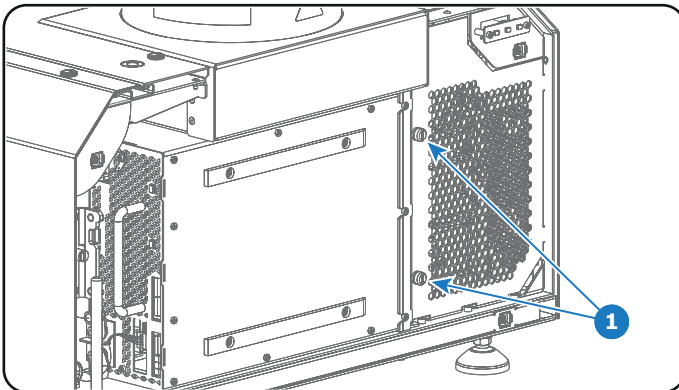


Image 5-4

2. Install the rear cover of the projector. See procedure "Installation of the rear cover", page 374.

5.3 Replacing the ON/OFF Switch

Necessary tools

- 2.5mm Allen wrench.
- Medium size flat screw driver.
- Torque flat screw driver (medium size).

How to replace the ON/OFF Switch?

1. Switch off the projector and disconnect the power cord of the projector from the power net.
2. Remove the rear cover of the projector and open the Mains Input compartment. See procedure "Accessing the Mains Input compartment", page 86.
3. Remove the ON/OFF switch from the projector chassis by loosening the two screws with reference 1 as illustrated in image 5-5. Use a 2.5mm Allen wrench.
4. Disconnect the four electrical wires from the ON/OFF switch. Use a medium size flat screw driver.
5. Connect the **LOAD side** (reference 2 image 5-5) of the new ON/OFF switch with the two loose wires from the **Input Filter**. Fasten the screws with a torque of **2.6Nm** (1.92 lbf*ft).
6. Connect the **LINE side** (reference 3 image 5-5) of the new ON/OFF switch with the two loose wires from the **Terminal Block**. Fasten the screws with a torque of **2.6Nm** (1.92 lbf*ft).
7. Install the new ON/OFF switch into the Mains Input compartment. Use a 2.5mm Allen wrench to fasten the two screws (reference 1 image 5-5) as illustrated.

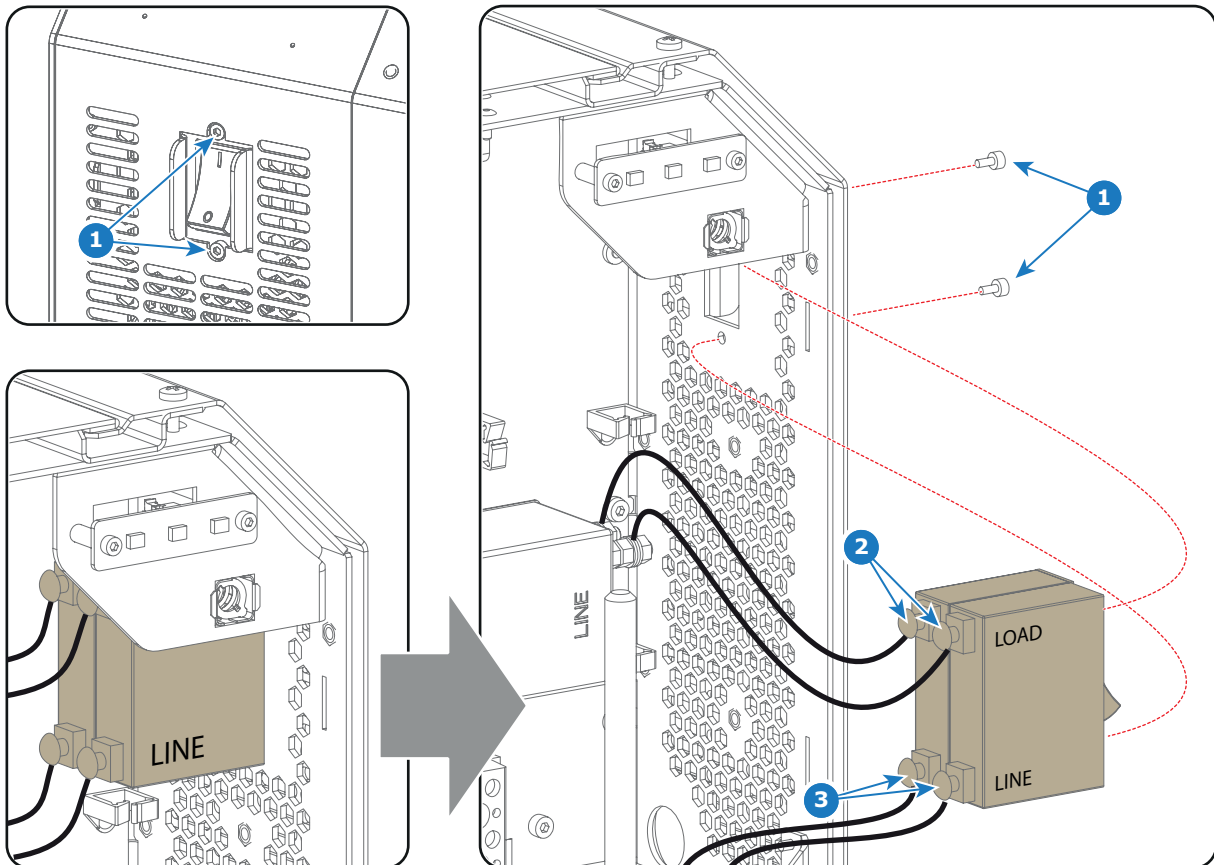


Image 5-5

8. Guide all wires in the cable clamps, close the Mains Input compartment and install the rear cover of the projector. See procedure "Accessing the Mains Input compartment", page 86.

5.4 Replacing the Mains Filter

Necessary tools

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

How to replace the Mains Filter?

1. Switch off the projector and disconnect the power cord of the projector from the power net.
2. Remove the rear cover of the projector and open the Mains Input compartment. See procedure "Accessing the Mains Input compartment", page 86.
3. Remove the Mains Filter from the projector chassis by loosening the two nuts with reference 1 as illustrated in image 5-6. Use a 3mm Allen wrench.
4. Disconnect the six electrical wires from the Mains Filter. Use a 8mm open end wrench.
5. Connect the **LINE side** (reference 2 image 5-6) 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: *Respect 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 again a plain washer and finally the second nut.*
6. Connect the gray wire (LPS) and thin white wire (SMPS) with the upper pin of the **LOAD side** (reference 3 image 5-6) of the new Mains Filter. Fasten the nut with a torque of **2.7Nm** (2.0 lbf*ft).
Note: *Respect 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 again a plain washer and finally the second nut.*
7. Connect the black wire (Solid State relay) and thin red wire (SMPS) with the lower pin of the **LOAD side** (reference 4 image 5-6) of the new Mains Filter. Fasten the nut with a torque of **2.7Nm** (2.0 lbf*ft).
Note: *Respect 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 again a plain washer and finally the second nut.*
8. Install the new Mains Filter into the Mains Input compartment. Use a 3mm Allen wrench to fasten the two screws (reference 1 image 5-6) as illustrated.

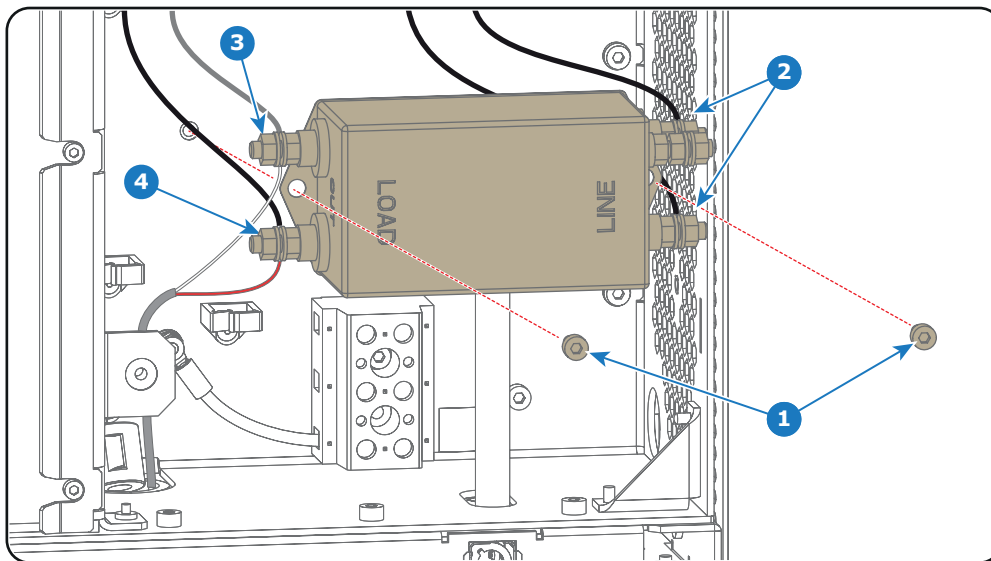


Image 5-6

9. Guide all wires in the cable clamps, close the Mains Input compartment and install the rear cover of the projector. See procedure "Accessing the Mains Input compartment", page 86.

5.5 Replacing the Solid State relay

Necessary tools

- 3mm Allen wrench.
- Medium size flat screw driver or Phillips PH2 screw driver.
- Torque screw driver with PH2 socket.

How to replace the Solid State relay?

1. Switch off the projector and disconnect the power cord of the projector from the power net.
2. Remove the rear cover of the projector and open the Mains Input compartment. See procedure "Accessing the Mains Input compartment", page 86.
3. Disconnect the four electrical wires (reference 1, 2, 3 & 4 image 5-7) from the Solid State relay. Use a medium size flat screw driver or Phillips PH2 screw driver.
4. Remove the Solid State relay from the projector chassis by loosening the two screws with reference 5 as illustrated in image 5-7. Use a 3mm Allen wrench.

Note: An insulation sheet and heat sink (reference 7 & 8 image 5-7) fits between the Solid State relay and the projector chassis. These two parts come loose together with the Solid State relay.

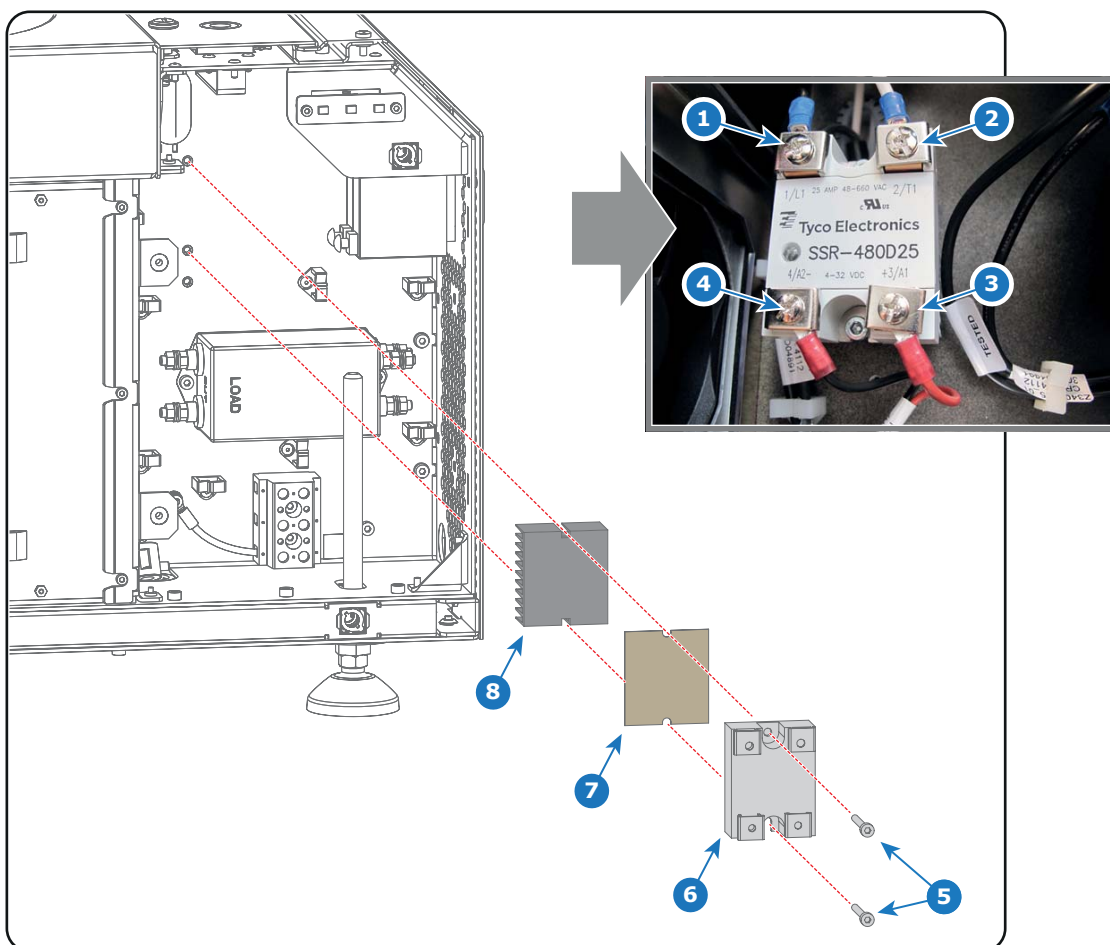


Image 5-7

5. Install the new Solid State relay. The load side (pin 1 & pin 2) of the Solid State relay should be at the top. Ensure to mount the heatsink and insulation sheet between the Solid State relay and projector chassis as illustrated in image 5-7. Use a 3mm Allen wrench to fasten the two screws (reference 5 image 5-7).
6. Connect the wires with the Solid State relay. Use a torque screw driver and apply a torque of **2.3Nm** (1.70 lbf*ft) upon the large screws (LOAD) and a torque of **1.1Nm** (0.81 lbf*ft) upon the small screws.
 - Connect the **black wire** from the LOAD side of the Mains Filter with **pin 1** of the Solid State relay (reference 1 image 5-7).
 - Connect the **white wire** (LPS cable) with **pin 2** of the Solid State relay (reference 2 image 5-7)
 - Connect the **thin red wire** with **pin 3** of the Solid State relay (reference 3 image 5-7)
 - Connect the **thin black wire** with **pin 4** of the Solid State relay (reference 4 image 5-7)
7. Close the Mains Input compartment and install the rear cover of the projector. See procedure "Accessing the Mains Input compartment", page 86.

6. SWITCH MODE POWER SUPPLY (SMPS)

About this chapter

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

Overview

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

6.1 Introduction DP2K-S series SMPS board

Introduction

The SMPS board has a separated 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-S 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

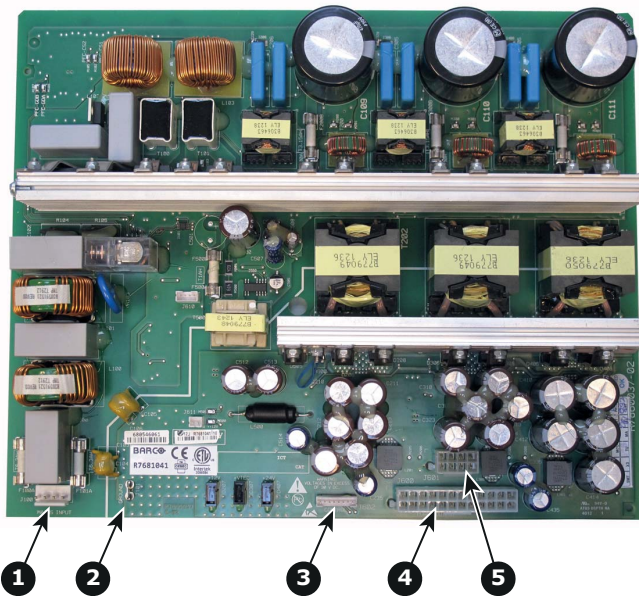


Image 6-1

- 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

3mm Allen wrench.

How to remove the SMPS board from the projector?

1. Remove the cover of the SMPS compartment. Use a 3mm Allen wrench to loosen the two screws (reference 1 image 6-2) of the cover.

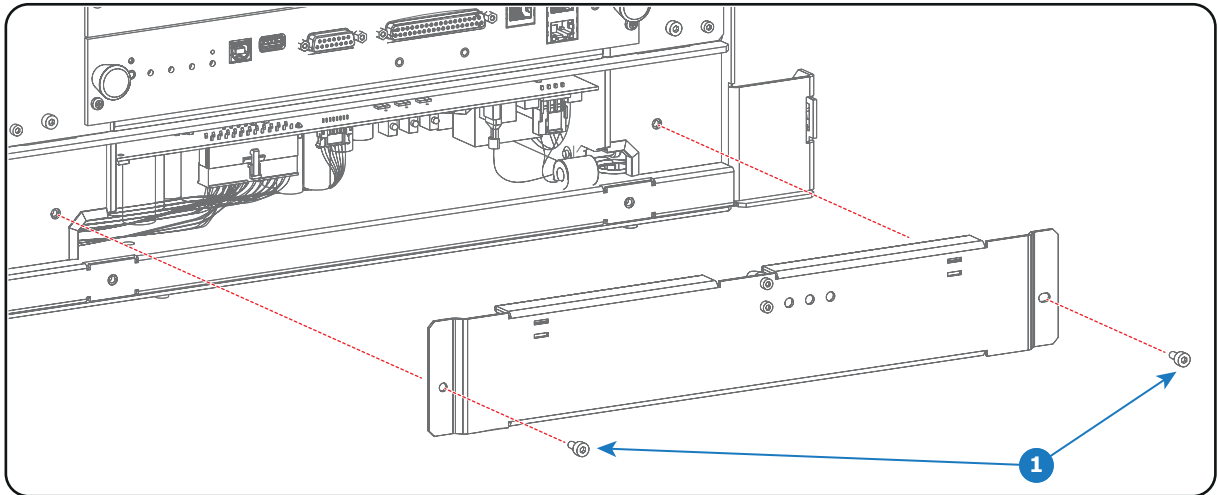


Image 6-2

2. Gently pull out the SMPS board 3 or 4 centimeters out of its compartment and disconnect the following connectors:
 - Power out connector 2 (reference 2 image 6-3)
 - Power out connector 1 (reference 1 image 6-3)
 - Control connector (reference 3 image 6-3)
 - Ground wire (reference 4 image 6-3)
 - Mains input (reference 5 image 6-3)

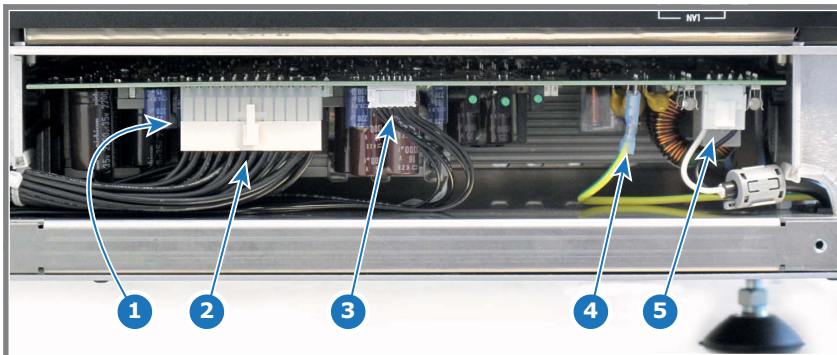


Image 6-3

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

6. Switch Mode Power Supply (SMPS)

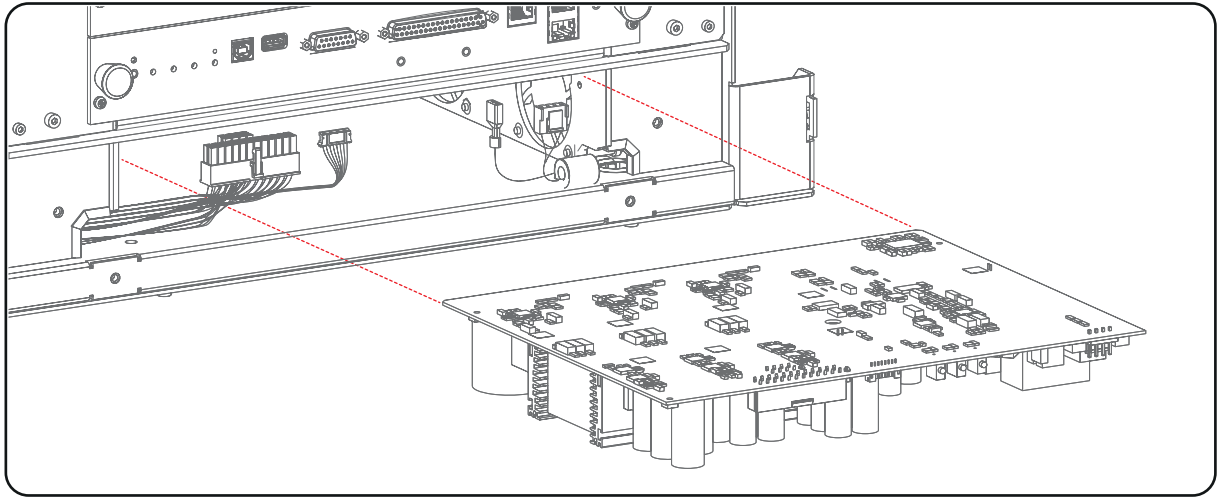


Image 6-4

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 6-5.

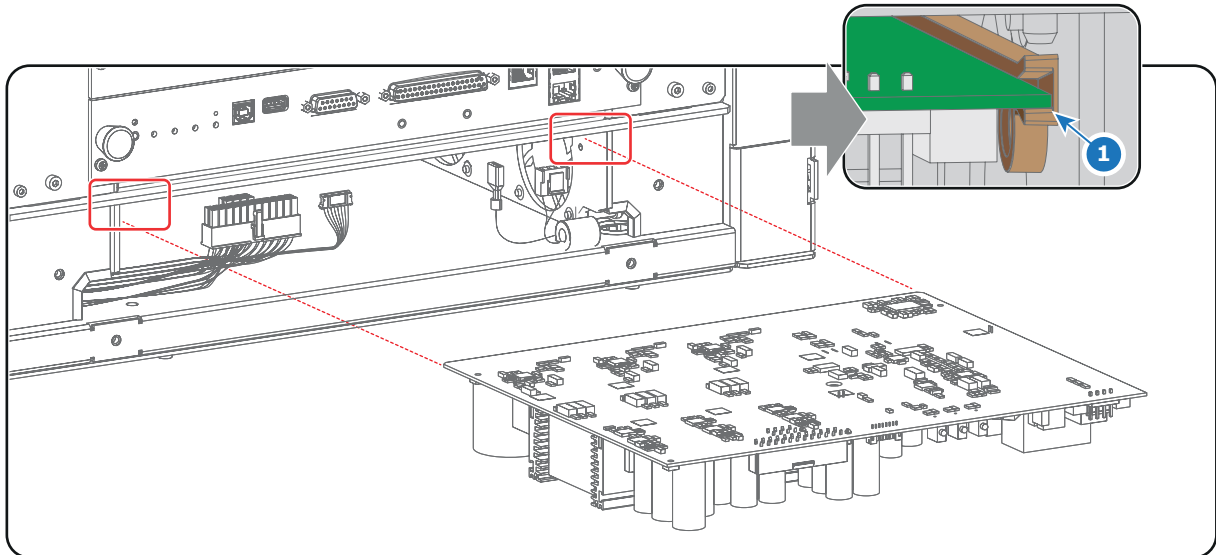


Image 6-5

2. Make the electrical connections:
 - Power out connector 1 (reference 1 image 6-6)
 - Power out connector 2 (reference 2 image 6-6)
 - Control connector (reference 3 image 6-6)
 - Ground wire (reference 4 image 6-6)
 - Mains input (reference 5 image 6-6)

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

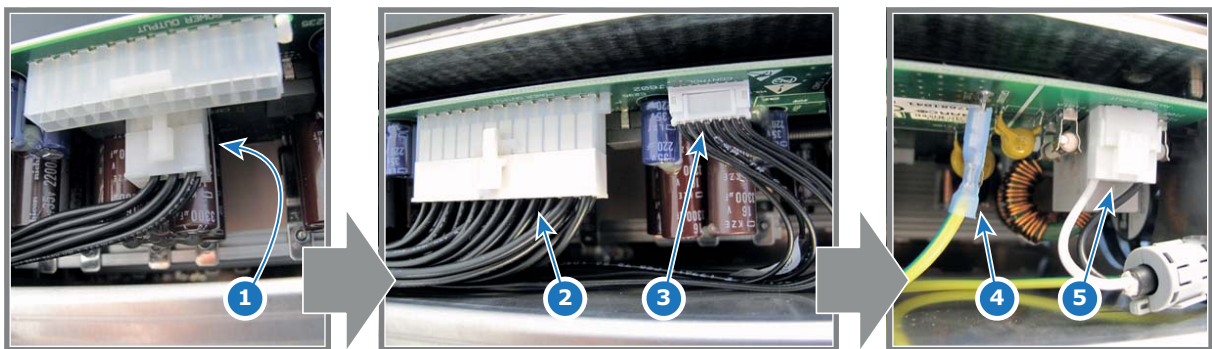


Image 6-6

3. Install the cover of the SMPS compartment. Use a 3mm Allen wrench to fasten the 2 screws (reference 1 image 6-7) .
Caution: Ensure no wires are pinched.

6. Switch Mode Power Supply (SMPS)

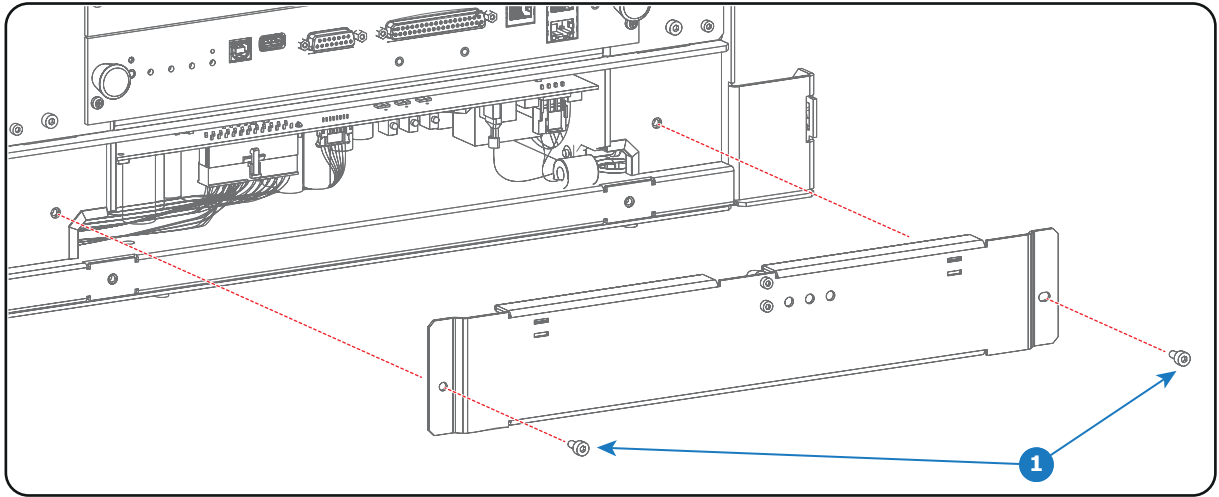


Image 6-7

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 small dust filter has to be removed. This procedure assumes that the projector small dust filter is already removed.

Necessary tools

2.5mm Allen wrench

How to replace the fans of the SMPS compartment?

1. Disconnect the wire of both SMPS fans (reference 1 & 2 image 6-8).

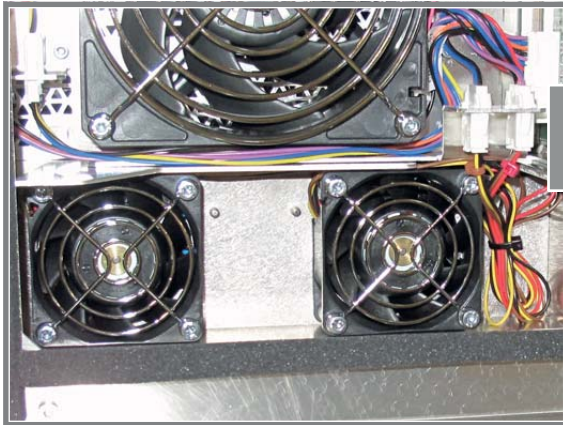
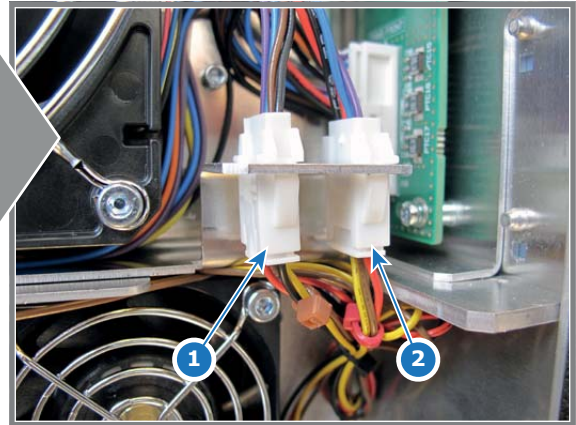


Image 6-8



2. Remove the fans from the projector chassis. Use a 2.5mm Allen wrench to loosen the screws (reference 3 image 6-9) of the fans.

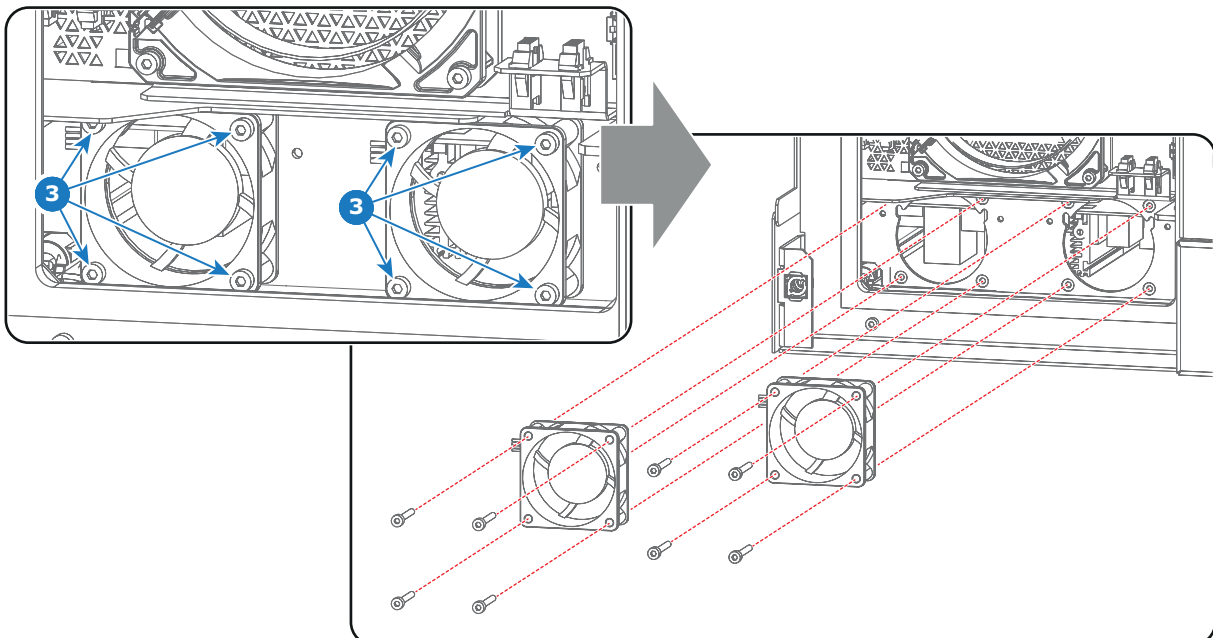


Image 6-9

3. Install two new SMPS fans. Guide the wires above the housing of the fans. Use a 2.5mm Allen wrench to fasten the screws (reference 3 image 6-9) 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 6-8).
- The wire of the right fan with the right socket (reference 2 image 6-8).

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 DP2K-S series Lamp Power Supply
- Removing the Lamp Power Supply
- Installing the Lamp Power Supply

7.1 Introduction DP2K-S series Lamp Power Supply

Functionality of the Lamp Power Supply

The Lamp Power Supply (LPS) is located at the rear upper left side of the projector. The LPS module can deliver maximum 2500 watts and maximum 100 amps.

To ignite the lamp the voltage on the output pins of the LPS modules is brought up to 150 volt typical. This boost voltage will trigger the Start Pulse Generator (SPG) to ignite the lamp. Once the lamp is ignited the voltage on the output pins of the LPS modules is dropped to the typical arc voltage of the lamp e.g. 27 volt for a 2,5 kW lamp.



In case the LPS module fails an error will be logged in the projector log file.

LPS module

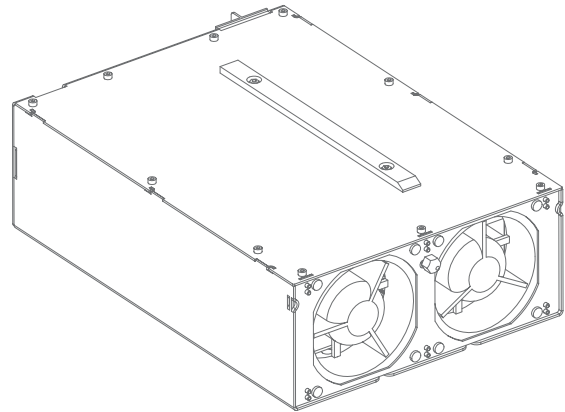
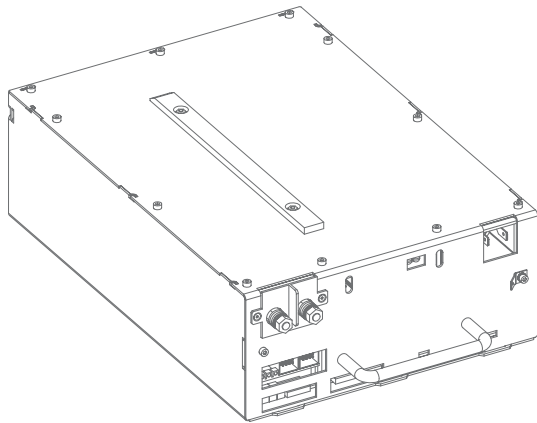


Image 7-1
Left: LPS module front view. Right: LPS module rear view.

7.2 Removing the Lamp Power Supply



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

Necessary tools

- 7mm flat screwdriver.
- 10mm nut driver or open end wrench.

How to remove the Lamp Power Supply from the projector?

1. Remove the rear cover and left side cover from the projector.
2. Disconnect the MAINS INPUT wires (reference 1 image 7-2) and the PE wire (reference 2 image 7-2) from the Lamp Power Supply.
3. Disconnect the CTLB IN wire (reference 3 image 7-2) from the Lamp Power Supply.

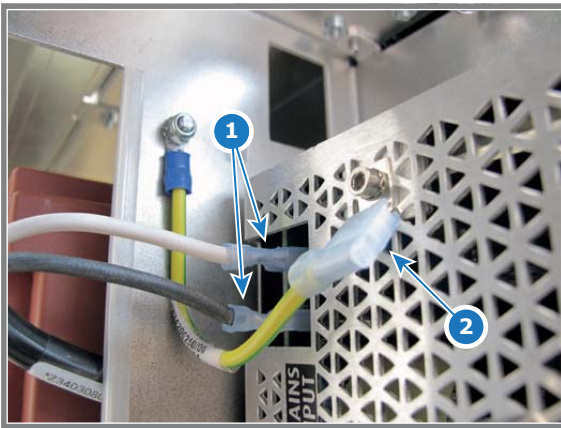
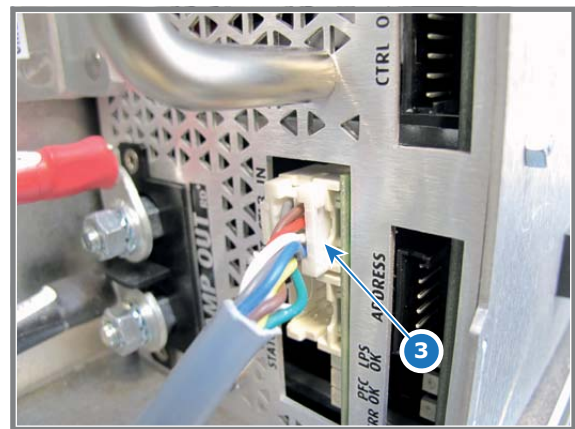


Image 7-2



4. Disconnect both LAMP OUTPUT power cables (reference 4 & 5 image 7-3) from the Lamp Power Supply. Use a 10mm nut driver. Guide the nut driver through the opening in the chassis (reference 6 image 7-3) to access the nuts.

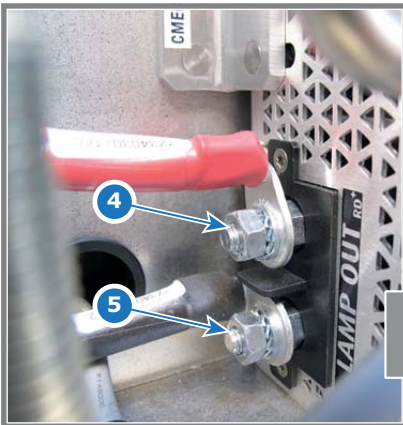
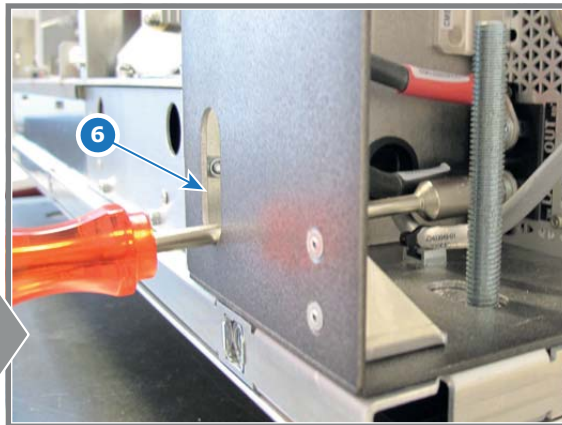


Image 7-3



5. Remove the fixation bracket as illustrated. Use a flat screwdriver to loosen the captive screw (reference 7) of the fixation bracket.

7. Lamp Power Supply (LPS)

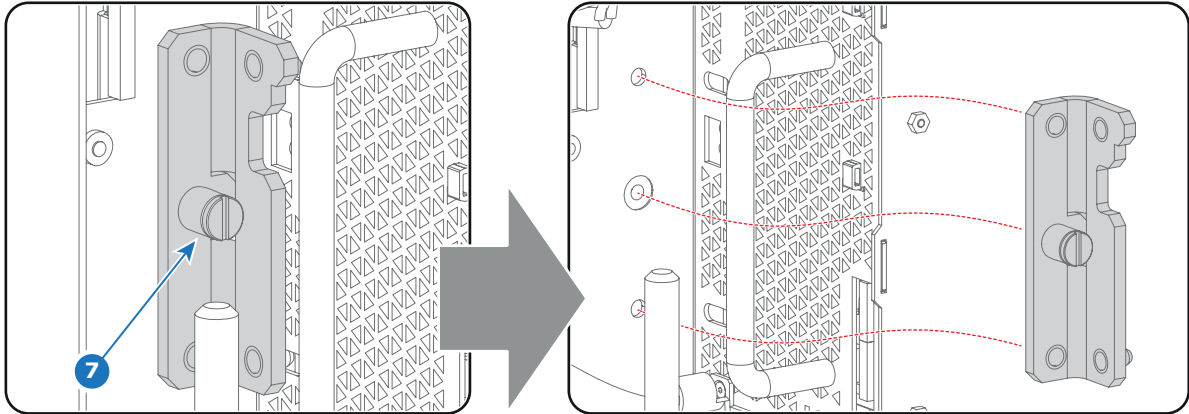


Image 7-4

6. Pull out the Lamp Power Supply from its compartment.

Caution: Do not damage the wire units while removing the Lamp Power Supply!

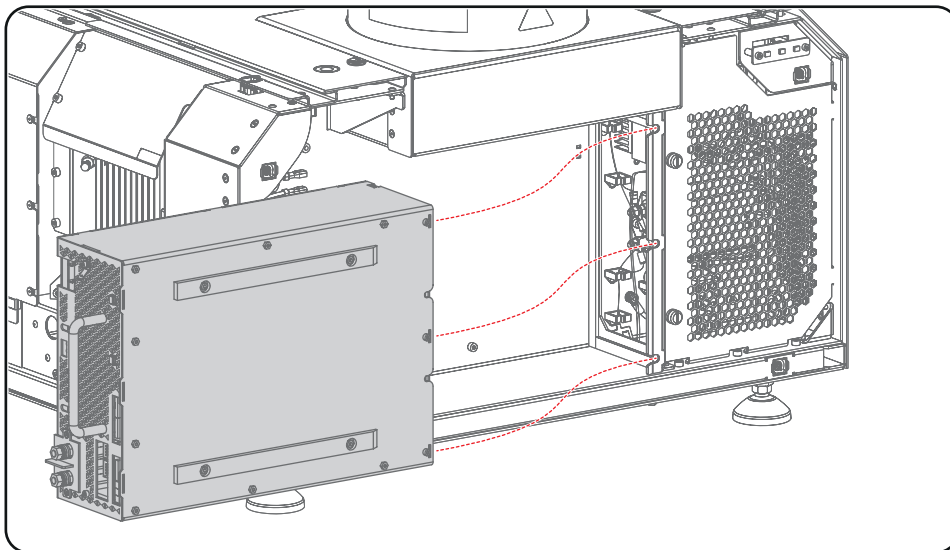


Image 7-5

7.3 Installing the Lamp Power Supply

Necessary tools

- 7mm flat screwdriver.
- Torque wrench with 10mm hexagon socket.

How to install the Lamp Power Supply of the projector?

1. Gently slide the Lamp Power Supply in its compartment as illustrated.
Caution: Do not damage the wire units while inserting the Lamp Power Supply!

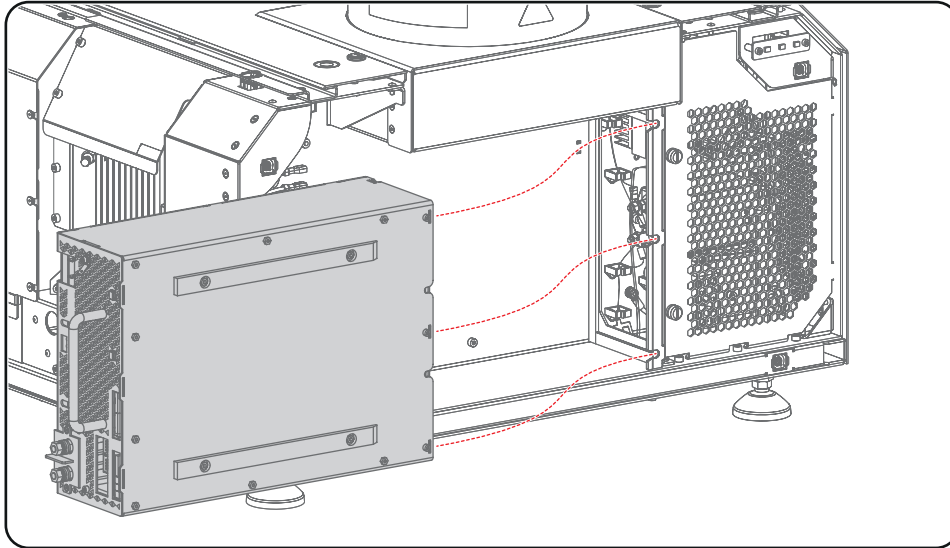


Image 7-6

2. Install the fixation bracket as illustrated. Use a Flat screwdriver to fasten the captive screw (reference 7) of the bracket.

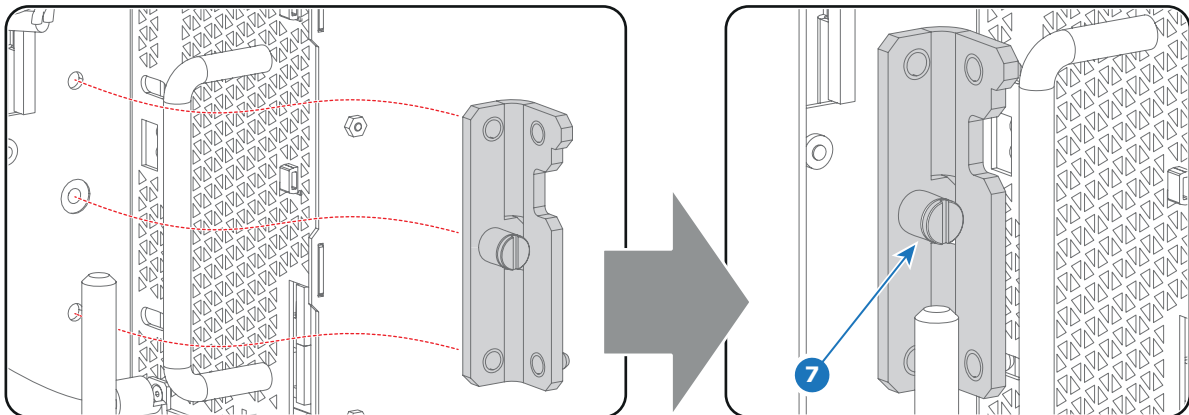


Image 7-7

3. Connect the **LAMP OUT** power cables with the LPS module as illustrated. Respect the polarity of the socket and cables. Use a torque wrench with a 10 mm hexagon socket to fasten the nuts on the pins with a torque of **4Nm** (2.95 lbt*ft).
Caution: Make sure to place the washers and cable eyes in correct order upon the pins as illustrated. First a plane washer (reference 1), then the wire lug (reference 2), then again a plane washer (reference 3), then the lock washer (reference 4) and finally the nut (reference 5).

7. Lamp Power Supply (LPS)

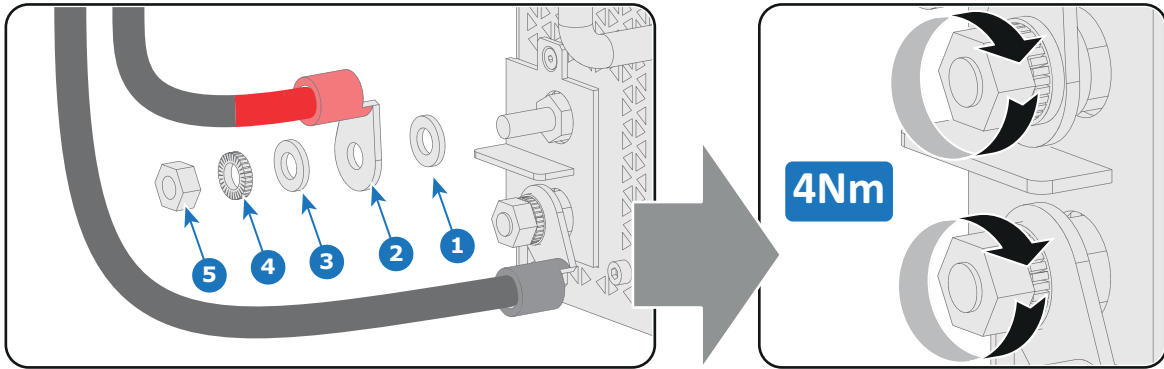


Image 7-8

4. Connect the wire with the **CTLB IN** socket (reference 3 image 7-9) of the Lamp Power Supply.
5. Connect the two **MAINS INPUT** wires (reference 1 image 7-9) and the **PE** wire (reference 2 image 7-9) with the Lamp Power Supply.

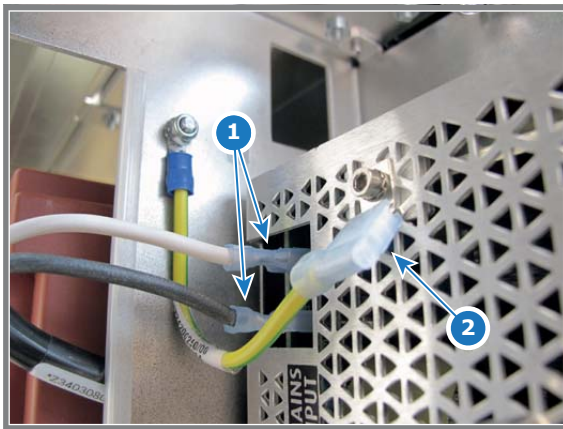
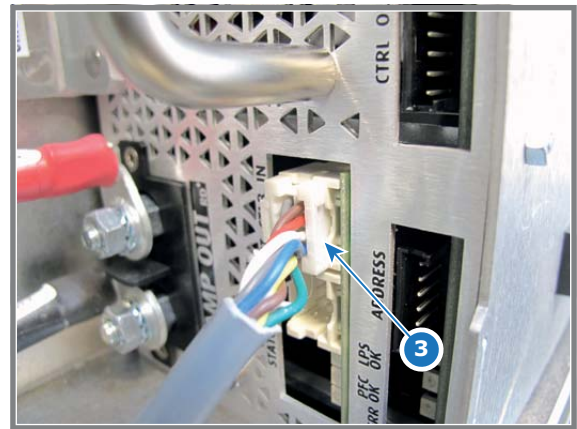


Image 7-9



6. Install the rear cover and left side cover of the projector.

8. START PULSE GENERATOR

About this chapter

This chapter describes briefly the functionality, the different parts and the replacement procedure of the Start Pulse Generator (SPG).

Overview

- Introduction DP2K-S series Start Pulse Generator
- Removing the Start Pulse Generator
- Installing the Start Pulse Generator

8.1 Introduction DP2K-S series Start Pulse Generator

Functionality of the Start Pulse Generator

The purpose of the Start Pulse Generator (SPG) is to ignite the lamp with a burst of high voltage peaks. The SPG superimposes high voltage peaks onto the normal dc startup voltage of the lamp supplied by the Lamp Power Supply module. Once the lamp is started up and illuminating the high voltage is removed and the lamp voltage drops to the arc voltage. The high voltage peaks are added to the lamp voltage by a superimposing transformer which is in series with the positive connection from the LPS to the lamp. The negative connection from LPS to lamp is direct and is connected to the chassis at the lamp side. The full lamp current passes through the secondary of the superimposing transformer.

Parts of the Start Pulse Generator

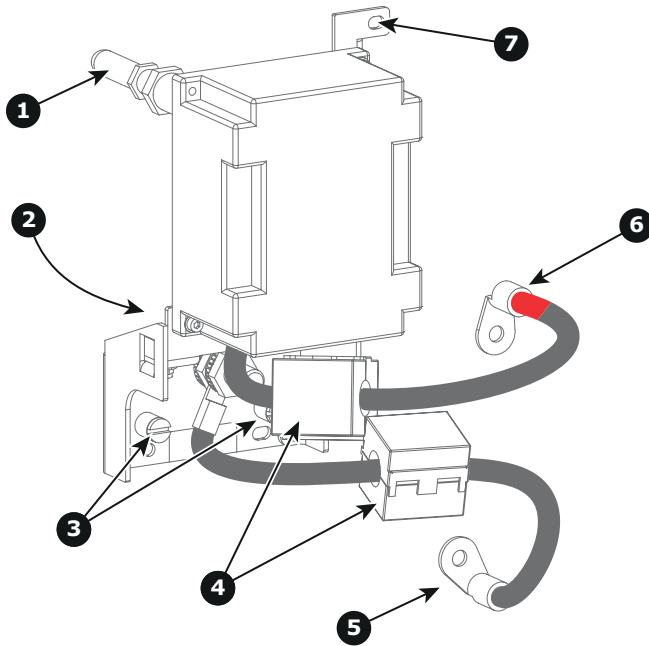


Image 8-1

- 1 Positive connection pin from SPG to Lamp House.
- 2 Negative connection pin from SPG to Lamp House.
- 3 Retaining fixation screws.
- 4 Ferrite blocks.
- 5 Black marked cable lug. Has to be connected with the negative "LAMP OUT" pin of the LPS module.
- 6 Red marked cable lug. Has to be connected with the positive "LAMP OUT" pin of the LPS module.
- 7 Mounting hole.

8.2 Removing the Start Pulse Generator



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

Necessary tools

- 7mm flat screwdriver.
- 10mm nut driver.
- 3mm Allen wrench.

How to remove the Start Pulse Generator from the projector?

1. Remove Lamp House, projector rear cover, projector left cover, and the Light Processor cover plate.
2. Disconnect both **LAMP OUT** power cables (reference 4 & 5 image 8-2) from the Lamp Power Supply. Use a 10mm nut driver. Guide the nut driver through the opening in the chassis (reference 6 image 8-2) to access the nuts.

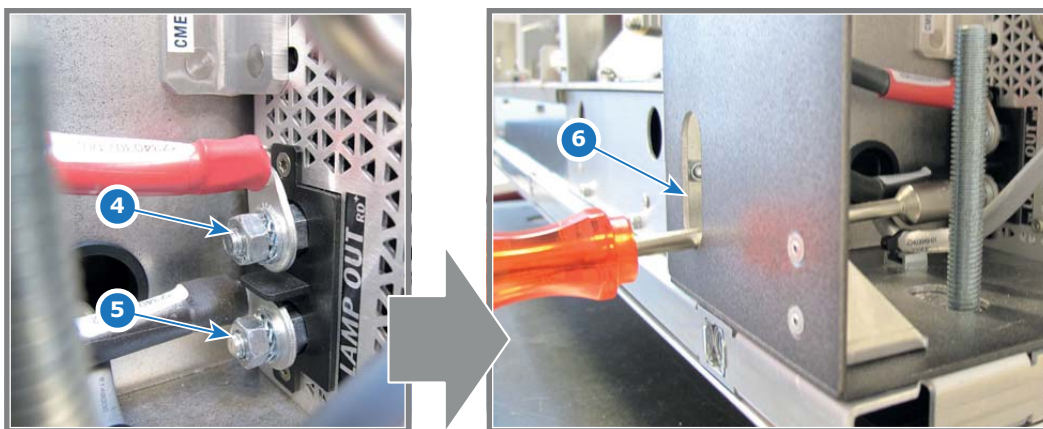


Image 8-2

3. Guide the **LAMP OUT** power cables through the opening in the chassis towards the SPG module.

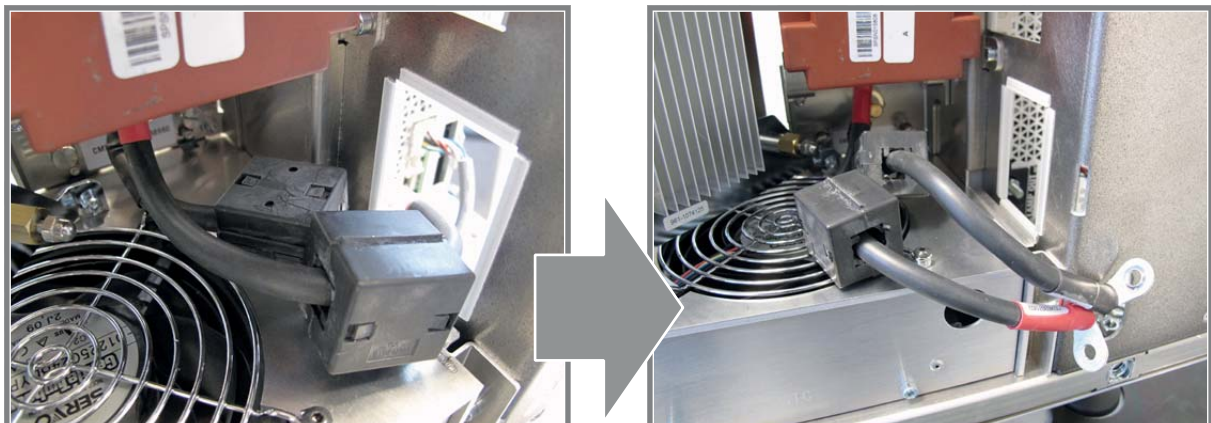


Image 8-3

4. Remove the cover plate above the SPG module and Cold Mirror assembly as illustrated. Use a 3mm Allen wrench to loosen the three screws (reference 3 image 8-4).

8. Start Pulse Generator

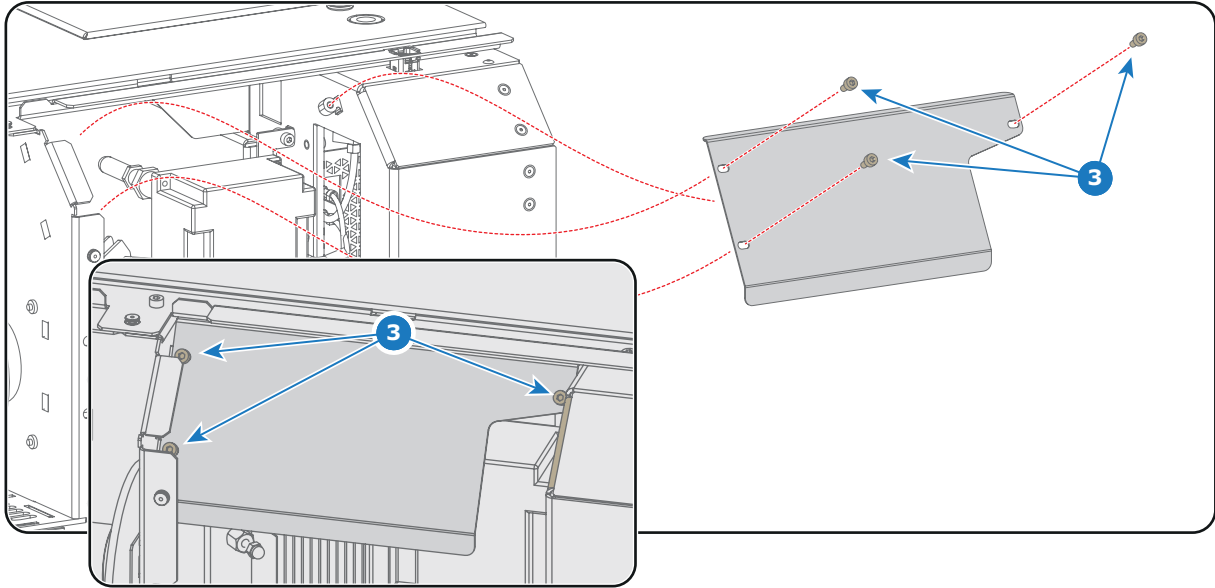


Image 8-4

5. Loosen the two retaining screws (reference 2 image 8-5) at the base of the SPG module and remove the screw (reference 1 image 8-5) at the upper right of the SPG module. Use a flat screwdriver and a 3mm Allen wrench.
6. Gently remove the SPG module from the projector.
Note: Some tilting and rotating of the SPG module is required to remove the SPG module from its location.
Caution: Do not touch the Cold Mirror assembly while removing the SPG module.

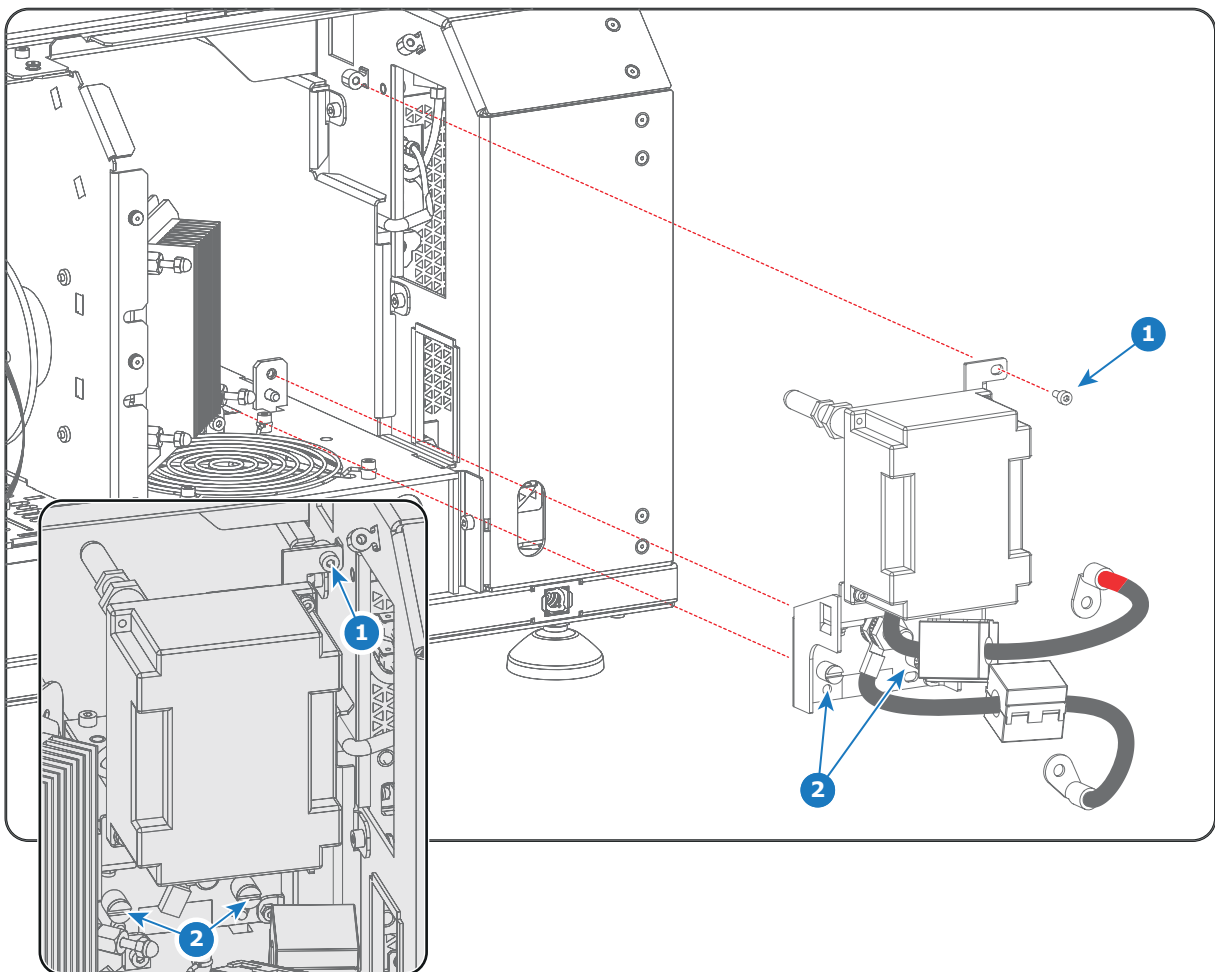


Image 8-5

8.3 Installing the Start Pulse Generator

Necessary tools

- 7mm flat screwdriver.
- Torque wrench with 10mm hexagon socket.
- 3mm Allen wrench.

How to Install the Start Pulse Generator in the projector?

1. Gently place the SPG module into position.

Note: Some tilting and rotating of the SPG module is required to place the SPG module in its location. Ensure that the positioning pins of the SPG module fits in the positioning holes in the projector chassis.

Caution: Do not touch the Cold Mirror assembly while installing the SPG module.

2. Fasten the two retaining screws (reference 2 image 8-6) at the base of the SPG module and insert the screw (reference 1 image 8-6) at the upper right of the SPG module. Use a flat screwdriver and a 3mm Allen wrench.

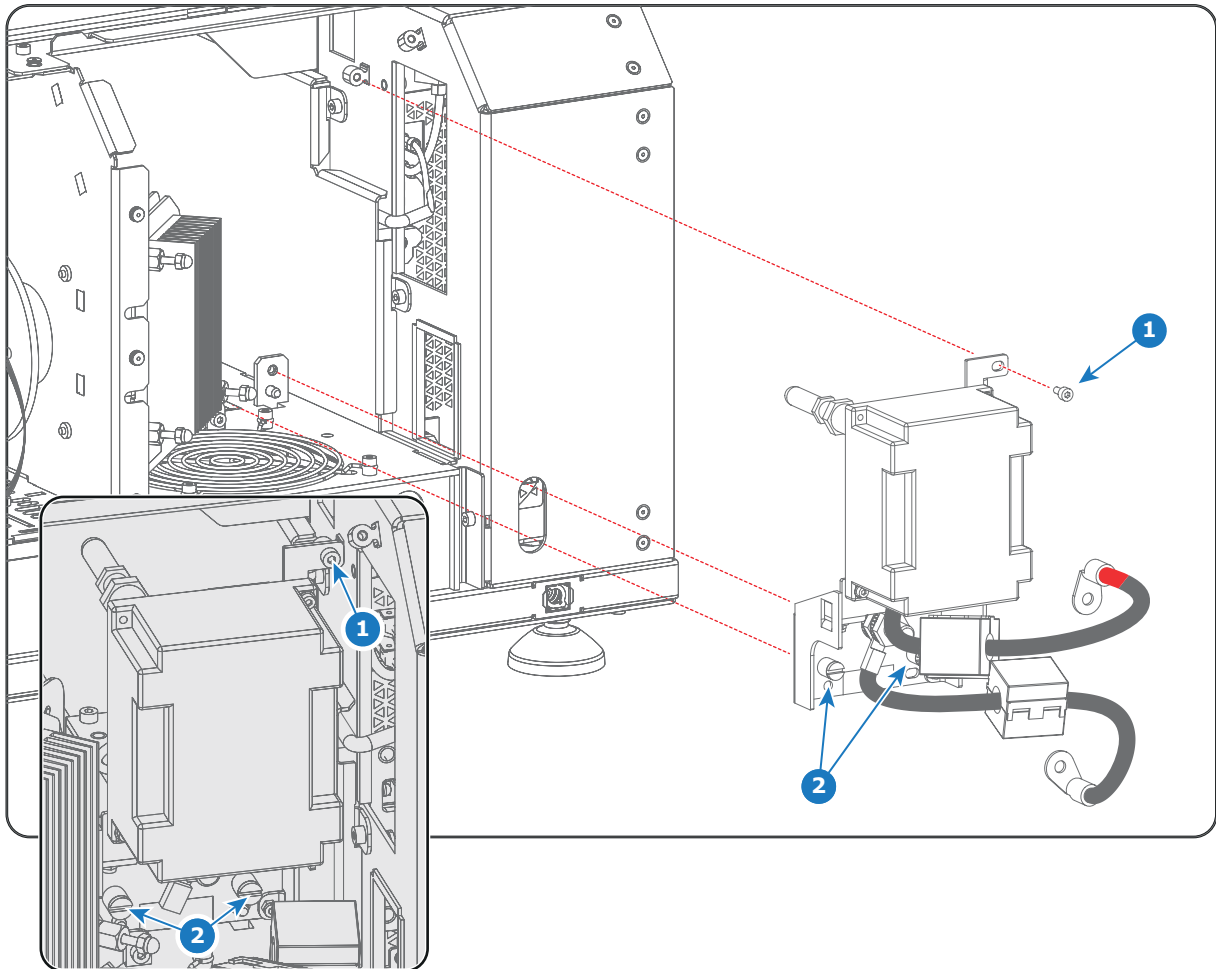


Image 8-6

3. Install the cover plate above the SPG module and Cold Mirror assembly as illustrated. Use a 3mm Allen wrench to fasten the three screws (reference 3 image 8-7).

8. Start Pulse Generator

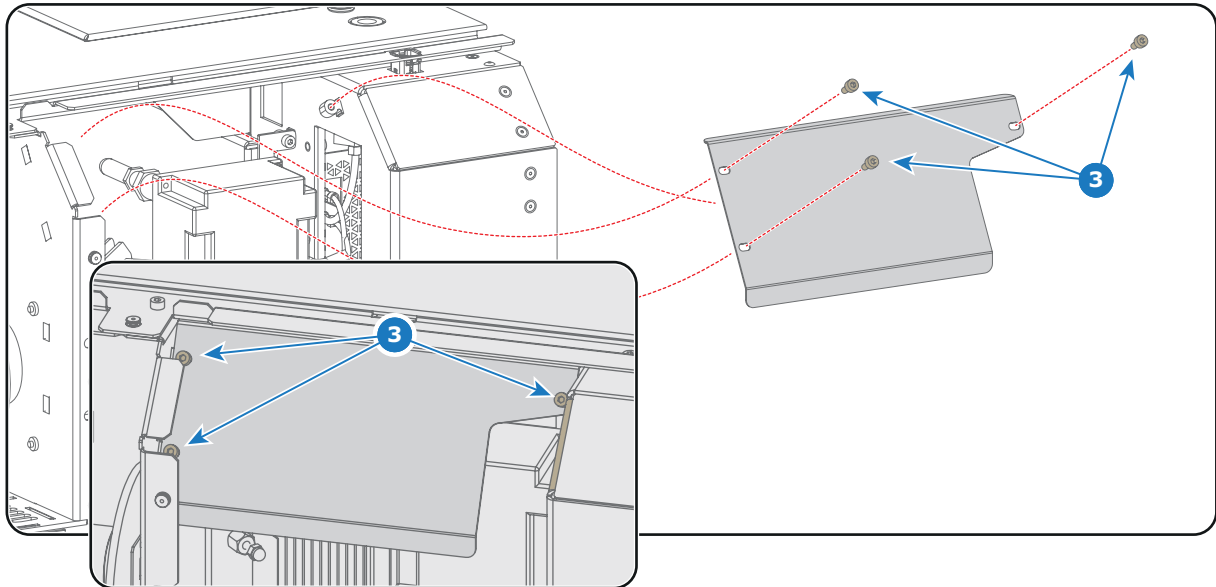


Image 8-7

4. Guide the **LAMP OUT** power cables through the opening in the chassis towards the LPS module.
Caution: Ensure the **LAMP OUT** power cables cannot rub-up against any sharp edges.

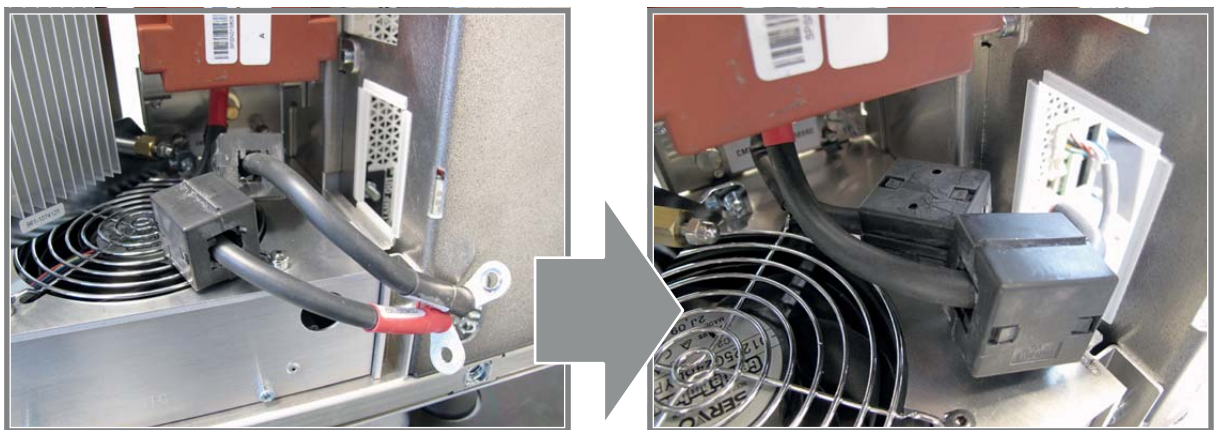


Image 8-8

5. Connect the **LAMP OUT** power cables with the LPS module as illustrated. Respect the polarity of the socket and cables. Use a torque wrench with a 10 mm hexagon socket to fasten the nuts on the pins with a torque of **4Nm** (2.95 lbt*ft).
Caution: Make sure to place the washers and cable eyes in correct order upon the pins as illustrated. First a plane washer (reference 1), then the wire lug (reference 2), then again a plane washer (reference 3), then the lock washer (reference 4) and finally the nut (reference 5).

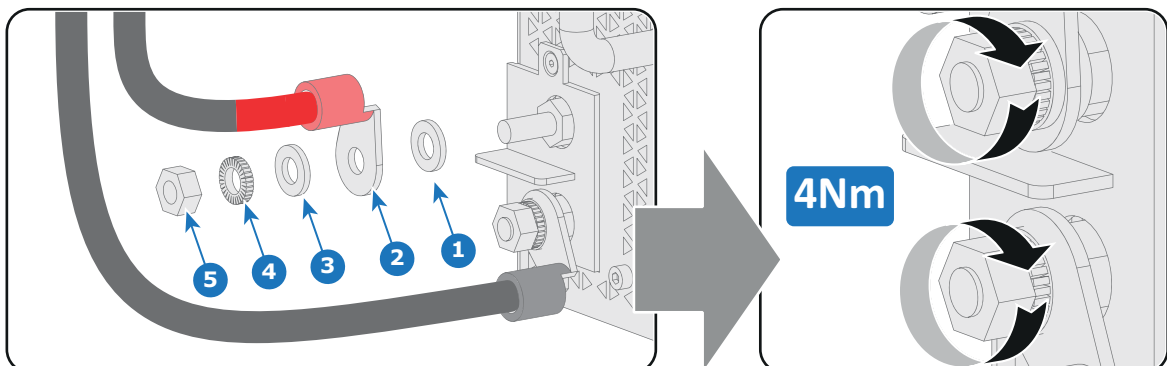


Image 8-9

6. Install the Light Processor cover plate, projector left cover, projector rear cover, and the Lamp House.

9. LAMP & LAMP HOUSE

About this chapter

This chapter enumerates all the supported xenon lamps for the DP2K-S series and how to replace the xenon lamp in the Lamp House. Also included are the procedure to reset the lamp parameters, which is required after a xenon lamp replacement, and the procedure to realign the lamp in its reflector for optimal performance.

Also included in this chapter are the replacement procedures for the UV blocker and Lamp Reflector set.



WARNING: DO NOT PERMIT UNAUTHORIZED PERSONNEL TO PERFORM OR ATTEMPT ANY PHASE OF XENON LAMP HANDLING OR SERVICE. ONLY TRAINED AND QUALIFIED TECHNICAL SERVICE PERSONNEL ARE ALLOWED TO HANDLE THE XENON LAMP.



CAUTION: Xenon compact arc lamps are highly pressurized. When ignited, the normal operating temperature of the bulb increases the pressure to a level at which the bulb may explode if not handled in strict accordance to the manufacturer's instructions. The bulb is stable at room temperature, but may still explode if dropped or otherwise mishandled. Whenever the lamp house, containing a xenon lamp, has to be dismantled or whenever the protective container or cloth has to be removed from the xenon lamp, authorized protective clothing **MUST be worn!**



WARNING: Always wear face protection (full face shield) when handling xenon lamps.



WARNING: Always wear protective clothing (welder's jacket) when handling xenon lamps.



WARNING: Always wear clean leather gloves with wrist protectors when handling xenon lamps.

Overview

- Introduction
- Supported xenon lamps
- Lamp replacement process
- Removal of the Lamp House
- Removal of the xenon lamp from the Lamp House
- Installation of the xenon lamp into the Lamp House
- Installation of the Lamp House
- Resetting the lamp parameters
- Realignment of the lamp in its reflector
- Cleaning the UV blocker of the Lamp House
- Cleaning the Reflector of the Lamp House
- Replacement of the UV blocker
- Replacement of the Reflector
- Replacement of the cathode wire of the Lamp House
- Replacement of the Lamp Anode Fan
- Replacement of the Lamp Cathode Fan

9.1 Introduction

Lamp and Lamp House

Xenon lamps are highly pressurized. At room temperature the pressure inside the bulb is between 10 and 15 bar. When ignited, the normal operating temperature of the bulb increases the pressure up to somewhere between 30 and 50 bar. The bulb temperature of an ignited lamp is approximately 700°C and the temperature of the arc is approximately 12000°C! To ignite a xenon lamp a voltage of 40000 volt is required. Once the lamp is ignited the startup voltage drops to 26 volt. The DC current consumed by the lamp during normal operation can increase to 86 ampere. The maximum light produced by the xenon lamp inside the Lamp House of the DP2K-S series projector is roughly 90000 lumens.

The xenon lamp is safely sheltered inside the Lamp House. The Lamp House exist in a reflector, a UV blocker, a lamp anode socket, a lamp cathode socket, and an XYZ-adjustment mechanism to align the lamp in the reflector. The Lamp House can handle xenon lamps up to 2200 Watt. The xenon lamp and Lamp House can be removed from the projector as a whole, which allows a fast lamp replacement in cases when time is critical.

The Lamp House of the DP2K-S series does not contain a Lamp Info module like other Barco cinema projectors. It's important to know that the lamp parameters and lamp history (such as number of strikes, total lamp run time, etc.) are stored on the Cinema Controller board. Take this into account when switching Lamp Houses or replacing the xenon lamp. It is important to reset the lamp parameters after each lamp replacement.

The DP2K-S series is delivered with a Lamp House with a xenon lamp installed. The xenon lamp is a consumable item of the projector. Exhausted xenon lamps must be replaced on site by trained and qualified service technician.

The xenon lamp is packed in a protective container or wrapped in a protective cloth. Never remove this protective container or protective cloth without wearing adequate protective clothing (face shield, clean leather gloves, welder's jacket).



Image 9-1
Left: Xenon lamp in protective container. Right: Xenon lamp wrapped in protective cloth.



CAUTION: Xenon compact arc lamps are highly pressurized. When ignited, the normal operating temperature of the bulb increases the pressure to a level at which the bulb may explode if not handled in strict accordance to the manufacturer's instructions. The bulb is stable at room temperature, but may still explode if dropped or otherwise mishandled. Whenever the lamp house, containing a xenon lamp, has to be dismantled or whenever the protective container or cloth has to be removed from the xenon lamp, authorized protective clothing MUST be worn!

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

- The projector issues a lamp run time notification message (and have blue status LEDs) approximately 30 hours before the maximum lamp runtime occurs.
- The projector issues a lamp run time notification message (and have 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 House

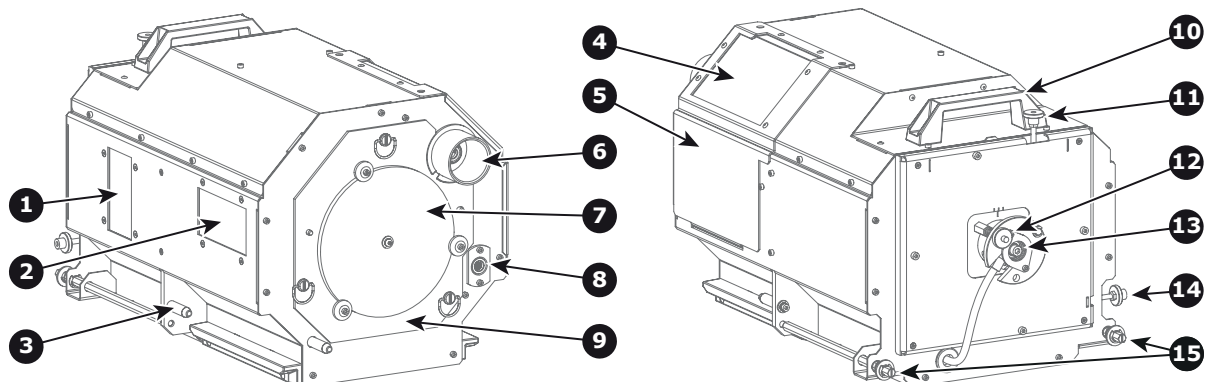


Image 9-2
1 Air inlet cathode cooling.

- 2 Air inlet anode cooling.
- 3 Positioning pin.
- 4 Air outlet.
- 5 Removable side cover.
- 6 Anode connection with ignitor (SPG).
- 7 UV blocker (with incorporated anode lamp support).
- 8 Cathode connection with ignitor (SPG).
- 9 Removable front cover (with UV blocker).
- 10 Handle.
- 11 Adjustment screw vertical lamp alignment.
- 12 Adjustment screw for lamp Z-alignment.
- 13 Lamp cathode fixation screw.
- 14 Adjustment screw horizontal lamp alignment.
- 15 Lamp House fixation screws.

Parts identification xenon lamp

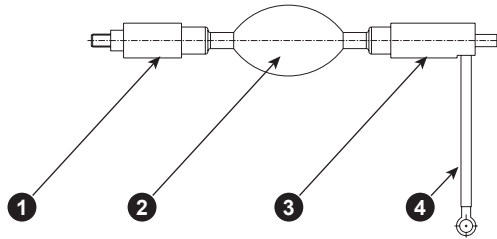


Image 9-3

- 1 Cathode of the xenon lamp.
- 2 Envelope (bulb) of the xenon lamp.
- 3 Anode of the xenon lamp.
- 4 Anode wire of the xenon lamp.



CAUTION: Expired xenon lamps.

Dispose of expired bulbs that are beyond warranty in the following manner: wrap the bulb tightly in several layers of canvas or heavy cloth. Place it on hard surface and shatter the envelope with a sharp hammer blow. **DO NOT** place a non shattered bulb in any ordinary refuse container.



When returning a xenon lamp for warranty adjustment, pack it in its original shipping container. Complete and return all required warranty information.

9.2 Supported xenon lamps

Cathode adaptor

A cathode adaptor is required to mount the xenon lamp in the Lamp House. The cathode adaptor has to be mounted on the cathode side of the xenon lamp prior to mounting the lamp in to the Lamp House. The purpose of the cathode adaptor is to position the arc of the xenon lamp in the middle of the reflector inside the Lamp House. Note that there is no anode adaptor for the Lamp House of the DP2K-S series.

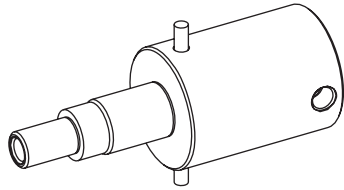


Image 9-4
Cathode adaptor (R858100K)



All lamps and adapters in the table below can be used in the Lamp House of the DP2K-S series. Note that the maximum lamp power the projector delivers depends on the type of projector and the installed lamp. Prior to install the lamp it's important to check with the Communicator software if the lamp is listed in the list of supported lamps for this projector.

Supported lamp types and cathode adapter:

Lamp type & Supplier	Cathode adapter	Barco Order No.	DP2K-8S	DP2K-10S
USHIO 1.2kW DXL12BAF	R858100K	R9855961	Yes	Yes
USHIO 1.6kW DXL16BAF	R858100K	R9855972	Yes	Yes
USHIO 2.0kW DXL20BAF	R858100K	R9855955	No	Yes
USHIO 2.0kW DXL20BAF2	R858100K	R9855965	No	Yes
USHIO 2.0kW DXL20BAF/L	R858100K	R9801067	No	Yes
USHIO 2.2kW DXL22BAF	R858100K	R9855971	No	Yes
OSRAM 1.2kW DHP	R858100K	R9855959	Yes	Yes
OSRAM 2.0kW DHP	R858100K	R9855956	No	Yes
PHILIPS 2.0kW XDC2000B	R858100K	R9801071	No	Yes



The table above is subject to changes and was last updated on 29 August 2013. Consult <https://my.barco.com> for the most recent information about supported lamps for the DP2K-S series.



WARNING: Always use the correct Cathode adapter for the xenon lamp in the Lamp House. Neglecting this may result in poor performance of the lamp and damage to the xenon lamp and Lamp House. Some adapters looks the same, therefore check the engraved item number upon the adapter to ensure you use the right adapter.

9.3 Lamp replacement process

About this process

This process enumerates all procedures in a chronological order for replacement of the xenon lamp of the projector. The stages in this process refer to the detailed step by step procedures included in this document.

Lamp replacement process from A to Z

1. Put the projector in standby mode, wait 15 minutes to let the projector cool down (after cooling), and then switch off the projector.

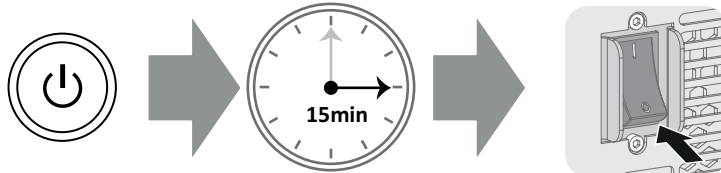


Image 9-5

2. Remove the cover of the Lamp House compartment. See page 362.

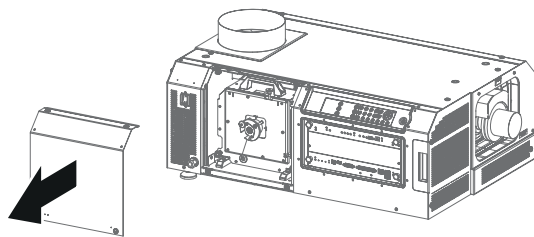


Image 9-6

3. Remove the Lamp House from the projector. See page 117.

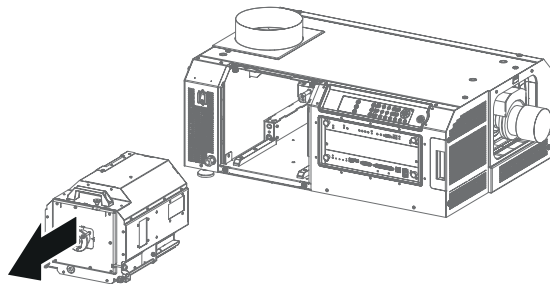


Image 9-7

4. Remove the exhausted xenon lamp from the Lamp House. See page 123.

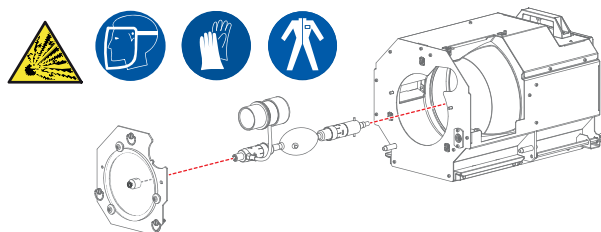


Image 9-8

5. Perform maintenance actions for lamp replacement. See page 22.
6. Install a new xenon lamp in the Lamp House. See page 123.

9. Lamp & Lamp House

7. Install the Lamp House back into the projector. See page 128.

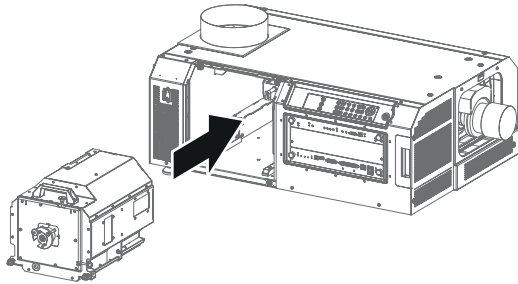


Image 9-9

8. Install the cover of the Lamp House compartment. See page 375.

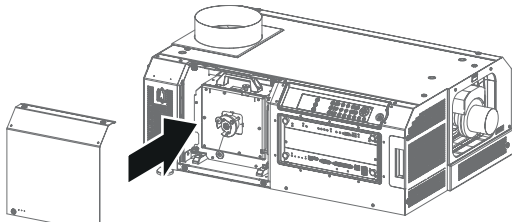


Image 9-10

9. Switch on the projector (into standby).

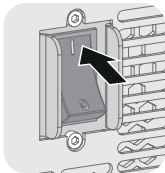


Image 9-11

10. Reset the lamp parameters. See page 129.

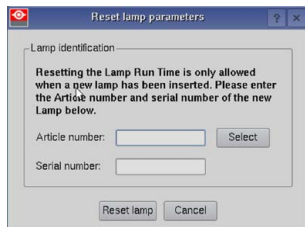


Image 9-12

11. Re-align the lamp in its reflector. See page 132.

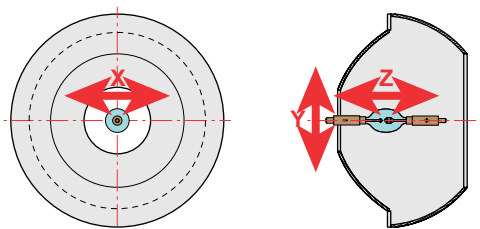


Image 9-13

12. Dispose of the exhausted lamp.

Caution: Expired xenon lamps.

Dispose of expired bulbs that are beyond warranty in the following manner: wrap the bulb tightly in several layers of canvas or heavy cloth. Place it on hard surface and shatter the envelope with a sharp hammer blow. DO NOT place a non shattered bulb in any ordinary refuse container.

9.4 Removal of the Lamp House



WARNING: This procedure may only be performed by qualified technical service personnel.



WARNING: The Lamp House is very hot after operation. To avoid burns, let the projector cool down for at least 15 minutes before proceeding to remove the Lamp House.



CAUTION: Due to its high internal pressure, the lamp may explode in either hot or cold states if improperly handled.

Necessary tools

8mm nut driver or flat screw driver.

How to remove the Lamp House from the projector?

1. Ensure the projector is switched off and cooled down.
2. Remove the cover of the Lamp House compartment.
3. Release the two retaining screws (reference 1 image 9-14) at the base of the Lamp House. Use a 8mm nut driver or a flat screw driver.
4. Remove the Lamp House as follows:
 - a) Grip the Lamp House by the handle and slide it out half way of the lamp compartment
 - b) Support the Lamp House at the bottom with the other hand and remove it from the lamp compartment.
 - c) Place the Lamp House on a stable support.

Caution: Be aware of the weight of the lamp assembly (10kg). Take the necessary precautions to avoid personal injury.

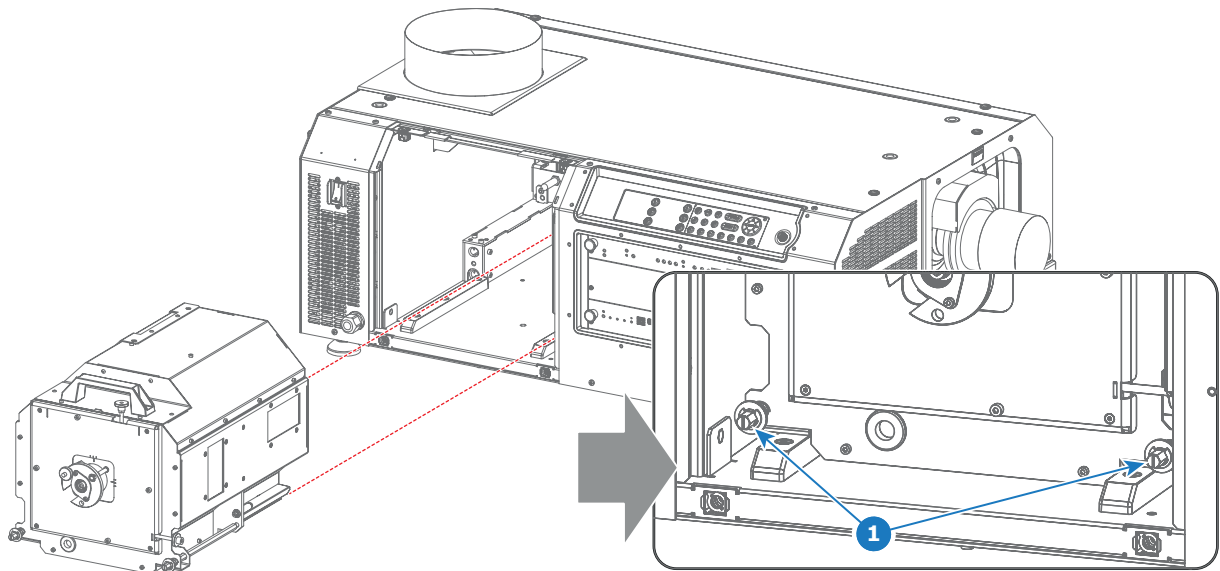


Image 9-14

9.5 Removal of the xenon lamp from the Lamp House



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WARNING: This procedure may only be performed by qualified technical service personnel.



CAUTION: Xenon compact arc lamps are highly pressurized. When ignited, the normal operating temperature of the bulb increases the pressure to a level at which the bulb may explode if not handled in strict accordance to the manufacturer's instructions. The bulb is stable at room temperature, but may still explode if dropped or otherwise mishandled. Whenever the lamp house, containing a xenon lamp, has to be dismantled or whenever the protective container or cloth has to be removed from the xenon lamp, authorized protective clothing **MUST be worn!**



WARNING: Always wear face protection (full face shield) when handling xenon lamps.



WARNING: Always wear protective clothing (welder's jacket) when handling xenon lamps.



WARNING: Always wear clean leather gloves with wrist protectors when handling xenon lamps.

Necessary tools

- 5mm Allen wrench.
- Lamp protective container or protective cloth with two binders.
- Flat blade screw driver.
- 2.5mm Allen wrench.
- 17mm open end wrench.
- 17mm nut driver.
- Welder's jacket (not included in the safety kit that Barco offers).
- Full face shield with neck protection.
- Leather gloves with wrist protection.

How to remove the xenon lamp out of the Lamp House?

1. Remove the hexagon socket head cap screw (reference 1 image 9-15) which fasten the cathode of the xenon lamp. Use a 5 mm Allen wrench. Do not release the cathode wire lug. The screw contains a spring washer and a plain washer (reference 2 & 3 image 9-15).

Note: *The cathode wire remains in its position after the screw and two washers are removed.*

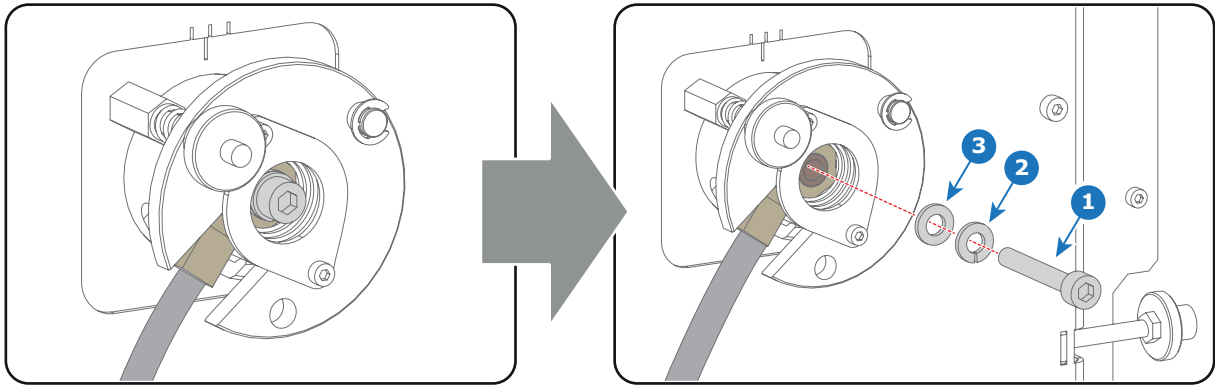


Image 9-15

- Remove the side cover of the Lamp House by releasing the two quarter turn screws (reference 4 image 9-16) of the side cover as illustrated.

Caution: Ensure that you wear protective clothing, a full face shield and protective gloves.

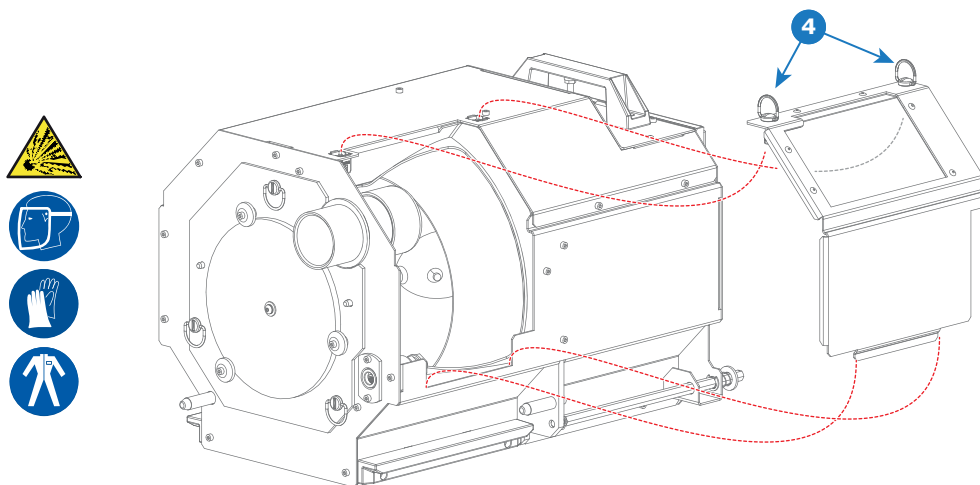


Image 9-16

- Release the three quarter turn screws (reference 5 image 9-17) of the UV blocker assembly as illustrated. Do not remove the UV blocker yet. Hold it in position!

Caution: Ensure that the anode support remains in its position while releasing the screws as it serves to support the front end of the lamp.

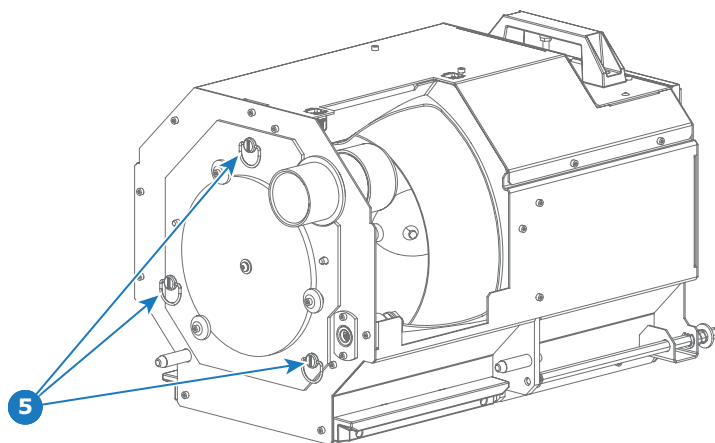


Image 9-17

- Support the xenon lamp inside the Lamp House with one hand while removing the UV blocker assembly from the Lamp House. Take care not to damage the UV blocker.

Warning: Supporting the xenon lamp with one hand prevents the xenon lamp from dropping and colliding with the chassis of the Lamp House.

9. Lamp & Lamp House

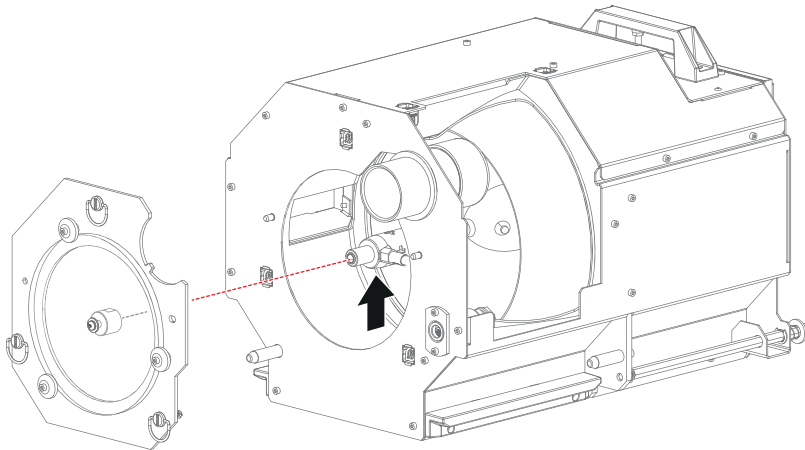


Image 9-18

5. Slide out the anode connector from the Lamp House. The anode connector remains attached with the lamp anode wire.

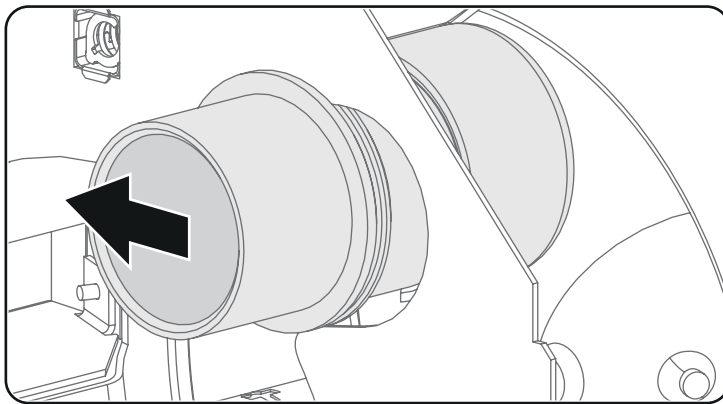


Image 9-19

6. Gently remove the xenon lamp together with the anode connector out of the Lamp House. Do not apply excessive force to the xenon lamp. The xenon lamp should easily slide out the cathode socket of the Lamp House.

Warning: Supporting the xenon lamp with one hand while pulling it out with other hand prevents it from bumping against the chassis of the Lamp House.

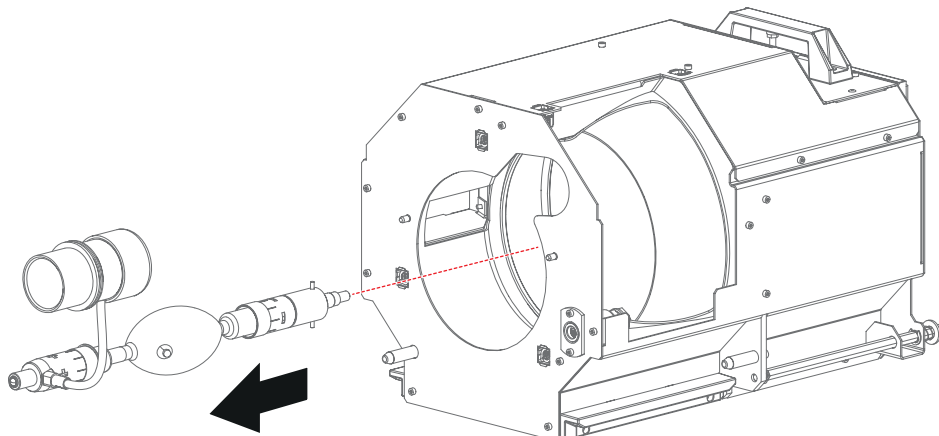


Image 9-20

7. Place the xenon lamp in its protective container or wrap the xenon lamp in a protective cloth and secure with two binders.

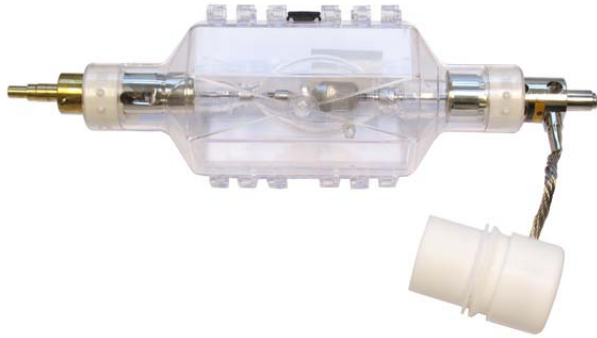


Image 9-21

8. Remove the protection cap from the anode connector.

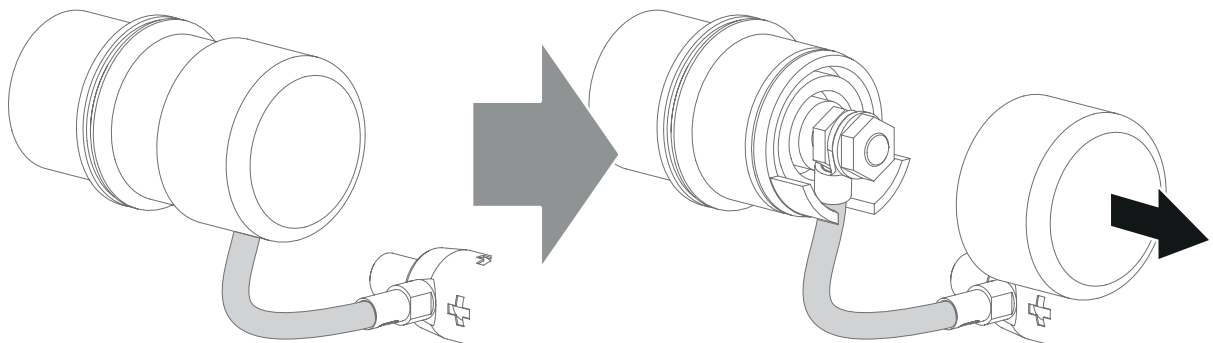


Image 9-22

9. Remove the anode wire lug from the anode connector. For this, use a 17mm open end wrench and a 17mm nut driver. Hold one nut (reference 6 image 9-23) with the open end wrench while releasing the other nut (reference 9 image 9-23) with the nut driver. Note that there is a plain washer (reference 8 image 9-23) in front of the wire lug (reference 7 image 9-23).

Tip: To avoid losing the plain washer and bolt (reference 8 & 9 image 9-23), place these back immediately after lug removal.

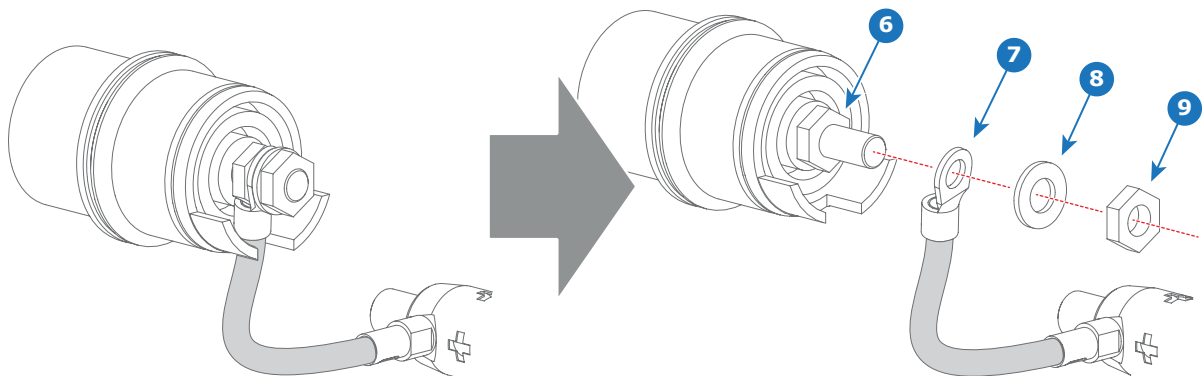


Image 9-23

10. Remove the cathode adapter from the xenon lamp by releasing the hexagon socket head cap screw (reference 10 image 9-24) of the adapter as illustrated. Use a 5mm Allen wrench.

Note: The xenon lamp has a cathode pin with screw thread (reference 11 image 9-24).

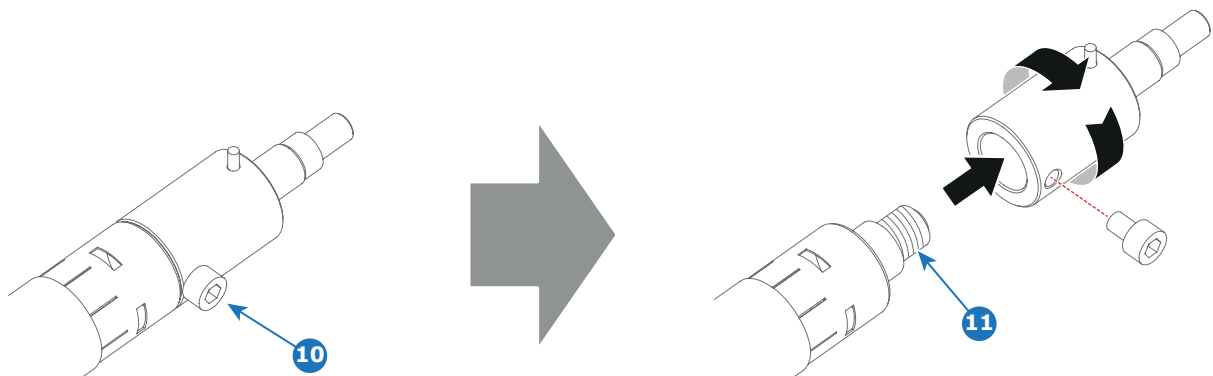


Image 9-24



Reinstall the UV blocker assembly and the side cover in case you do not intend to install another xenon lamp immediately in the Lamp House.



CAUTION: Expired xenon lamps.

Dispose of expired bulbs that are beyond warranty in the following manner: wrap the bulb tightly in several layers of canvas or heavy cloth. Place it on hard surface and shatter the envelope with a sharp hammer blow. **DO NOT** place a non shattered bulb in any ordinary refuse container.



CAUTION: Small amounts of radioactive material (< 1000 Bq per lamp) are deliberately added to Xenon lamps for functional reasons. These lamps are manufactured under regulatory control as consumer product according to IAEA basic safety standard BSS 115. Disposal according to national regulations is required e.g. in Europe covered by WEEE regulation. See also related user manual of the lamp supplier for more guidance.



When returning a xenon lamp for warranty adjustment, pack it in its original shipping container. Complete and return all required warranty information.

9.6 Installation of the xenon lamp into the Lamp House



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WARNING: This procedure may only be performed by qualified technical service personnel.



CAUTION: Xenon compact arc lamps are highly pressurized. When ignited, the normal operating temperature of the bulb increases the pressure to a level at which the bulb may explode if not handled in strict accordance to the manufacturer's instructions. The bulb is stable at room temperature, but may still explode if dropped or otherwise mishandled. Whenever the lamp house, containing a xenon lamp, has to be dismantled or whenever the protective container or cloth has to be removed from the xenon lamp, authorized protective clothing **MUST** be worn!



WARNING: Always wear face protection (full face shield) when handling xenon lamps.



WARNING: Always wear protective clothing (welder's jacket) when handling xenon lamps.



WARNING: Always wear clean leather gloves with wrist protectors when handling xenon lamps.



This procedure assumes that the UV blocker assembly and the side cover are already removed from the Lamp House due to the removal of the xenon lamp.

Necessary tools

- Torque Allen key.
- 17mm open-end wrench.
- Torque wrench with a 17mm hexagon socket.
- Torque wrench with a 5mm Allen socket.
- Welder's jacket (not included in the safety kit that Barco offers).
- Full face shield with neck protection.
- Leather gloves with wrist protection.

How to install the xenon lamp into the Lamp House?

1. Have you considered required maintenance actions?
If yes, proceed with this procedure.
If no, see chapter "Lamp change maintenance actions", page 22.
2. Install the lamp cathode adaptor onto the cathode of the xenon lamp. Note that the xenon lamp has a threaded cathode pin (reference 11 image 9-25). Tighten the adaptor by hand on the cathode pin. Make sure that there is full contact between the adapter flat surface and the lamp base (no air gap may be visible). Fasten the screw (reference 10 image 9-25) of the cathode adapter with a torque of **2.5Nm** (1.84 lbf*ft). Use a torque wrench with a 5mm Allen socket.

Caution: Ensure that the adaptor is clean. Periodically clean the adaptor. Remove oxide from adaptor with standard household metal polish (E.g. Brasso).

Warning: Install the cathode adaptor prior to removing the protective container or protective cloth from the xenon lamp.

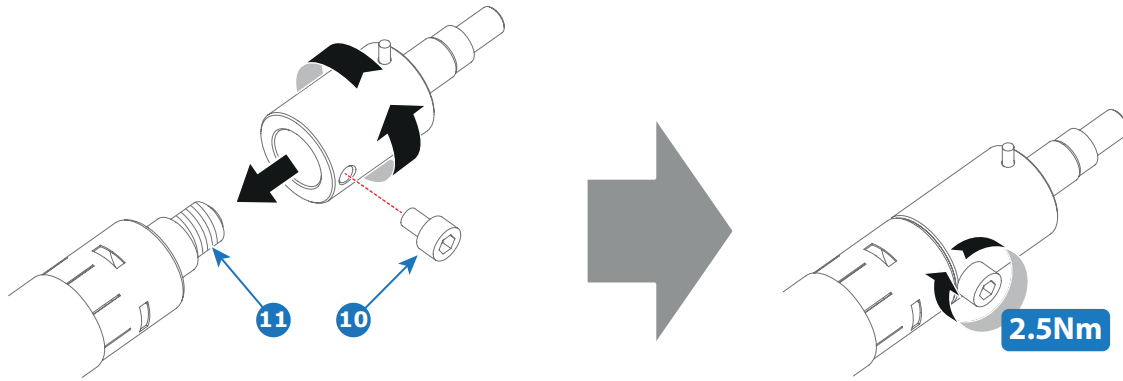


Image 9-25

3. Install the anode wire lug (reference 7 image 9-26) onto the anode socket of the Lamp House as illustrated. Take care of wire orientation (must fit through slot of white Teflon part). Use an open-end wrench of 17 mm to hold the first nut (reference 6 image 9-26) while fastening the second nut (reference 9 image 9-26) with a torque of **9Nm** (6.64 lbf*ft) using a torque wrench. Ensure that there is a flat washer (reference 8 image 9-26) between the second nut and the wire lug (reference 7 image 9-26).
Warning: A torque of **9Nm** (6.64 lbf*ft) must be applied to fasten the nuts. Make sure that there is no tension on the anode wire of the xenon lamp.

Note: After tightening the two nuts, the connector should still be "floating".

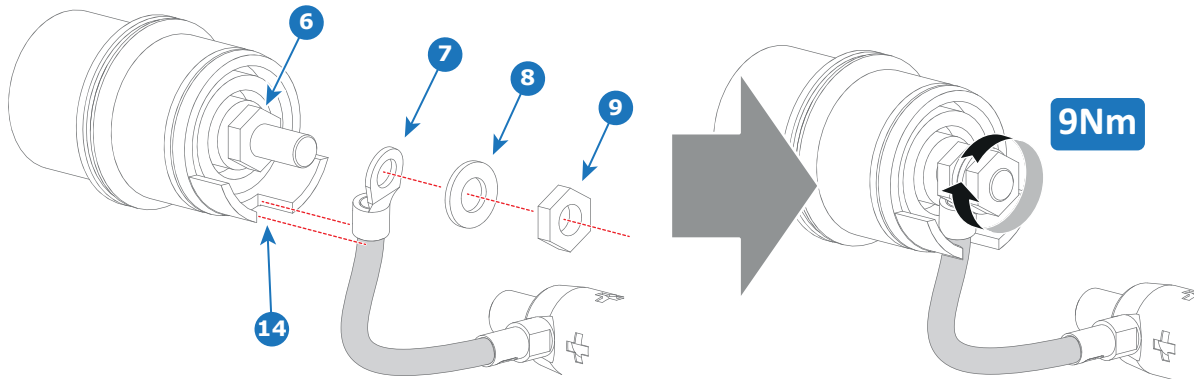


Image 9-26

Tip: Write down the serial number of the xenon lamp. You will need this while updating the lamp parameters after installation of the xenon lamp. The serial number of the xenon lamp is engraved in the neck of the xenon lamp.

4. Click the protection cap onto the anode socket.
Caution: Ensure the cap is properly installed. It may not come loose from the socket.

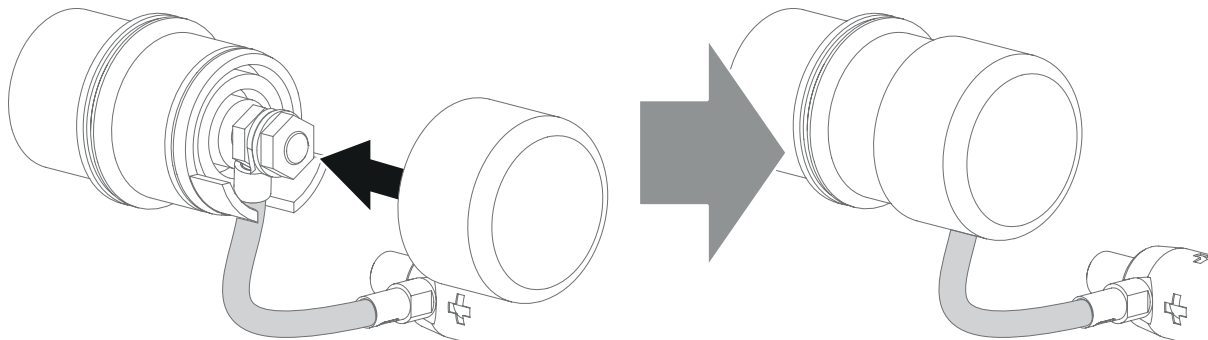


Image 9-27

5. Remove the protective packing from the xenon lamp and gently insert the xenon lamp (cathode first) into the Lamp House as illustrated. While inserting the lamp, rotate it slightly, **engaging the pins** (reference 11 image 9-28) of the cathode adapter in the foreseen slots. This is to ensure the lamp cathode is completely inserted. Keep supporting the anode of the lamp with one hand once the xenon lamp is in position. It's important that the anode **cable is freely routed** as shown in the illustration.
Caution: Ensure that you wear protective clothing, a full face shield and protective gloves.
Tip: Retain the protective packaging for future use (you will need it when replacing the next lamp).

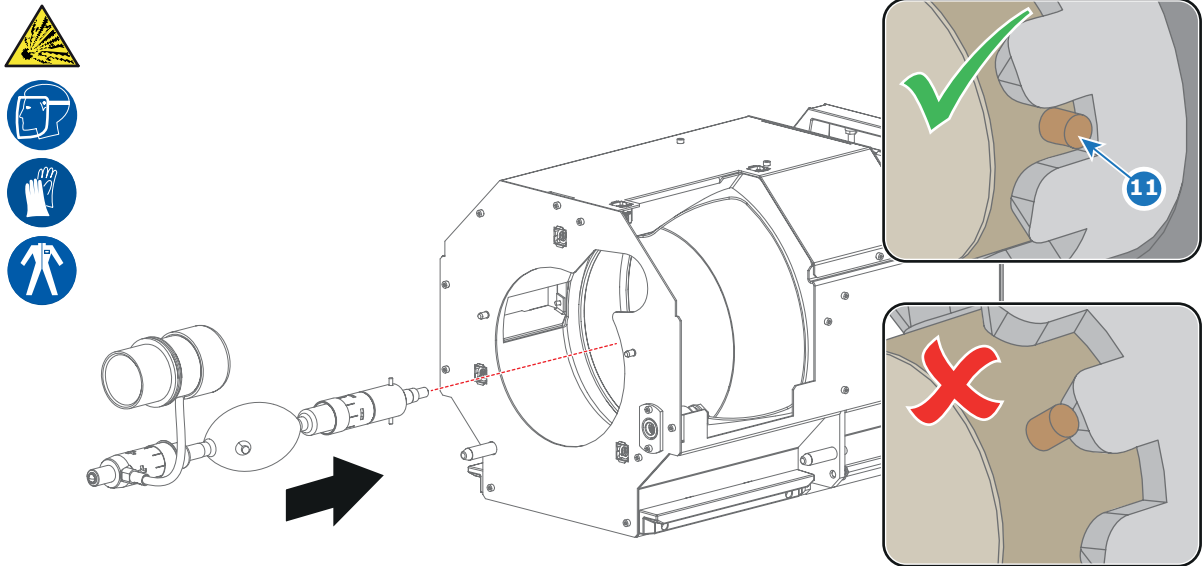


Image 9-28

6. Slide the anode connector into position on the Lamp House as illustrated.

Caution: Avoid any tension on the anode wire, ensuring there is no mechanical stress on the lamp.

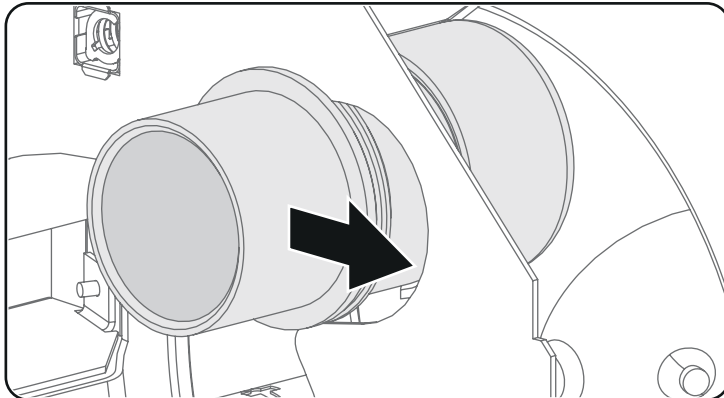


Image 9-29

7. Install the UV blocker assembly as illustrated. While supporting the lamp, via the Lamp House side opening, guide the UV blocker (with supporting mechanism) into position and engage it with the lamp.

Install the UV blocker assembly as illustrated. Use the opening at the side of the Lamp House to guide the anode pin of the xenon lamp into the anode supporting mechanism of the UV blocker.

Note: Make sure that the notch (reference 12 of image 9-30) of the UV blocker assembly matches with the gap (reference 12 of image 9-30) of the anode connector.

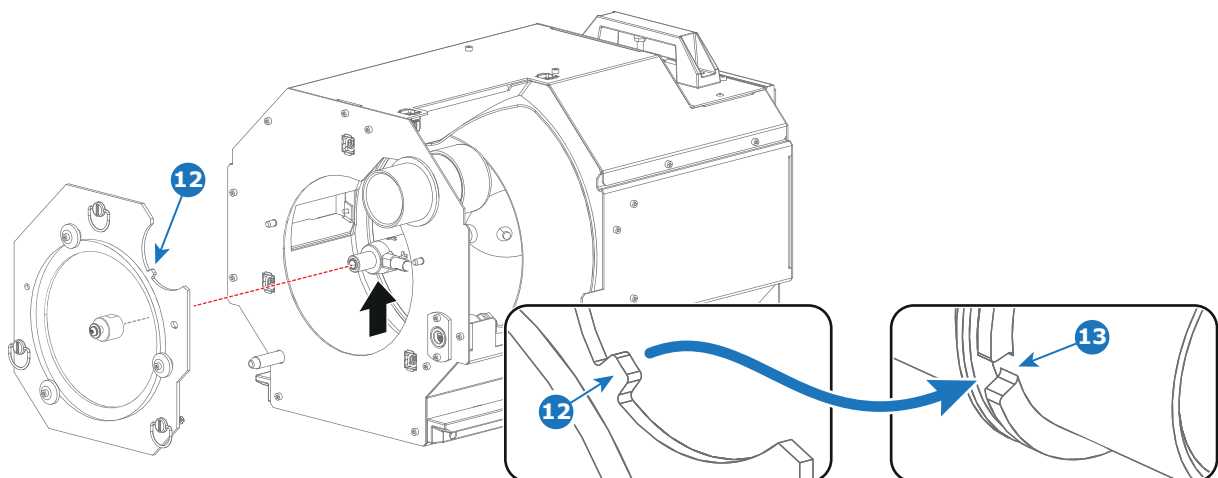


Image 9-30

8. Secure the UV blocker by fastening the three quarter turn screws (reference 5 image 9-31) as illustrated.

9. Lamp & Lamp House

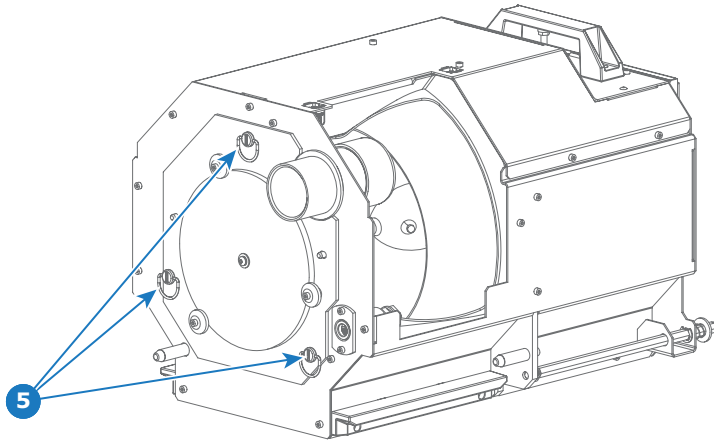


Image 9-31

- Secure the xenon lamp cathode with the hexagon socket head cap screw (reference 1 image 9-32), spring washer (reference 2 image 9-32) and plain washer (reference 3 image 9-32). Fasten the screw with a torque of **2.5Nm** (1.84 lbf*ft). Use a torque wrench with a 5 mm Allen socket.

Caution: Make sure that both pins (reference 11 image 9-32) of the cathode adapter remain engaged in the foreseen slots.

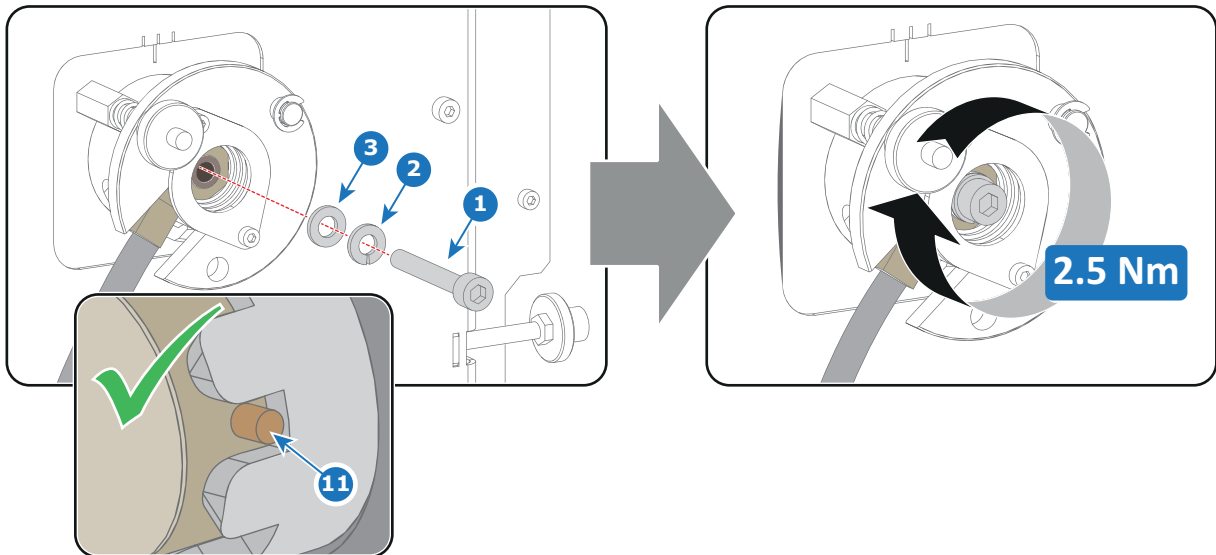


Image 9-32

- Install the side cover of the Lamp House and fasten the two quarter turn screws (reference 4 image 9-33) of the cover.

Note: Ensure that the quarter turn screws turning wires are flush with the cover or interference will occur while inserting the Lamp House into the projector.

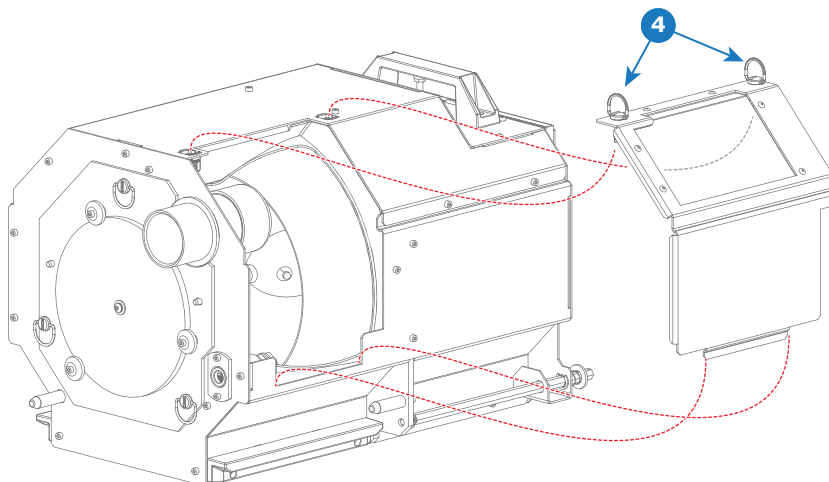


Image 9-33



CAUTION: The “LAMP INFO” parameters which are stored on the Cinema Controller board of the projector **MUST** be updated after each installation of an xenon lamp inside the Lamp House. Neglecting this update will result in poor performance and short life time of the xenon lamp.



A realignment of the xenon lamp in its reflector is required after the installation of the xenon lamp in the Lamp House.

9.7 Installation of the Lamp House



WARNING: This procedure may only be performed by qualified technical service personnel.



CAUTION: Due to its high internal pressure, the lamp may explode in either hot or cold states if improperly handled.

Necessary tools

8mm nut driver or flat screw driver.

How to install the Lamp House in the projector?

1. Check if the five quarter turn screws turning wires (reference 1 image 9-34) are flush with the cover or interference will occur while inserting the Lamp House into the projector.

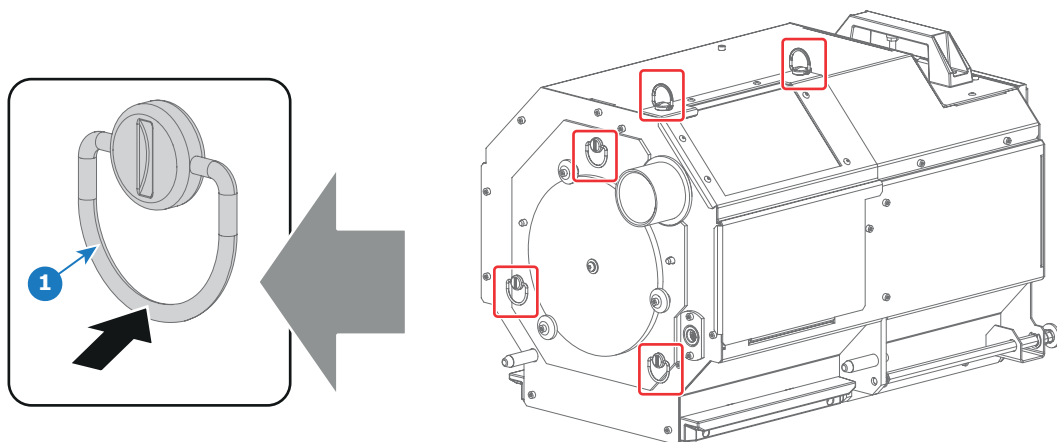


Image 9-34

2. Grip the Lamp House by the handle and place the front of the Lamp House onto the base plate guides inside the lamp compartment of the projector, lining up the pins of the Lamp House with the slots on the base.
3. Insert the Lamp House fully into the slots.
4. Secure the Lamp House by fastening the two retaining screws (reference 1 image 9-35) at the base of the Lamp House. Use a 8mm nut driver or flat screw driver.
5. Reinstall the cover of the Lamp House compartment.

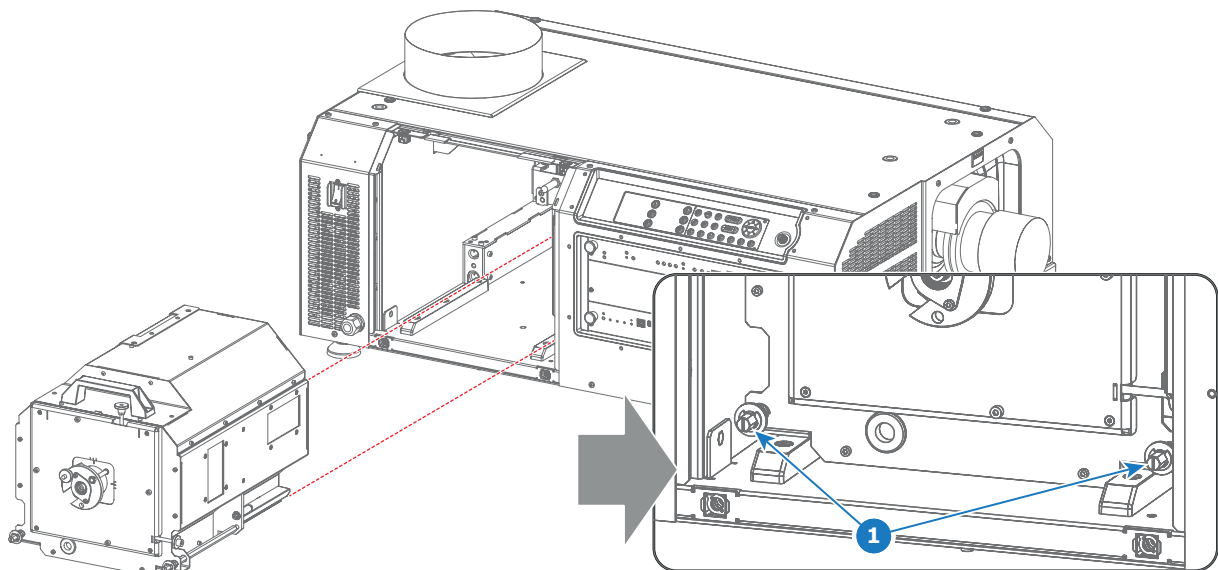


Image 9-35

9.8 Resetting the lamp parameters



CAUTION: The “LAMP INFO” parameters **MUST** be updated after each installation of a xenon lamp inside the Lamp House. Neglecting this update will result in poor performance and short life time of the xenon lamp.

For a new lamp, how to reset the values

1. While the *Lamp information* window is displayed, click on **Change lamp** (1).

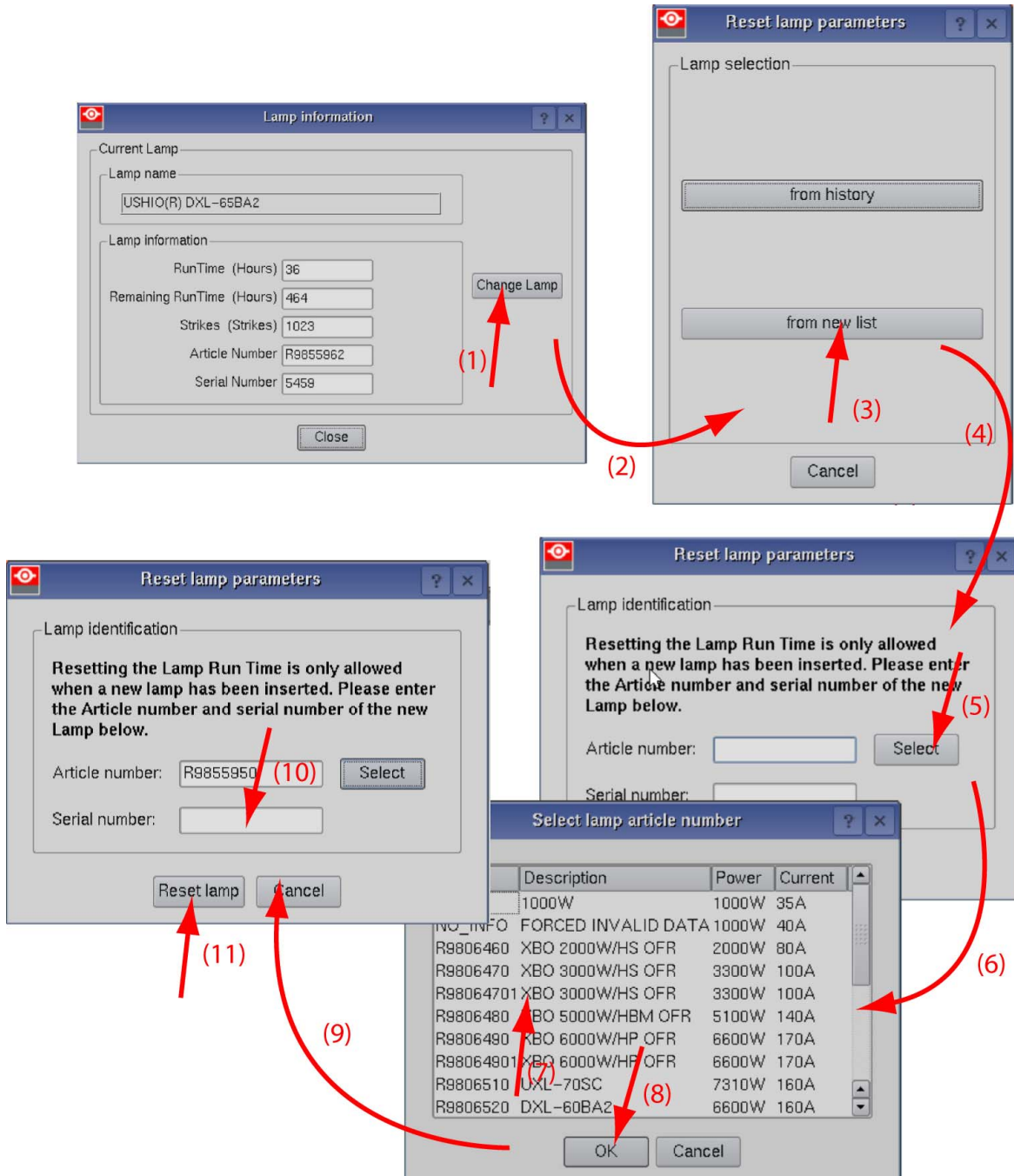


Image 9-36
Reset lamp info, new lamp

1. A *Reset lamp parameters* selection window opens (2).
2. To get new lamps, click on **From new list** (3).
3. The lamp article and serial number opens (4).
3. Fill out the article number of the new lamp (5a)

9. Lamp & Lamp House

Or,
 click on **Select** (5b) to display a list of possible article numbers (6). Select a article number (7) and click **OK** (8).
 The software will check if the entered article number is a valid number (9).

4. Fill out the serial number of the lamp (10).
5. Click **Reset lamp** (11).

For a used lamp, how to set back the original values

1. While the *Lamp information* window is displayed, click on **Change lamp** (1).

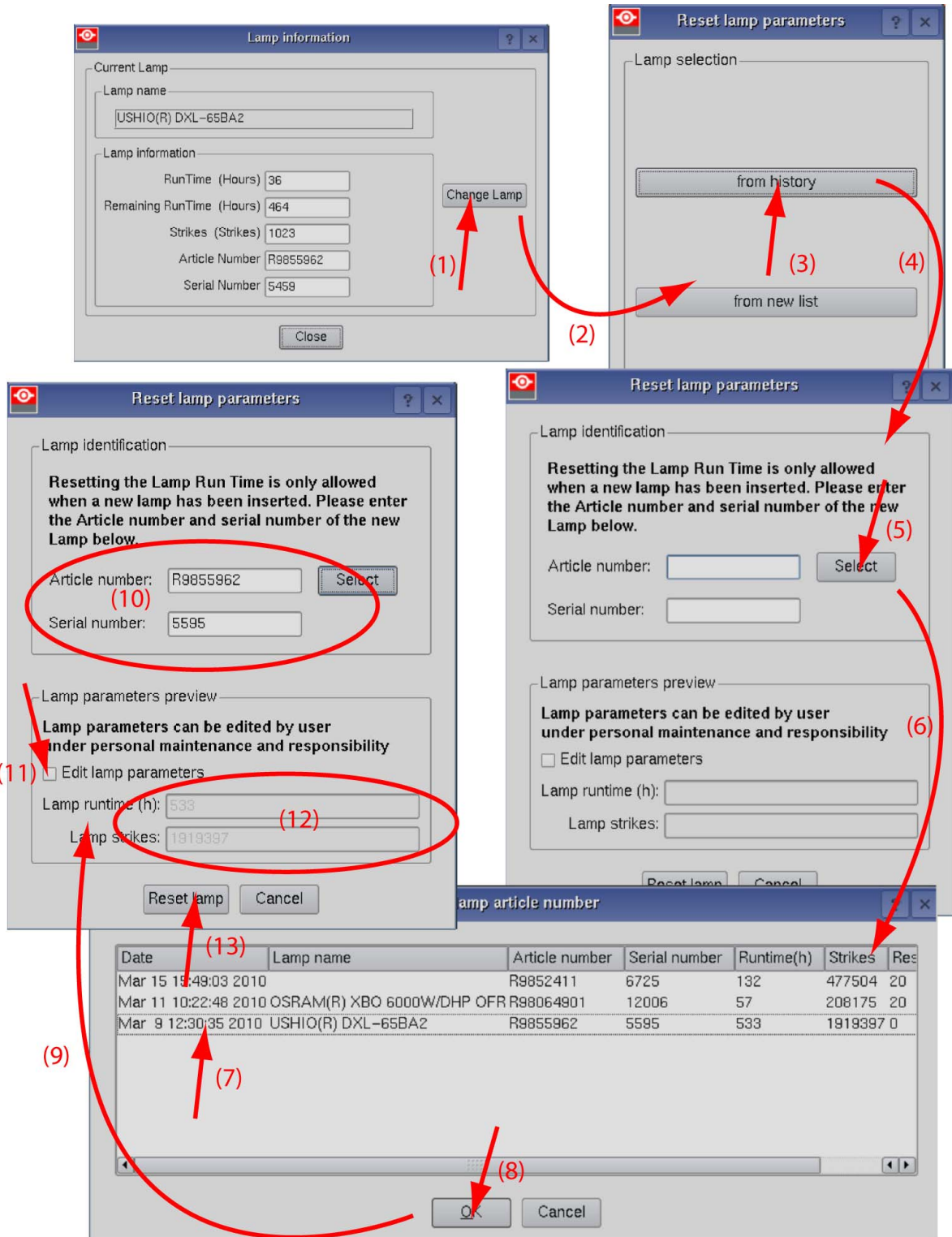


Image 9-37
 Reset lamp info, used lamp

- A *Reset lamp parameters* window opens (2).
- To get history of the used lamps, click **from history** (3).
The *Reset lamp history selection* window opens (4).
 - Click on **Select** (5) to display a list of possible lamps (6).
 - Select the desired lamp (7) and click **OK** (8).
The article number and serial number of the selected lamp is added to the *Reset lamp parameters* window (10). The lamp run time and number of strikes of this lamp are added in *Lamp parameter preview* (12).
 - The lamp parameters can be edited by the user under personnel maintenance and responsibility. If you want to change these parameters, check the check box in front of *Edit lamp parameters* (11).
The current parameter fields become active (12).
 - Click in an input field and change to the desired value.
 - Click **Reset lamp** (13).

9.9 Realignment of the lamp in its reflector

About lamp alignment

Due to ageing of the lamp, the light output will be reduced if no corrective actions are taken. To bring the light output again on its normal level, lamp alignment should be performed on a regular time. Also when the lamp is replaced physically the alignment procedure has to be done. Normal Z-axis alignment is enough to bring the light output again on its normal level. But sometimes, alignment of the other axes are also necessary to reach the maximum light output. These alignments are done manually on the Lamp House itself.

What is required?

The arc of the xenon lamp must be placed in the focal point of the Reflector for maximum light output.

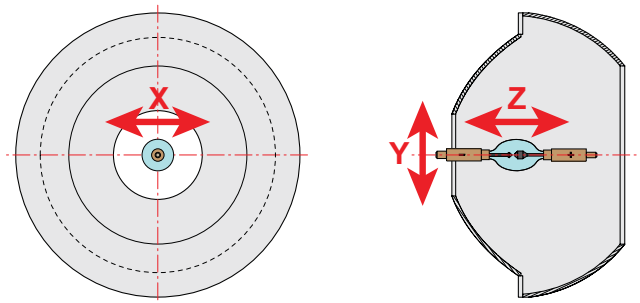


Image 9-38



Each xenon lamp installation requires a realignment of the lamp in its reflector for optimal performance of the xenon lamp. Furthermore, it is recommended to realign the lamp after the first run time of 100 and 200 hours. Especially the Z-axis of the lamp.



WARNING: This procedure may only be performed by qualified technical service personnel.

Necessary tools

Communicator

How to realign the lamp in its reflector?

1. Remove the cover of the lamp compartment to gain access to the X-, Y-, and Z-axis adjustment thumbscrews of the lamp.
2. Switch on the projector and start up the lamp.
3. Via the Communicator go to the menu *Installation > Lamp > Light alignment*.

Note: This window on the Communicator shows the measured value of the built-in light sensor of the projector. For purposes of finding the maximum light output, a non calibrated readout serves the purpose. For correct readout levels (fL) refer to the user guide of the Communicator to learn about system calibration.

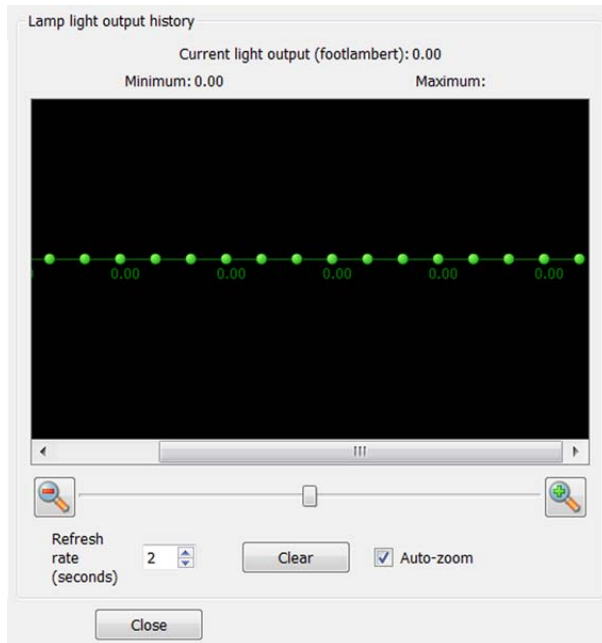


Image 9-39

4. Adjust the X-axis (ref X image 9-40), the Y-axis (ref Y image 9-40) and the Z-axis (ref Z image 9-40) for maximum current light output (Footlambert Measured). Carefully turn the thumbscrew for maximum light output. Once over the maximum, turn slightly in opposite direction to reach the maximum light output again. Do this for each direction and repeat this adjustment cycle twice.

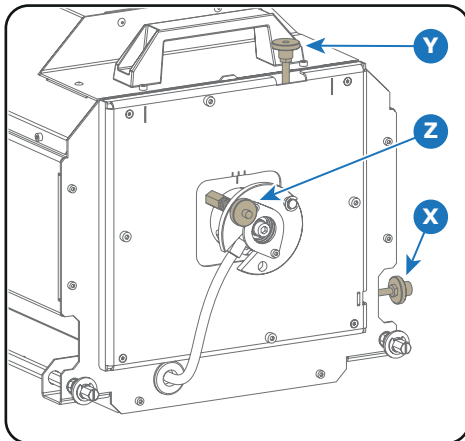


Image 9-40

5. Switch off the projector.
6. Reinstall the cover of the lamp compartment.

9.10 Cleaning the UV blocker of the Lamp House

When cleaning the UV blocker?

Clean UV blocker on regular basis to maintain light output level.



This procedure requires that the UV blocker is removed from the Lamp House.

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 UV blocker of the Lamp House?

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.



CAUTION: Never reinstall a UV blocker which is cracked or has a damaged coating. Neglecting this will result in irreversible damage of optical parts in the projector.

9.11 Cleaning the Reflector of the Lamp House

When cleaning the Reflector?

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



This procedure requires that the lamp is removed from the Lamp House.

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 Reflector of the Lamp House?

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.



CAUTION: Never use a Lamp House with cracked or damaged Reflector. Neglecting this may result in irreversible damage of the projector.

9.12 Replacement of the UV blocker



This procedure assumes that the UV blocker assembly has already been removed from the Lamp House. How to remove the UV blocker in a safe manner is described in the procedure "Removal of the xenon lamp from the Lamp House", page 118.

Necessary tools

- Latex or cotton gloves.
- 2.5mm Allen wrench.

How to replace the UV blocker of the Lamp House?

1. Loosen two of the three fixation screws (reference 1 image 9-41) by a few turns. Do not remove. Use a 2.5mm Allen wrench.
2. Remove the third fixation screw and spacer (reference 2 & 3 image 9-41). Use a 2.5mm Allen wrench.
3. Replace the UV blocker with integrated anode support by a new one.

Caution: Do not touch the new UV blocker with bare fingers. Wear latex or cotton gloves.

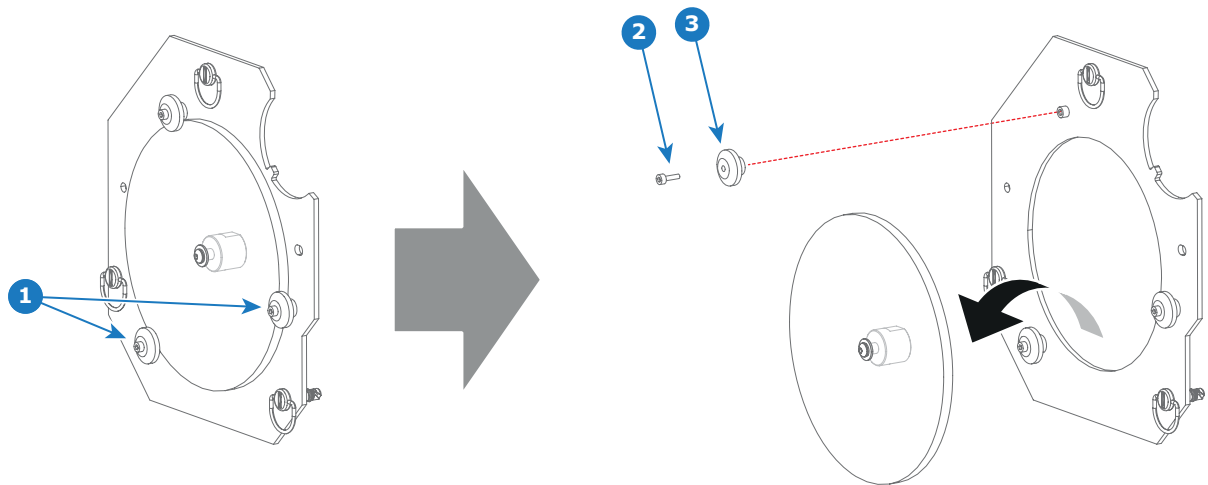


Image 9-41

4. Reinstall the removed spacer and fasten all three fixation screws. Use a 2.5mm Allen wrench.

9.13 Replacement of the Reflector



This procedure assumes that there is no lamp installed in the Lamp House. How to remove the xenon lamp in a safe manner is described in the procedure "Removal of the xenon lamp from the Lamp House", page 118.

Necessary tools

- Latex or cotton gloves.
- 2mm Allen wrench.
- 2.5mm Allen wrench.
- 3mm Allen wrench.
- TX10 Torx screwdriver.
- 17mm open-end wrench (two pieces).
- Torque wrench with 17mm hexagon socket.

How to remove the Reflector of the Lamp House?

1. Release the cathode wire lug (reference 7 image 9-42) from the SPG cathode socket. Use two open-end wrenches of 17mm. One to hold the first nut (reference 6 image 9-42) and one to release the second nut (reference 9 image 9-42).
2. Remove the SPG cathode socket (reference 5 image 9-42) from the Lamp House. Use a 2mm Allen wrench to release the two screws (reference 4 image 9-42).

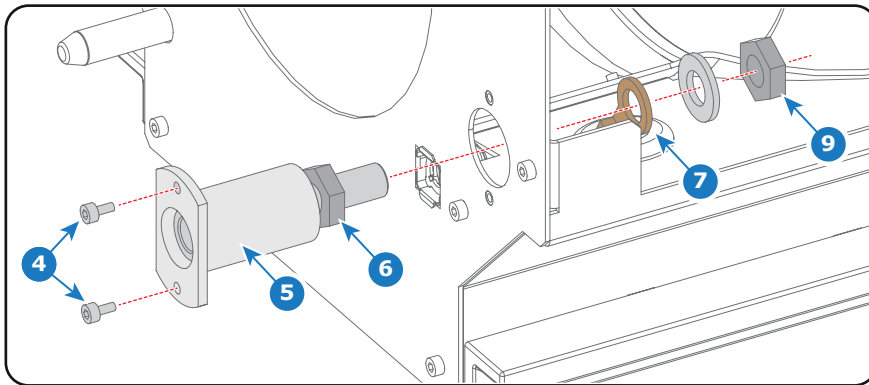


Image 9-42

3. Remove both Lamp House position pins (reference 1 image 9-43) at the left and right side of the Lamp House. Use a 3mm Allen wrench to loosen the screw (reference 4 image 9-43).

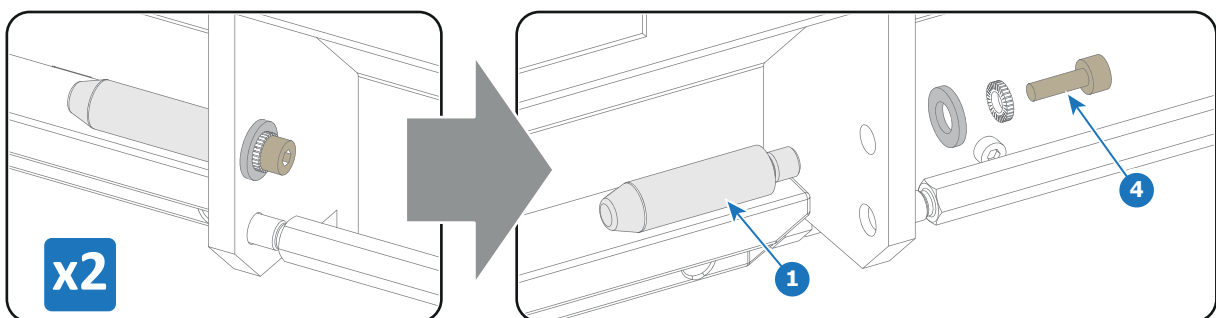


Image 9-43

4. Remove the top cover plate from the Lamp House. Use a 2.5mm Allen wrench to loosen all 12 screws as illustrated (reference 31, 32, 33, 34 & 35 image 9-44).

9. Lamp & Lamp House

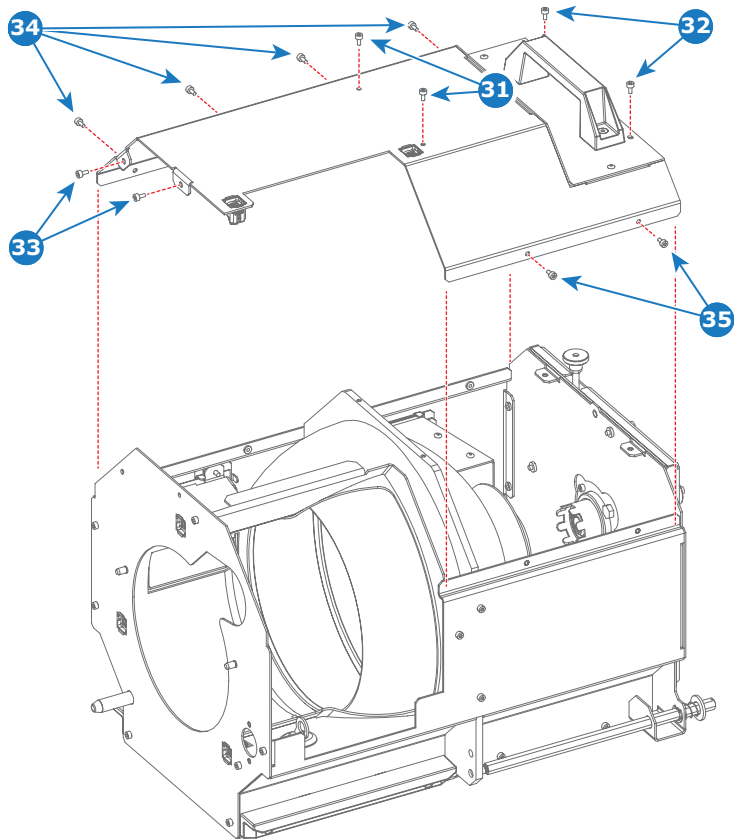


Image 9-44

5. Remove the left side cover plate from the Lamp House. Use a TX10 Torx driver to loosen the two counter head sunken screws (reference 22 image 9-45) and use a 2.5mm Allen wrench to loosen the 10 head cap screws as illustrated (reference 21, 23, 24, 26, 27 & 28 image 9-45). Note that the plastic slider (reference 25 image 9-45) comes loose together with the cover plate.

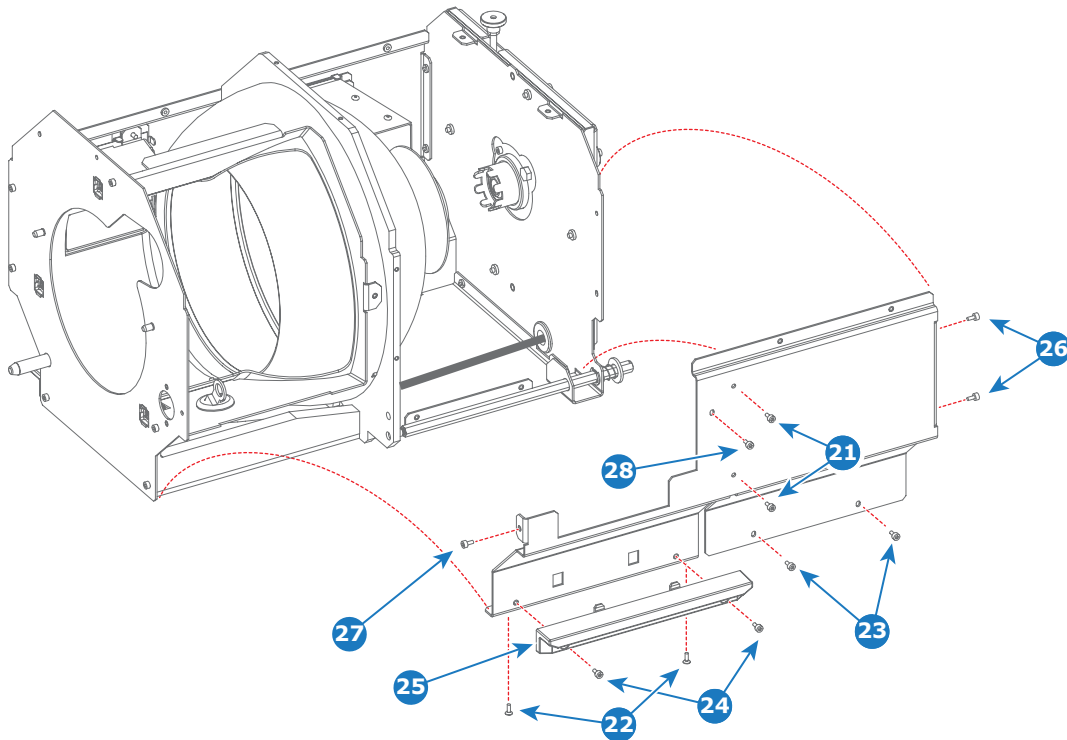


Image 9-45

6. Remove the right side cover plate from the Lamp House. Use a TX10 Torx driver to loosen the four counter head sunken screws (reference 11 & 12 image 9-46) and use a 2.5mm Allen wrench to loosen the 8 head cap screws as illustrated (reference 13, 14, 16 & 17 image 9-46). Note that the plastic slider (reference 15 image 9-46) comes loose together with the cover plate.

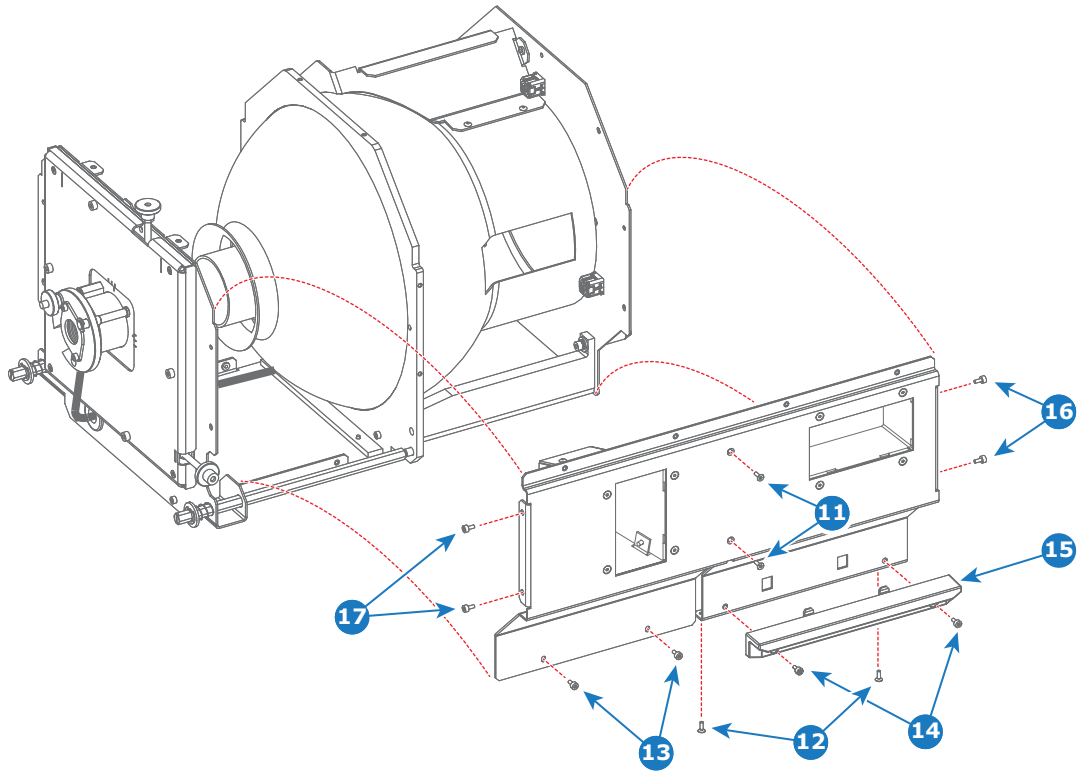


Image 9-46

7. Remove the front assembly from the Lamp House. Guide the cathode wire through the opening in the front assembly. Use a 2.5mm Allen wrench to loosen the two fixation screws (reference 9 image 9-47) of the front assembly.

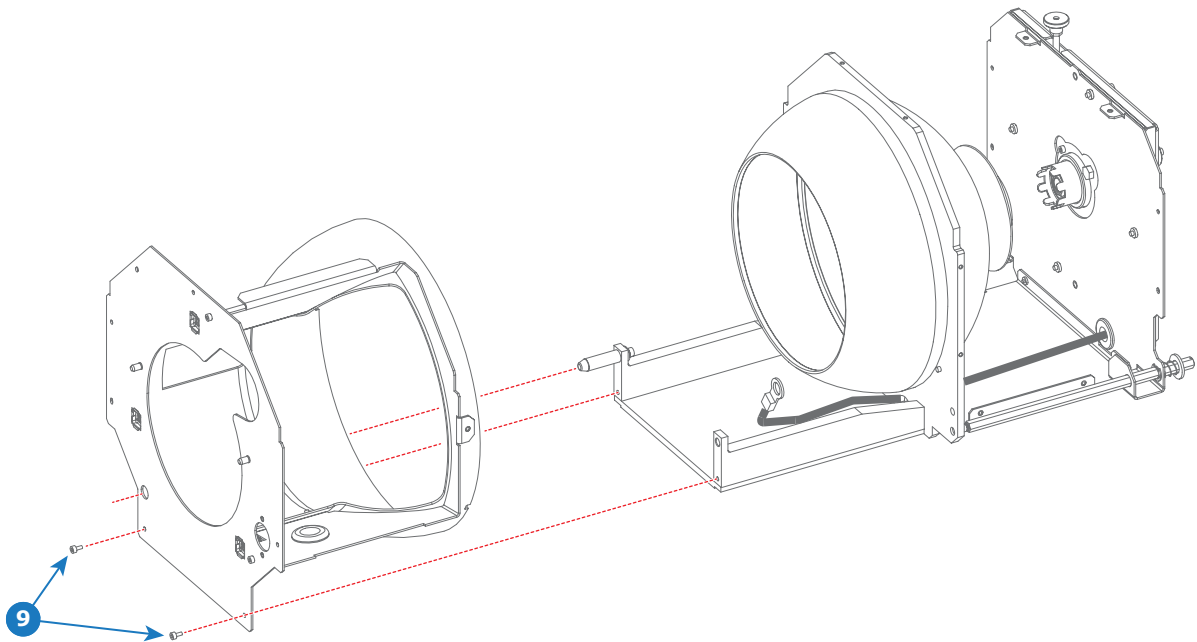


Image 9-47

8. Remove the XYZ-assembly from the base of the Lamp House. Use a 2.5mm Allen wrench to loosen the two fixation screws (reference 6 image 9-48) of the XYZ-assembly.

9. Lamp & Lamp House

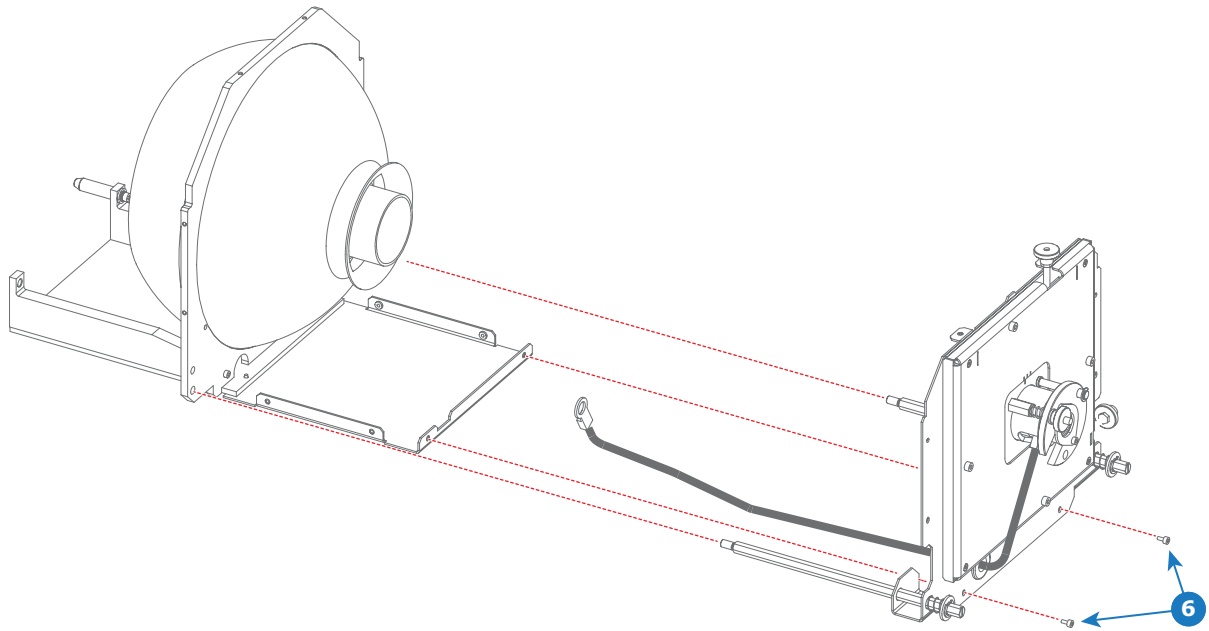


Image 9-48

9. Remove the Reflector assembly from the base of the Lamp House. First loosen the two screws (reference 5 image 9-49) at the bottom and then loosen the two long screws (reference 4 image 9-49). Use a 2.5mm Allen wrench.

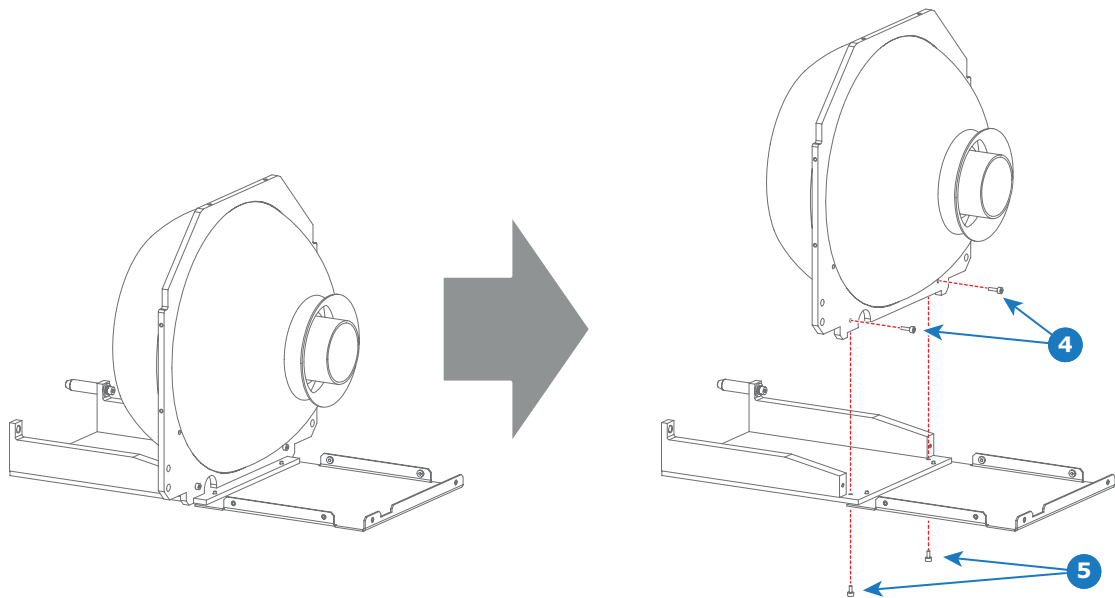


Image 9-49

10. Remove the heat shield (reference 1 image 9-50) from the Reflector. Use a 2.5mm Allen wrench to loosen the two screws (reference 3 image 9-50) from the four fixation brackets (reference 2 image 9-50) and four spacer plates (reference 4 image 9-50).

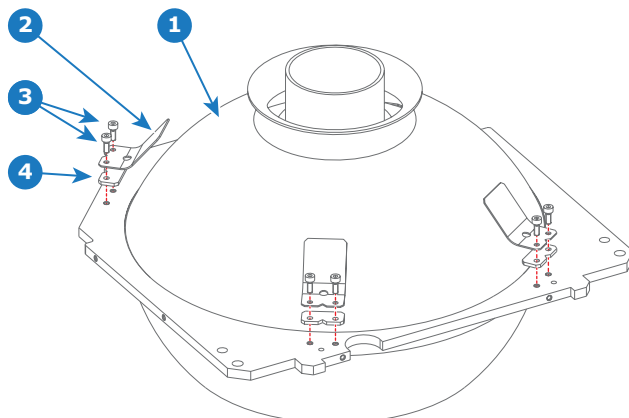


Image 9-50

How to install a new Reflector in the Lamp House?

1. Install the heat shield (reference 1 image 9-51) on the new Reflector. Use for that 4 fixation brackets (reference 2 image 9-51) and 4 spacer plates (reference 4 image 9-51). Fasten each bracket with 2 screws (reference 3 image 9-51). Use a 2.5mm Allen wrench.

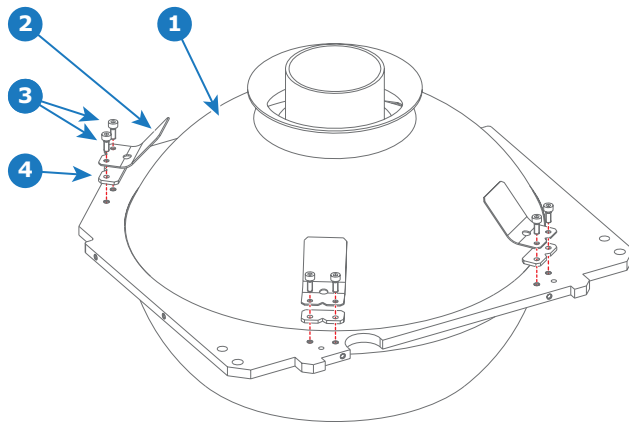


Image 9-51

2. Install the Reflector assembly on the base of the Lamp House. First fasten the two long screws (reference 4), then fasten the two screws at the bottom as illustrated. Use a 2.5mm Allen wrench.

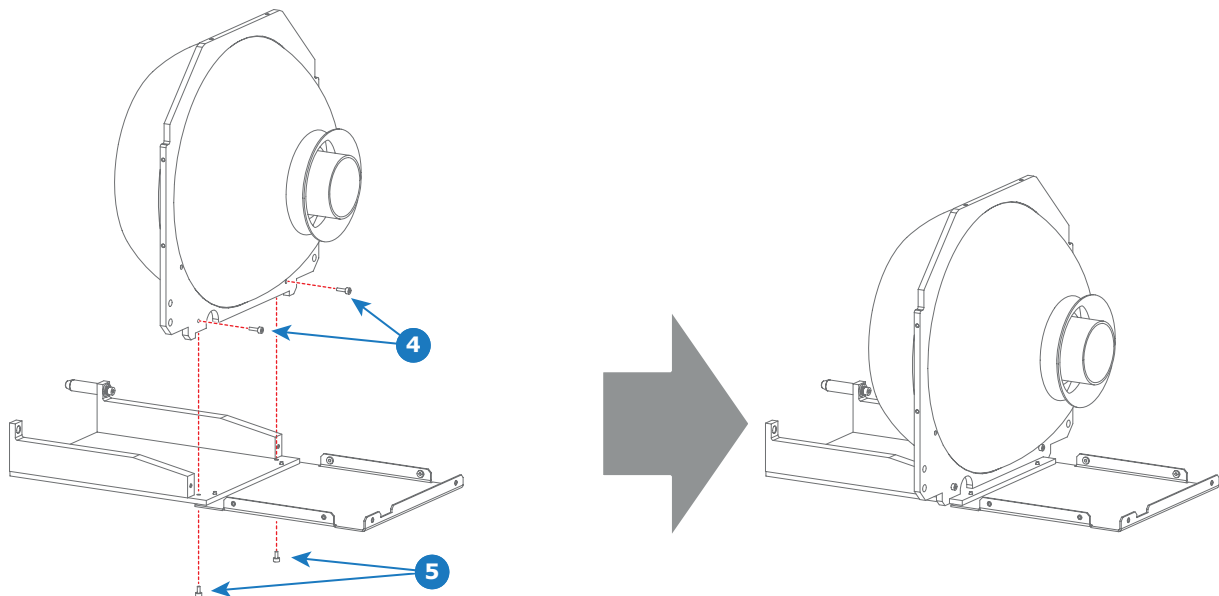


Image 9-52

3. Install the XYZ-assembly on the base of the Lamp House. Guide the anode wire into the opening as illustrated. Ensure that both spacer screws (reference 7 image 9-53) fit in the lower holes of the Reflector assembly (reference 8 image 9-53). Use a 2.5mm Allen wrench to fasten the two fixation screws (reference 6 image 9-53) of the XYZ-assembly.

9. Lamp & Lamp House

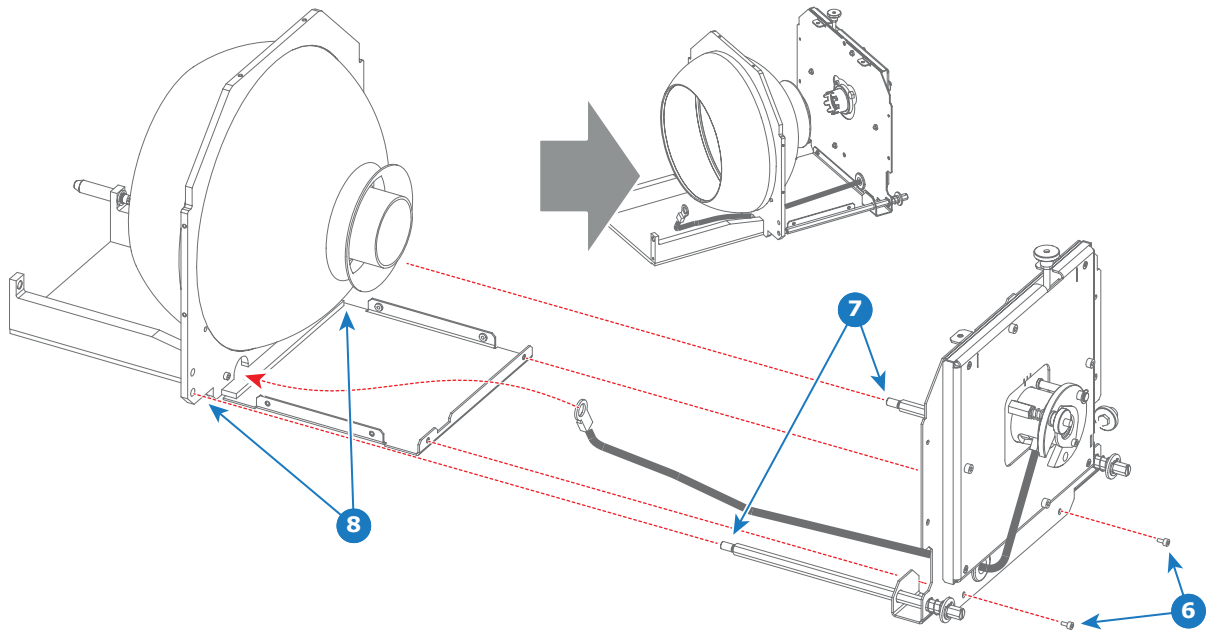


Image 9-53

4. Install the front assembly of the Lamp House. Guide the cathode wire through the opening in the front assembly as illustrated. Note that the positioning pin (reference 10) is inserted in a hole of the front assembly. Use a 2.5mm Allen wrench to fasten the two fixation screws (reference 9 image 9-53) of the front assembly.

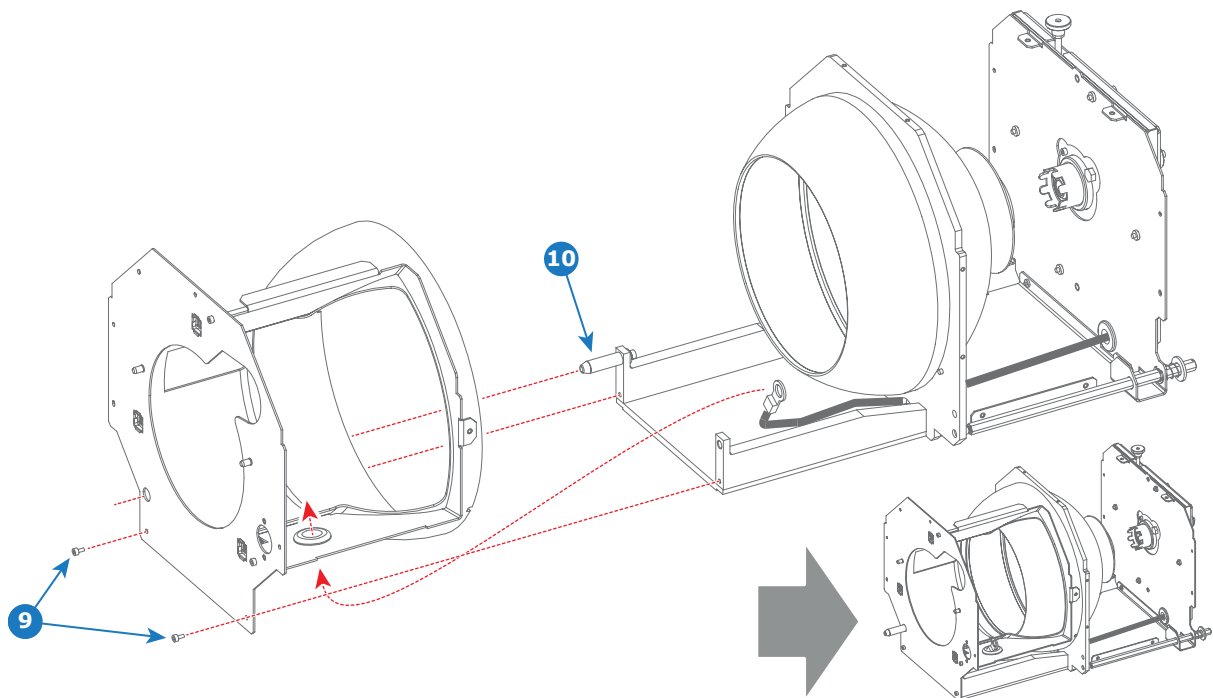


Image 9-54

5. Install the right side cover plate of the Lamp House. First fasten the four counter head sunken screws (reference 11 & 12 image 9-55), then fasten the other eight head cap screws (reference 13, 14, 16 & 17 image 9-55). Attach the plastic slider (reference 15 image 9-55) simultaneously as illustrated. Use TX10 Torx driver for the counter head sunken screws and a 2.5mm Allen wrench for the head cap screws.

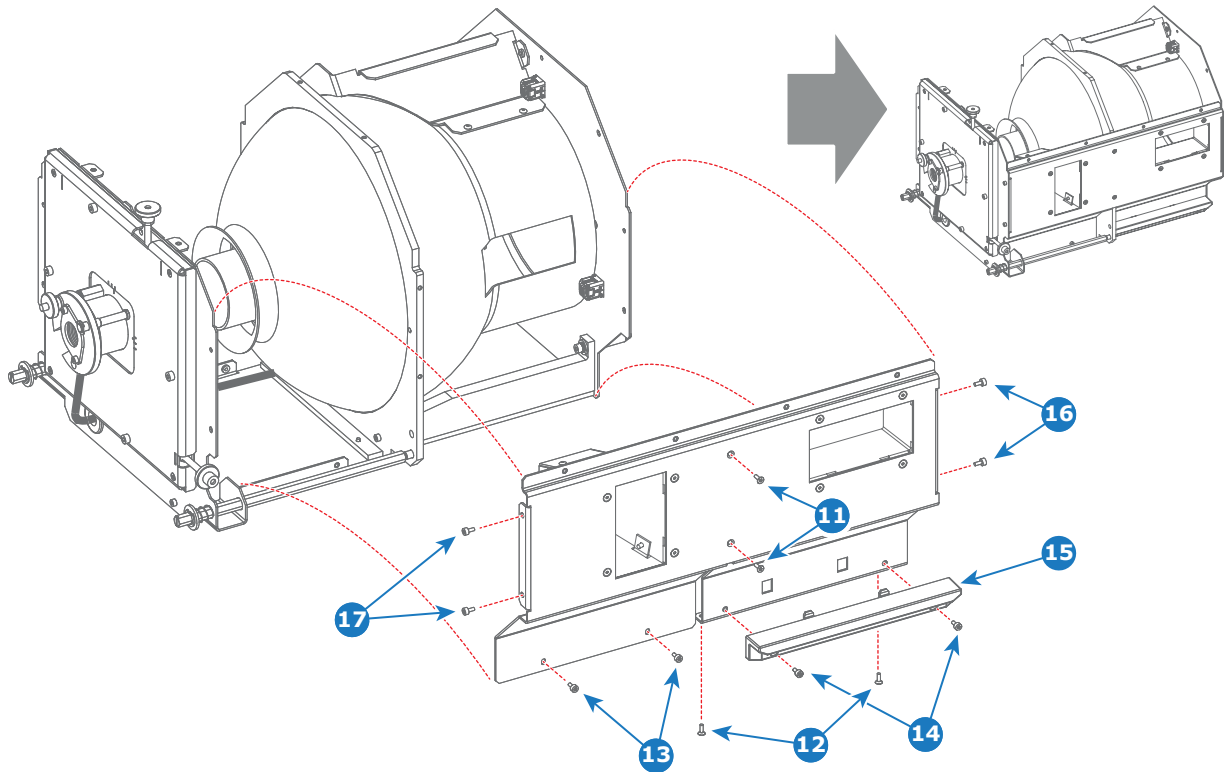


Image 9-55

6. Install the left side cover plate of the Lamp House. First fasten the two head cap screws (reference 21 image 9-56), then fasten the two counter head sunken screws at the bottom (reference 22), and then fasten the other eight head cap screws (reference 23, 24, 26, 27 & 28 image 9-56). Attach the plastic slider (reference 25 image 9-56) simultaneously as illustrated. Use TX10 Torx driver for the counter head sunken screws and a 2.5mm Allen wrench for the head cap screws.

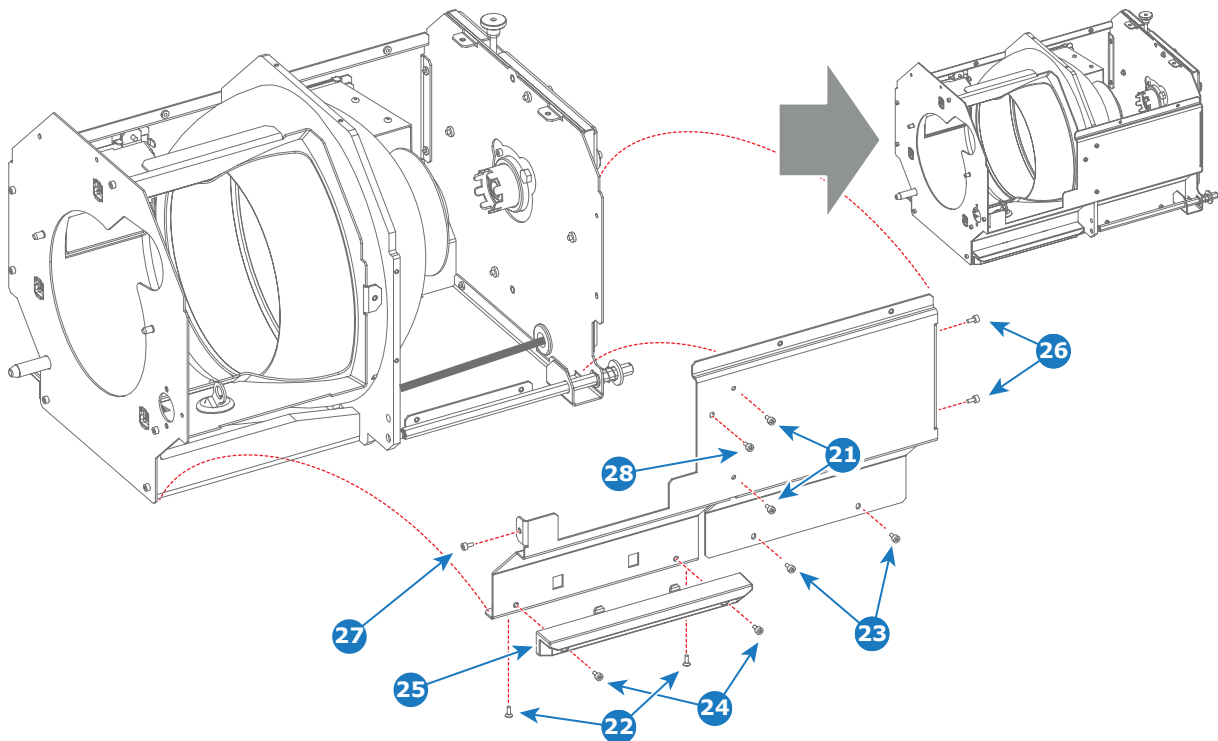


Image 9-56

7. Install the top cover plate of the Lamp House. First fasten the two head cap screws (reference 31 image 9-56), then fasten the other ten head cap screws (reference 32, 33, 34 & 35 image 9-56). Use a 2.5mm Allen wrench.

9. Lamp & Lamp House

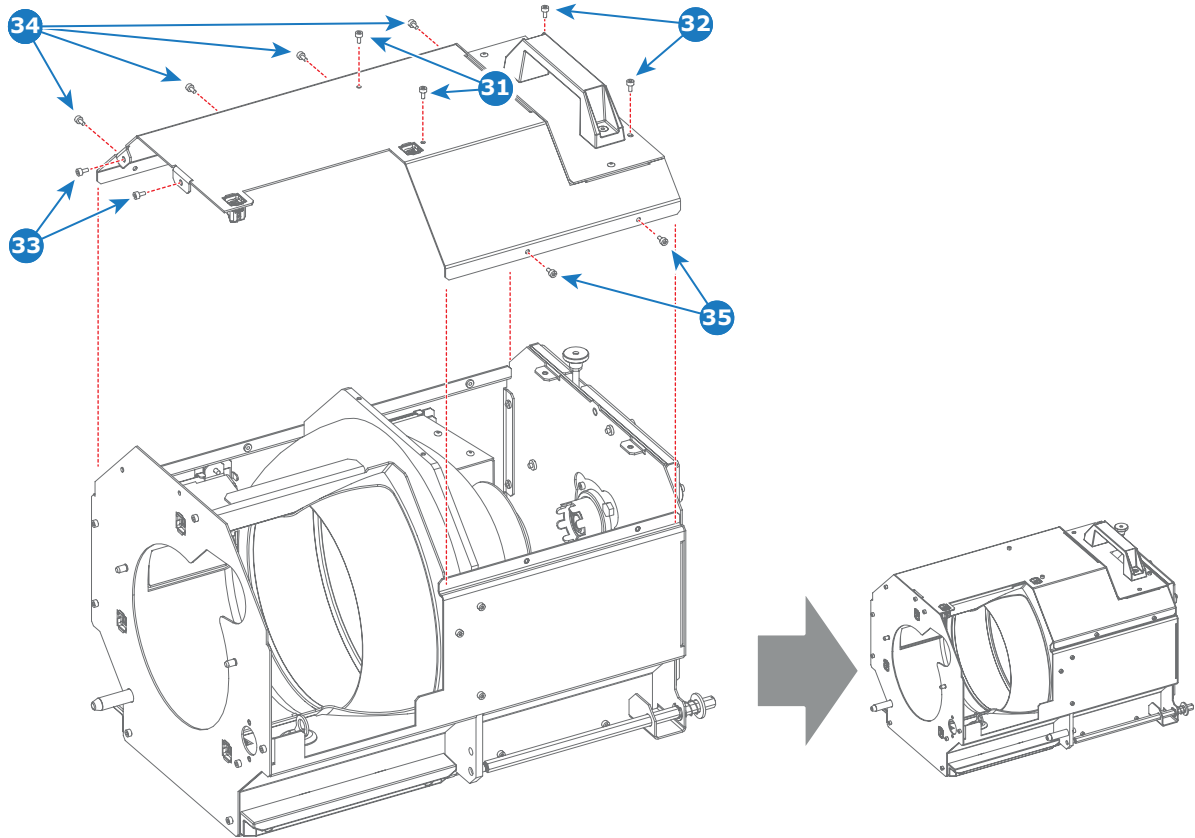


Image 9-57

8. Install both Lamp House position pins (reference 1 image 9-58) at the left and right side of the Lamp House. First place the small washer (reference 3 image 9-58) on the screw (reference 4 image 9-58) and then the large washer (reference 2 image 9-58) as illustrated. Use a 3mm Allen wrench.

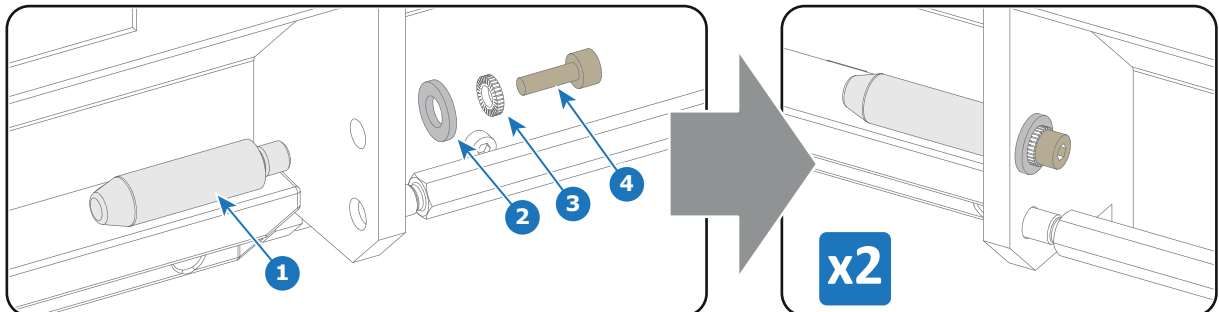


Image 9-58

9. Install the SPG cathode socket (reference 5) onto the Lamp House as illustrated in image 9-59. While inserting the SPG cathode socket into the opening in the front plate simultaneously guide the cathode wire lug (reference 7 image 9-59) onto the threaded rod. Fasten the SPG cathode socket with two screws (reference 4 image 9-59). Use a 2mm Allen wrench.
10. Fasten the cathode wire lug (reference 7 image 9-59). Use an open-end wrench of 17mm to hold the first nut (reference 6 image 9-59) while fastening the second nut (reference 9 image 9-59) with a torque of **9Nm** (6.64 lbf*ft) using a torque wrench. Ensure that there is a flat washer (reference 8 image 9-59) between the second nut and the wire lug.
Note: After tightening the two nuts, the connector should still be "floating".

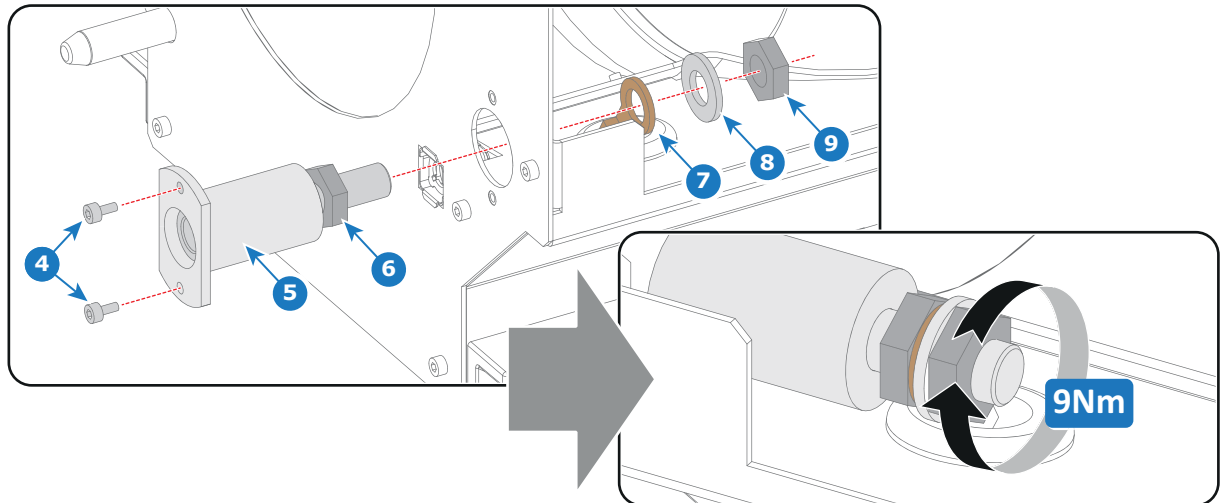


Image 9-59

11. Proceed with the procedure: "Installation of the xenon lamp into the Lamp House", page 123.

9.14 Replacement of the cathode wire of the Lamp House

Cathode wire, SPG cathode socket and cathode nut

This procedure describes how to replace the cathode wire, the SPG cathode socket and the cathode nut from the Lamp House.



This procedure assumes that there is no lamp installed in the Lamp House. How to remove the xenon lamp in a safe manner is described in the procedure "Removal of the xenon lamp from the Lamp House", page 118.

Necessary tools

- Latex or cotton gloves.
- 2mm Allen wrench.
- 2.5mm Allen wrench.
- 3mm Allen wrench.
- TX10 Torx screwdriver.
- 17mm open-end wrench (two pieces).
- Torque wrench with 17mm hexagon socket.

How to remove the cathode wire from the Lamp House?

1. Release the cathode wire from the Lamp House cathode socket. Use a 2.5mm Allen wrench to loosen the two screws (reference 1 image 9-60).

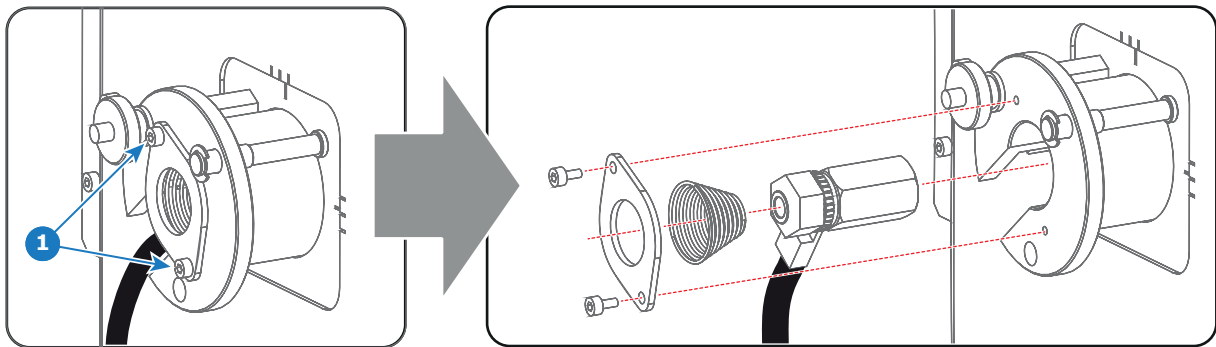


Image 9-60

2. Release the cathode wire lug (reference 5 image 9-61) from the cathode nut (reference 4 image 9-61). Use two open-end wrenches of 17mm.

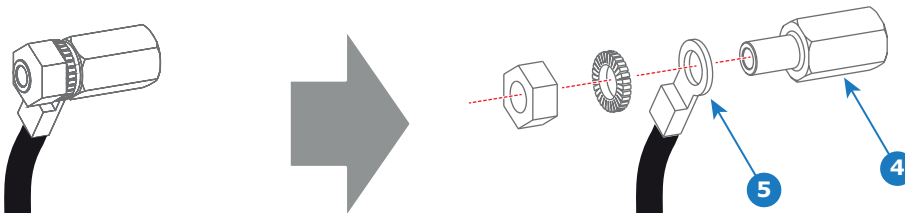


Image 9-61

3. Release the cathode wire lug (reference 7 image 9-62) from the SPG socket. Use two open-end wrenches of 17mm. One to hold the first nut (reference 6 image 9-62) and one to release the second nut (reference 9 image 9-62).
4. Remove the cathode socket (reference 5 image 9-62) from the Lamp House. Use a 2mm Allen wrench to release the two screws (reference 4 image 9-62).

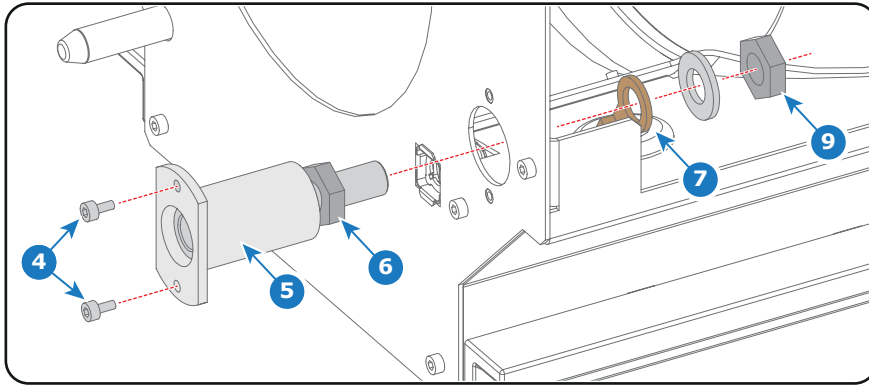


Image 9-62

- Remove the top cover plate from the Lamp House. Use a 2.5mm Allen wrench to loosen all 12 screws as illustrated (reference 31, 32, 33, 34 & 35 image 9-63).

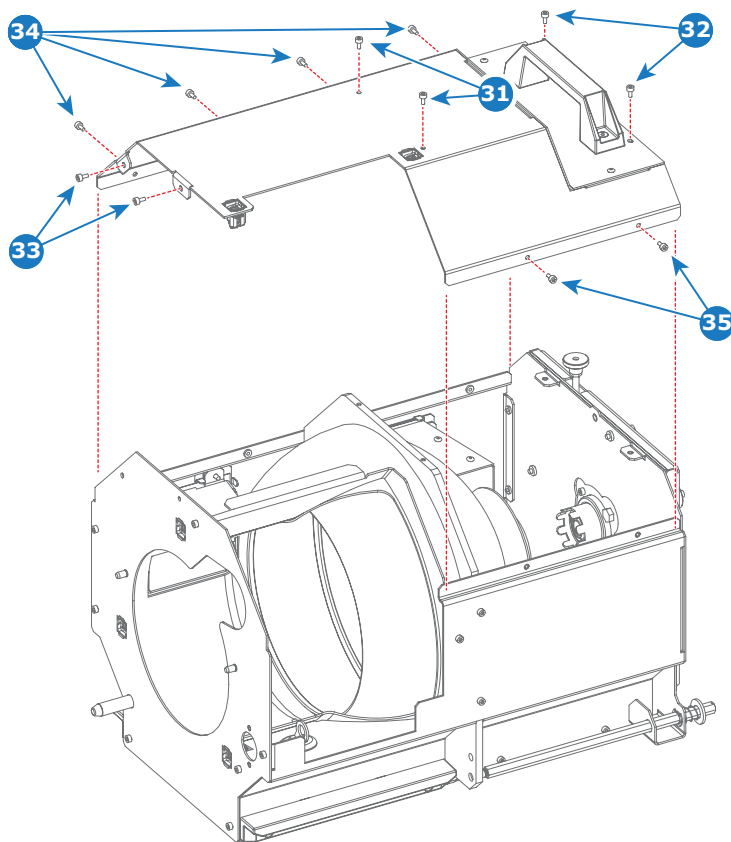


Image 9-63

- Remove the left side cover plate from the Lamp House. Use a TX10 Torx driver to loosen the two counter head sunken screws (reference 22 image 9-64) and use a 2.5mm Allen wrench to loosen the 10 head cap screws as illustrated (reference 21, 23, 24, 26, 27 & 28 image 9-64). Note that the plastic slider (reference 25 image 9-64) comes loose together with the cover plate.

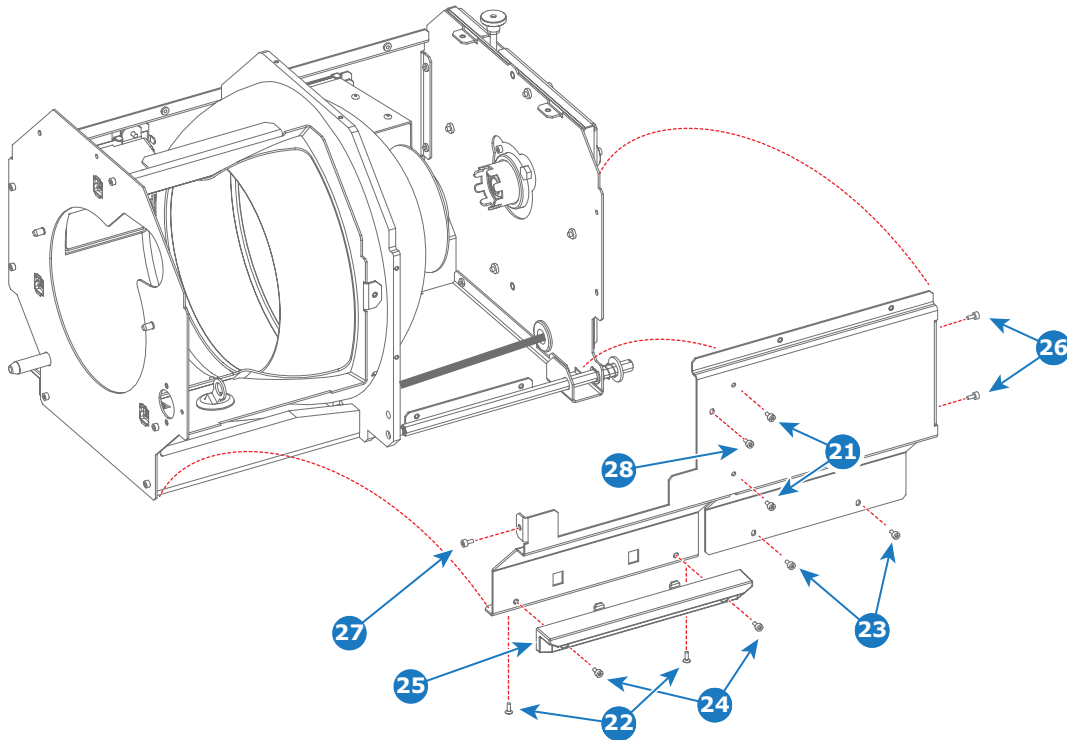


Image 9-64

7. Remove the right side cover plate from the Lamp House. Use a TX10 Torx driver to loosen the four counter head sunken screws (reference 11 & 12 image 9-65) and use a 2.5mm Allen wrench to loosen the 8 head cap screws as illustrated (reference 13, 14, 16 & 17 image 9-65). Note that the plastic slider (reference 15 image 9-65) comes loose together with the cover plate.

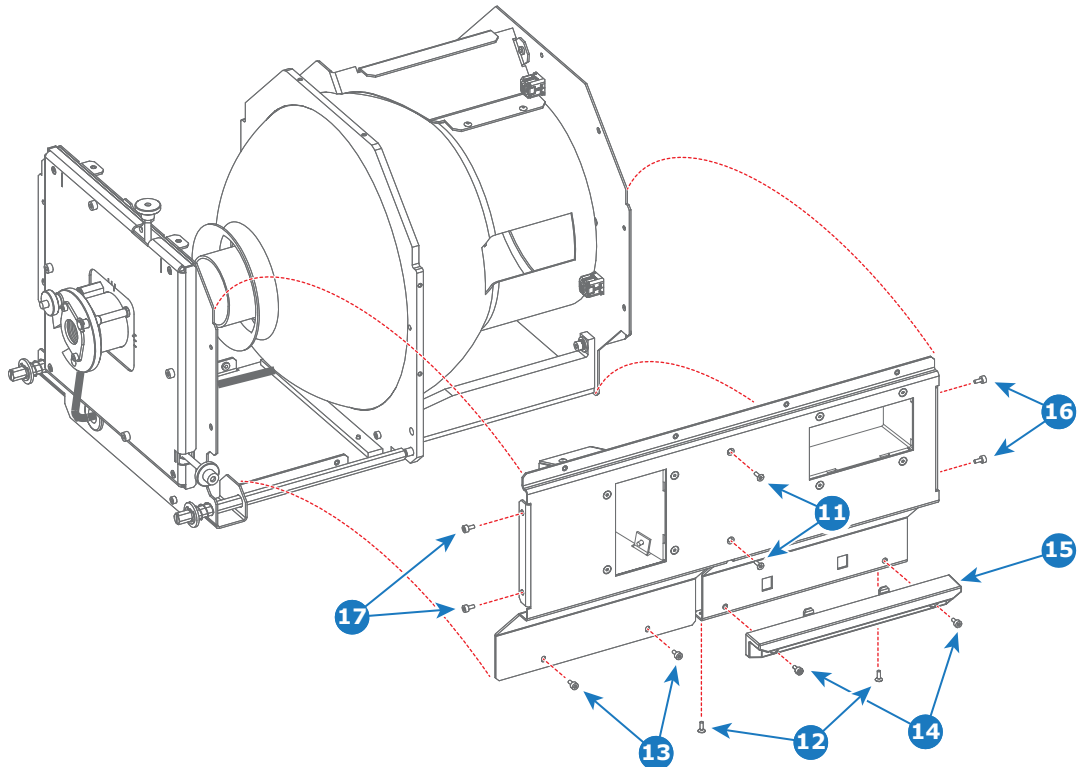


Image 9-65

8. Remove the front assembly from the Lamp House. Guide the cathode wire through the opening in the front assembly. Use a 2.5mm Allen wrench to loosen the two fixation screws (reference 9 image 9-66) of the front assembly.

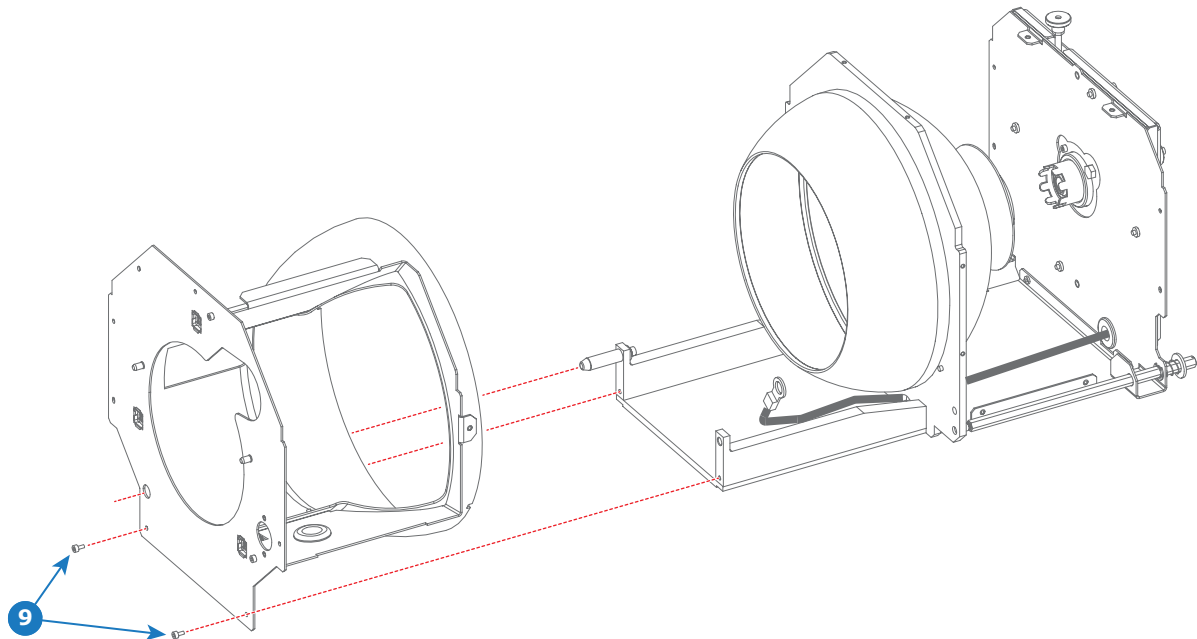


Image 9-66

9. Carefully remove the cathode wire from the Lamp House.

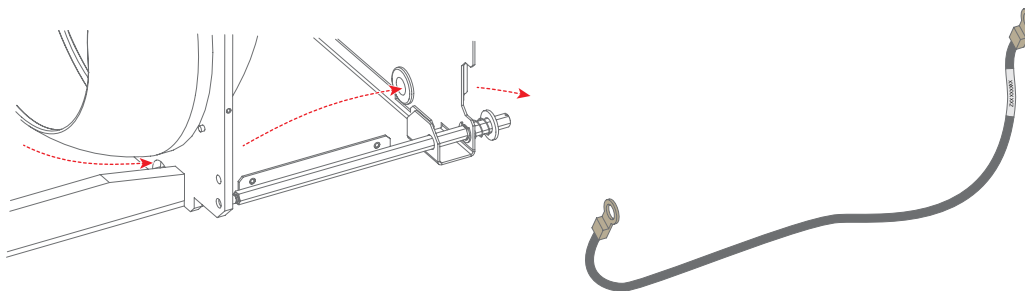


Image 9-67

How to install the cathode wire onto the Lamp House?

1. Guide the new cathode wire through the hole at the bottom of the XYZ-assembly and through the hole at the bottom of the Reflector assembly.

Caution: The wire lug close to the label (reference 1 image 9-68) must remain outside the Lamp House.

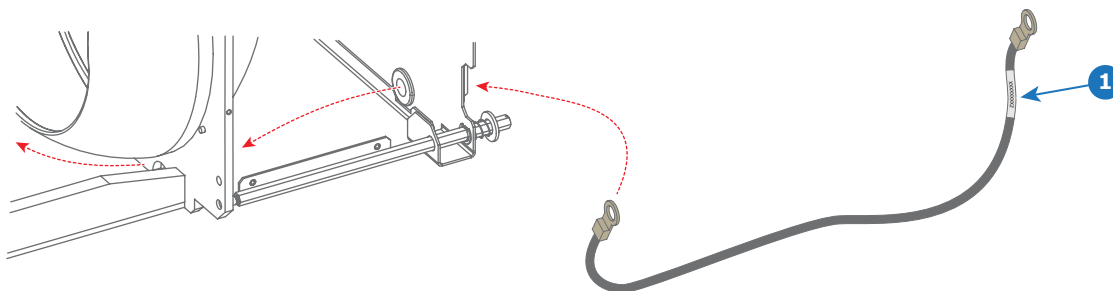


Image 9-68

2. Install the front assembly of the Lamp House. Guide the cathode wire through the opening in the front assembly as illustrated. Note that the positioning pin (reference 10) is inserted in a hole of the front assembly. Use a 2.5mm Allen wrench to fasten the two fixation screws (reference 9 image 9-52) of the front assembly.

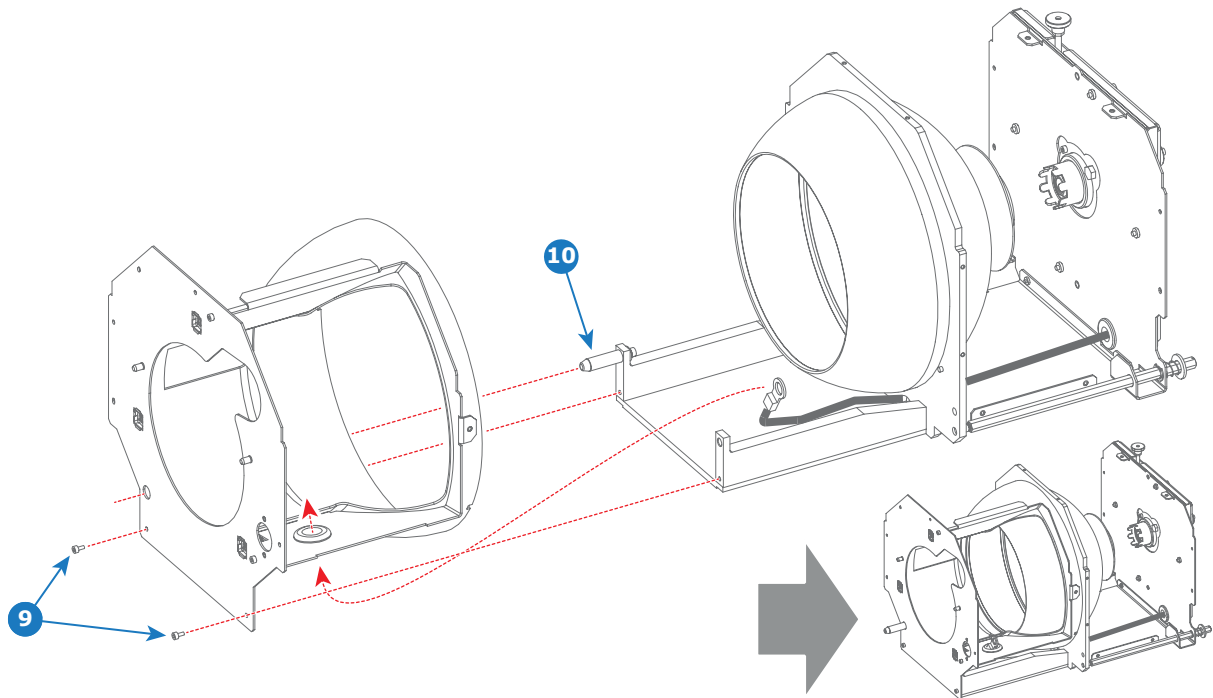


Image 9-69

3. Install the right side cover plate of the Lamp House. First fasten the four counter head sunken screws (reference 11 & 12 image 9-70), then fasten the other eight head cap screws (reference 13,14, 16 & 17 image 9-70). Attach the plastic slider (reference 15 image 9-70) simultaneously as illustrated. Use TX10 Torx driver for the counter head sunken screws and a 2.5mm Allen wrench for the head cap screws.

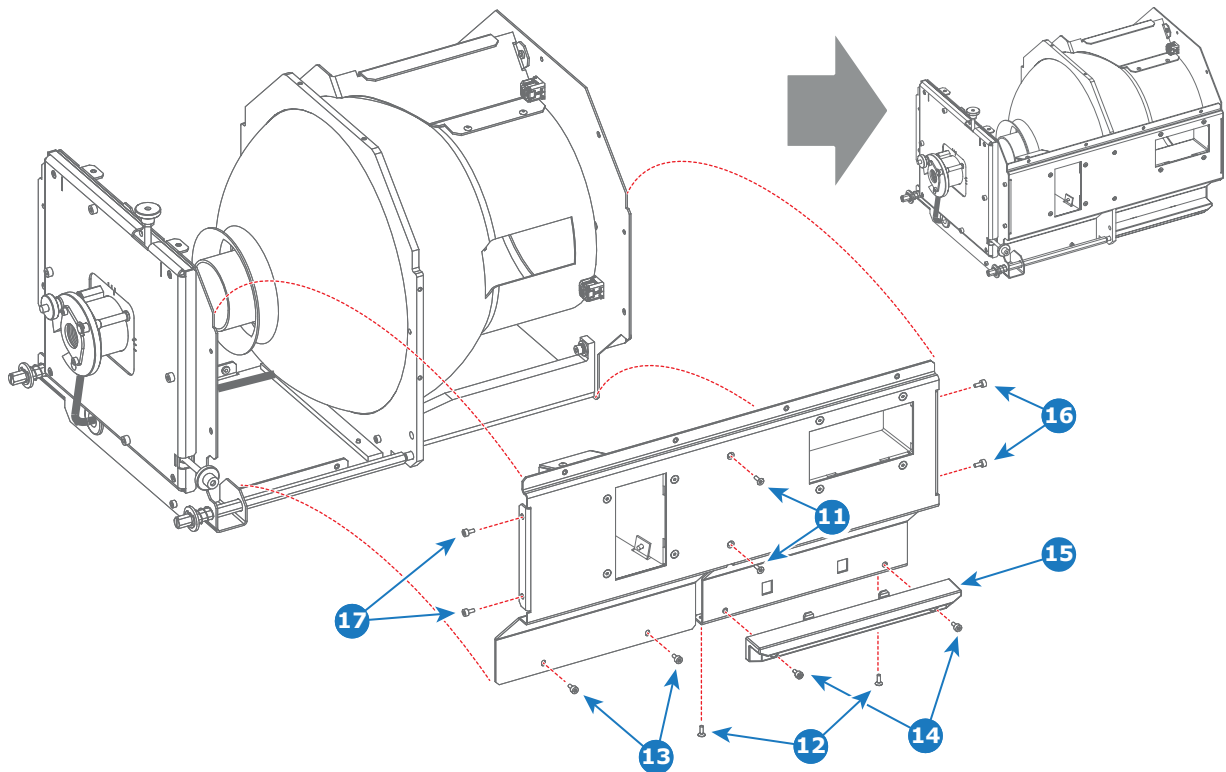


Image 9-70

4. Install the left side cover plate of the Lamp House. First fasten the two head cap screws (reference 21 image 9-71), then fasten the two counter head sunken screws at the bottom (reference 22), and then fasten the other eight head cap screws (reference 23, 24, 26, 27 & 28 image 9-71). Attach the plastic slider (reference 25 image 9-71) simultaneously as illustrated. Use TX10 Torx driver for the counter head sunken screws and a 2.5mm Allen wrench for the head cap screws.

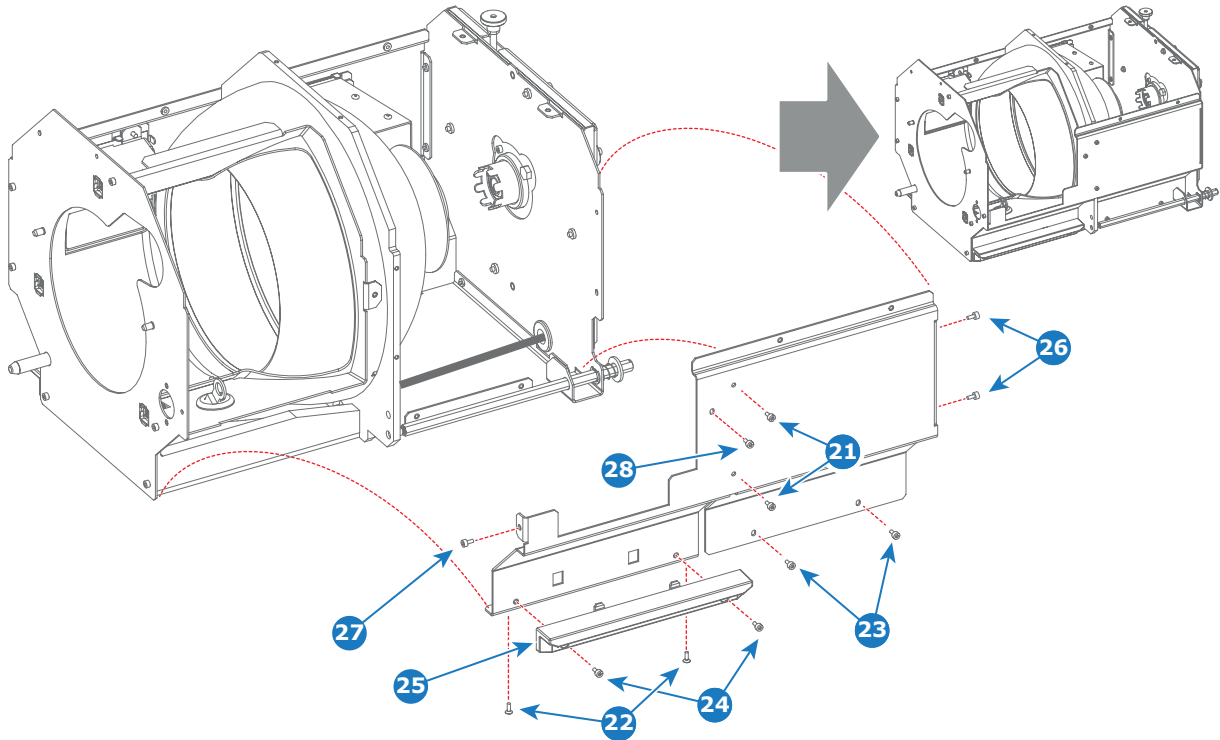


Image 9-71

5. Install the top cover plate of the Lamp House. First fasten the two head cap screws (reference 31 image 9-72), then fasten the other ten head cap screws (reference 32, 33, 34 & 35 image 9-72). Use a 2.5mm Allen wrench.

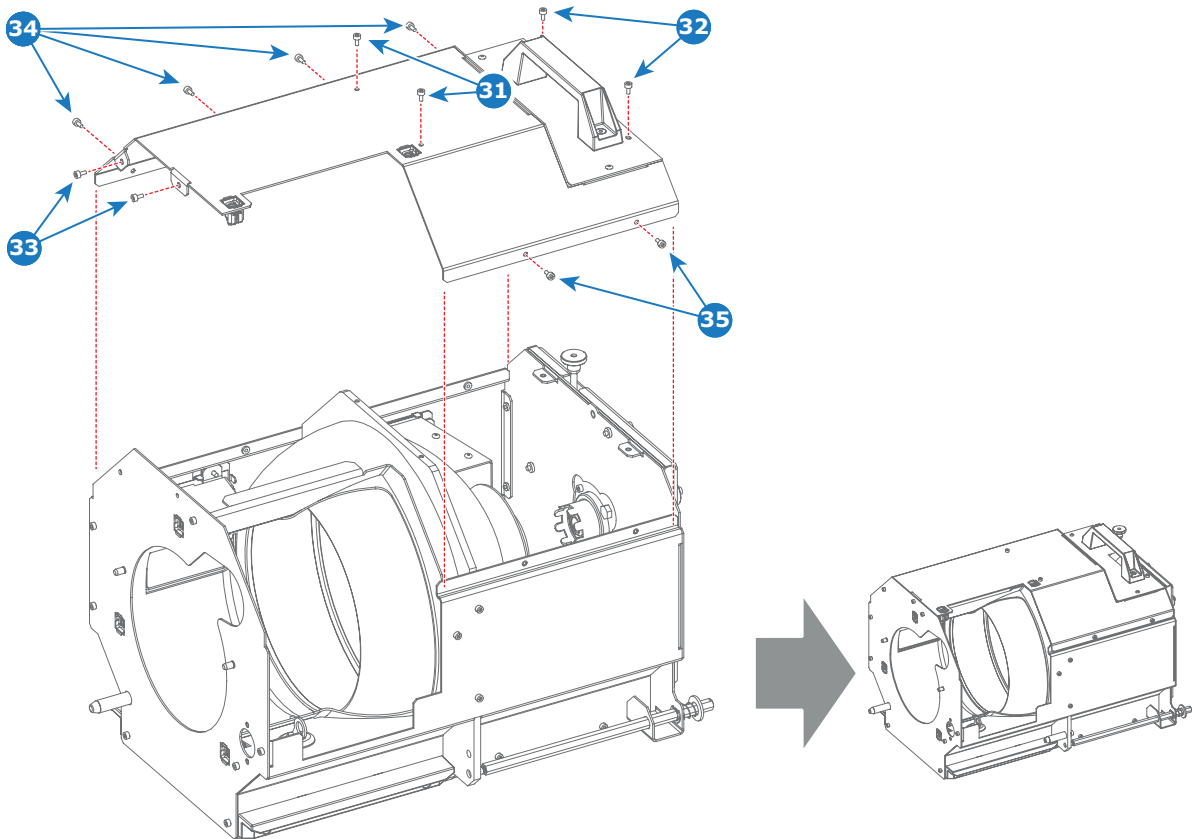


Image 9-72

6. Assemble the new SPG cathode socket as illustrated. Insert the connection pin (reference 4 image 9-73) into the socket housing (reference 5 image 9-73) and place a nut (reference 6 image 9-73) onto the threaded rod of the connection pin.
Caution: Do NOT tighten the nut. The connector should still be "floating".

9. Lamp & Lamp House

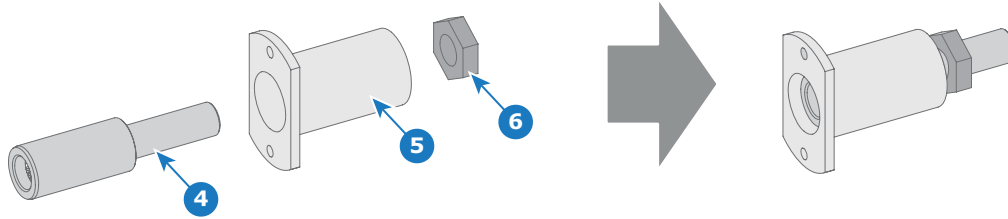


Image 9-73

7. Install the SPG cathode socket (reference 5) onto the Lamp House as illustrated in image 9-74. While inserting the SPG cathode socket into the opening in the front plate simultaneously guide the cathode wire lug (reference 7 image 9-74) onto the threaded rod. Fasten the SPG cathode socket with two screws (reference 4 image 9-74). Use a 2mm Allen wrench.
8. Fasten the cathode wire lug (reference 7 image 9-74). Use an open-end wrench of 17mm to hold the first nut (reference 6 image 9-74) while fastening the second nut (reference 9 image 9-74) with a torque of **9Nm** (6.64 lbf*ft) using a torque wrench. Ensure that there is a flat washer (reference 8 image 9-74) between the second nut and the wire lug.
Note: After tightening the two nuts, the connector should still be "floating".

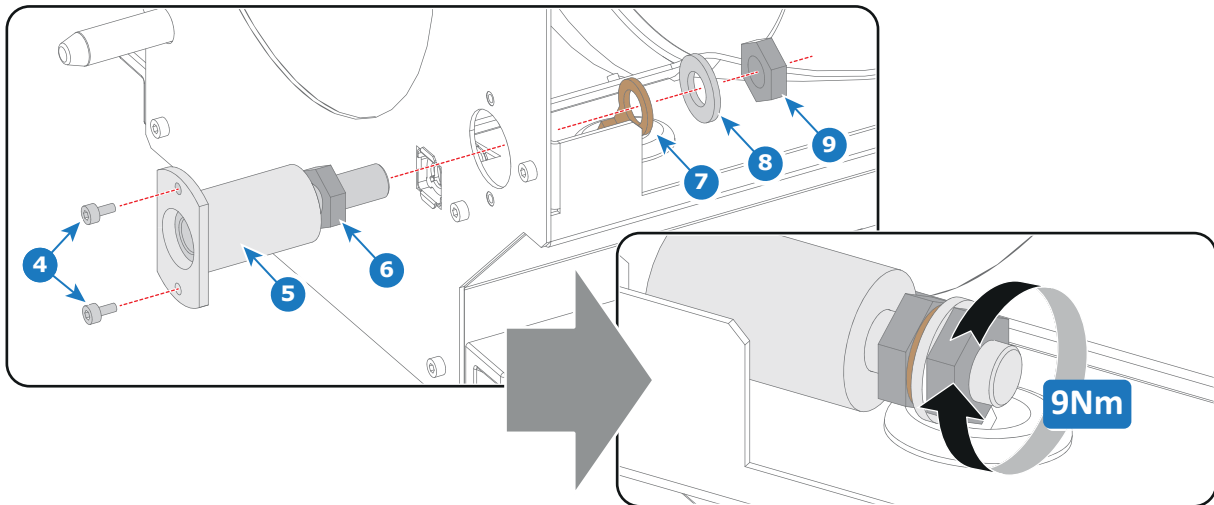


Image 9-74

9. Install the cathode nut (reference 4 image 9-75) onto the cathode wire lug (reference 5 image 9-75). Use an open-end wrench of 17mm to hold the cathode nut (reference 4 image 9-75) while fastening the second nut (reference 7 image 9-75) with a torque of **9Nm** (6.64 lbf*ft) using a torque wrench. Ensure that there is a lock washer (reference 6 image 9-75) between the second nut and the wire lug.

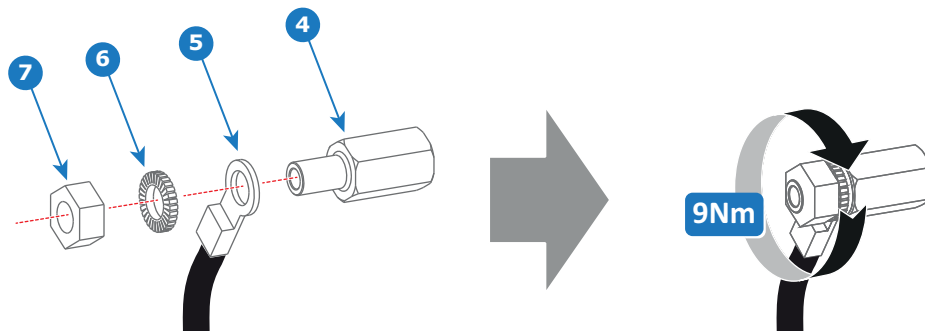


Image 9-75

10. Install the cathode wire (reference 4 image 9-76) onto the Lamp House cathode socket. Use a 2.5mm Allen wrench to fasten the two screws (reference 1 image 9-76) of the bracket (reference 2 image 9-76). Ensure that the spring (reference 3 image 9-76) fits perfectly between bracket and cathode wire.

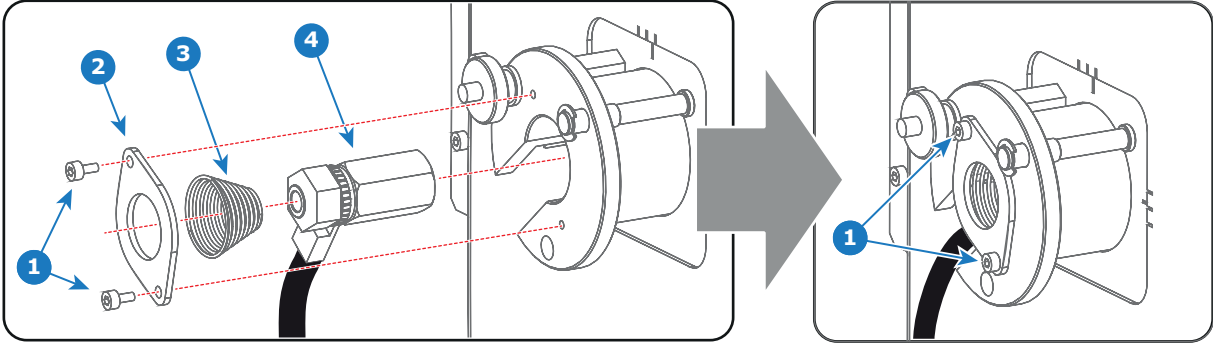


Image 9-76

9.15 Replacement of the Lamp Anode Fan



To replace the Anode Fan, the projector top cover and top cover plate must to be removed first. This procedure assumes these covers are already removed.

Necessary tools

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

How to replace the Anode Fan?

1. Disconnect the wire of the Anode Fan (reference 1 image 9-77) and remove the wire from the wire clamp (reference 2 image 9-77).
2. Remove the Convergence flex cable from the cable clamp (reference 3 image 9-77) which is attached to the Anode Fan assembly.

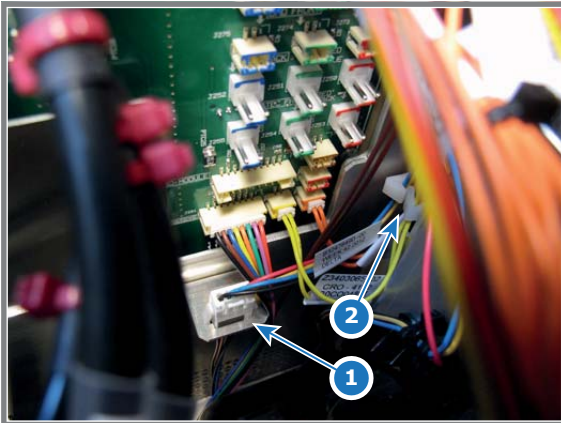
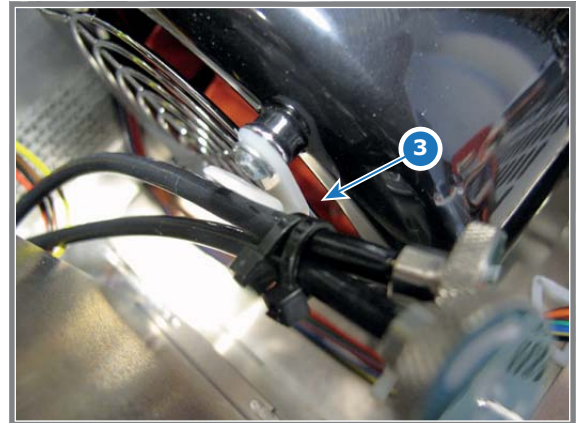


Image 9-77



3. Remove the two fixation screws at the top of the Anode Fan assembly (reference 4 image 9-78). Use a 3mm Allen wrench.
4. Gently remove the Anode Fan assembly out of the Light Processor compartment.

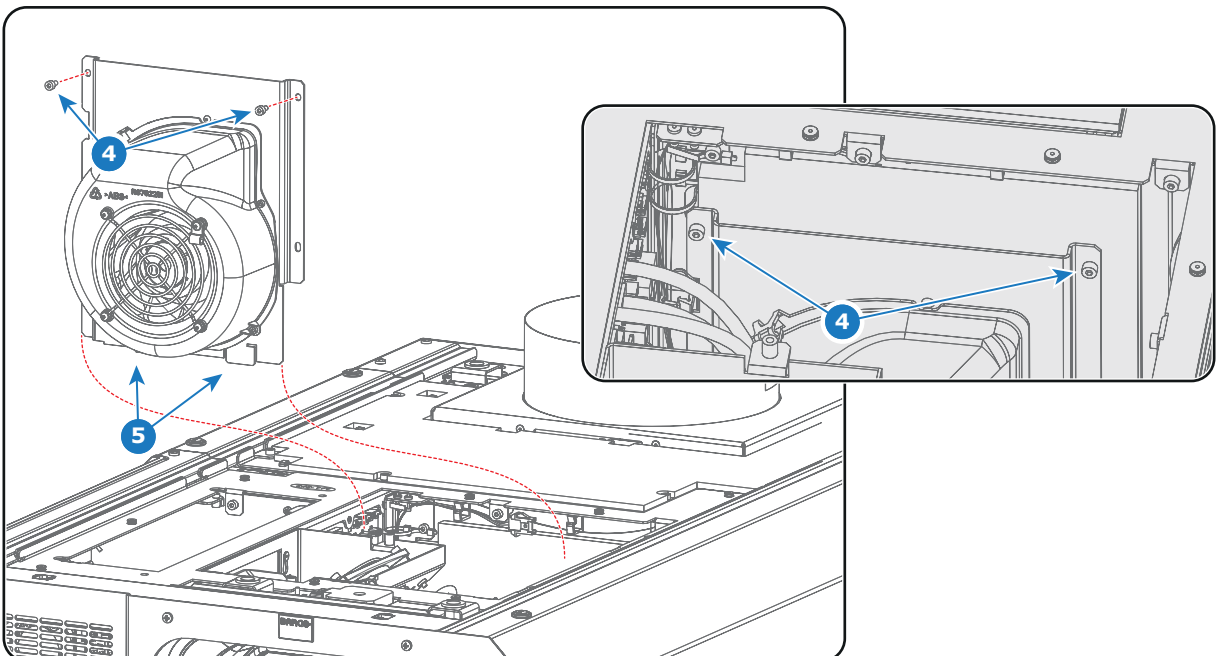


Image 9-78

5. Remove the cover of the Anode Fan by loosening the four screws (reference 6 image 9-79) as illustrated. Use a 2.5mm Allen wrench.
6. Remove the mounting plate from the Anode Fan by loosening the four screws (reference 7 image 9-79) as illustrated. Use a 3mm Allen wrench.

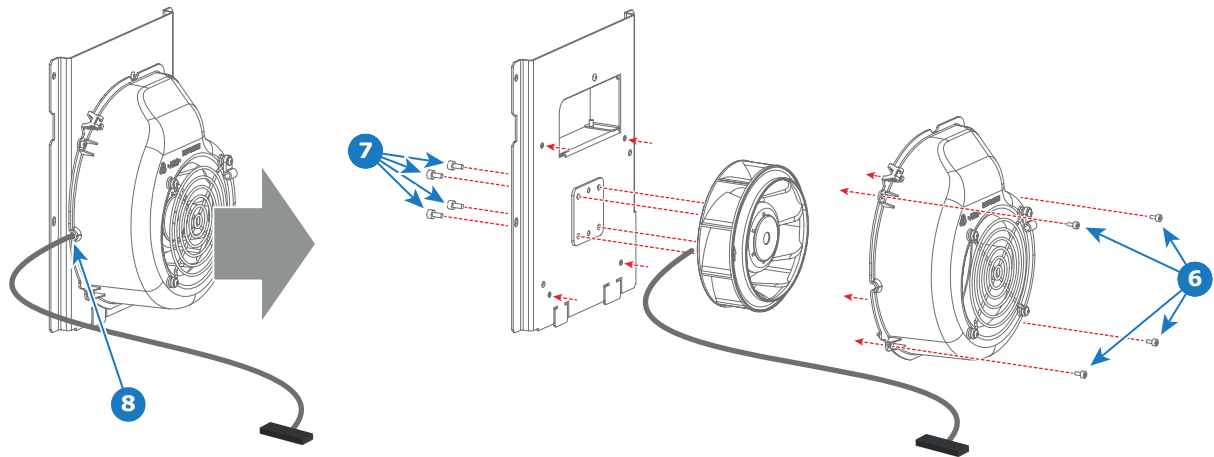


Image 9-79

7. Install a new Anode Fan onto the mounting plate. Fasten the Anode Fan with four screws (reference 7 image 9-79). Use a 3mm Allen wrench.
Note: Ensure that the wire of the Anode Fan is oriented as illustrated. So, it will match with the cut out in the cover (reference 8 image 9-79)
8. Install the cover of the Anode Fan. Fasten the cover with four screws (reference 6 image 9-79). Use a 2.5mm Allen wrench.
Note: Ensure that the wire of the Anode Fan fits in the cut out of the cover (reference 8 image 9-79)
9. Install the Anode Fan assembly into the projector. Ensure that both teeth (reference 5 image 9-78) at the bottom of the Anode Fan assembly are engaged in the foreseen slots in the projector chassis.
Caution: Take care that no electrical wires get pinched between the Anode Fan assembly and the projector chassis.
10. Secure the Anode Fan assembly with two screws (reference 4 image 9-78). Use a 3mm Allen wrench.
11. Reconnect the wire of the Anode Fan (reference 1 image 9-77) and guide the wire into the wire clamp (reference 2 image 9-77).
12. Insert the convergence flex cable into the cable clamp (reference 3 image 9-77) which is attached to the Anode Fan assembly.
Note: One flex cable is engaged into the cable clamp, while the other is retained by the cable tie which should be located between knob and cable clamp.
13. Install the top cover plate of the Light Processor compartment and the projector top cover.

9.16 Replacement of the Lamp Cathode Fan



To replace the Cathode Fan the Lamp House has to be removed first. This procedure assumes that Lamp House is already removed.

Necessary tools

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

How to replace the Cathode Fan?

1. Remove the two fixation screws at the top of the Cathode Fan assembly (reference 1 image 9-80). Use a 3mm Allen wrench.
2. Gently remove the Cathode Fan assembly from the projector chassis.
Note: The Cathode Fan assembly is still connected with its wire.

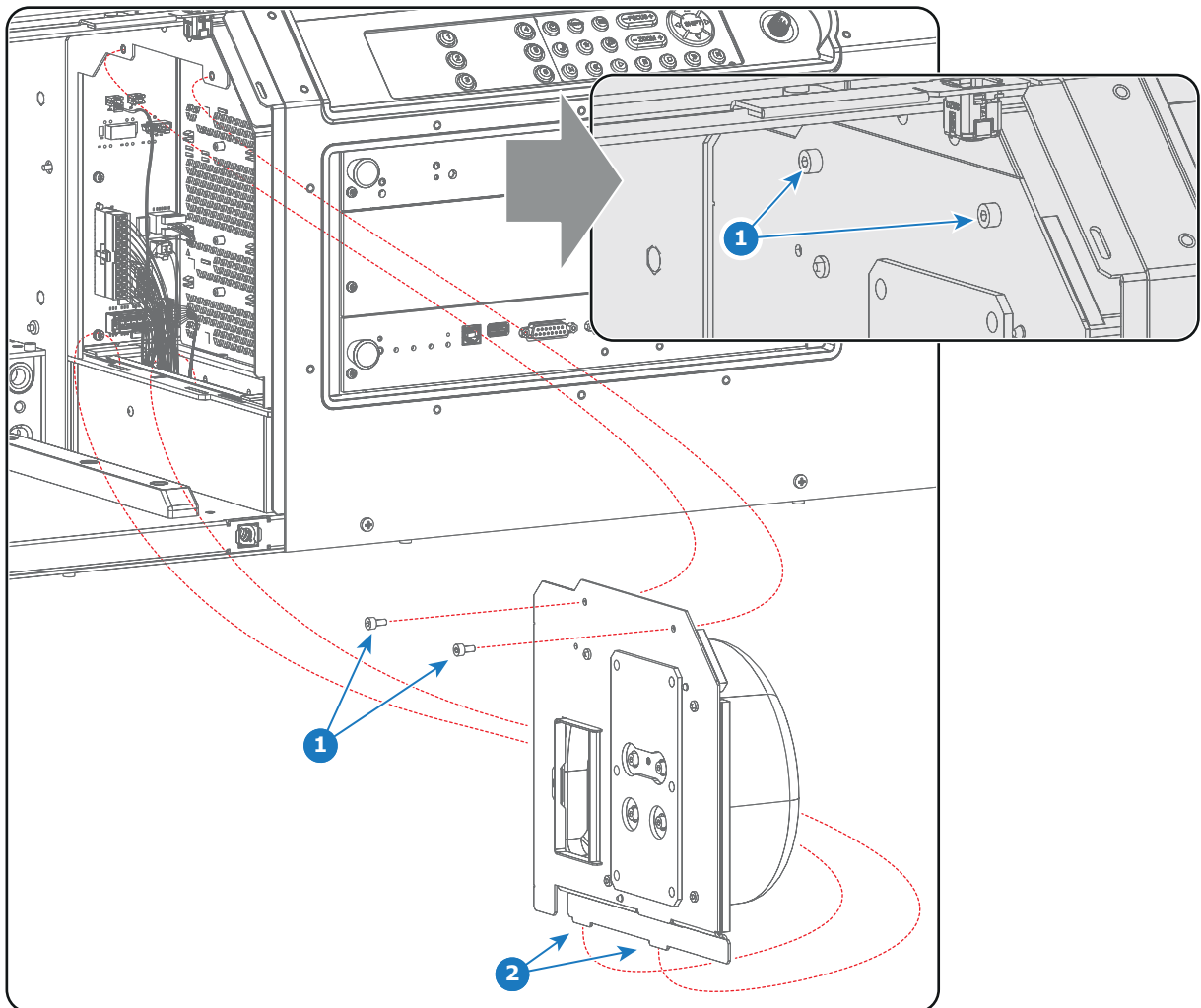


Image 9-80

3. Disconnected the wire of the Cathode Fan (reference 3 image 9-81).

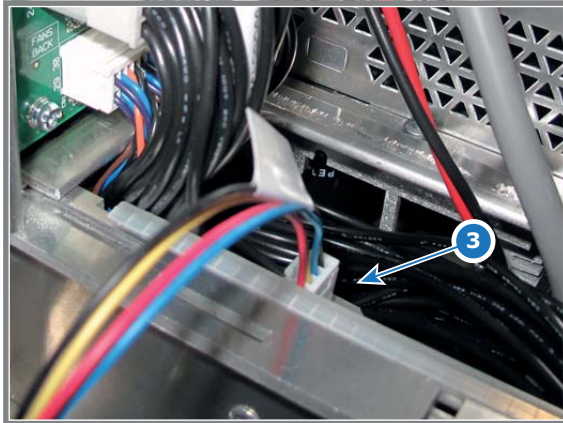


Image 9-81

4. Remove the cover of the Cathode Fan by loosening the four screws (reference 4 image 9-82) as illustrated. Use a 2.5mm Allen wrench.
5. Remove the mounting plate from the Cathode Fan by loosening the four screws (reference 5 image 9-82) as illustrated. Use a 3mm Allen wrench.
6. Install a new Cathode Fan on the mounting plate. Fasten the Cathode Fan with four screws (reference 5 image 9-82). Use a 3mm Allen wrench.
Note: Ensure that the wire of the Cathode Fan is oriented as illustrated to match it with the cut out in the cover. (reference 6 image 9-82)

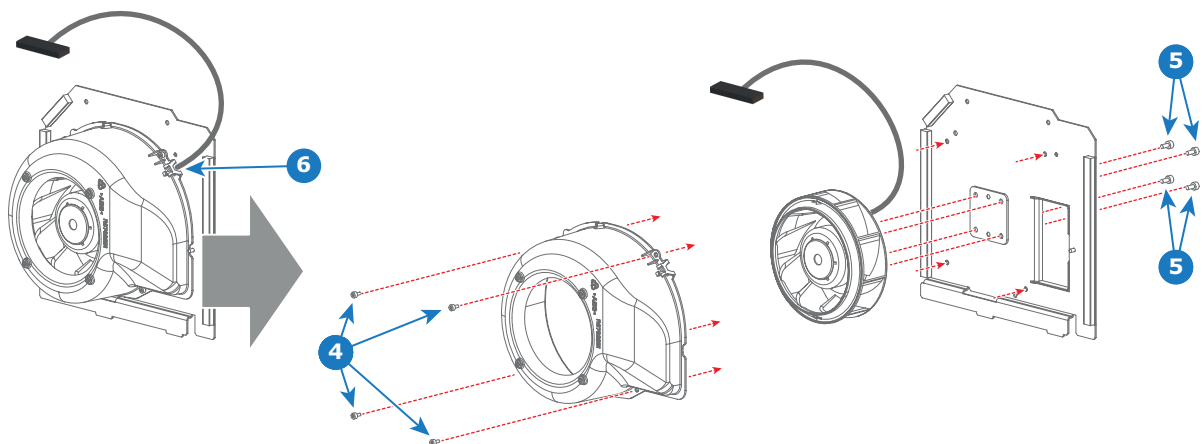


Image 9-82

7. Install the cover of the Cathode Fan. Fasten the cover with four screws (reference 4 image 9-82). Use a 2.5mm Allen wrench.
Note: Ensure that the wire of the Cathode Fan fits in the cut out of the cover (reference 6 image 9-82)
8. Reconnect the wire of the Cathode Fan (reference 3 image 9-81).
9. Install the Cathode Fan assembly in the projector. Ensure that both teeth (reference 2 image 9-80) at the bottom of the Cathode Fan assembly are engaged in the foreseen slots in the projector chassis.
10. Secure the Cathode Fan assembly with two screws (reference 1 image 9-80). Use a 3mm Allen wrench.

10. COLD MIRROR

About this chapter

This chapter describes how to replace the Cold Mirror. It also describes the adjustments for the Cold Mirror and when an adjustment or cleaning is needed.



CAUTION: Typically the Cold Mirror should never be readjusted in the field except when the Cold Mirror or Lamp Reflector have been replaced. In case a readjustment is required follow the instructions in this chapter precisely. Only qualified technicians who have experience with adjusting the Cold Mirror may adjust the Cold Mirror. A misaligned Cold Mirror may cause irreversible damage to other parts of the projector!

Overview

- Introduction Cold Mirror
- Replacement of the Cold Mirror assembly
- Adjusting the Cold Mirror
- Cleaning the Cold Mirror
- Replacement of the Cold Mirror fan
- Replacement of the compartment window

10.1 Introduction Cold Mirror

Functionality of the Cold Mirror

The Cold Mirror is located in the light path between the light source (xenon lamp) and the light pipe. The Cold Mirror reflects visible light and absorbs infra red light (it makes the light 'colder' that's why its cold the Cold Mirror). Due to this absorbing, a lot of heat is produced. The Cold Mirror is mounted with the rear side upon a big heat sink. The fan below cools the Cold Mirror and heat sink. Hot air is transported to the outside of the projector. The Cold Mirror is equipped with three adjustment screws. This to reflect the light spot precisely into the centre of the Integration Rod, hence adjusting for optimal performance.

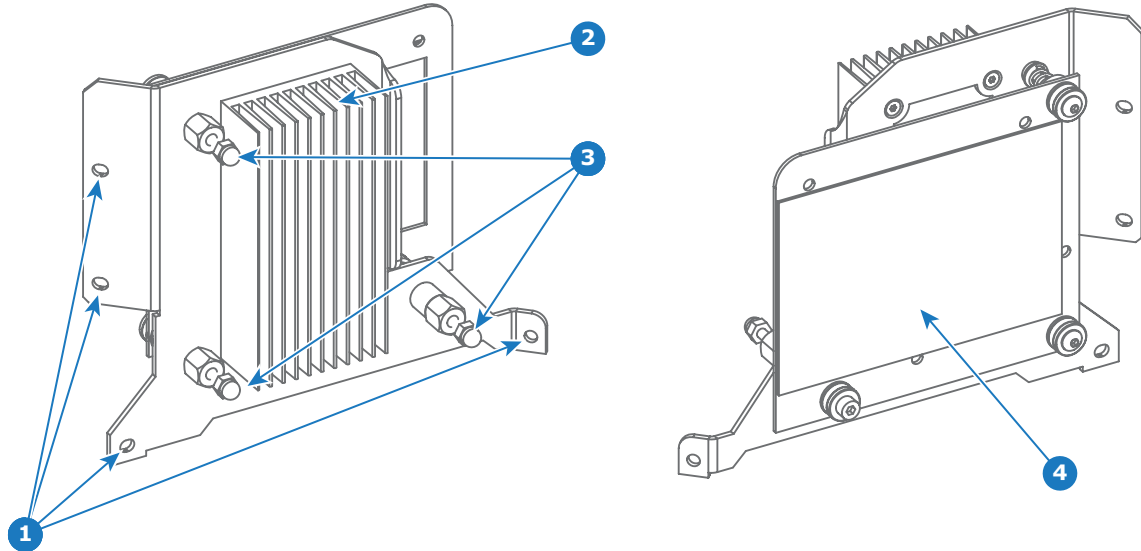


Image 10-1

- 1 Mounting holes.
- 2 Heat sink.
- 3 Adjustment screws.
- 4 Cold Mirror.

Diagnostic

The easiest way to check the condition of the Cold Mirror is by removing the Lamp House. When the Lamp House is removed, the Cold Mirror becomes visible at the end of the lamp compartment. In case the Cold Mirror is not damaged but dirt is clearly visible upon the surface of the mirror it is recommended to clean the Cold Mirror. Always replace the Cold Mirror with a new one in the event the Cold Mirror is damaged. Possible damages are:

- Cold Mirror is broken.
- Coating peels off.
- Cold Mirror is cracked.



The light output on the screen will be lower than the normal light output in case of a damaged or dirty Cold Mirror.

10.2 Replacement of the Cold Mirror assembly



To replace the Cold Mirror the side cover plate of the Light Processor compartment has to be removed first. This procedure assumes that the side cover plate is already removed.

Necessary tools

- 3mm Allen wrench.
- Cotton gloves.

How to replace the Cold Mirror?

1. Remove the cover plate above the SPG module and Cold Mirror assembly as illustrated. Use a 3mm Allen wrench to loosen the three screws (reference 3 image 10-2).

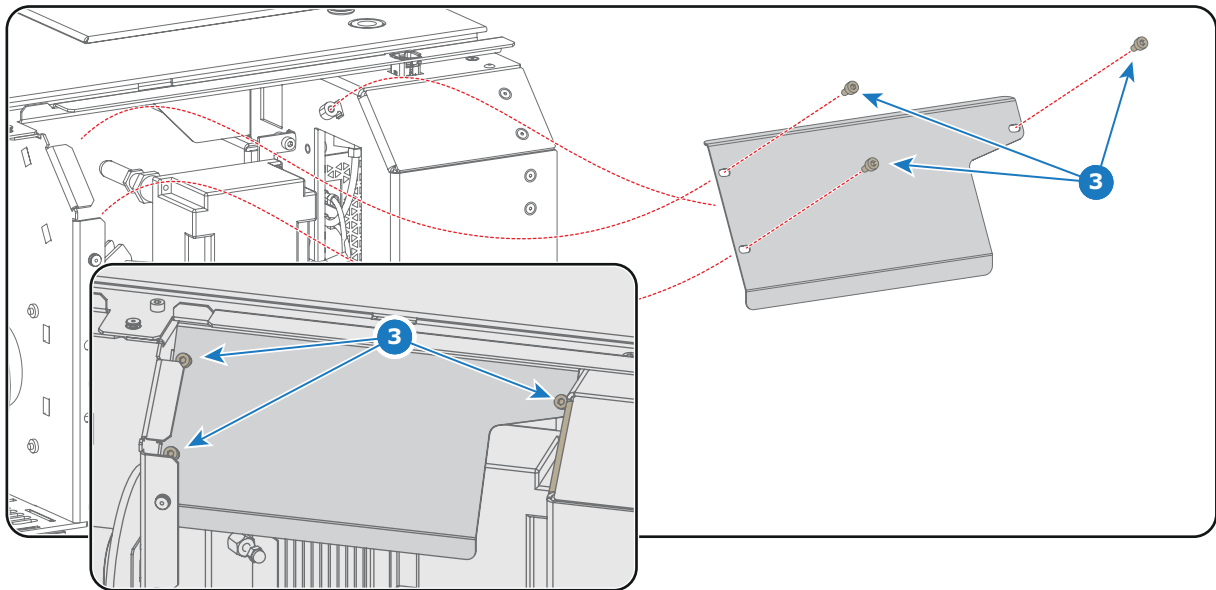


Image 10-2

2. Remove the four fixation screws of the Cold Mirror assembly. Use a 3mm Allen wrench to loosen the 2 screws (reference 1 image 10-3) at the side of the Cold Mirror assembly and the two screws (reference 2 image 10-3) at the base of the Cold Mirror assembly.
3. Remove the Cold Mirror assembly from the projector.

Note: Some tilting and rotating of the Cold Mirror assembly is required to remove the Cold Mirror assembly from its location.

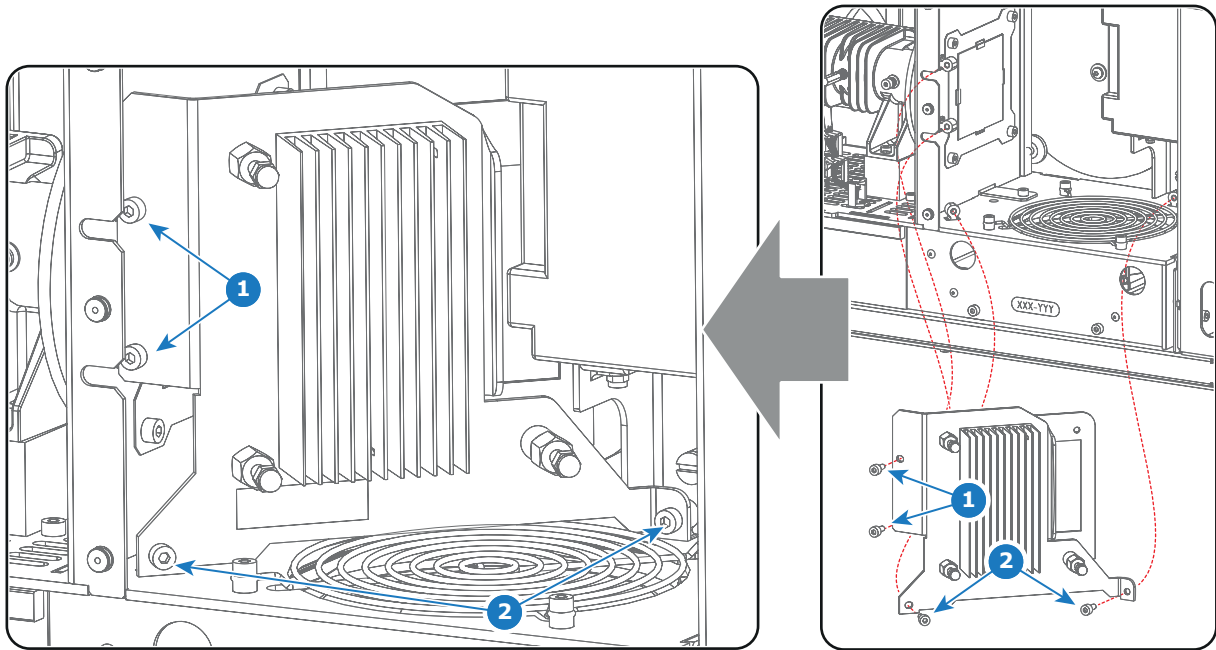


Image 10-3

4. Prepare the new Cold Mirror assembly by removing all packing material and check the position of the three adjustment screws:
 - a) The two adjustment screws at the rear left side of the Cold Mirror assembly should stick out **26mm** as illustrated. (reference 1 & 2 image 10-4)
 - b) The adjustment screw at the right side of the Cold Mirror assembly should stick out **36mm** as illustrated. (reference 3 image 10-4)

This position of the adjustment screws correspond with nearly an optimal position of the cold mirror. Release to lock nuts prior to adjust the adjustment screws. Fasten the lock nuts afterwards.

Caution: Do not touch the surface of the Cold Mirror. Use cotton gloves to handle the Cold Mirror.

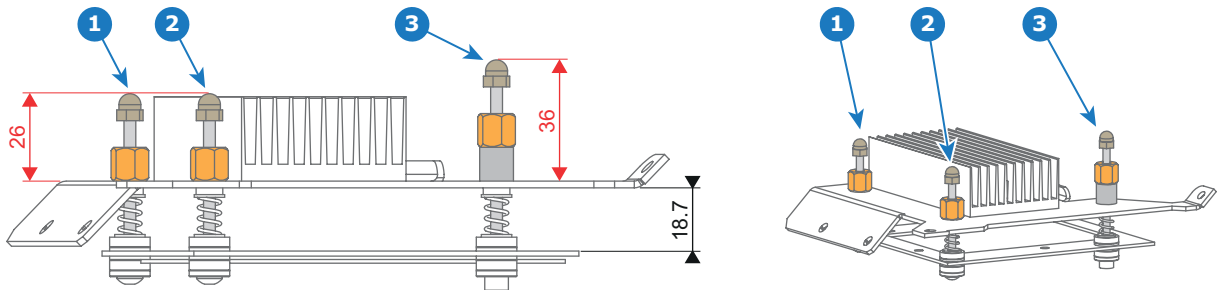


Image 10-4

5. Install the Cold Mirror assembly in the projector. Use a 3mm Allen wrench to fasten the 4 screws (reference 1 & 2 image 10-3).

Caution: Do not touch the Cold Mirror while installing the assembly.
6. Install the cover plate above the SPG module and Cold Mirror assembly as illustrated. Use a 3mm Allen wrench to fasten the three screws (reference 3 image 10-2).
7. Check the Cold Mirror for dirt. If necessary clean the Cold Mirror. See procedure "Cleaning the Cold Mirror", page 165.
8. Readjust the Cold Mirror. See procedure "Adjusting the Cold Mirror", page 163.

10.3 Adjusting the Cold Mirror

Important note!

The position of the xenon lamp in its Reflector effects the position of the Cold Mirror with respect to the entrance of the Integration Rod. Hence the adjustment of the Cold Mirror requires simultaneous adjustment of the xenon lamp in its Reflector for maximum light output. This procedure describes how to do so. However, if you are 100% sure that the xenon lamp is perfectly aligned in the Lamp House you can skip the adjustments on the Lamp House.



Adjust the Lamp House first in another projector, which Cold Mirror is correctly adjusted, or have it aligned by Barco before proceeding with the Cold Mirror adjustments. That way any Lamp House will be usable in that projector, or all others, and vice versa.

Once the Cold Mirror and xenon lamp are optimally adjusted, the Cold Mirror should never be adjusted again. A xenon lamp replacement only requires realignment of the xenon lamp in its Reflector. Only when the Cold Mirror or Reflector is replaced, should the Cold Mirror be readjusted.



To adjust the Cold Mirror the lamp cover and the left cover have to be removed. This procedure assumes that these covers are already removed.

Necessary tools

- 3mm Allen wrench.
- 10mm open-end wrench.
- 7mm open-end wrench or nut driver.
- Projected Light meter (Lux meter).
- Slide caliper.

How to setup the projector for adjusting the Cold Mirror?

1. Remove, if not removed yet, the lamp cover and the left cover of the projector.
2. Loosen the lock nuts (reference 4 image 10-5) of the three Cold Mirror adjustment screws (reference 1, 2 & 3 image 10-5). Use for that a 10mm open-end wrench.

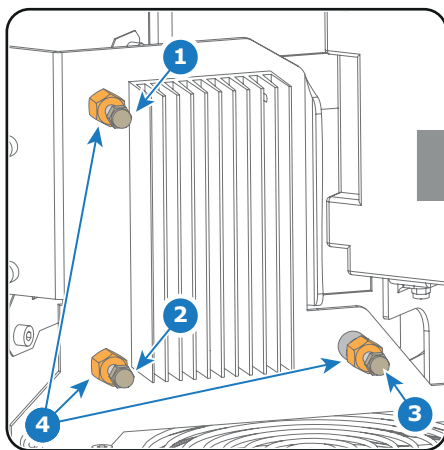
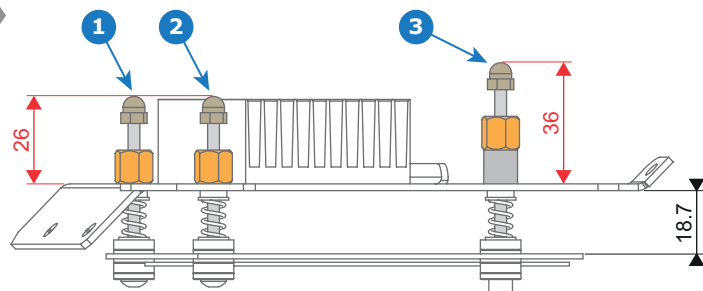


Image 10-5



3. Check the nominal position of the Cold Mirror and if required adjust.
 - a) The distance between the head of the two adjustment screws at the left side and the assembly plate should be **26mm** (reference 1 & 2 image 10-5).
 - b) The distance between the head of the adjustment screw at the upper right side and the assembly plate should be **36mm** (reference 3 image 10-5).

This nominal position is the best position to start the adjustment procedure. Use a 7mm open-end wrench or nut driver for the adjustment screws.

4. Project a white test pattern.

Tip: Start the adjustment procedure with a dimmed xenon lamp.
5. Place the light meter in the center of the projected image.

How to adjust the Cold Mirror?

1. Turn the adjustment screw 1 (reference 1 image 10-6) in or out until the maximum light output is measured. Use for that a 7 mm nut driver.

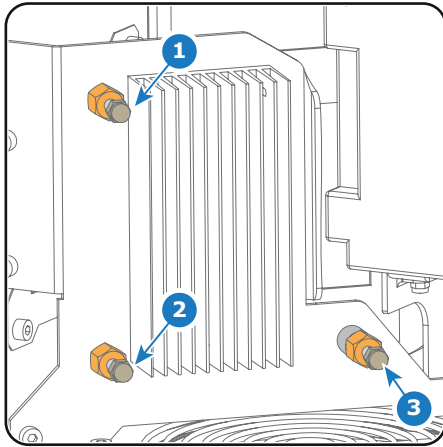
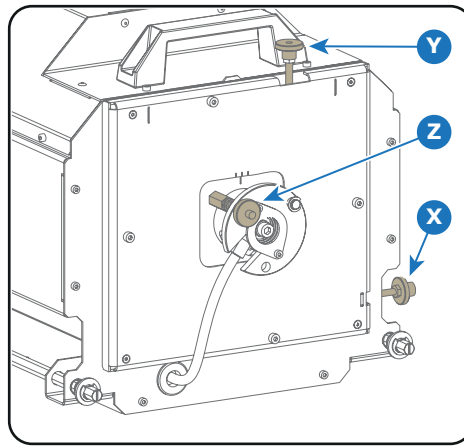


Image 10-6



2. Turn the adjustment screw 3 (reference 3 image 10-6) in or out until the maximum light output is measured.
3. Repeat step 1 and 2 until the maximum light output is measured.
4. Adjust the X-axis, Y-axis and Z-axis (reference X, Y & Z image 10-6) of the xenon lamp in the Lamp House for maximum light output. Carefully turn the thumbscrew for maximum light output. Once over the maximum, turn slightly in opposite direction to reach the maximum light output again. Do this for each direction and minimum repeat this adjustment cycle twice.

Tip: If you are 100% sure that the xenon lamp is perfectly aligned in the Lamp House you can skip the adjustments on the Lamp House. See "Important note!" above.
5. Turn the adjustment screw 1, 2 and 3 (reference 1, 2 & 3 image 10-6) equally in or out until the maximum light output is measured.
6. Repeat from step 1 until the maximum light output is measured.
7. Check the brightness uniformity. In most cases it will be OK.
If not OK, turn slightly on the adjustment screws 1 and 3 (reference 1 & 3 image 10-6) until a uniform brightness is obtained.
 - Screw 1 (reference 1 image 10-6) will correct the difference between the left and the right side of the
 - Screw 3 (reference 3 image 10-6) will correct the difference between the top and the bottom side of the projected image.

Check again and repeat if necessary.
8. When the adjustment is finished, secure the position of the Cold Mirror by turning the lock nuts (reference 4 image 10-5) against the plate (hold on the screws while securing the nuts).
9. Reinstall the lamp cover and the left cover of the projector.

10.4 Cleaning the Cold Mirror

When cleaning the Cold Mirror?

Clean the Cold Mirror on a regular basis to maintain light output level.



This procedure requires that the Lamp House is removed from the projector.

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 Cold 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.

10.5 Replacement of the Cold Mirror fan



To access the Cold Mirror fan assembly the projector left cover has to be removed. This procedure assumes that the projector left cover is already removed.

Necessary tools

2.5mm Allen wrench

How to replace the Cold Mirror fan?

1. Remove the two fixation screws (reference 1 image 10-7) of the Cold Mirror fan assembly. Use a 2.5mm Allen wrench.
2. Pull the Cold Mirror fan assembly a few centimeters out of its compartment.
3. Disconnect the wire (reference 2 image 10-7) of the Cold Mirror fan.
4. Remove the Cold Mirror fan assembly completely from the projector.

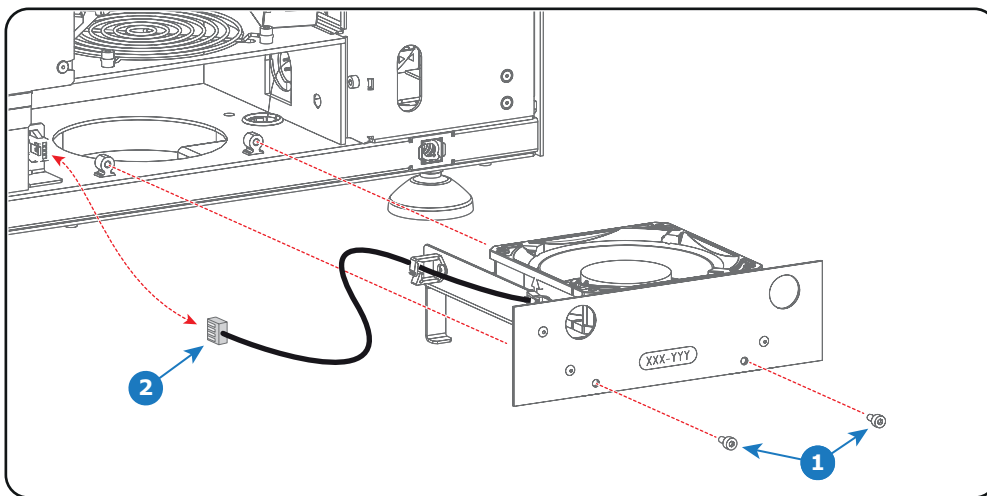


Image 10-7

5. Remove the Cold Mirror fan from the mounting plate. Use a 2.5mm Allen wrench to Loosen the four screws (reference 3 image 10-8).
6. Install a new Cold Mirror fan onto the mounting plate and guide the wire through the two cable clamps.
Caution: Ensure that the airflow of the fan is upwards oriented.

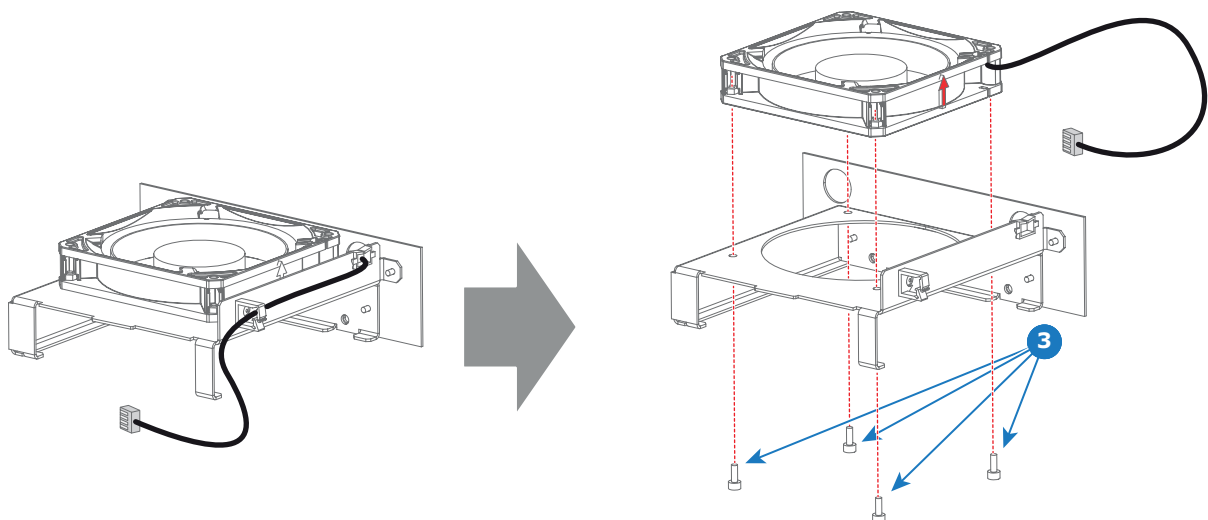


Image 10-8

7. Place the Cold Mirror fan assembly halfway in its compartment.
8. Connect the wire (reference 2 image 10-7) of the Cold Mirror fan.
9. Insert the Cold Mirror fan assembly completely in its compartment.
10. Fixate the Cold Mirror fan assembly with two screws (reference 1 image 10-7). Use a 2.5mm Allen wrench.

10.6 Replacement of the compartment window



To replace the compartment window the Cold Mirror has to be removed first. This procedure assumes that the Cold Mirror is already removed.

Necessary tools

- 2.5mm Allen wrench.
- Cotton gloves.

How to replace the compartment window?

1. Remove the compartment window from the projector chassis. Use a 2.5mm Allen wrench to loosen the four screws (reference 1) of the metal frame (reference 2) which holds the compartment window (reference 3).

Note: The compartment window sits loose in the metal frame!

2. Place a new compartment window in the metal frame and attach both to the projector chassis.

Caution: Wear cotton gloves to handle the compartment window.

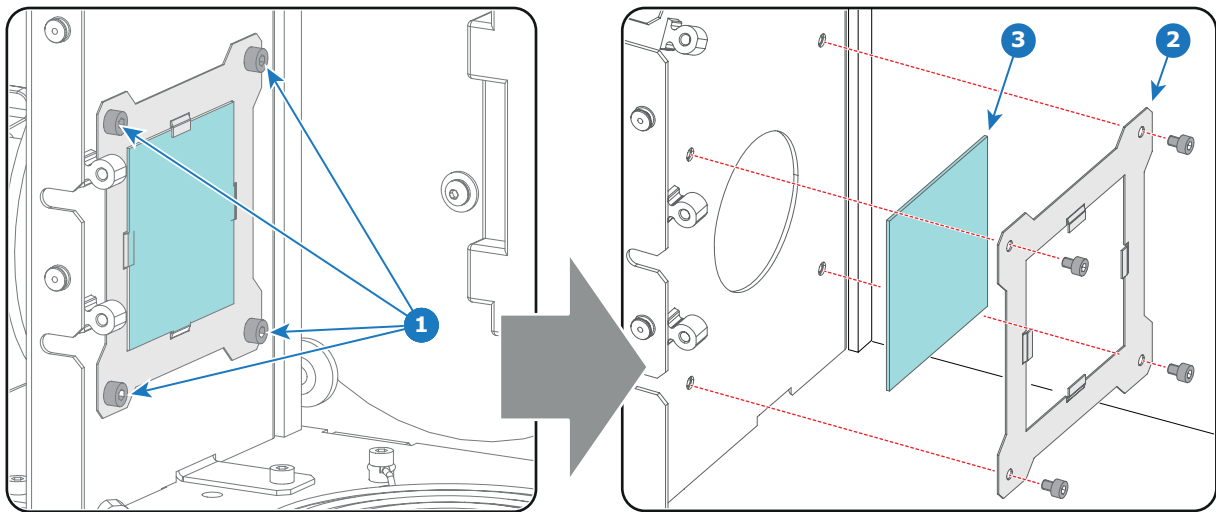


Image 10-9

3. Ensure that the compartment window is clean at both sides after installation. If necessary clean the window. See "General cleaning procedure for optical components", page 379.

11. LIGHT PROCESSOR

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 and the service information about the Integration Rod is grouped in a separate chapters in this manual, see chapter "Convergence", page 237, and "Integration Rod", page 221.



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.

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

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.

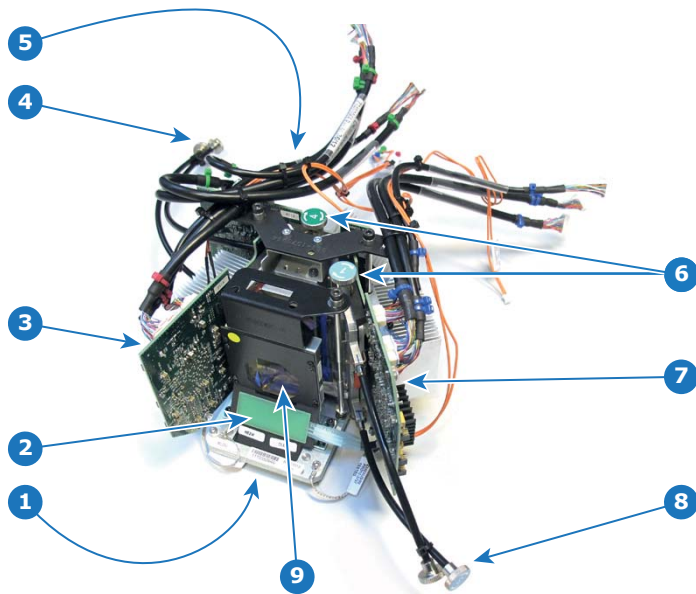


Image 11-1

- 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 malfunction Light Processor. See detailed procedure "Removing the Light Processor", page 173.
2. Install the new Light Processor. See detailed procedure "Installing the Light Processor", page 176.
3. Obtain serial number of the installed Light Processor. See included procedure on page 231.
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 232.
 - Upload the LUT-SCC file into the projector file system. (e.g. 1110351581.LUT-SCC). See included procedure on page 234.
 - Activate the LUT-SCC file. See included procedure on page 235.
 - 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.



To remove the Light Processor from the projector the lens, the top cover, left side cover, top cover plate and side cover plate have to be removed first. This procedure assumes that the lens and covers are already been removed.



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

Necessary tools

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

How to remove the Light Processor from the projector?

1. Remove top fan of the Light Processor and place it on top of the Card Cage. No need to disconnect the wire of the fan. See image 11-2.

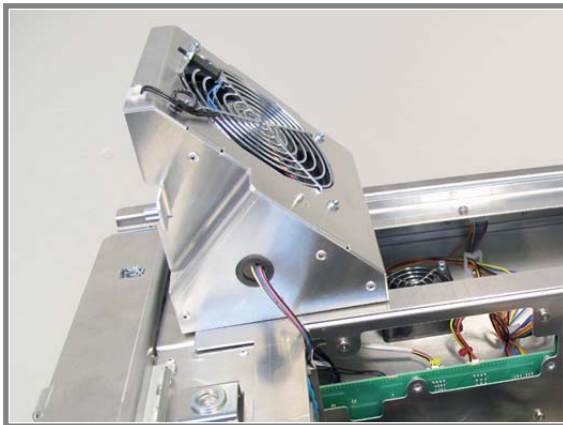


Image 11-2

2. Disengage the Convergence flex cables from the cable clamp on the Anode Fan assembly (green channel, reference 1 image 11-3) and the cable clamp on the projector chassis (blue channel, reference 2 image 11-3).

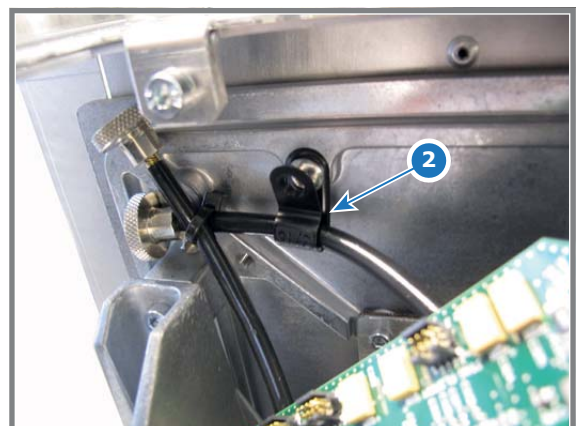
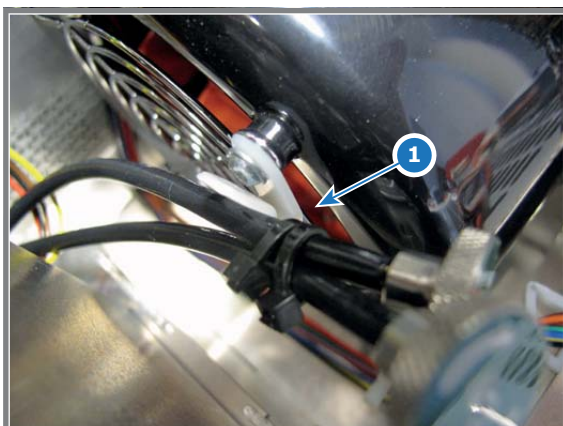


Image 11-3

3. Disconnect the nine RGB connectors (reference 3 image 11-4) from the Signal Distribution board. Push the little tab (reference 4 image 11-4) 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.

11. Light Processor

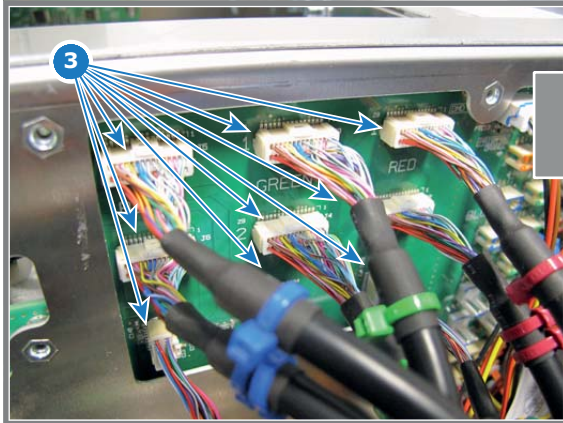
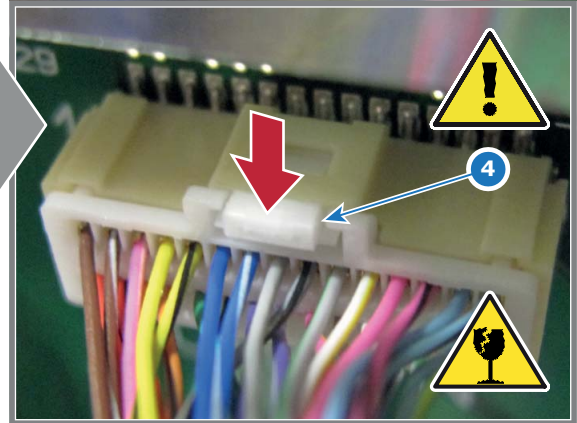


Image 11-4



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

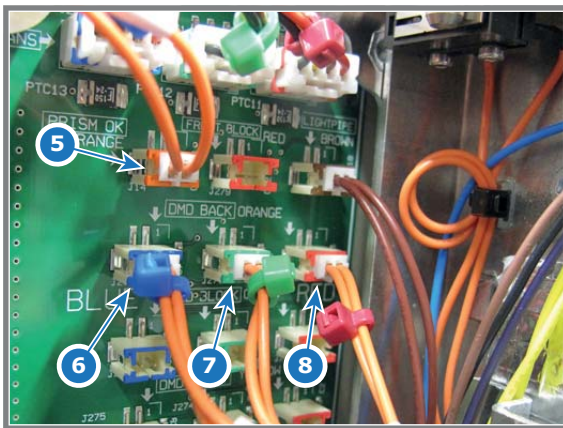


Image 11-5

5. Loosen the three captive screws (reference 9 image 11-6) of the Light Processor by a few turns until you feel that the screws can bob up-and-down. Use a 3mm Allen wrench.
Caution: Do not keep turning the captive screws as this will dismantle the screws' captive system.

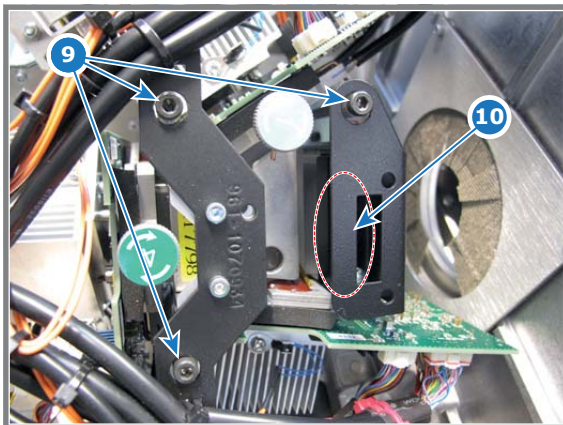


Image 11-6

6. Gently remove the Light Processor from the projector chassis. Take the Light Processor by the black bracket (reference 10 image 11-6) which serves as a handle.

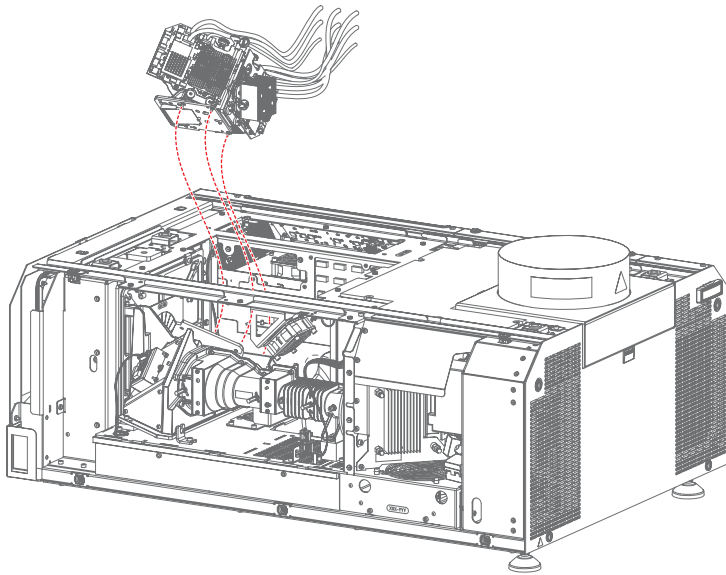


Image 11-7

7. Place the Light Processor on a clean flat surface with the prism entrance (reference 1 image 11-8) 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.

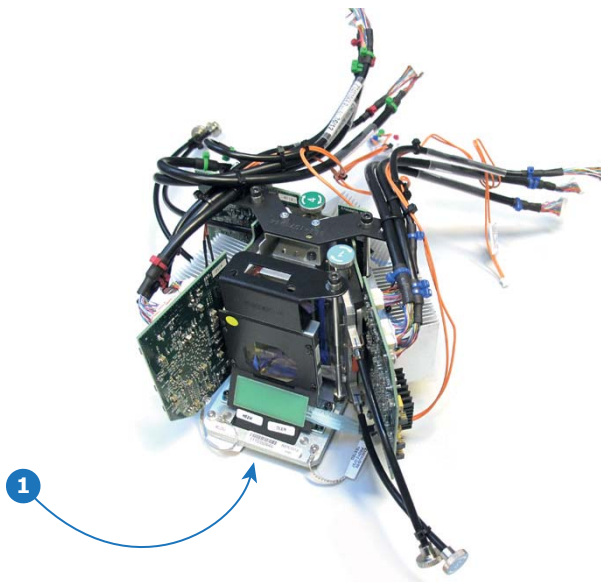


Image 11-8

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 229.

Necessary tools

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

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 11-9) of the Light Processor matches the positioning holes (reference 13 image 11-9) in the optical base.

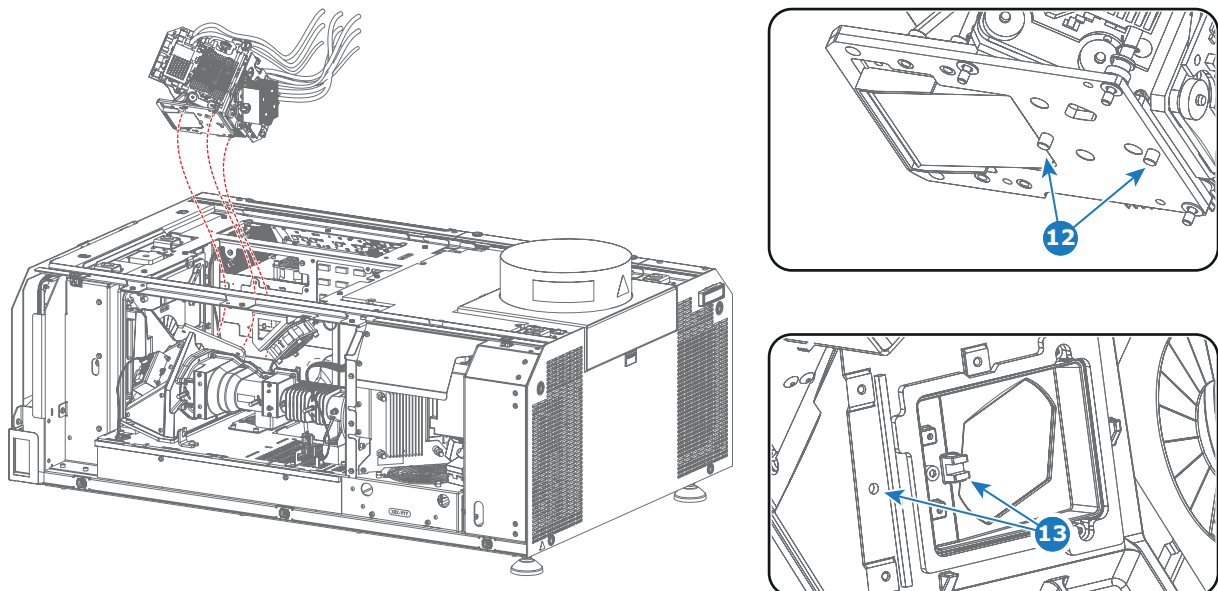


Image 11-9

2. Fasten the three captive screws (reference 9 image 11-10) of the Light Processor assembly as illustrated. Use a 3mm Allen wrench.

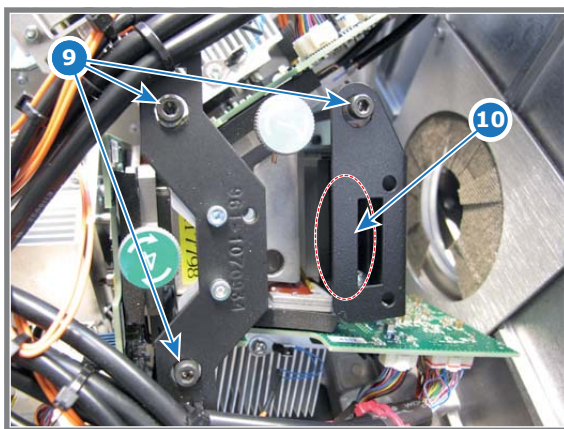


Image 11-10

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

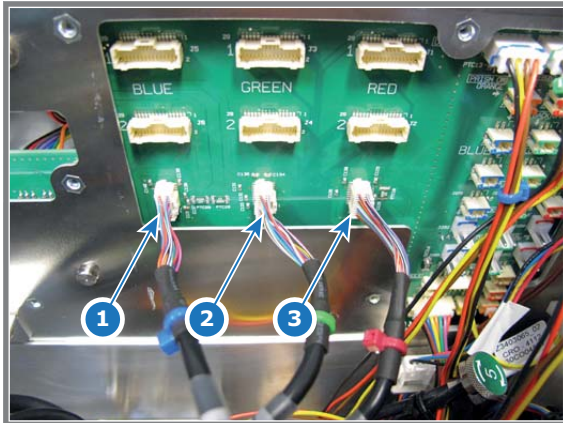
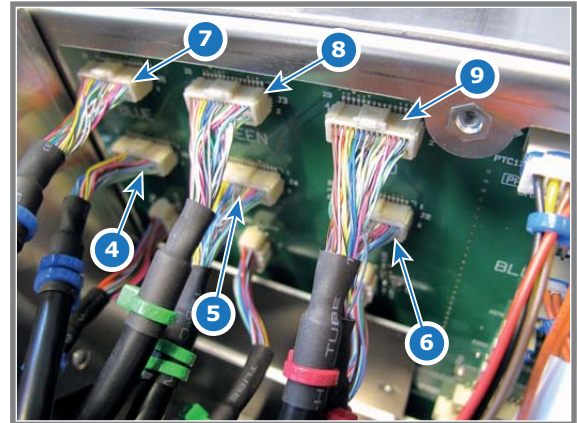


Image 11-11



4. Connect the four orange wires of the Light Processor with the Signal Distribution board as illustrated in image 11-12.

- 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.

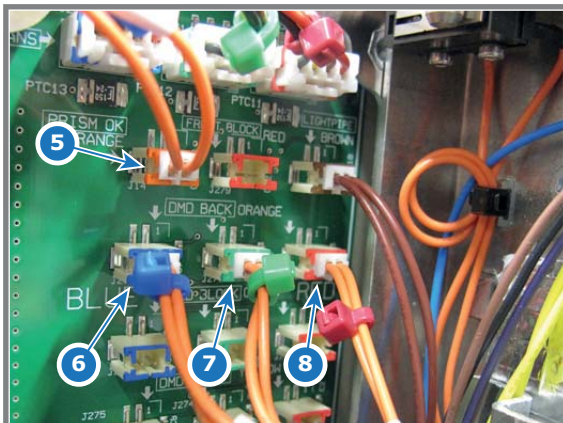


Image 11-12

5. Gently insert the Convergence flex cables into the corresponding cable clamp on the Anode Fan assembly and the cable clamp on the projector chassis (reference 1 & 2 image 11-13).

11. Light Processor

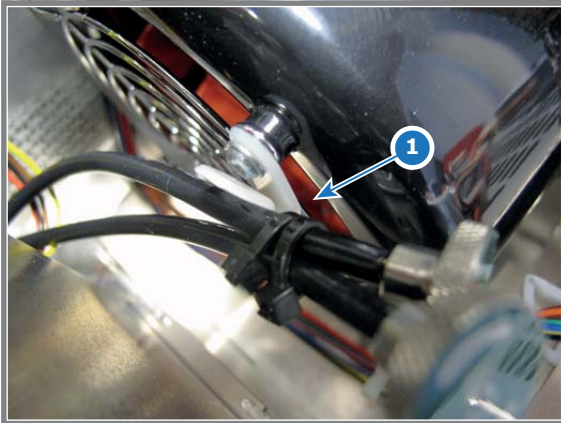
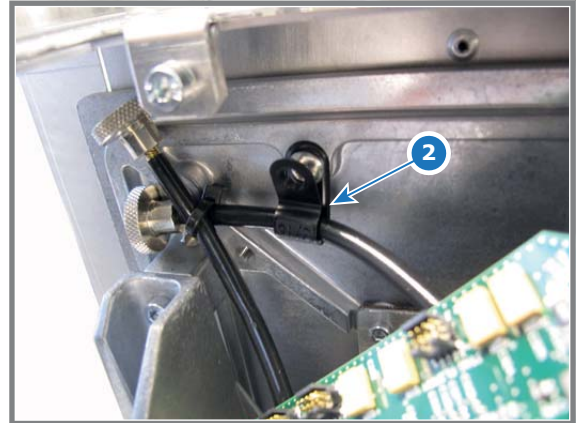


Image 11-13



6. Place the top fan of the Light Processor in the lower position. Ensure that the four mounting pins (reference 1 image 11-14) of the fan assembly are engaged.

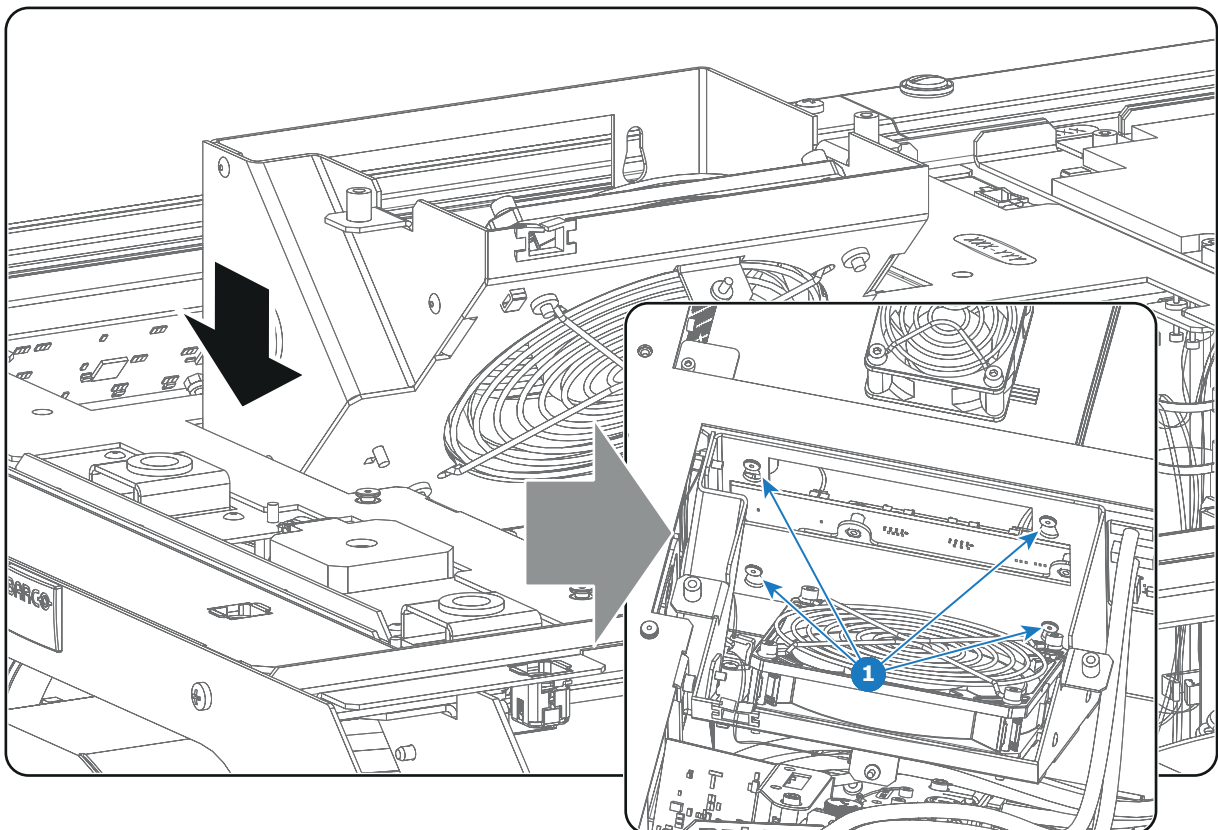


Image 11-14

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 "Replacing the Notch Filter", page 209.
 - 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 229.
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 11-16) and the wire of the temperature sensor (reference 6 image 11-16) 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 11-15).. Pull the fan assembly a few mm upwards and then away from the projector chassis.

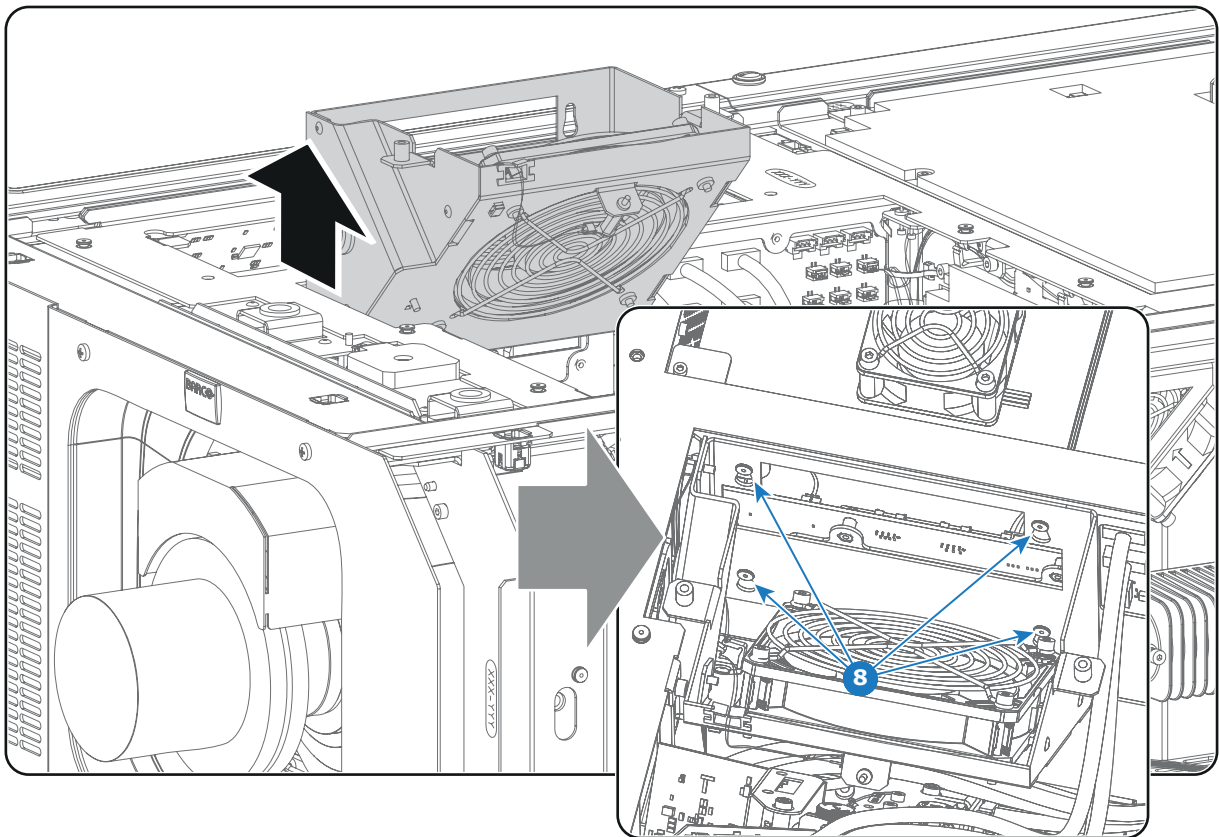


Image 11-15

3. Release both wires from the cable clamp at the side (reference 7 image 11-16).

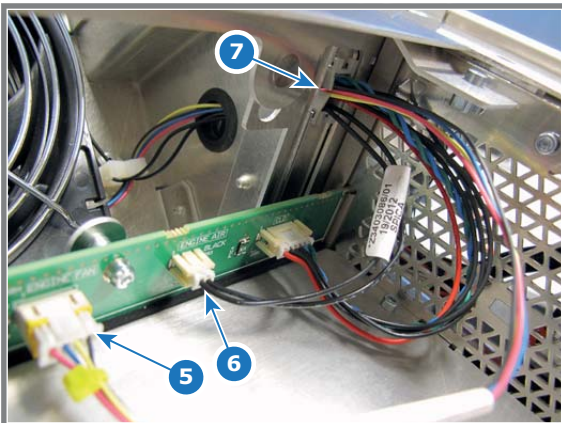


Image 11-16

- Remove the fan from the assembly. Use a 3mm Allen wrench to release the four screws (reference 3 image 11-17). While remove the fan guide the wire through the grommet (reference 4 image 11-17).

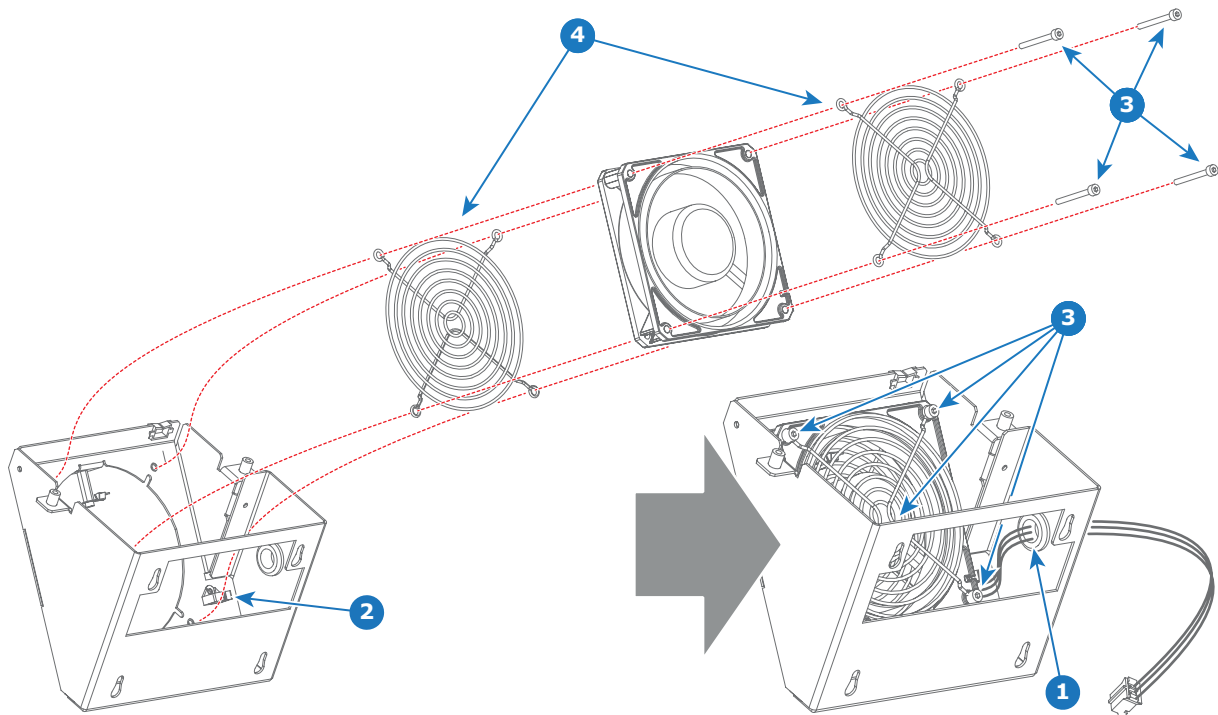


Image 11-17

- Install the new fan. Guide the wire of the new fan through the grommet (reference 4 image 11-17) and ensure that the wire is inserted in the cable clamp (reference 2 image 11-17). Use a 3mm Allen wrench to fasten the four screws (reference 3 image 11-17). **Caution:** Ensure that the airflow of the fan is towards the Light Processor.
- Place the wire of the fan and the wire of the temperature sensor in the cable clamp (reference 7 image 11-16).
- Install the fan assembly. Ensure that the four mounting pins (reference 1 image 11-18) of the fan assembly are engaged.

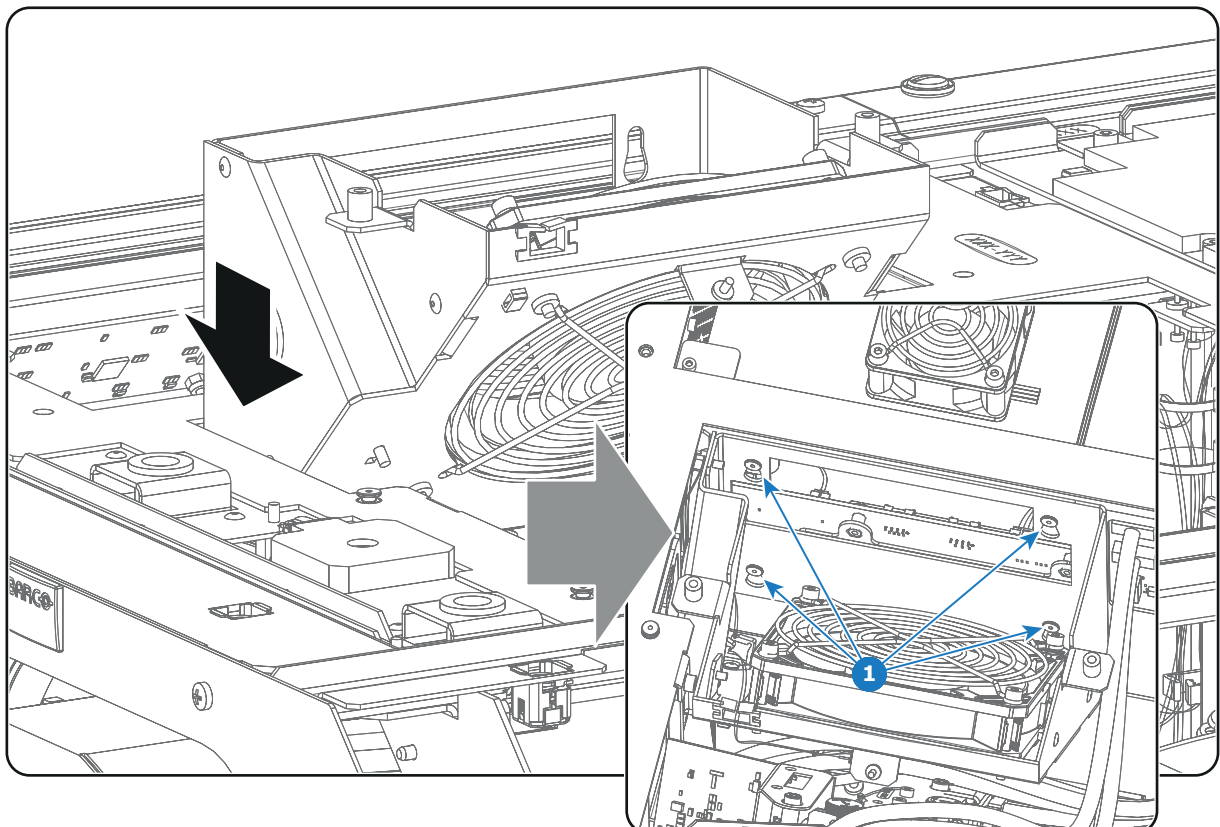


Image 11-18

11. *Light Processor*

8. Connect the wire of the fan (reference 5 image 11-16) and the wire of the temperature sensor (reference 6 image 11-16) 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 11-19) of the fan from the Signal Backplane.

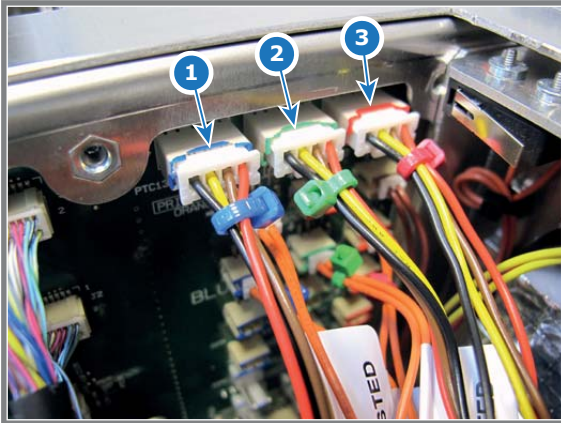


Image 11-19

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).

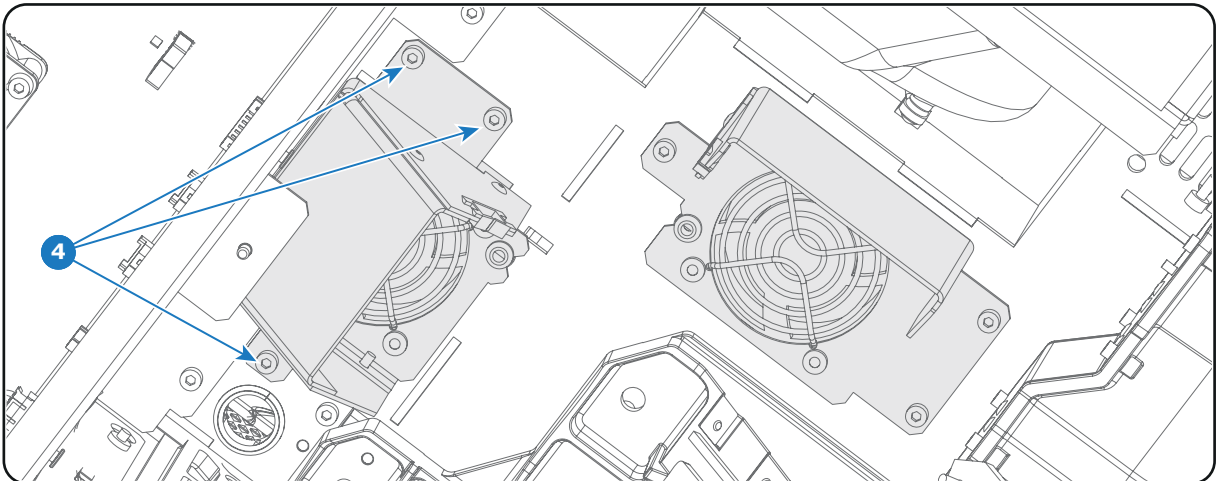


Image 11-20

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

11. Light Processor

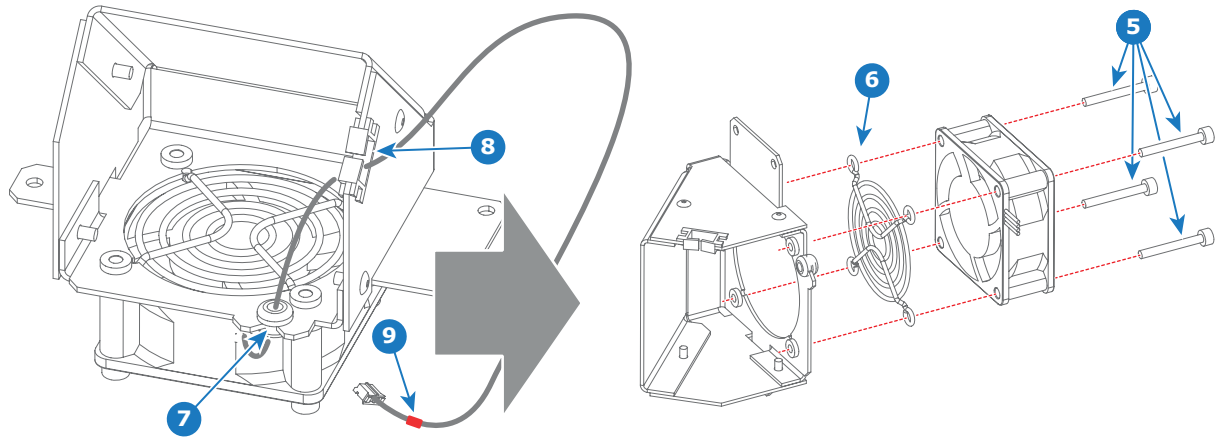


Image 11-21

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 Red 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 red 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 3 image 11-19)

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 11-22) of the fan from the Signal Backplane.

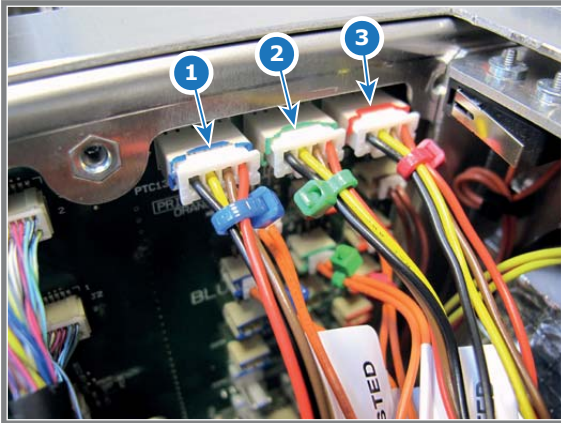


Image 11-22

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 11-23).

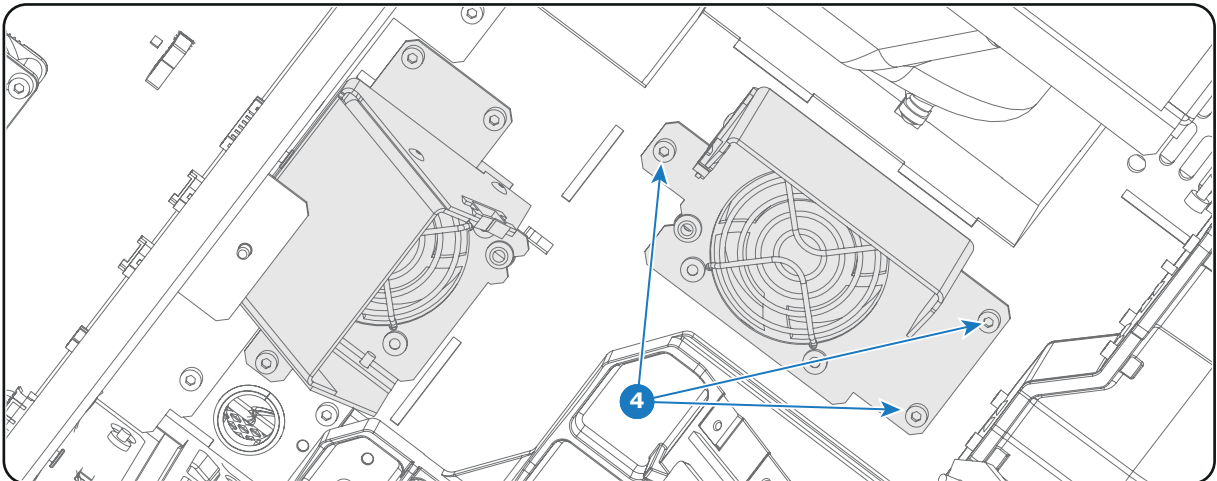


Image 11-23

3. Remove the fan from the assembly. Use a 3mm Allen wrench to loosen the four screws (reference 5 image 11-24) as illustrated.

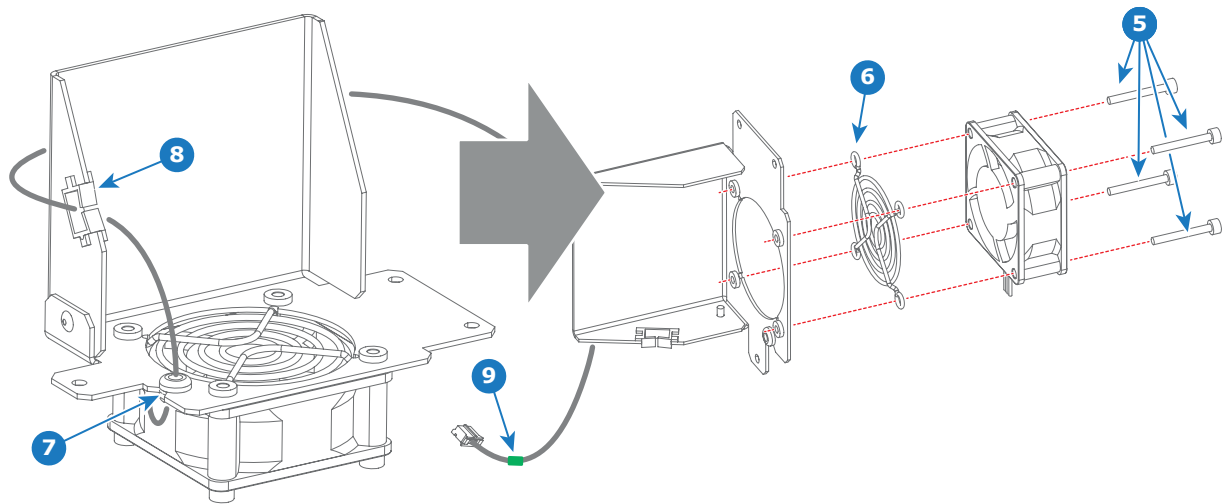


Image 11-24

4. Mount the new fan on the assembly as illustrated. Place the fan guard (reference 6 image 11-24) between the fan and mounting plate. Fixate fan and fan guard with four long screws (reference 5 image 11-24) 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 11-24) and cable clamp (reference 8 image 11-24) and mark the wire by attaching a green colored cable tie two centimeters from the plug (reference 9 image 11-24).
6. Install the fan assembly onto the projector chassis. Use a 3mm Allen wrench to fasten the three screws (reference 4 image 11-23).
7. Connect the wire of the fan with the Signal Backplane. (reference 2 image 11-22)

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 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 Blue channel?

1. Disconnect the wire (reference 1 image 11-25) of the fan from the Signal Backplane.

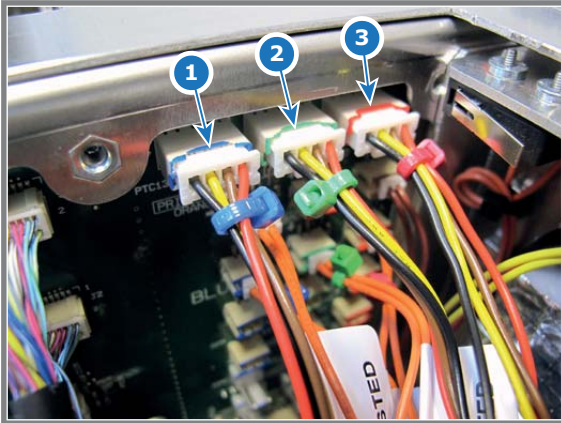


Image 11-25

2. Remove the fan assembly from the chassis. Use a 3mm Allen wrench to loosen the two fixation screws of the assembly (reference 4 image 11-26).

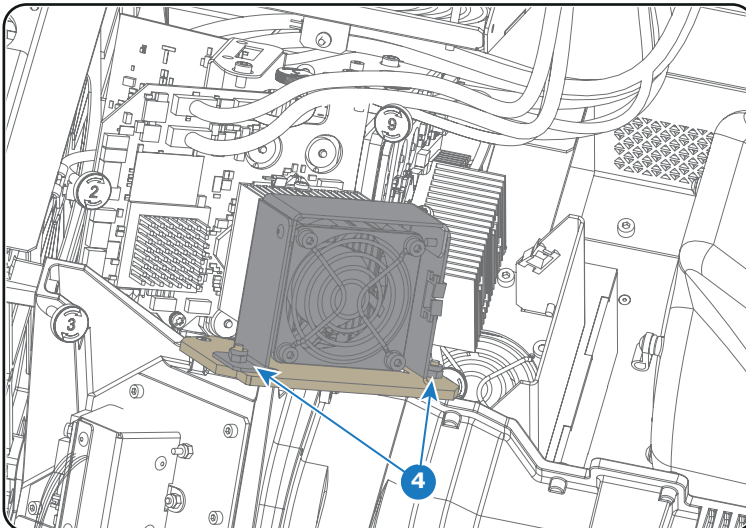
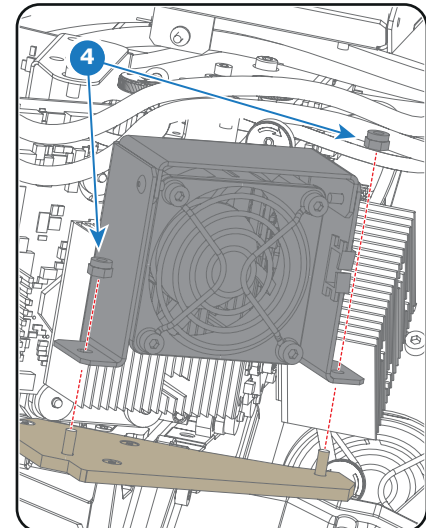


Image 11-26



3. Remove the fan from the assembly. Use a 3mm Allen wrench to loosen the four screws (reference 5 image 11-27) as illustrated.

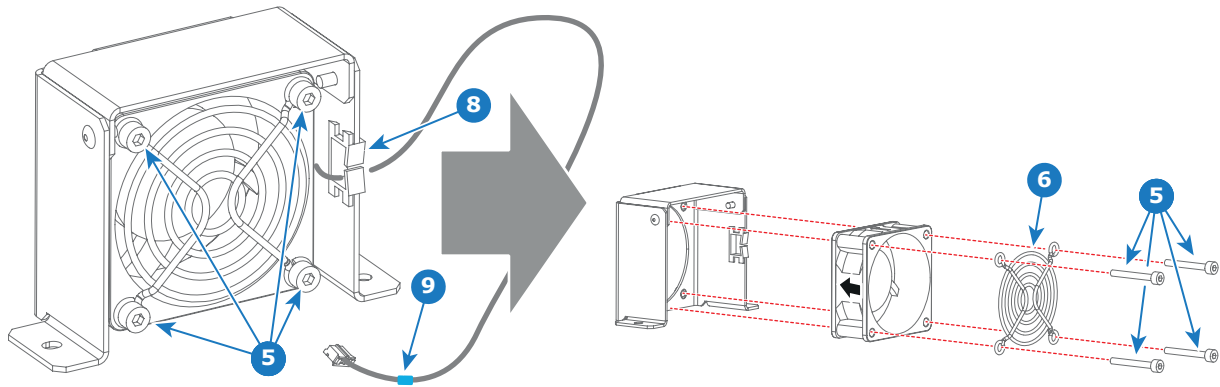


Image 11-27

4. Mount the new fan on the assembly as illustrated. Place the fan guard (reference 6 image 11-27) on top of the fan and fixate fan and fan guard with four long screws (reference 5 image 11-27) using a 3mm Allen wrench.
Caution: Ensure that the airflow of the fan is towards the heatsink of the Blue channel.
5. Guide the wire of the fan through the cable clamp (reference 8 image 11-27) and mark the wire by attaching a blue colored cable tie two centimeters from the plug (reference 9 image 11-27).
6. Install the fan assembly onto the projector chassis. Use a 3mm Allen wrench to fasten the two screws (reference 4 image 11-26).
7. Connect the wire of the fan with the blue marked socket on the Signal Backplane. (reference 1 image 11-25)

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 blue 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 blue.
 - 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 **blue**.
 - 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 **blue**.



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. Furthermore, this chapter includes the replacement procedure of the Fold Mirror, High Contrast Plate, Light Sensor, Notch Filter, and Light Pipe Lenses No1-2-3-4. Note that the service information about the Integration Rod is grouped in a separate chapter in this manual, see chapter "Integration Rod", page 221.

Overview

- Introduction Light Pipe
- Removal of the Light Pipe
- Removal of the Light Pipe cover plate
- Replacing Light Pipe lens No1 (focus lens)
- Replacing Light Pipe lens No2
- Replacing Light Pipe lens No3 (zoom lens)
- Replacing Light Pipe lens No4
- Cleaning the Light Pipe lenses
- Installing the Light Pipe cover plate
- Installing the Light Pipe
- Adjusting the Light Pipe lens No1 (focus lens)
- Adjusting the Light Pipe lens No3 (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 High Contrast plate
- Replacing the Light Sensor module (CLO)
- Replacement of the Light Pipe fan

12.1 Introduction Light Pipe

Light Pipe

The Light Pipe transforms the light emitted by the lamp into a homogeneous light beam and focuses this beam precisely on the active surface of the DMD's. The Light Pipe is mounted onto the Corner Block.

The Light Pipe itself contains the Integration Rod at the Light Pipe entrance, the Light Pipe lenses No1-2-3, the Notch Filter, and the High Contrast Plate. The Light Pipe can easily be removed from the Corner Block for servicing.

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 No4, 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

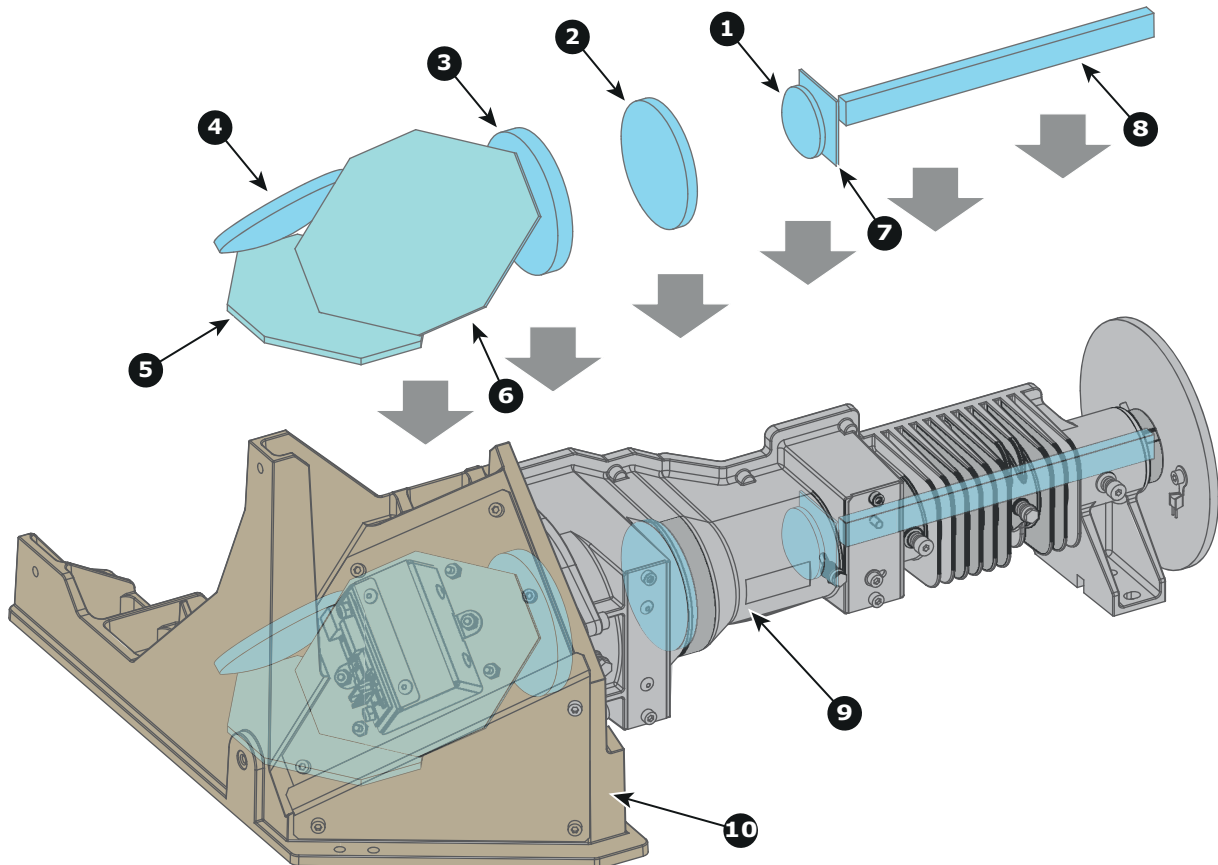


Image 12-1

- 1 Lens No1 (Light Pipe focus lens).
- 2 Lens No2 (diverging fixed lens).
- 3 Lens No3 (Light Pipe zoom lens).
- 4 Lens No4 (converging fixed lens).
- 5 Fixed Fold Mirror.
- 6 Adjustable Fold Mirror.
- 7 Notch Filter.
- 8 Integration Rod.
- 9 Light Pipe housing (removable).
- 10 Corner Block housing.

Light Pipe and Corner Block parts

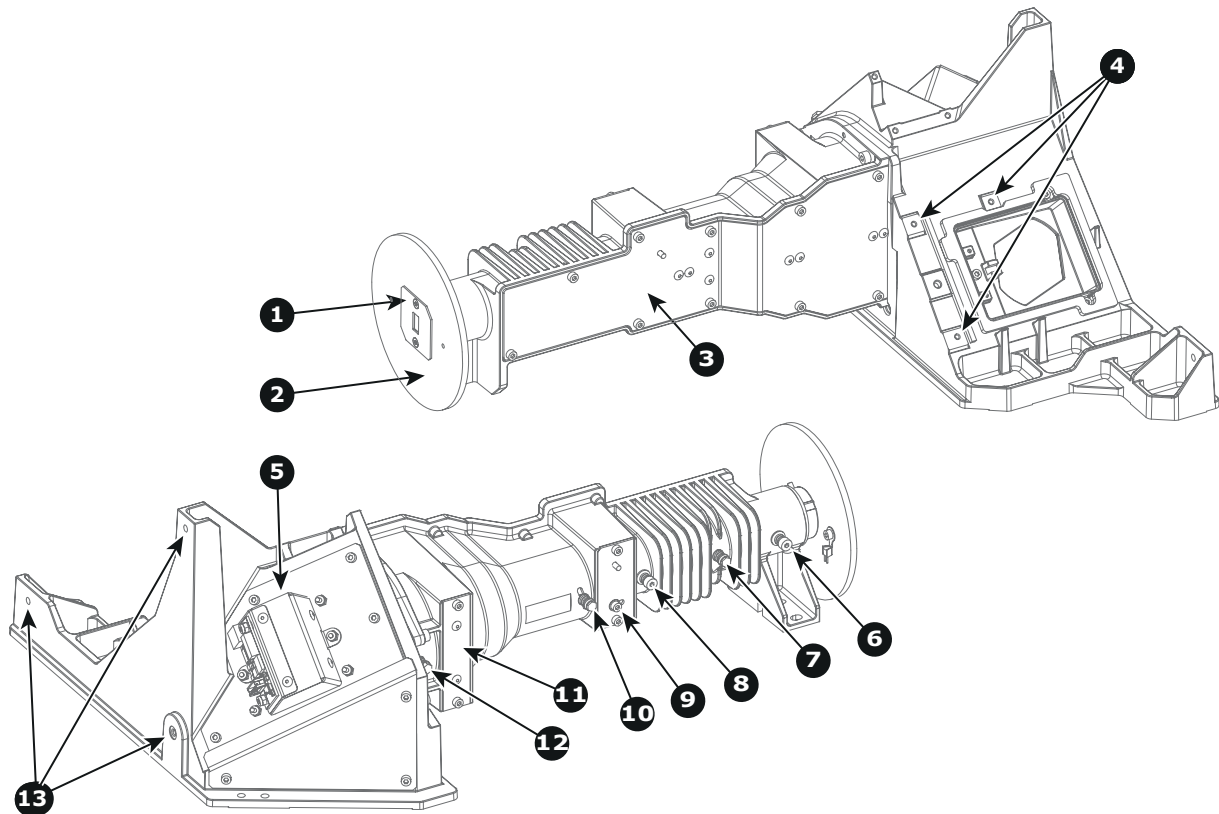


Image 12-2

- 1 Mask plate.
- 2 Heatsink (Rod entrance).
- 3 Cover plate of Light Pipe.
- 4 Fixation points for Light Processor.
- 5 Light sensor module.
- 6 Integration Rod fixation screw.
- 7 Integration Rod rotation adjustment screw.
- 8 Integration Rod fixation screw.
- 9 Notch Filter adjustment screw.
- 10 Light Pipe focus adjustment screw.
- 11 High contrast plate.
- 12 Light Pipe zoom adjustment screw.
- 13 Fixation points for Lens Holder.

12.2 Removal of the Light Pipe



To remove the Light Pipe from the corner block the left side cover of the projector and the side cover plate of the Light Processor compartment has to be removed. This procedure assumes that the cover and plate are already removed.

Necessary tools

3mm Allen wrench.

How to remove the Light Pipe from the corner block?

1. Disconnect the wire (reference 1 image 12-3) of the temperature sensor on the Light Pipe heatsink and release it from the cable clamp.

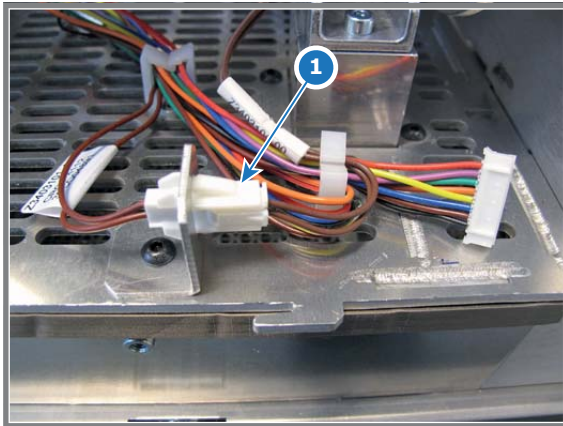


Image 12-3

2. Remove the five fixation screws (reference 2 image 12-4) of the Light Pipe. Use a 3mm Allen wrench.

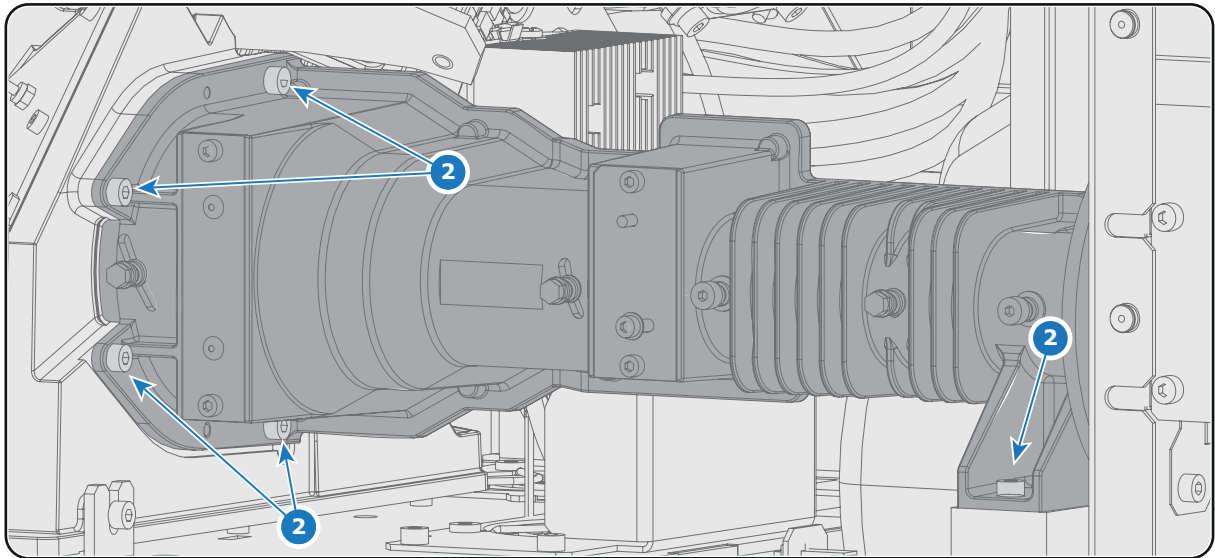


Image 12-4

3. Carefully move the Light Pipe one centimeter to the right and then move it gently away from the projector. Place the Light Pipe on a clean surface.

Caution: Do not bump (accidentally) with the lens (reference 3) of the Light Pipe against the projector chassis.

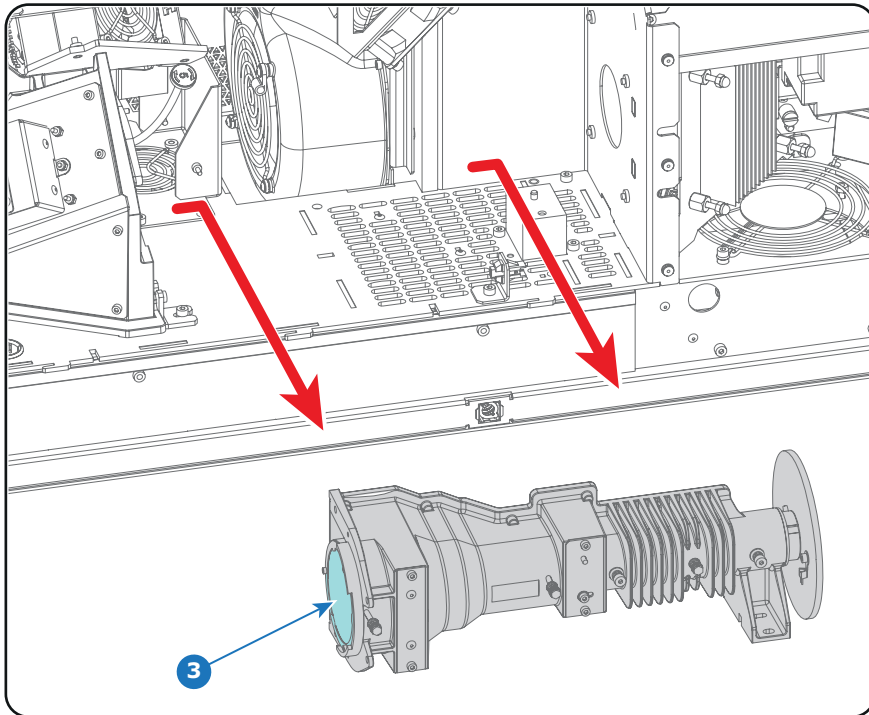


Image 12-5

12.3 Removal of the Light Pipe cover plate



This procedure assumes that the Light Pipe is removed from the Corner Block.



CAUTION: All servicing to the Light Pipe components has to be done in a dust free area.

Necessary tools

2.5mm Allen wrench.

How to remove the cover plate of the Light Pipe?

1. Remove the 10 screws (reference 1 image 12-6) from the cover plate. Use a 2.5mm Allen wrench.
2. Remove the cover plate from the Light Pipe housing.

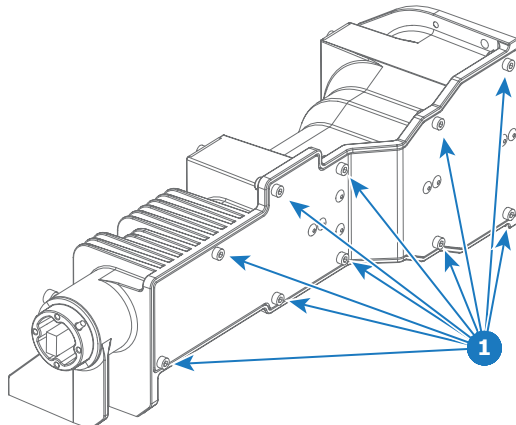
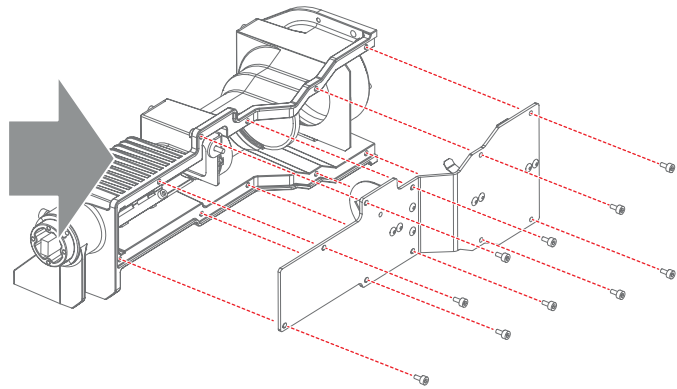


Image 12-6



12.4 Replacing Light Pipe lens No1 (focus lens)



To replace the Light Pipe lens No1 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)
- 5.5mm nut driver.
- 1.5mm Allen wrench.

How to replace the Light Pipe focus lens?

1. Open the Light Pipe housing. See procedure "Removal of the Light Pipe cover plate", page 196.
2. Remove the adjustment screw (reference 2 image 12-7) of the Light Pipe focus lens. Note that a spring and plain washer (reference 3 & 4 image 12-7) comes loose together with the adjustment screw. Use a 5.5mm nut driver.
3. Remove the lens container from the Light Pipe (reference 5 image 12-7).

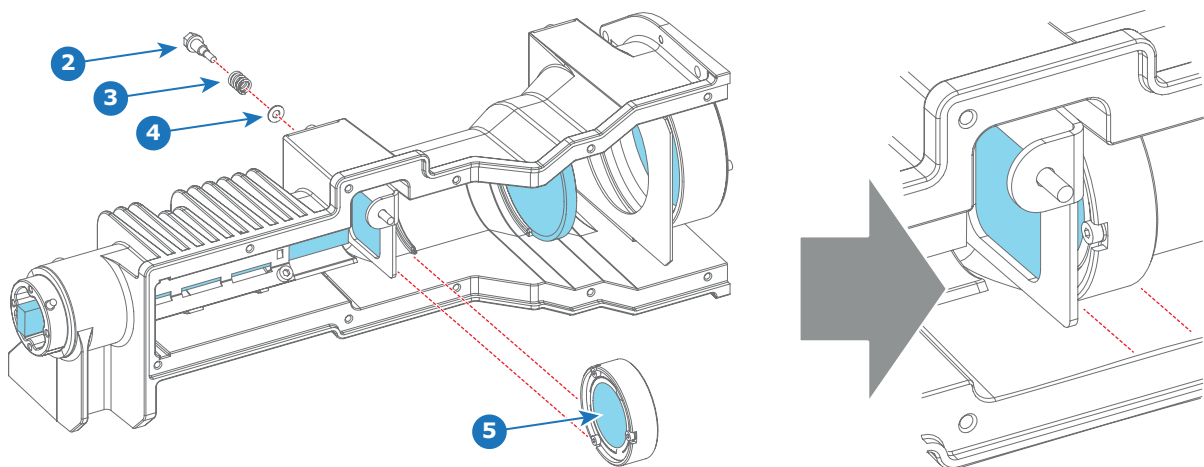


Image 12-7

4. Replace the focus lens (reference 7 image 12-7) from the container (reference 8 image 12-7) as illustrated. Use a 1.5mm 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 No1 (focus lens) is the smallest lens of the four Light Pipe lenses. Lens No1 has a diameter of 30mm.

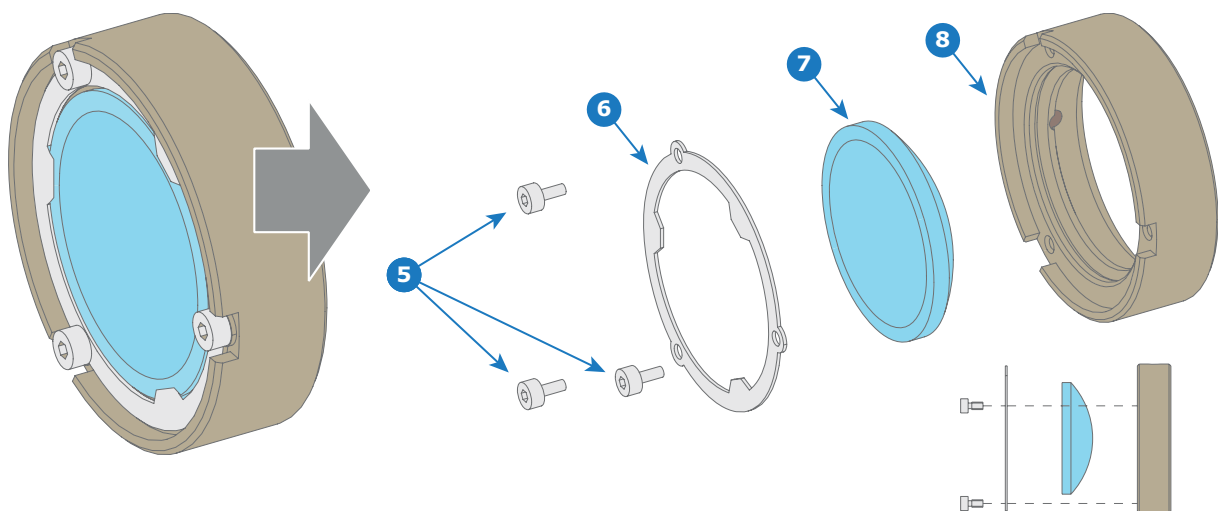


Image 12-8

5. Place the lens container back in the Light Pipe (reference 5 image 12-7). 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 2 image 12-7). Place a spring and a plain washer (reference 3 & 4 image 12-7) on the adjustment screw. Use a 5.5mm nut driver.
7. Close the Light Pipe housing. See procedure "Installing the Light Pipe cover plate", page 204.



The Light Pipe focus lens needs readjustment after replacement. See procedure "Adjusting the Light Pipe lens No1 (focus lens)", page 207.

12.5 Replacing Light Pipe lens No2



To replace the Light Pipe lens No2 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)

How to replace the Light Pipe lens No2?

1. Open the Light Pipe housing. See procedure "Removal of the Light Pipe cover plate", page 196.
2. Replace the Light Pipe lens No2 as illustrated (reference 2 image 12-9). 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.

Note: Light Pipe lens No2 is larger than lens No1 but smaller than Lens No3 and lens No4. . Lens No2 has a diameter of 54mm.

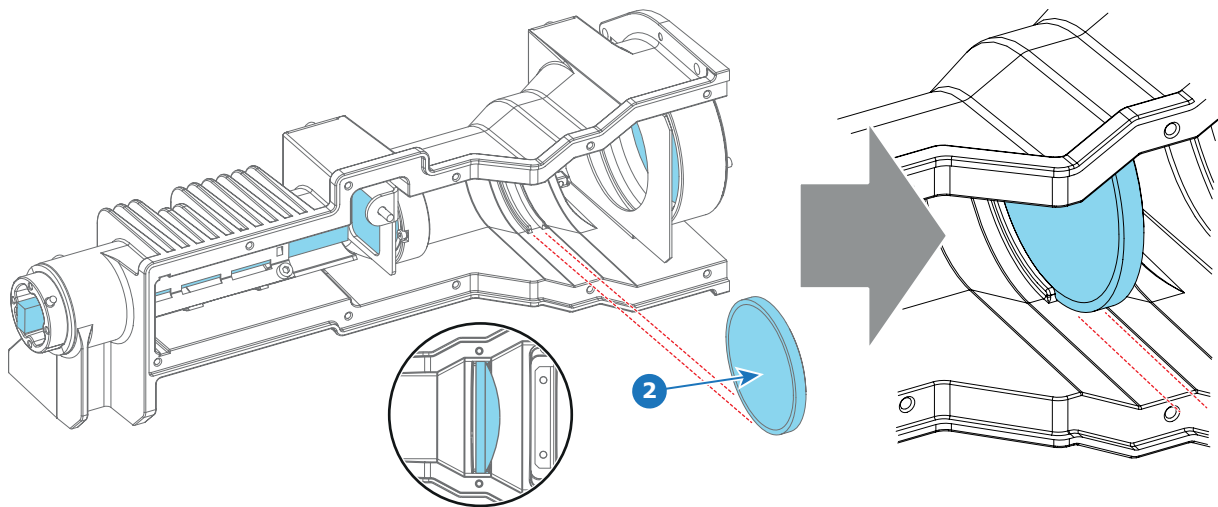


Image 12-9

3. Close the Light Pipe housing. See procedure "Installing the Light Pipe cover plate", page 204.

12.6 Replacing Light Pipe lens No3 (zoom lens)



To replace the Light Pipe lens No3 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)
- 5.5mm nut driver.
- 1.5mm Allen wrench.

How to replace the Light Pipe zoom lens?

1. Open the Light Pipe housing. See procedure "Removal of the Light Pipe cover plate", page 196.
2. Remove the adjustment screw (reference 5 image 12-10) of the Light Pipe zoom lens. Note that a spring and plain washer (reference 4 & 3 image 12-10) comes loose together with the adjustment screw. Use a 5.5mm nut driver.
3. Remove the lens container from the Light Pipe (reference 5 image 12-10).

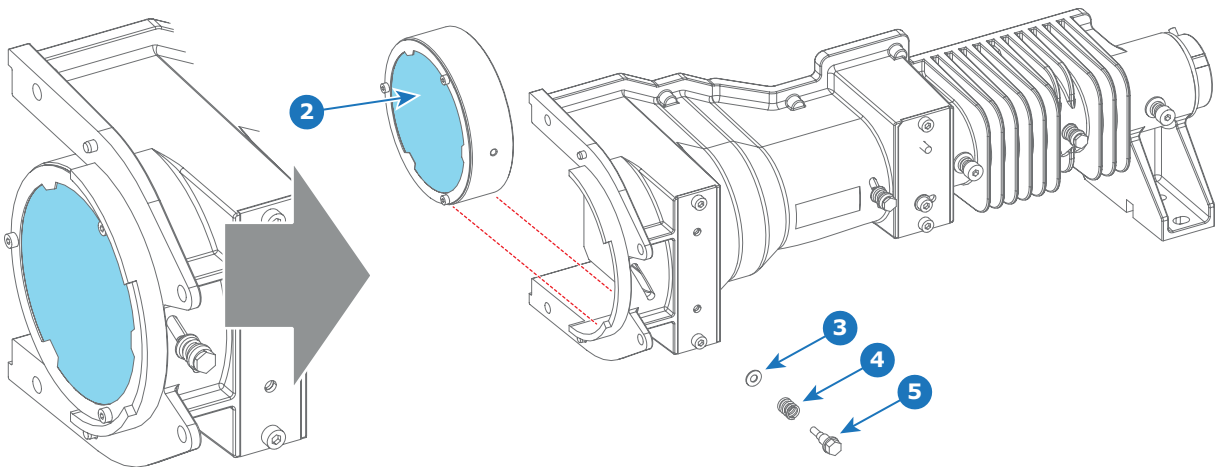


Image 12-10

4. Replace the zoom lens (reference 7 image 12-11) from the container (reference 8 image 12-11) as illustrated. Use a 1.5mm 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.

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.

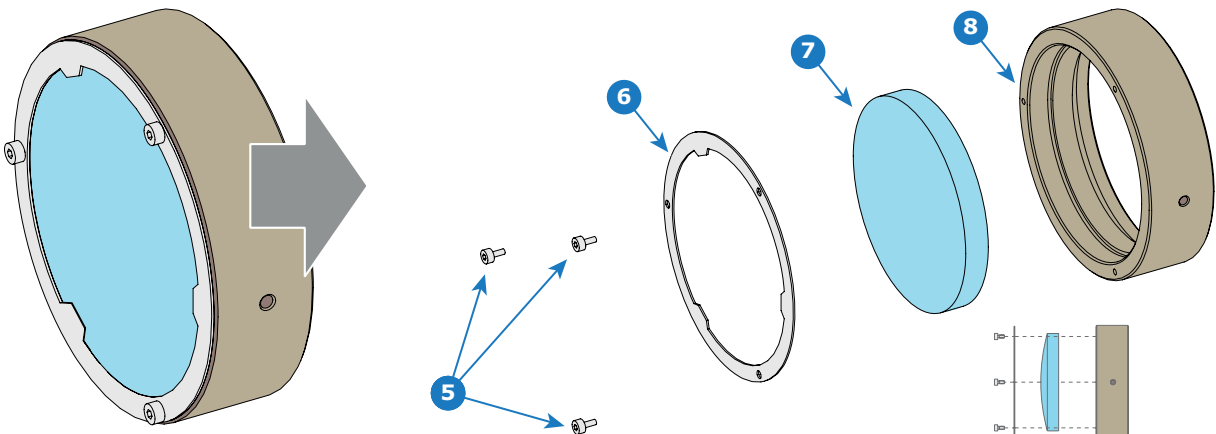


Image 12-11

5. Place the lens container back in the Light Pipe (reference 2 image 12-10). Ensure that the flat side of the lens faces the Integration Rod (convex side towards Folding Mirror).
6. Secure the lens container with the adjustment screw (reference 5 image 12-10). Place a spring and a plain washer (reference 4 & 3 image 12-10) on the adjustment screw. Use a 5.5mm nut driver.
7. Close the Light Pipe housing. See procedure "Installing the Light Pipe cover plate", page 204.



The Light Pipe zoom lens needs readjustment after replacement. See procedure "Adjusting the Light Pipe lens No3 (zoom lens)", page 208

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 12-12) of the lens container. Use a 2.5mm Allen wrench.
2. Remove the lens container from the Corner Block as illustrated in image 12-12.

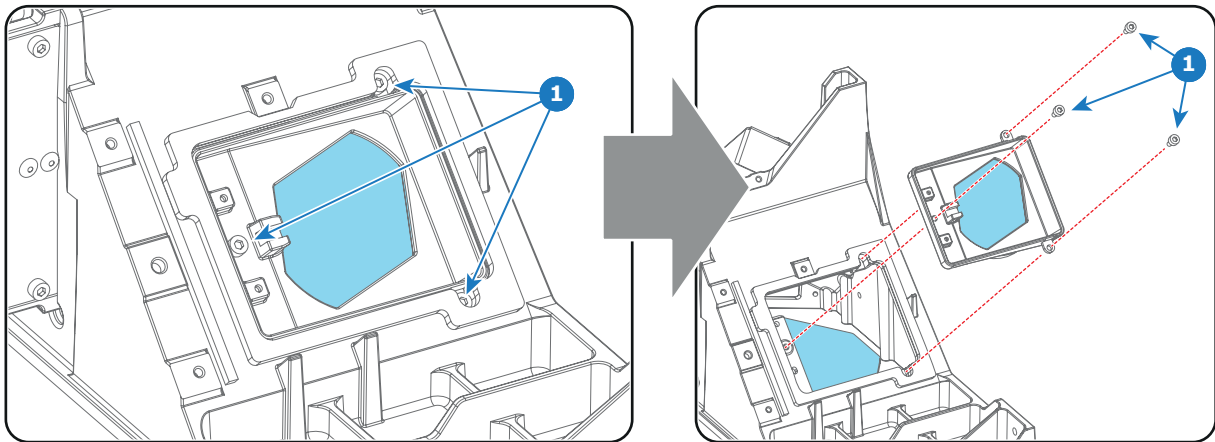


Image 12-12

3. Remove the lens (reference 4 image 12-13) from the container (reference 5 image 12-13) as illustrated. Use a 1.5mm Allen wrench to loosen the four lens fixation screws (reference 2 image 12-13).

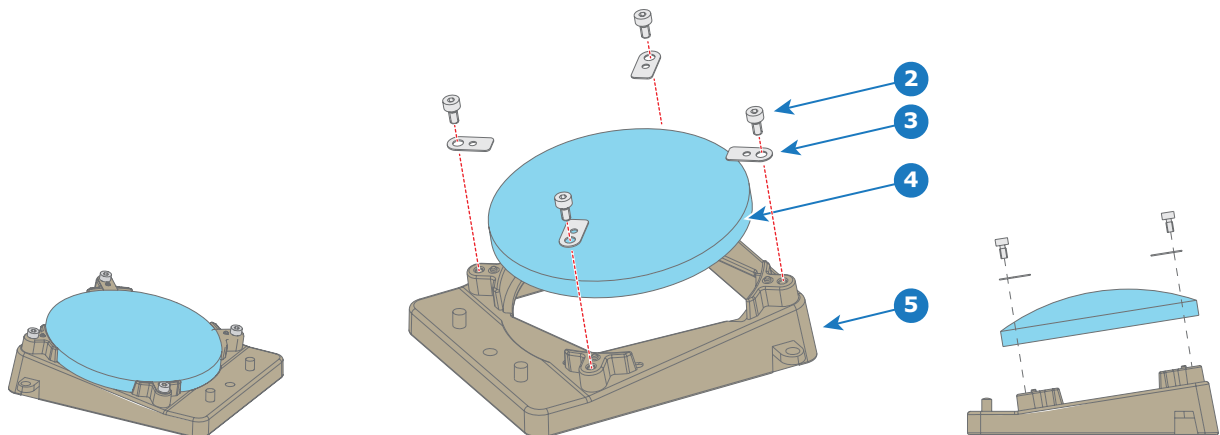


Image 12-13

4. Install the new lens No4 (reference 4 image 12-13) in the container (reference 5 image 12-13) as illustrated. Secure the lens with small brackets and four screws (reference 3 & 2 image 12-13) 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 12-12.
6. Fasten the lens container with three fixation screws (reference 1 image 12-12). 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 Installing the Light Pipe cover plate

Necessary tools

2.5mm Allen wrench.

How to install the cover plate of the Light Pipe?

1. Place the cover plate on the Light Pipe housing.
2. Fasten the cover plate with 10 screws (reference 1 image 12-14) as illustrated. Use a 2.5mm Allen wrench.

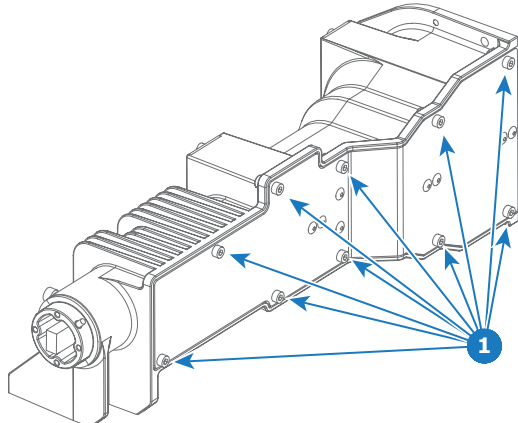
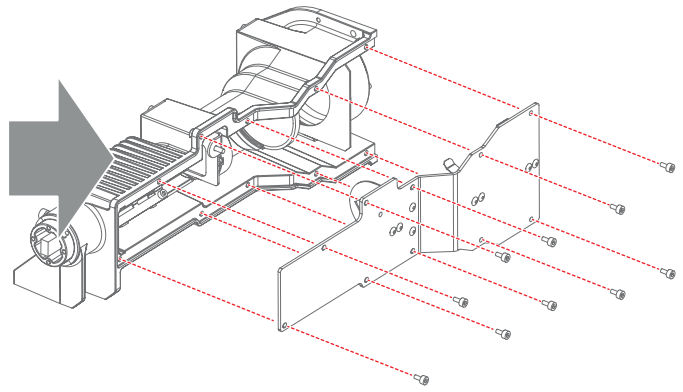


Image 12-14



12.10 Installing the Light Pipe

Necessary tools

3mm Allen wrench.

How to install the Light Pipe onto the corner block?

1. Carefully insert the Light Pipe into the compartment and engage the Light Pipe in the corner block.

Caution: Do not bump (accidentally) with the lens (reference 3 image 12-15) of the Light Pipe against the projector chassis.

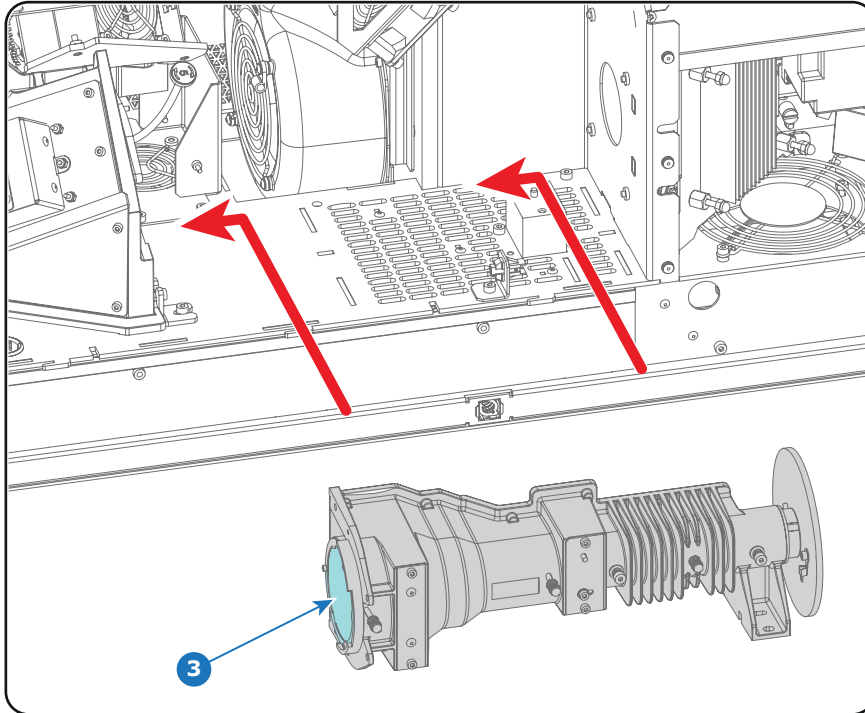


Image 12-15

2. Fixate the Light Pipe with five screws (reference 2 image 12-16). Use a 3mm Allen wrench.

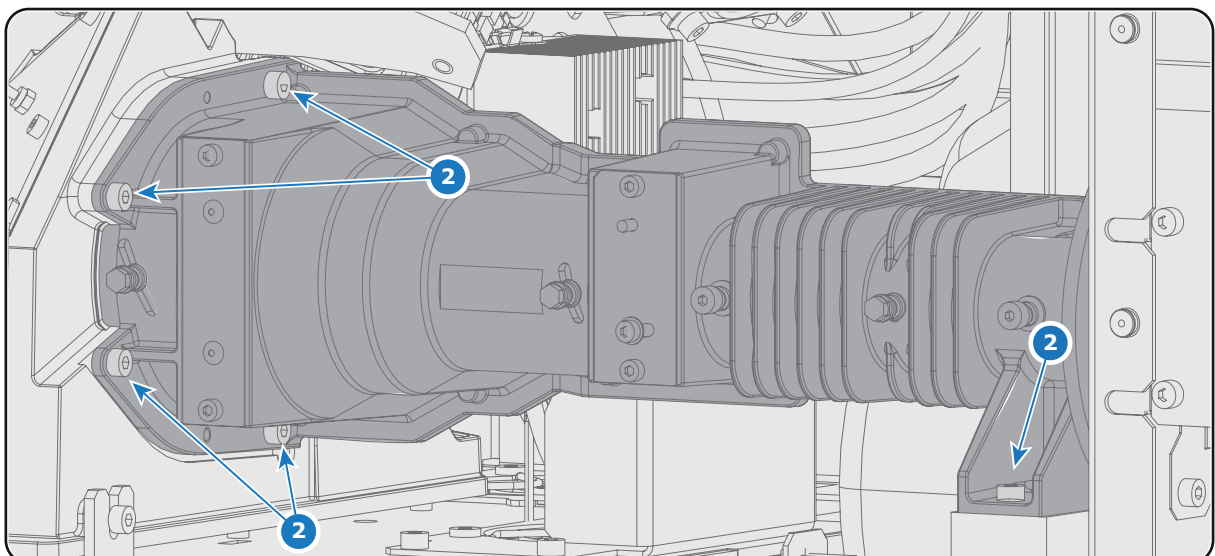


Image 12-16

3. Connect the wire (reference 1 image 12-17) of the temperature sensor.

12. Light Pipe

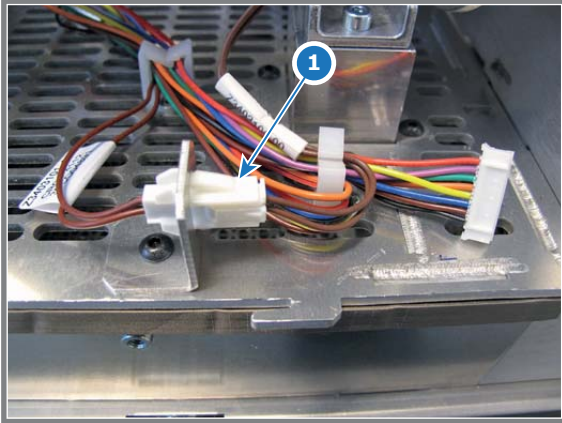


Image 12-17

12.11 Adjusting the Light Pipe lens No1 (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

5.5mm nut driver.

How to adjust the Light Pipe focus lens?

1. Loosen the adjustment screw of the focus lens (reference 2 image 12-18) a few turns. Use a 5.5mm nut driver. 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 5.5mm nut driver 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 12-18) of the Light Pipe focus lens **UP** or **DOWN** into a position which projects the sharpest possible edges on the screen (**FOCUS**). Use a 5.5mm nut driver 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 5.5mm nut driver for moving the Integration Rod.*

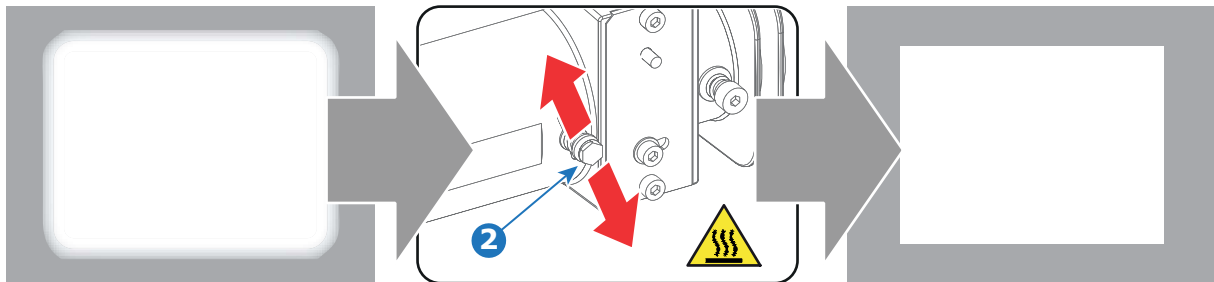


Image 12-18

6. Fasten the adjustment screw (reference 1 image 13-9) which you released in step 1. Use a 5.5mm Allen wrench.



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 No3 (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

5.5mm nut driver.

How to adjust the Light Pipe zoom lens?

1. Loosen the adjustment screw of the Light Pipe zoom lens (reference 5 image 12-18) a few turns. Use a 5.5mm nut driver. 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 5.5mm nut driver 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 5.5mm nut driver as an extension bar of the adjustment screw. This allows a more precise adjustment.

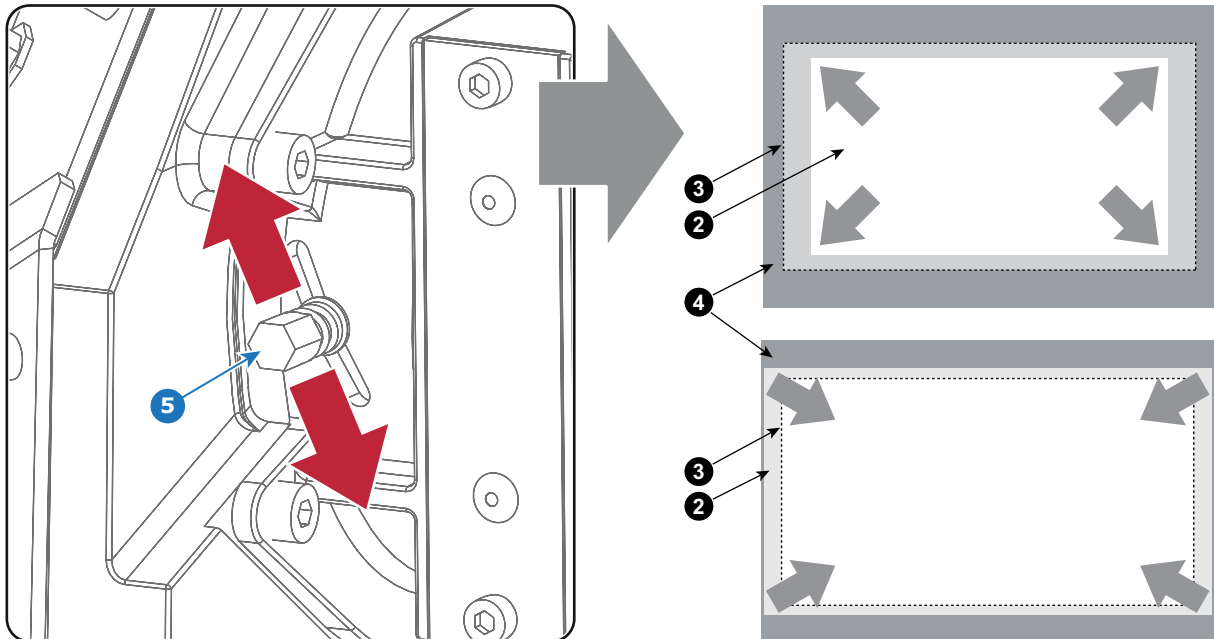


Image 12-19

Warning: The adjustment screw of the Light Pipe focus lens is hot. To prevent burn injuries use 5.5mm nut driver for moving the Integration Rod.

6. Fasten the adjustment screw (reference 5 image 13-9) which you released in step 1. Use a 5.5mm Allen wrench.

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 12-20) as illustrated. Use for that a 2.5mm Allen wrench.

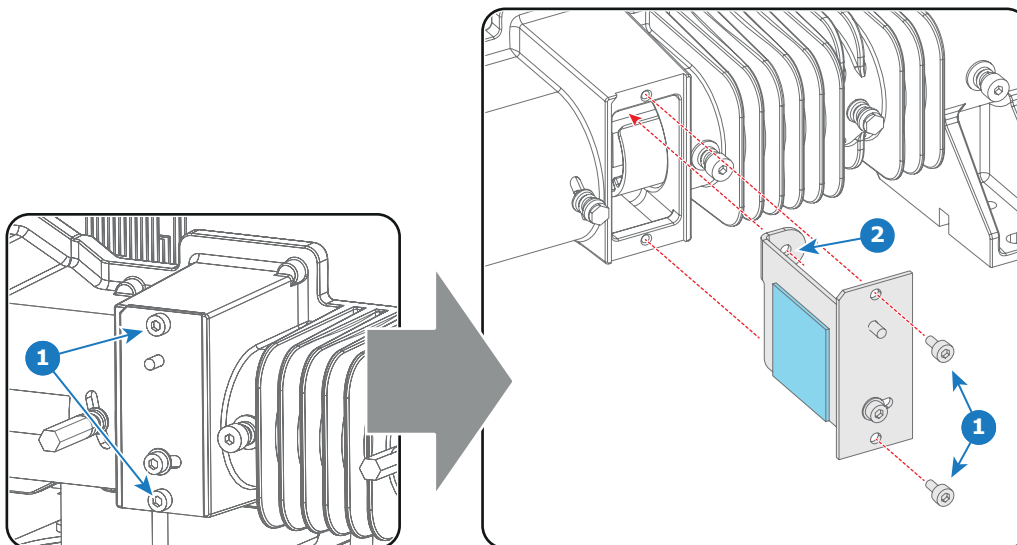


Image 12-20

2. Insert a new Notch Filter. Note that the Notch Filter has a mounting hole (reference 2 image 12-20) 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 212.

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 12-20). Use for that a 2.5mm Allen wrench.
4. Readjust the Notch Filter. See procedure "Adjusting the Notch Filter", page 210.

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 xenon lamp 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.

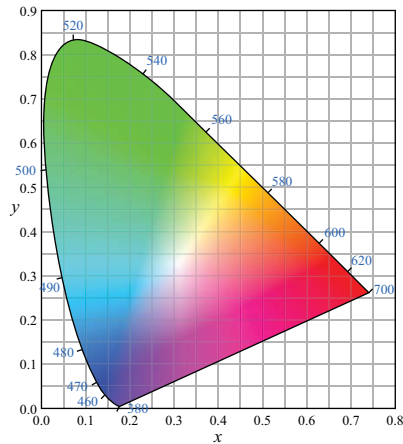


Image 12-21
Color triangle.

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 – 0.8



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 12-22) of the Notch Filter a few turns. Use for that a 2.5mm Allen wrench.

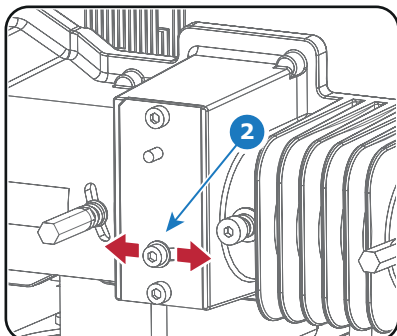


Image 12-22

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 image 12-22) 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 image 12-22) 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 12-22) to secure the position of the Notch Filter. Use for that 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 12-23 or image 12-24) of the Light Sensor module.

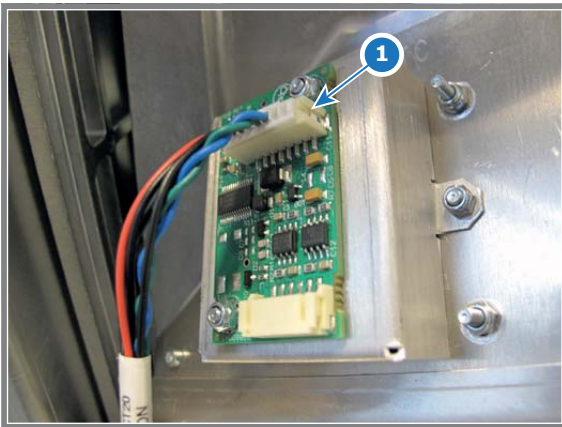


Image 12-23
Type "A" Light Sensor.



Image 12-24
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 12-25).

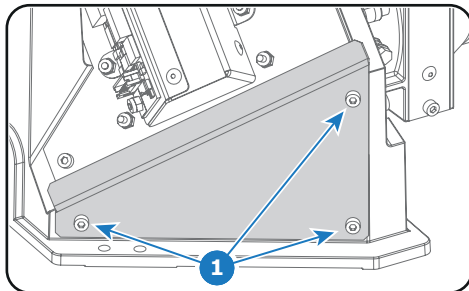
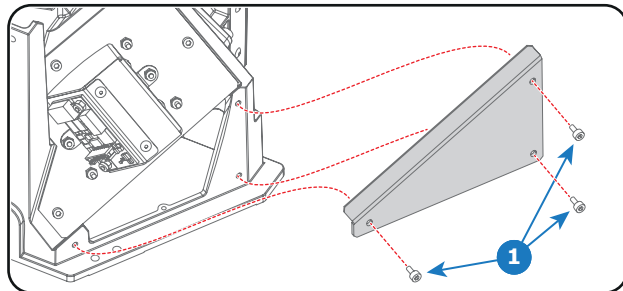


Image 12-25



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 12-26).

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

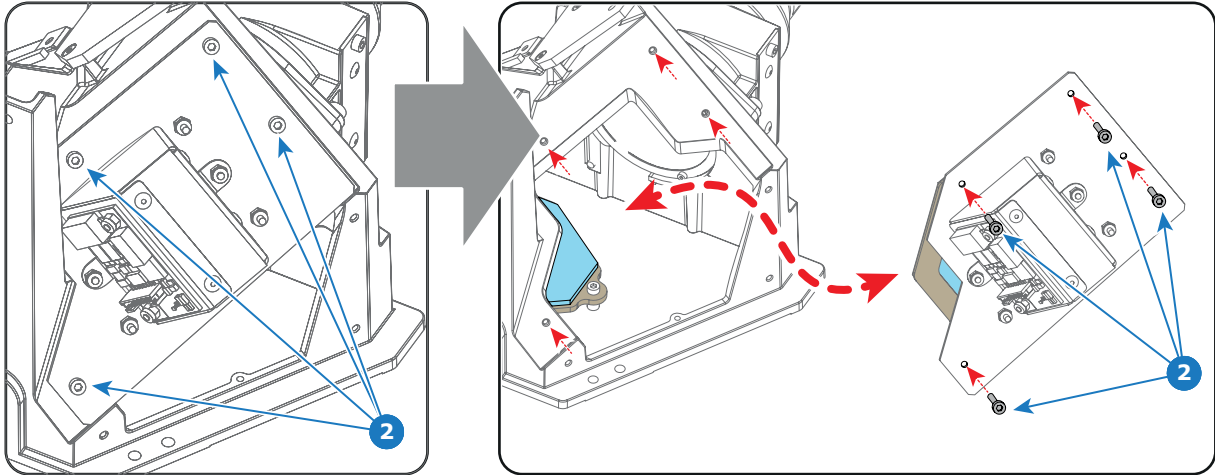


Image 12-26

- 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 12-27).

Note: To access the two fixation screws with reference 3 in image 12-27 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.

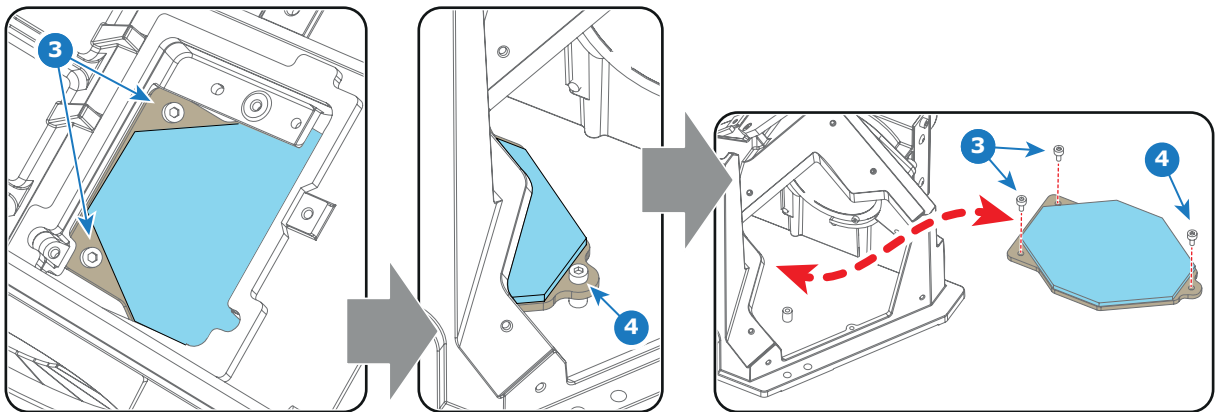


Image 12-27

- 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 12-28). Reuse the three springs (reference 7 image 12-28) and the three plain washers (reference 6 image 12-28) 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.

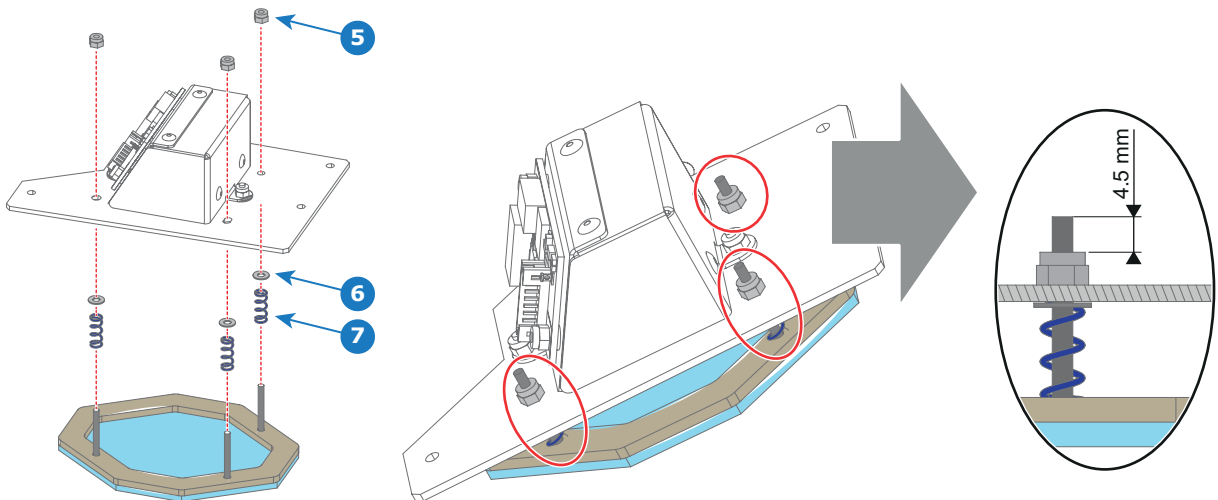


Image 12-28

- 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 12-28.

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 12-26).
8. Install the side cover plate of the Corner Block. Use a 2.5mm Allen wrench to fasten the three screws (reference 1 image 12-25).
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.

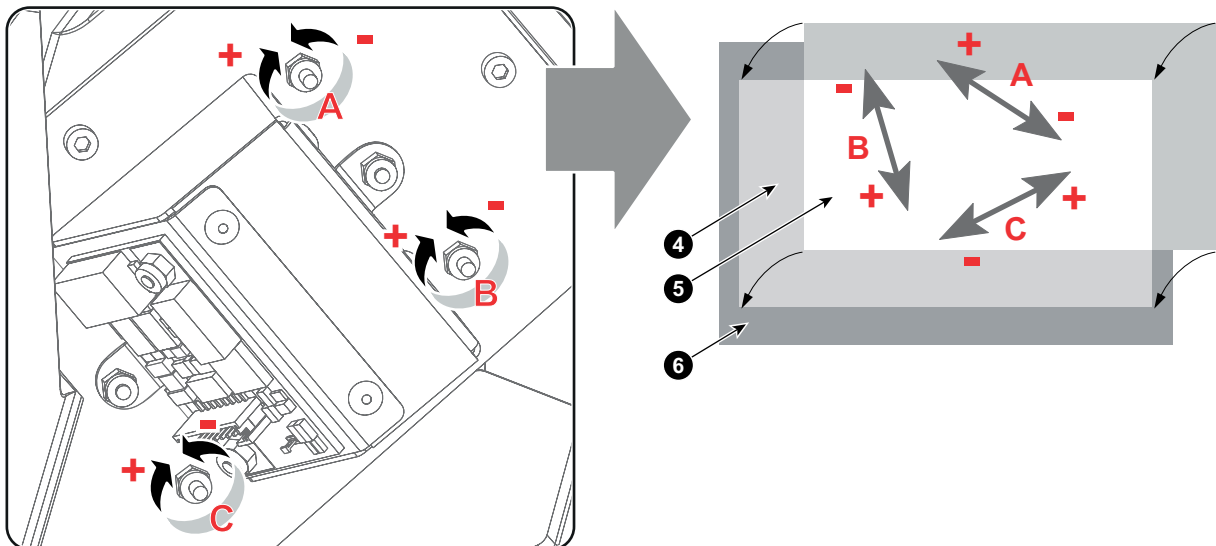


Image 12-29



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 High Contrast plate

Necessary tools

2.5mm Allen wrench.

How to replace the High Contrast plate?

1. Remove the two fixation screws of the High Contrast plate (reference 1 image 12-30). Use a 2.5mm Allen wrench.
2. Remove the High Contrast plate and insert the new one.
3. Fasten the High Contrast plate with two screws (reference 1 image 12-30). Use a 2.5mm Allen wrench.

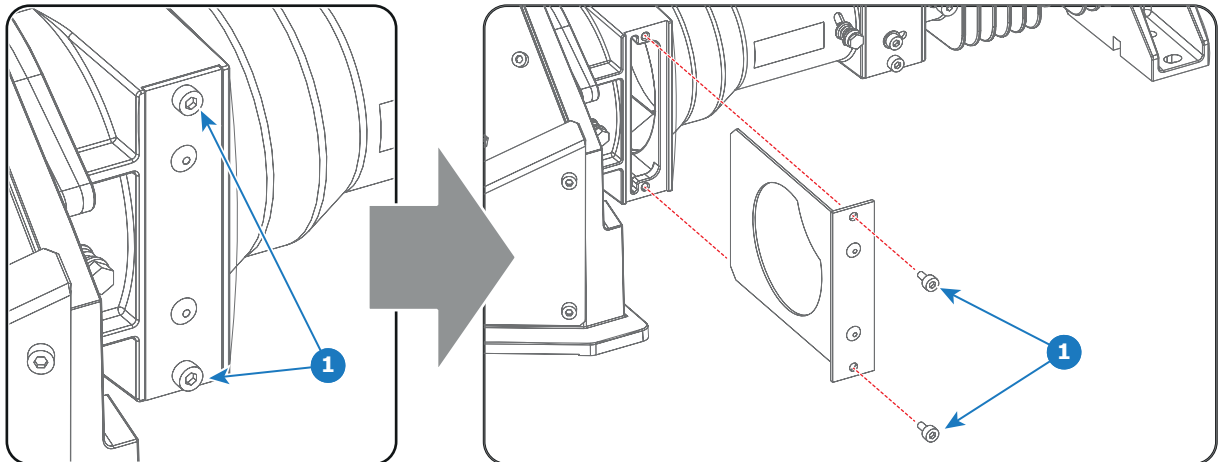


Image 12-30

12.20 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.

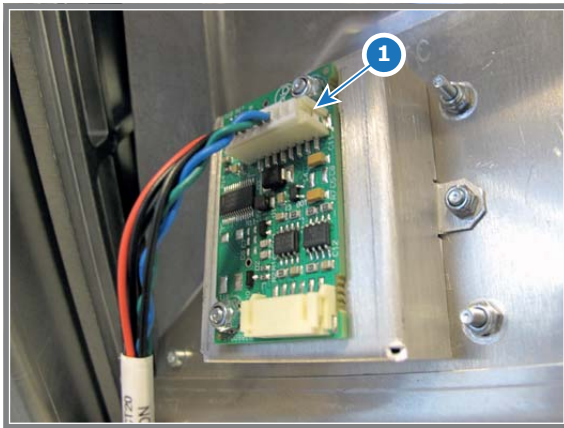


Image 12-31
Type "A" Light Sensor.

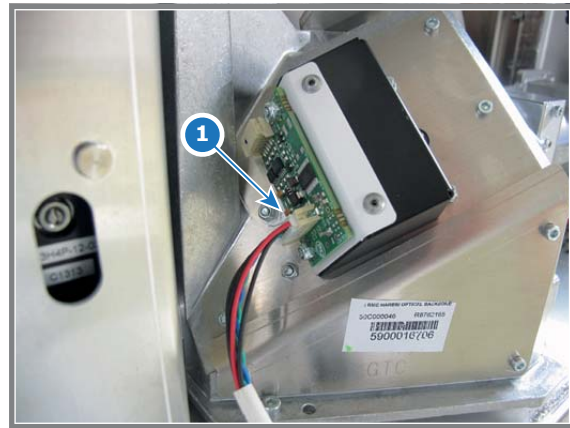


Image 12-32
Type "B" Light Sensor.

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.

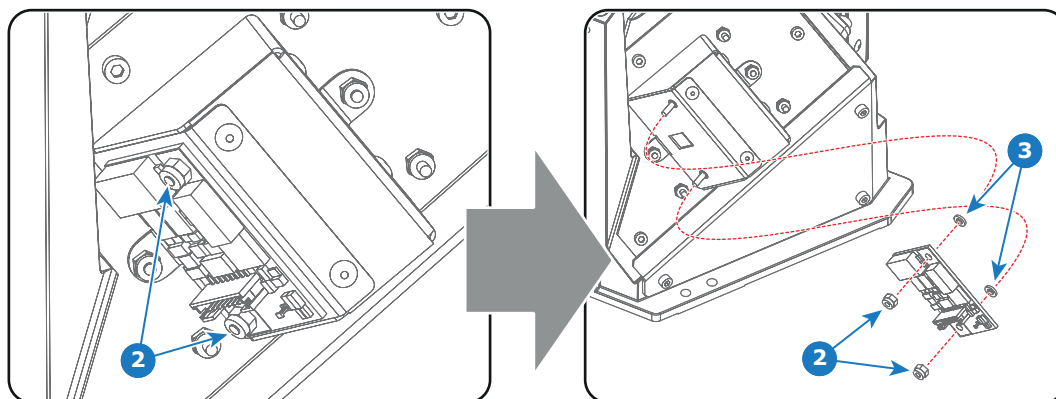


Image 12-33

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.

12.21 Replacement of the Light Pipe fan



To access the fan of the Light Pipe in the Light Processor compartment the left side projector cover and the side cover plate of the Light Processor compartment has to be removed. This procedure assumes that these components are already removed from the projector.

Necessary tools

3mm Allen wrench.

How to replace the fan of the Light Pipe?

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

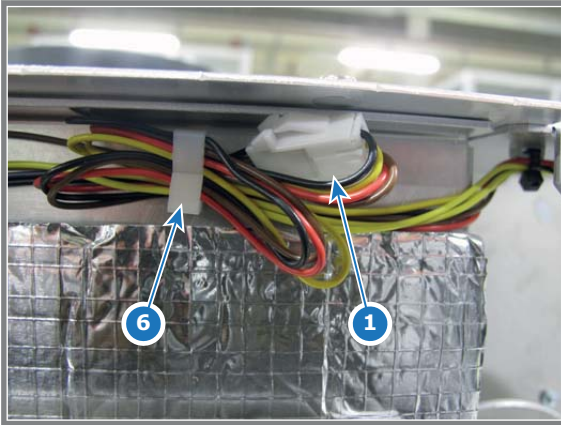


Image 12-34

2. Remove the fan from the chassis. Use a 3mm Allen wrench to loosen the four fixation screws of the fan (reference 3 image 12-35).
3. Install the new fan as illustrated. Place a fan guard (reference 4 image 12-35) at both sides of the fan (reference 5 image 12-35). Fixate fan and fan guards with four long screws (reference 3 image 12-35) using a 3mm Allen wrench.

Caution: Ensure that the airflow of the fan is towards the Light Pipe.

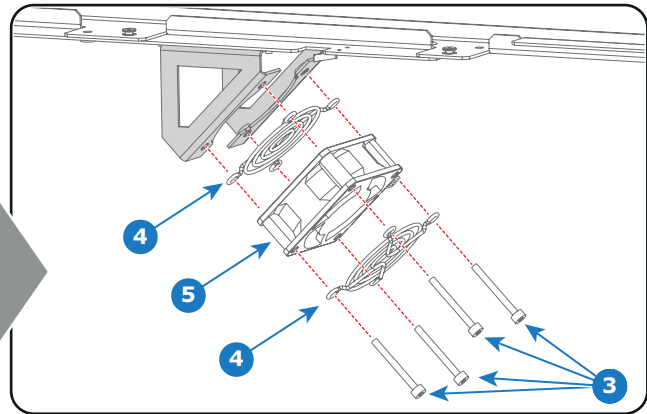
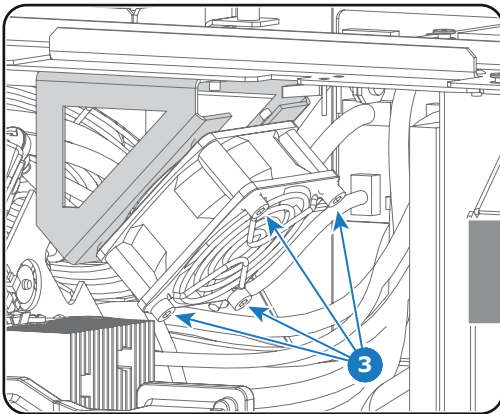


Image 12-35

4. Connect the wire of the fan. (reference 1 image 12-34)
5. Guide wire of the fan through the cable clamp (reference 6 image 12-34).

13. INTEGRATION ROD

About this chapter

This chapter describes briefly the functionality of the Integration Rod, how to diagnose the Integration Rod, how to replace the Integration Rod and how to adjust the Integration Rod.

Overview

- Introduction of the Integration Rod
- Integration Rod diagnostic
- Removal of the Mask plate and Rod heatsink
- Replacing the Integration Rod
- Installing the Mask plate and Rod heatsink
- Adjusting the Integration Rod

13.1 Introduction of the Integration Rod

Functionality of the Integration Rod

The Integration Rod is made of fused silica and is approximately 14 centimeter long. The cross-section of the rod has the same aspect ratio as the active surface of the DMD's used in the Light Processor. The function of the Integration Rod is to match the shape of the light path to the shape of the DMD's and to neutralize the hot spot effect caused by the light source.

The Integration Rod is located at the entrance of the Light Pipe. The light emitted by the lamp is reflected via the Cold Mirror into the rod, which integrates the incoming light into a homogeneous rectangle shaped beam of light.

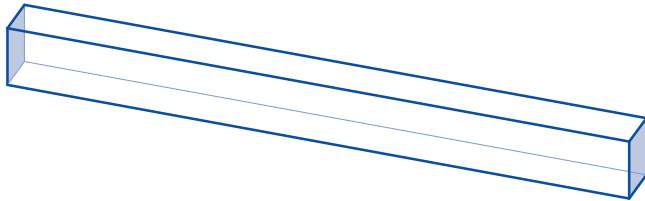


Image 13-1

The entrance and exit side of the Integration Rod are coated to achieve optimal performance. Clearly the rod may never be contaminated with grease, dirt, liquid or the such. For optimal protection the rod is mounted on an aluminium rod holder, which requires replacing together with the rod. The Integration Rod and the aluminium rod holder together form the "Integration Rod assembly".

Parts Integration Rod assembly

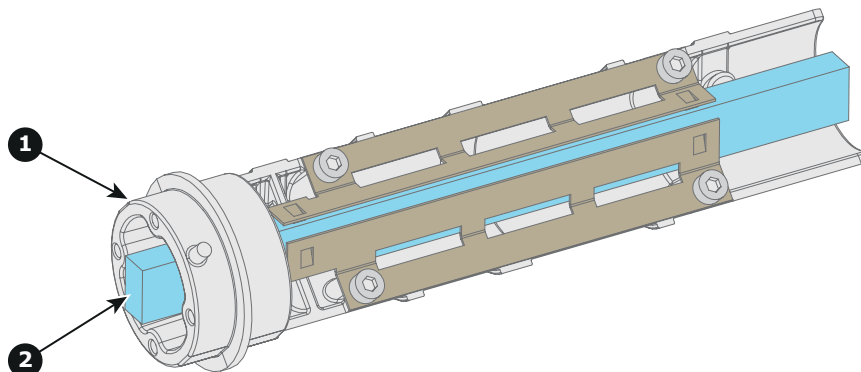


Image 13-2

- 1 Integration Rod housing.
- 2 Integration Rod (entrance side).



CAUTION: Never touch the entrance or exit of the Integration Rod assembly. Greasy fingerprints or other dirt on the Integration Rod entrance or exit will burn into the rod and cause permanent damage.

13.2 Integration Rod diagnostic

General

Due to bad environmental conditions the Integration Rod may become contaminated with grease, dust, dirt or other particles, which will burn into the rod and cause permanent damage. As a result spots may become visible in the projected image on the screen. To confirm that these spots are caused by a damages to the rod please diagnose the rod as described in the following procedure.

Necessary tools

- 7mm flat screw driver.
- 3mm Allen wrench.
- 5.5mm nut driver.

How to diagnose the Integration Rod of the projector?

1. Remove the left cover of the projector and the side cover plate of the Light Processor compartment.
2. Switch on the projector and project a white test pattern. See user manual of the projector to do so. Make sure that the projected white test pattern is focused.
3. Loosen the adjustment screw (reference 1 image 13-3) a few turns. Use a 5.5mm nut driver. Do not remove the adjustment screw.
4. Gently move the adjustment screw of the Integration Rod assembly up and down while watching the projected image.

Warning: The adjustment screw of the Integration Rod is hot. To prevent burn injuries use 5.5mm nut driver for moving the Integration Rod.

Caution: Maximum ten (10) seconds are allowed of minimum light output on a non-adjusted Integration Rod. Otherwise, the DMD's may be damaged.

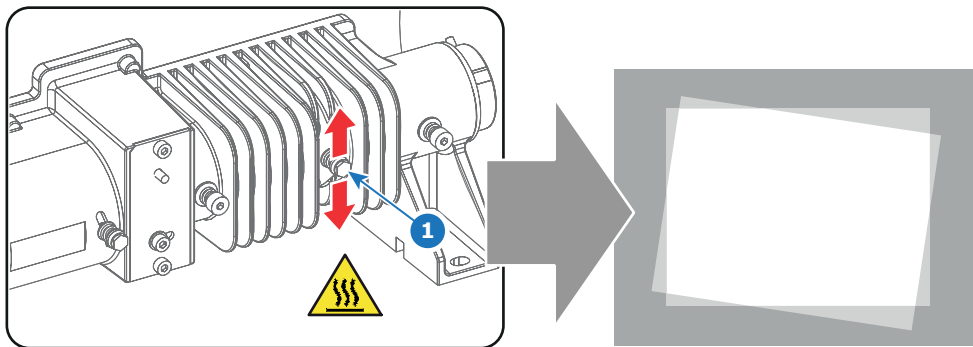


Image 13-3

5. Do you see spots in the projected image rotate along with the movements of the Integration Rod?
 If yes, these spots are caused by damages to the Integration Rod. Replace the Integration Rod assembly.
 If no, Integration Rod is OK. Re-adjust and secure the Integration Rod and reinstall the side cover plate and projector cover.

13.3 Removal of the Mask plate and Rod heatsink



This procedure assumes that the Light Pipe is removed from the projector.



CAUTION: Take into account that the Mask plate and Rod heatsink are mounted very close to the Rod entrance. The Rod is extremely fragile! Avoid touching the Rod at all times. An minor collision is sufficient to cause irreversible damage to the Rod.

Necessary tools

- TX10 Torx driver.
- Cotton gloves.
- 2.5mm Allen wrench.

How to remove the Mask plate and Rod heatsink from the Light Pipe entrance?

1. Remove the two fixation screws (reference 4 image 13-4) of the Mask plate (reference 5 image 13-4). Hold the Mask plate into position. Use a TX10 Torx driver.
Note: The Mask plate of the DP2K S series digital projector has to be reused when installing the 3D color wheel.
Tip: Wear cotton gloves to prevent fingerprints on the Mask plate.
2. Remove the Mask plate (reference 5 image 13-4).
Caution: Ensure that the Mask plate does NOT touches the Rod!
3. Remove the two fixation screws (reference 6 image 13-4) of the Rod heatsink (reference 7 image 13-4). Use a TX10 Torx driver.
Caution: Ensure that the Rod heatsink does NOT touches the Rod!
4. Remove the Rod heatsink (reference 7 image 13-4).
Note: The temperature sensor mounted on the Rod heatsink has to be reused when installing the 3D color wheel. Use a 2.5mm Allen wrench to remove the temperature sensor from the Rod heatsink.

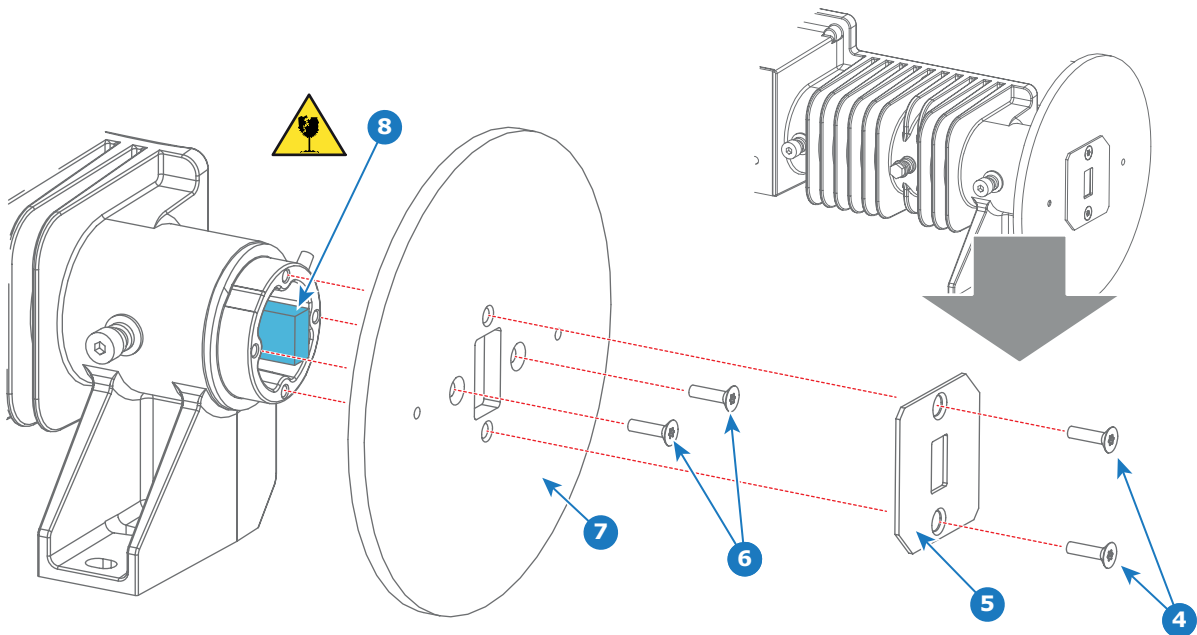


Image 13-4

13.4 Replacing the Integration Rod



To replace the Integration Rod 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.
- 2.5mm Allen wrench.
- 5.5mm nut driver.

How to replace the Integration Rod?

1. Remove the Mask plate and Rod heatsink. See procedure "Removal of the Mask plate and Rod heatsink", page 224.
2. Remove the two fixation screws (reference 1 image 13-5) of the Integration Rod. Note that a plain washer and spring (reference 2 & 3 image 13-5) comes loose together with the fixation screw. Use a 2.5mm Allen wrench.
3. Remove the adjustment screw (reference 4 image 13-5) of the Integration Rod. Note that a plain washer and spring (reference 5 & 6 image 13-5) comes loose together with the adjustment screw. Use a 5.5mm nut driver.
4. Carefully slide the Integration Rod assembly (reference 7 image 13-5) out of the Light Pipe.

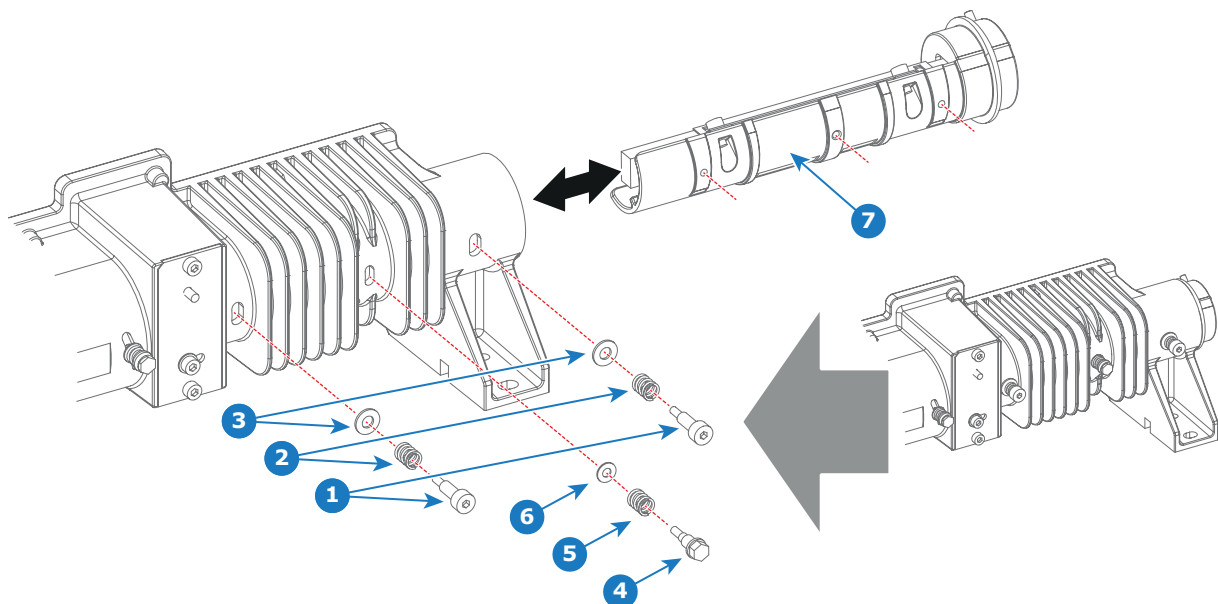


Image 13-5

5. Carefully slide the new Integration Rod assembly in the Light Pipe. Ensure that the three mounting holes of the Integration Rod assembly are oriented towards the three holes in the Light Pipe housing.

Caution: Wear cotton gloves and do not touch the glass of the Integration Rod. Furthermore, ensure that nothing hits accidentally the glass of the Integration Rod.

Note: The spare part Integration Rod assembly comes with a protective cap mounted on the Rod entrance side (reference 9 image 13-6). This protective cap remains until the Integration Rod assembly is fully installed.
6. Insert the two fixation screws (reference 1 image 13-5) of the Integration Rod as illustrated. Place a spring and a plain washer (reference 2 & 3 image 13-5) on each fixation screw. Use a 2.5mm Allen wrench.
7. Insert the adjustment screw (reference 4 image 13-5) of the Integration Rod. Place a spring and a plain washer (reference 5 & 6 image 13-5) on the adjustment screw. Use a 5.5mm nut driver.
8. Carefully remove the protective cap from the Integration Rod entrance. Use a 2.5mm Allen wrench.

13. Integration Rod

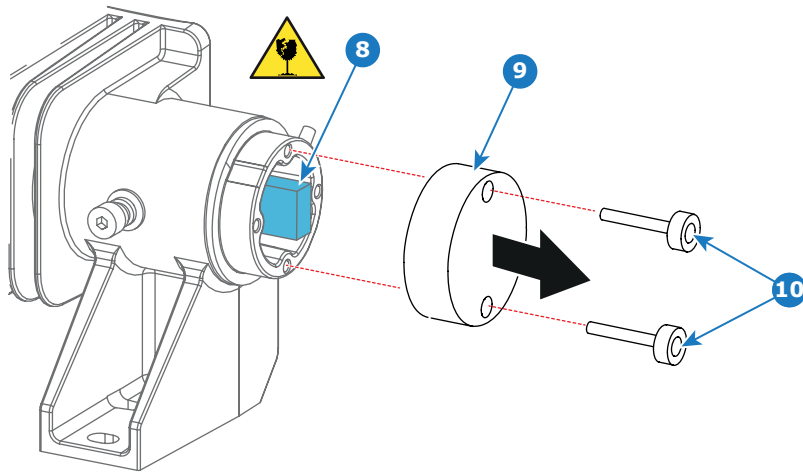


Image 13-6

9. Install the Mask plate and Rod heatsink. See procedure "Installing the Mask plate and Rod heatsink", page 227.



The Integration Rod has to be readjusted after replacement.

13.5 Installing the Mask plate and Rod heatsink



CAUTION: Take into account that the Mask plate and Rod heatsink are mounted very close to the Rod entrance. The Rod is extremely fragile! Avoid touching the Rod at all times. An minor collision is sufficient to cause irreversible damage to the Rod.

Necessary tools

- TX10 Torx driver.
- Cotton gloves.
- 3mm Allen wrench.

How to install the Mask plate and Rod heatsink onto the Light Pipe entrance?

1. Install the Rod heatsink as illustrated (reference 7 image 13-7). Fasten the Rod heatsink with two Torx **countersunk** head screws (reference 6 image 13-7). Use a TX10 Torx driver.

Note: The Rod heatsink is provided with a temperature sensor (reference 1). This temperature sensor must facing the Light Pipe as illustrated in image 13-8.

Caution: Ensure that the Rod heatsink does NOT touches the Rod!

Caution: Any contact with the integration rod may cause damage.

2. Install the Mask plate (reference 5 image 13-7) with the **shiny side facing outwards** as illustrated. Use the Mask plate with engraved number **R8761960**.. Fasten with two Torx **countersunk** head screws (reference 6 image 13-7). Use a TX10 Torx driver.

Caution: Ensure that the Mask plate does NOT touches the Rod!

Tip: Wear cotton gloves to prevent fingerprints on the Mask plate.

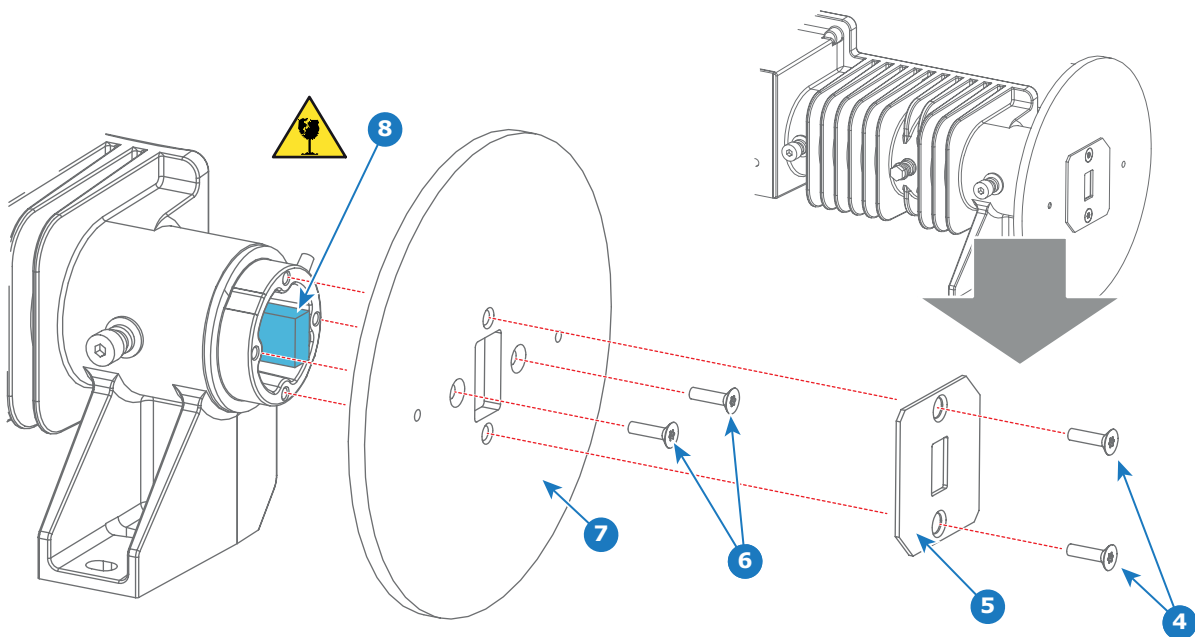


Image 13-7

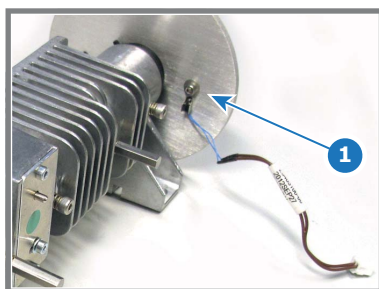


Image 13-8

13.6 Adjusting the Integration Rod



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



To adjust the Integration Rod the left cover of the projector and the side cover plate of the Light Processor compartment have to be removed.

Necessary tools

5.5mm nut driver.

How to adjust the Integration Rod of the projector?

1. Loosen the adjustment screw (reference 1 image 13-9) a few turns. Use a 5.5mm nut driver. 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 5.5mm nut driver within reach for the next steps.

Caution: Maximum ten (10) seconds are allowed of minimum light output on a non-adjusted Integration Rod. Otherwise, the DMD's may be damaged.

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 1 image 13-9) of the Integration Rod **UP** or **DOWN** until the projected light beam matches the projected outline of the DMD's (**ROTATION**). Use a 5.5mm nut driver as an extension bar of the adjustment screw. This allows a more precise adjustment.

Warning: The adjustment screw of the Integration Rod is hot. To prevent burn injuries use 5.5mm nut driver for moving the Integration Rod.

Note: No spots in the projected image may move along with the movements of the Integration Rod. Spots which move with the movements of the Integration Rod indicates that the exit side of the Integration Rod is contaminated with dust.

If this is the case, remove the Notch Filter and try to blow away the dust.

If this doesn't help replace the Integration Rod.

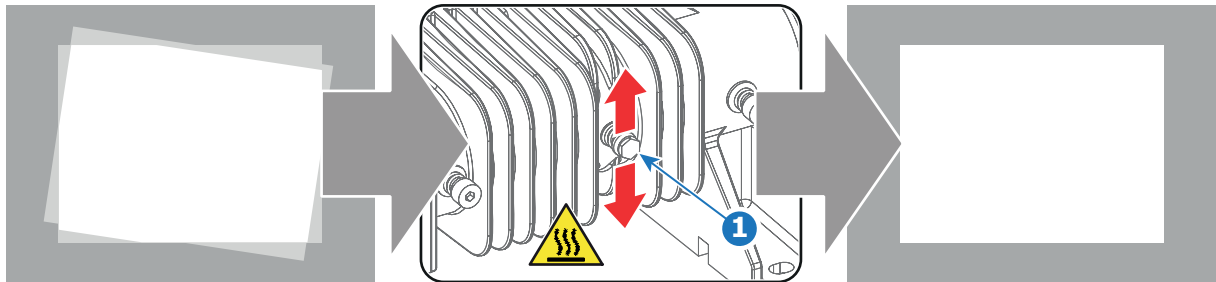


Image 13-9

6. Fasten the adjustment screw (reference 1 image 13-9) which you released in step 1. Use a 5.5mm Allen wrench.



It's recommended to check the Light Pipe focus (Lens No1) and the Light Pipe zoom (Lens No3) after adjusting the Integration Rod.

14. 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

14.1 Introduction to SCC file

Introduction

Barco has introduced the Spatial Color Calibration (SCC) file on the DP2K-S 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

14.2 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 14-1) is visible through the Lens Holder opening. The label is located at the front base of the Light Processor.



Image 14-1
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

14.3 Download the LUT-SCC file from the Barco website



A logon ID is required to access the secured zone myBarco on the Barco website <https://www.barco.com>. A logon 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 14-2

Or,

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

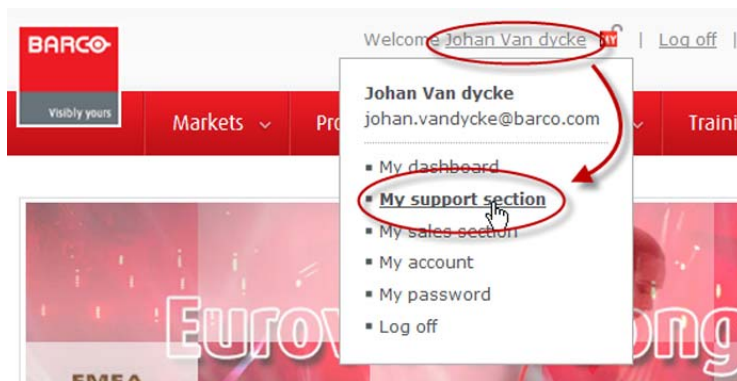


Image 14-3

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.

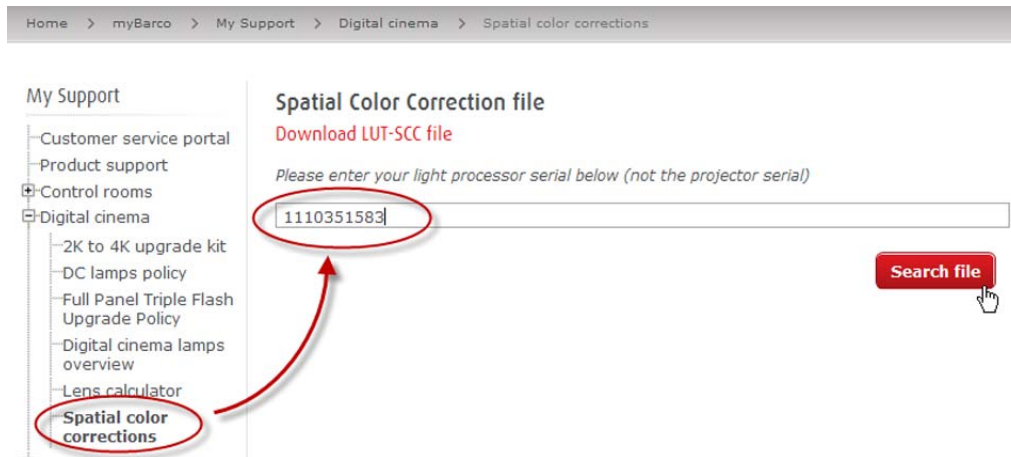


Image 14-4

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".

5. Click on the LUT-SCC download file.

Color file overview

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

Image 14-5

14.4 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 231, and "Download the LUT-SCC file from the Barco website", page 232.

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).

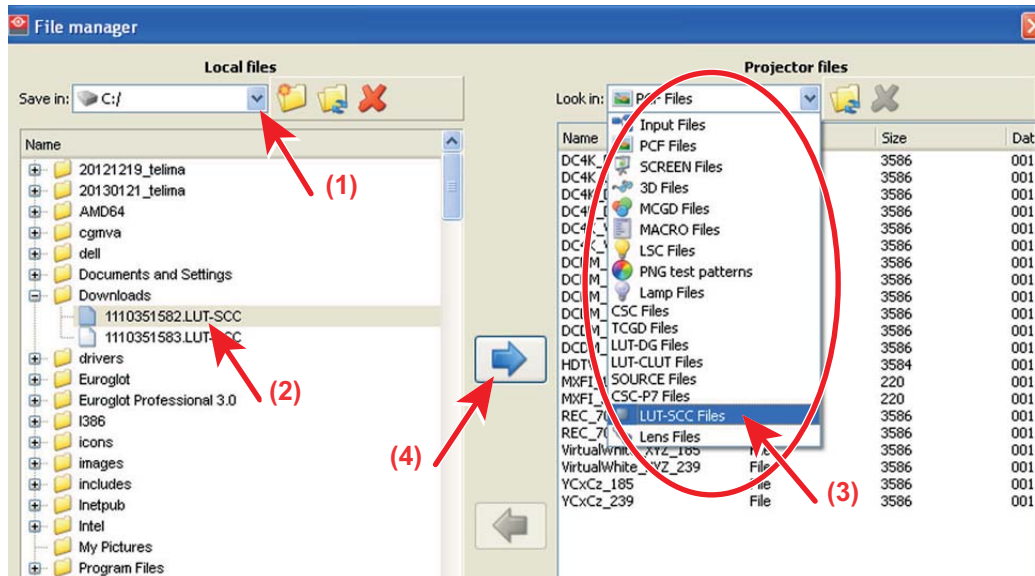


Image 14-6

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

14.5 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).

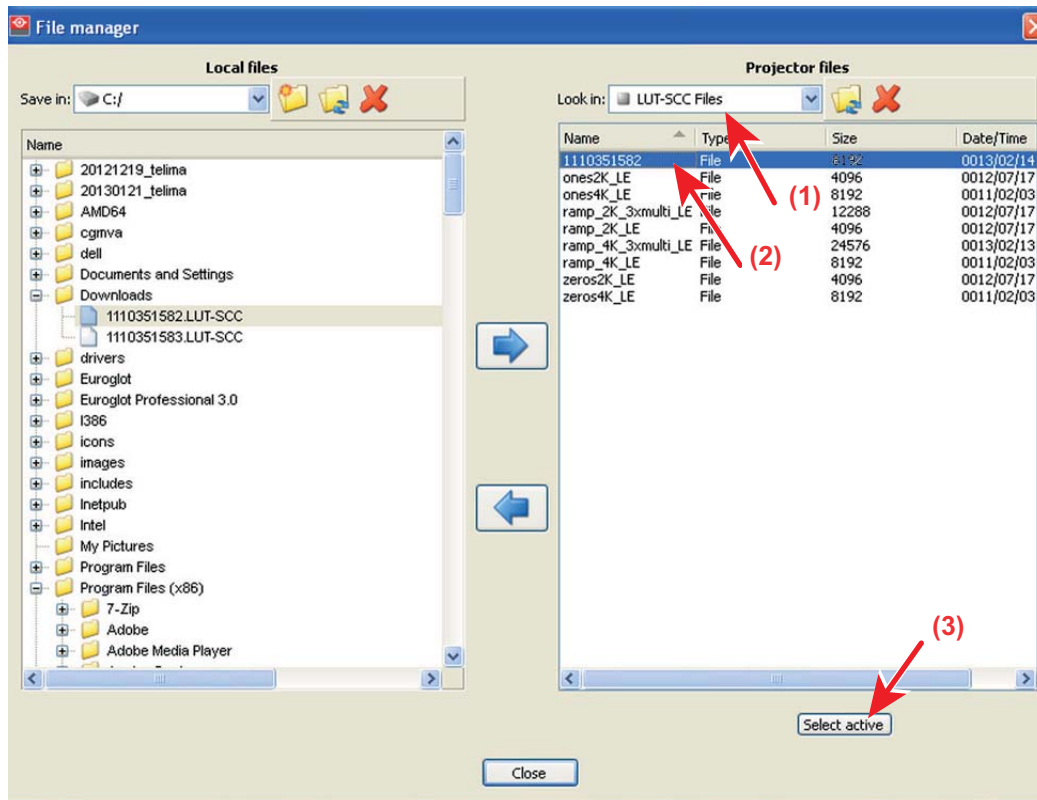


Image 14-7

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".

15. CONVERGENCE

About this chapter

This chapter describes how to prepare your DP2K-S series 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

15.1 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 15-1) . 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.

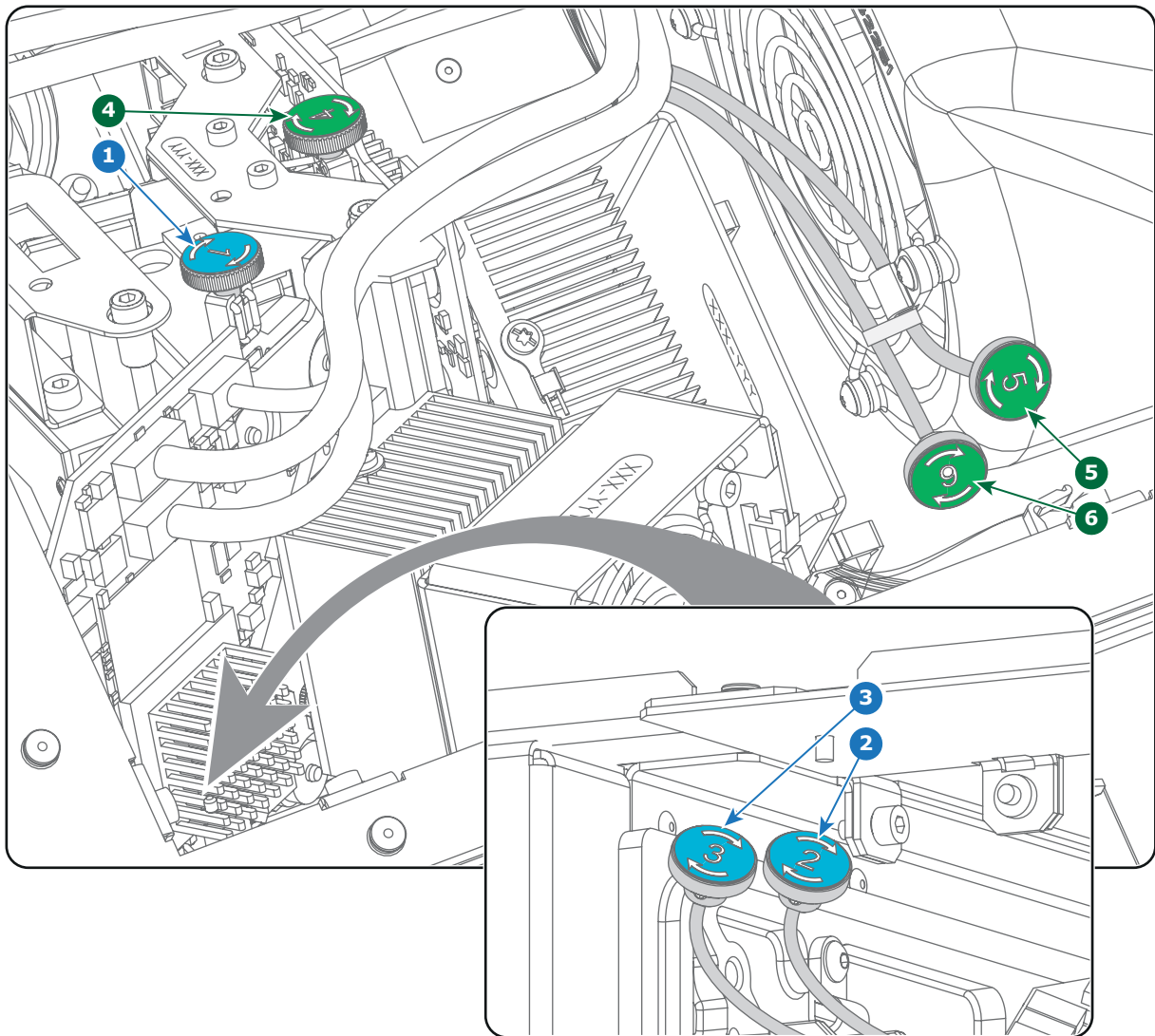


Image 15-1

- 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

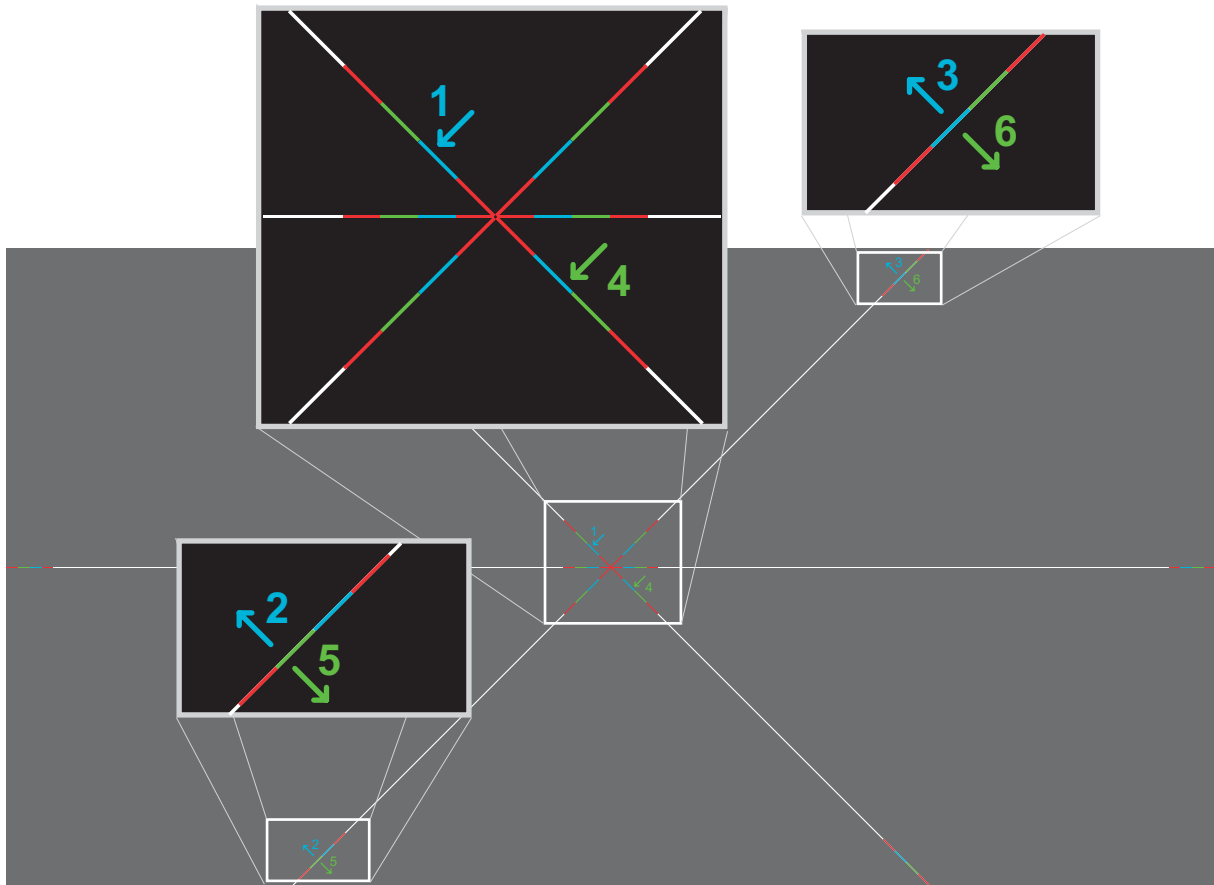


Image 15-2

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.

15.2 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 top cover plate of the Light Processor compartment.
4. Remove the left cover plate of the Light Processor compartment.
5. Place the fan on top of the Light Processor in the upper position as illustrated. Do this by engaging the two lower slots (reference 2 image 15-3) into the upper mounting pins as illustrated. The two upper slots (reference 3 image 15-3) remain free.

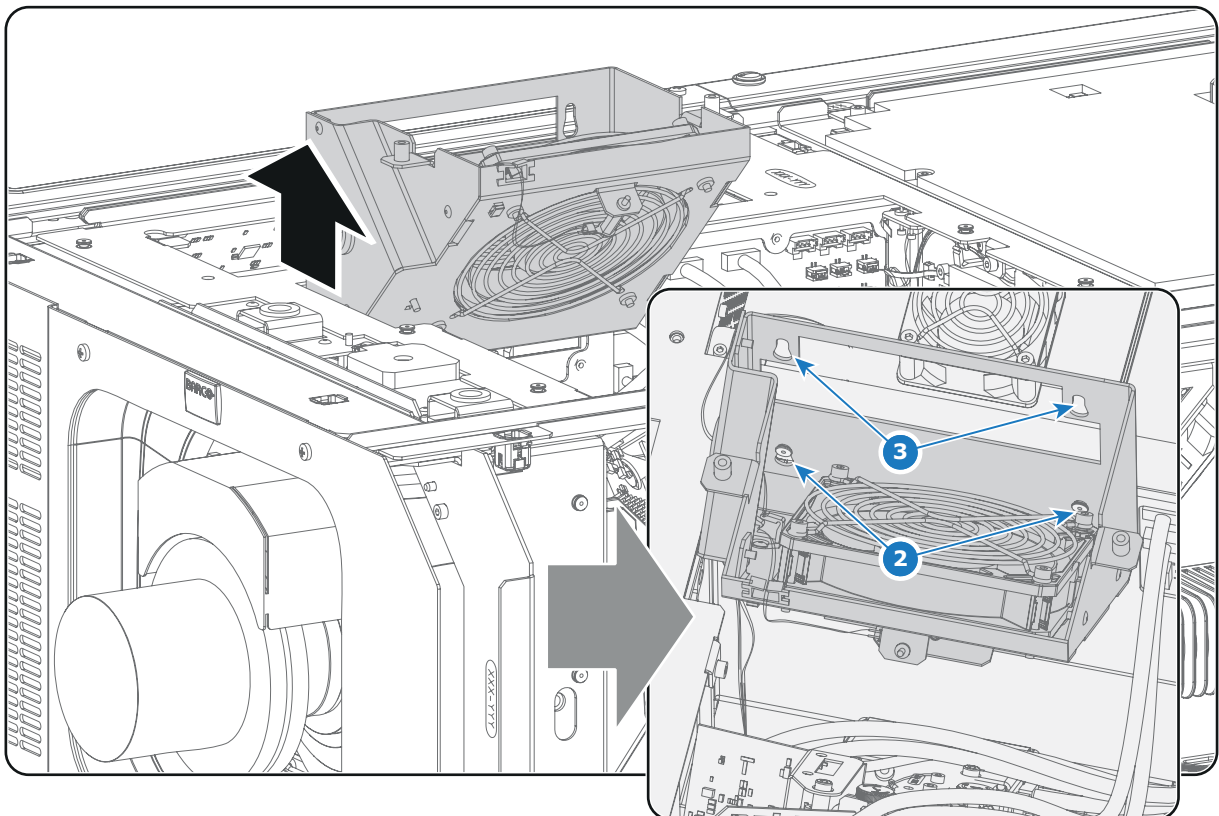


Image 15-3

6. Switch on the projector, ignite the lamp and open the dowsers.
7. Select the convergence test pattern, which is illustrated below (image 15-4). 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.

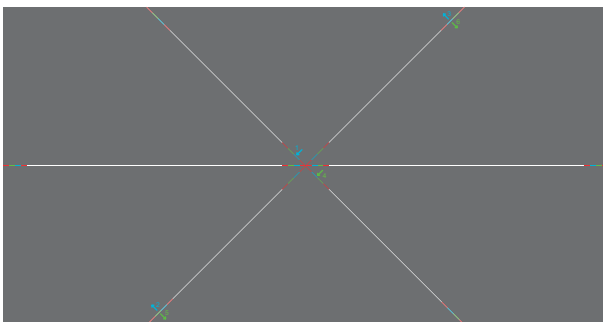


Image 15-4

15.3 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.

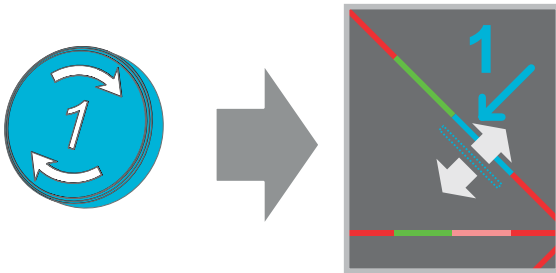


Image 15-5

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.

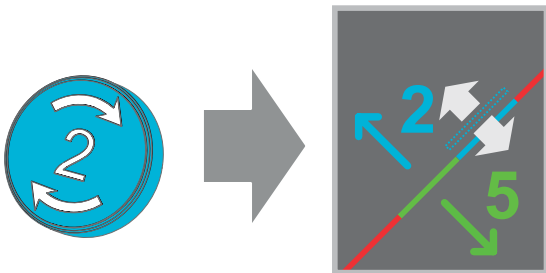


Image 15-6

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.

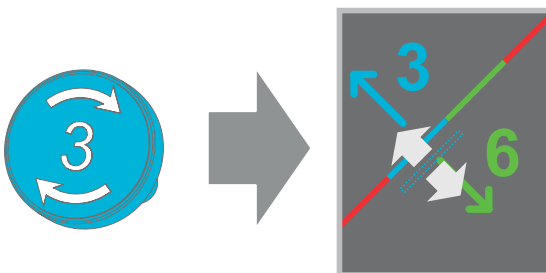


Image 15-7

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 242.

15.4 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.

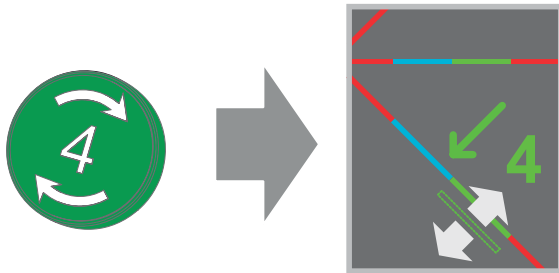


Image 15-8

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.

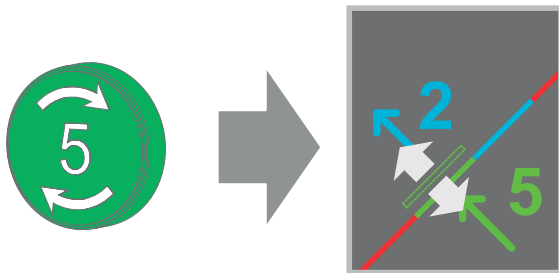


Image 15-9

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.

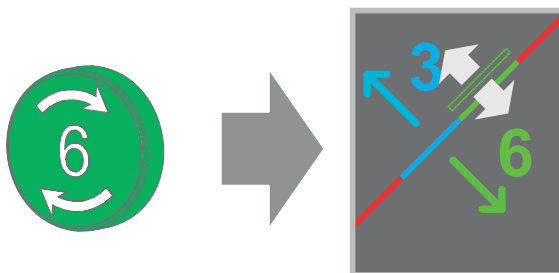


Image 15-10

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**.

15.5 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 (reference 1 image 15-11) of the fan assembly are engaged.

Caution: Take care of the wire.

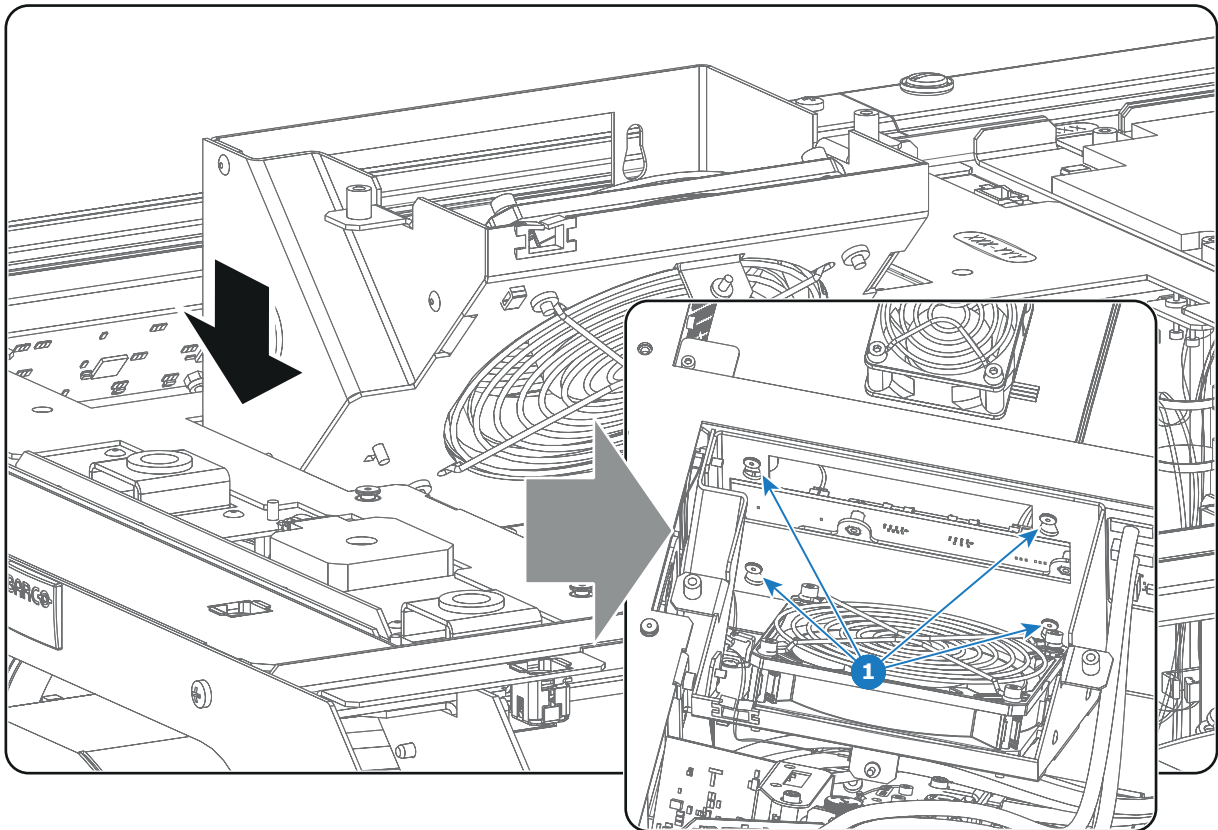


Image 15-11

2. Install the top cover plate of the Light Processor compartment.
3. Install the side cover plate of the Light Processor compartment.
4. Install the top cover of the projector.
5. Install the left side cover of the projector.
6. Switch on the projector.
7. Clear the security warning. See procedure page 189.

16. LENS HOLDER

About this chapter

This chapter describes how to replace the complete Lens Holder or single parts of the Lens Holder like 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 277.



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
- Available lenses
- Lens selection
- Lens installation
- Lens removal
- Lens shift, zoom & focus
- Cleaning the lens
- Removal of the Lens Holder cover plate
- Removal of the Lens Holder
- Installing the Lens Holder
- Installation of the Lens Holder cover plate
- 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

16.1 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 required for horizontal and vertical shift are built-in in the Lens Holder. The Lens Holder has an electrical socket for the zoom and focus functionality of the motorized Lens.

Parts identification of the Lens Holder

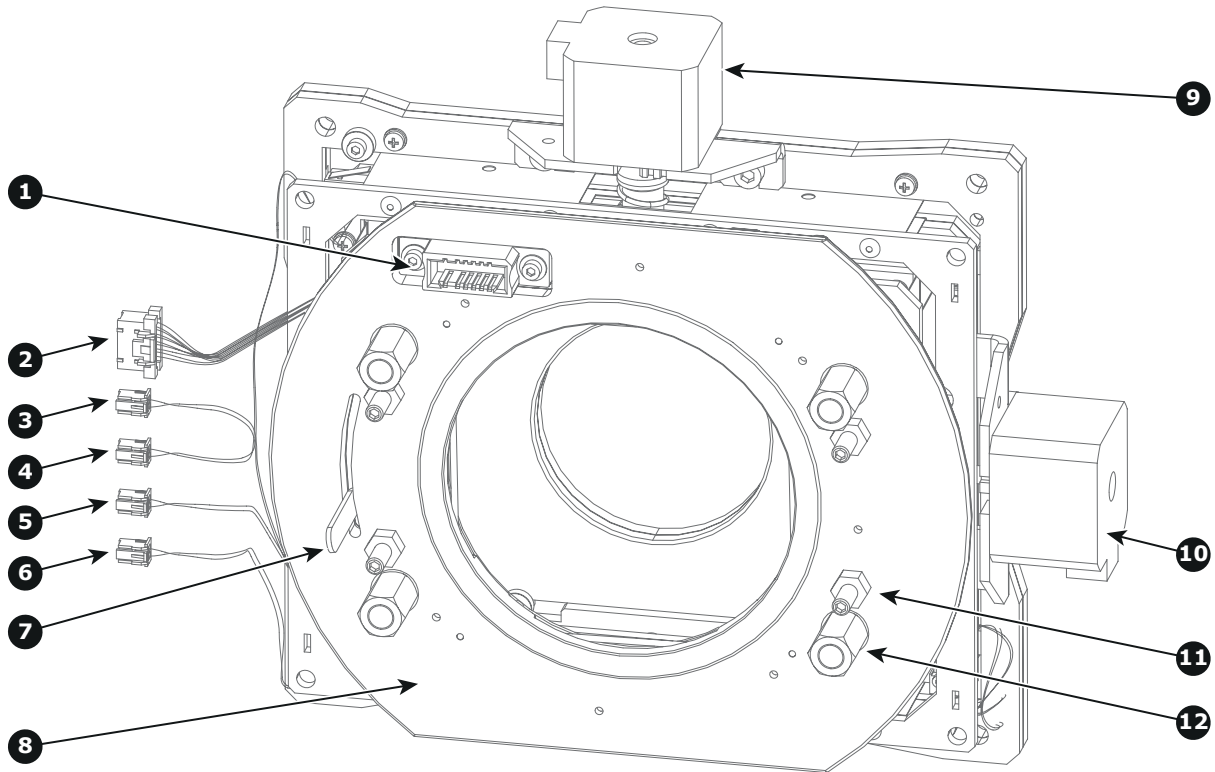


Image 16-1

- 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.

16.2 Available lenses

Which lenses are available?

For the DP2K-S 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-S series.

0.69" DC2K zoom lenses			
Product Number	2K zoom range	Image	Motor Block type
R9856520	1.2 - 1.7	image 16-2	M
R98565201	1.2 - 1.7		B
R9856521	1.34 - 1.9	image 16-3	M
R9856522	1.5 - 2.15	image 16-4	M
R9856523	1.7 - 2.55	image 16-5	M
R9856524	2 - 3.9	image 16-6	M
R98565241	2.09 - 3.9		F



Image 16-2
0.69" DC2K zoom lens 1.2 - 1.7 (R9856520)



Image 16-3
0.69" DC2K zoom lens 1.34 - 1.9 (R9856521)



Image 16-4
0.69" DC2K zoom lens 1.5 - 2.15 (R9856522)



Image 16-5
0.69" DC2K zoom lens 1.7 - 2.55 (R9856523)



Image 16-6
0.69" DC2K zoom lens 2 - 3.9 (R9856524)

16.3 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 16-7) 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: 10 m

Screen Height: 5.41 m

Projector Distance: 30 m

Screen gain: 1.8

Optical losses: 0 %

Lamp life: 0 %

Foot-Lambert: 14 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: 6,5k-W High Performance Bulb

Available lenses

Lens	4k
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 (62R)
Lamp: 3k-W Standard short-arc Bulb

Available lenses

Lens	2k	4k
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	2k
0.98" DC2K (1.2-1.8)	

Image 16-7
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.

16.4 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 (reference 1 image 16-8) downwards, away from the lens power supply socket (reference 2 image 16-8).
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.

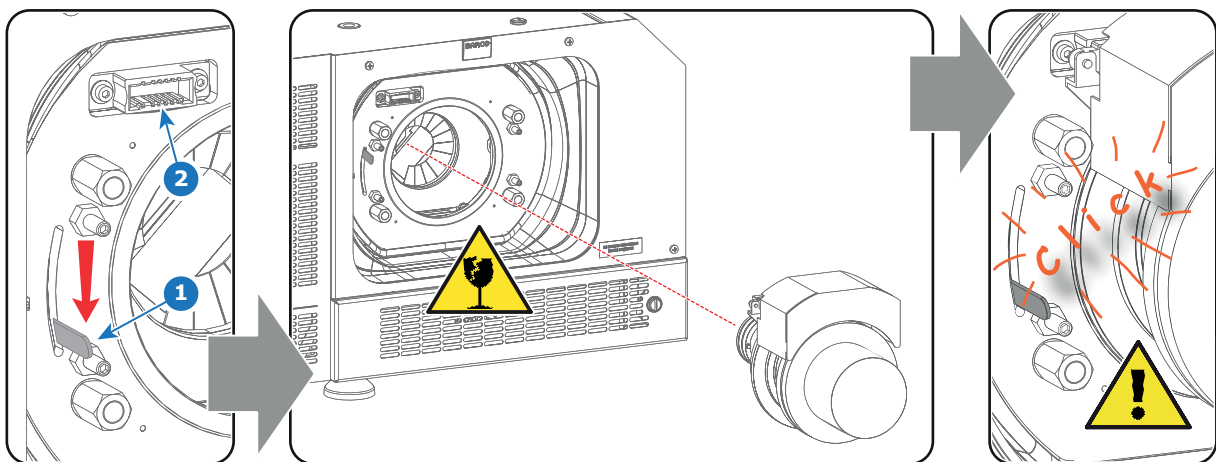


Image 16-8

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.

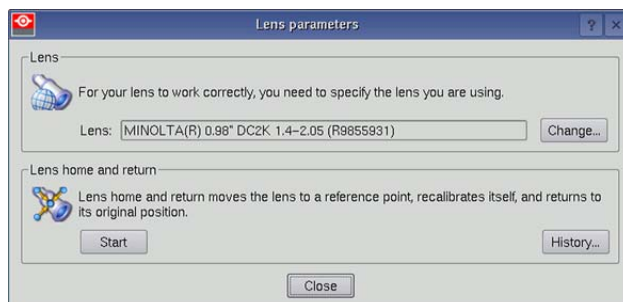


Image 16-9

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.

16.5 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 (reference 1 image 16-10) 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.

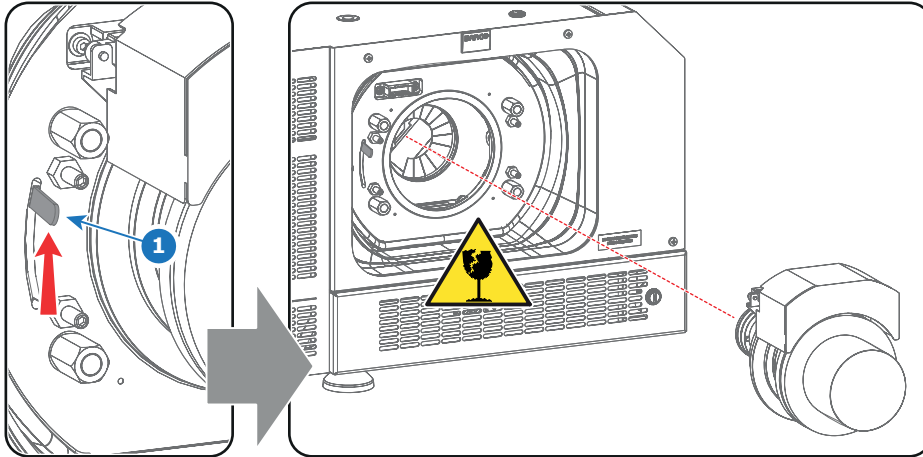


Image 16-10



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 foam rubber of the original projector packaging, back into the Lens opening to prevent intrusion of dust. Note that this foam rubber is packed in a plastic bag to prevent the dust, emitted by the foam, from entering the projector.

16.6 Lens shift, zoom & focus

Motorized lens adjustment

The DP2K-S 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.

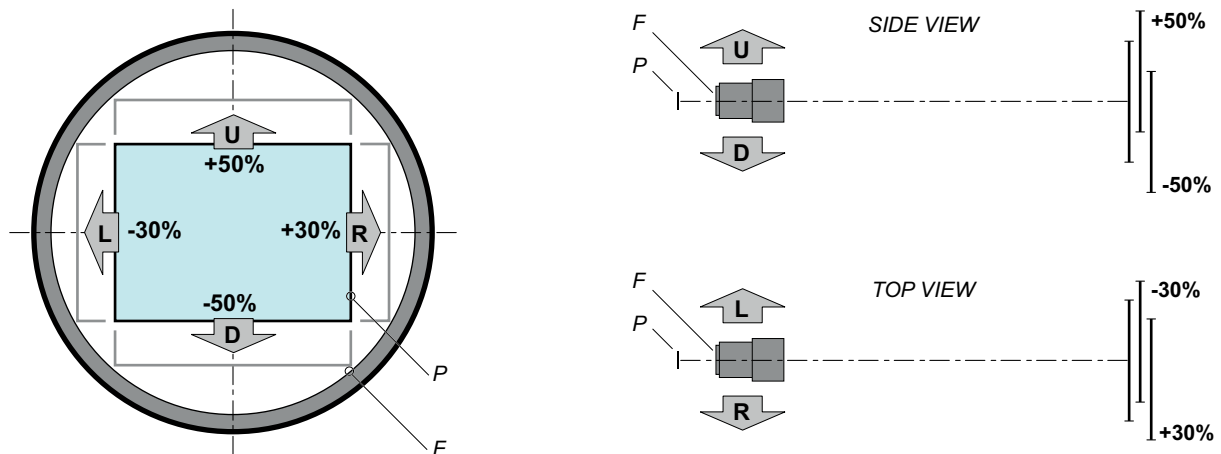


Image 16-11
P DMD.
F Field of view.



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-S 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**.

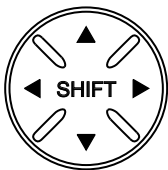


Image 16-12

How to zoom in or out?

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



Image 16-13

How to focus?

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

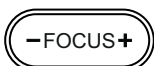


Image 16-14



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.

16.7 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

16.8 Removal of the Lens Holder cover plate



To remove the Lens Holder cover plate the large dust filter at the projector front has to be removed first. This procedure assumes that this component is already removed.

Necessary tools

Phillips screwdriver PH2.

How to remove the cover plate of the Lens Holder?

1. Remove the lens from the projector. See chapter "Lens removal", page 250.
2. Remove the large dust filter from the projector. See chapter "Check the large dust filter", page 334.
3. Remove the rubber dust ring from the Lens Holder front plate.

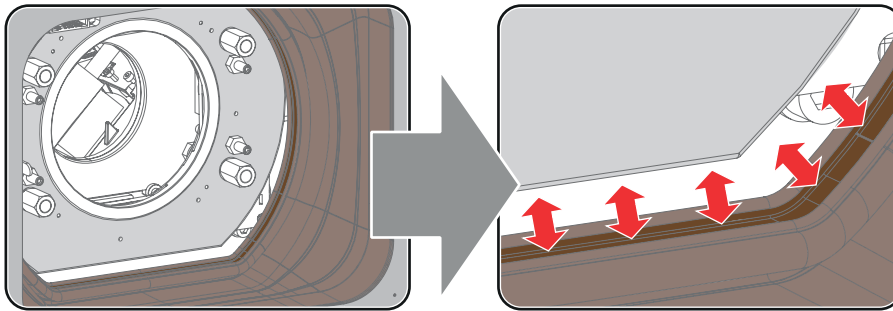


Image 16-15

4. Remove the screw (reference 1 image 16-16) at the lower left side of the cover plate (seen from the front of the projector). Use a Phillips screwdriver PH2.
5. Remove the three screws (reference 2 image 16-16) of the cover plate. Use a Phillips screwdriver PH2.
6. Remove the Lens Holder cover plate from the projector.

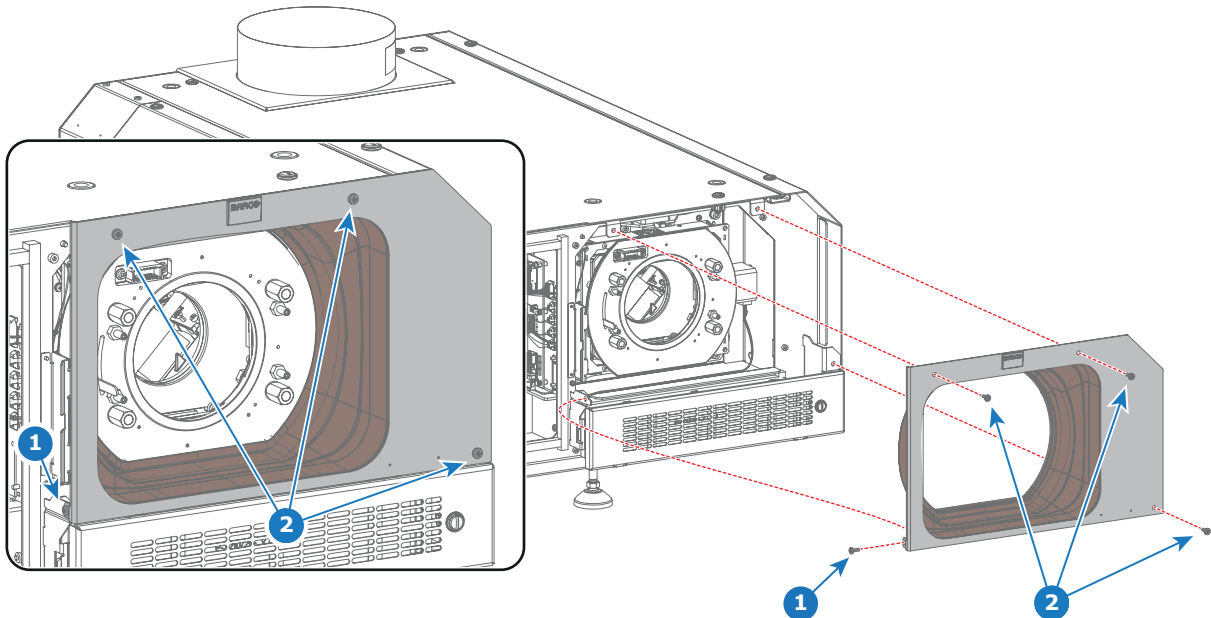


Image 16-16

16.9 Removal of the Lens Holder



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



To remove the Lens Holder the Lens and the cover plate of the Lens Holder have to be removed. This procedure assumes that these components are already removed.

Necessary tools

- 5mm Allen wrench.
- 5.5mm nut driver.

How to remove the Lens Holder from the projector?

1. Disconnect the wire unit (reference 3 image 16-17) of the vertical shift motor and the wire unit (reference 4 image 16-17) of the horizontal shift motor.

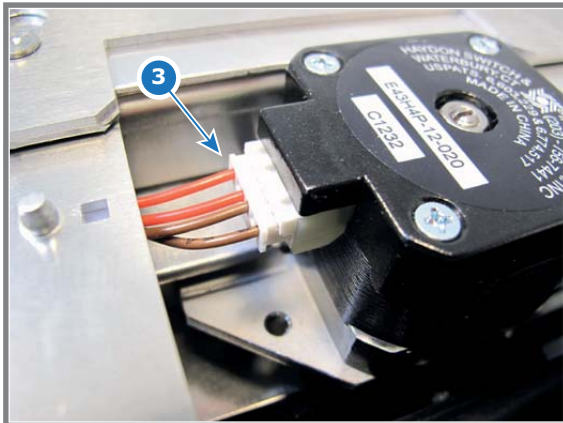
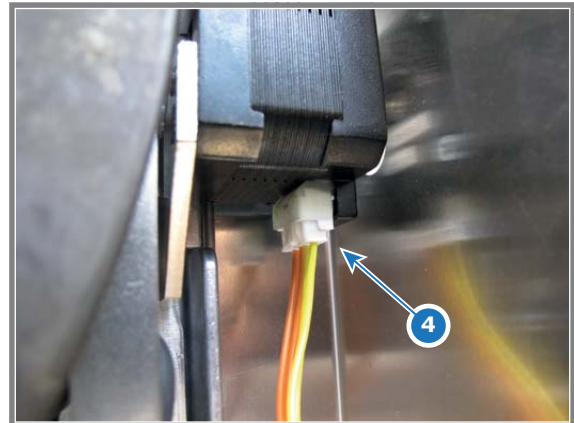


Image 16-17



2. Disconnect the 5 wires (reference 5, 6, 7, 8 & 9 image 16-18) at the left side from the Lens Holder.

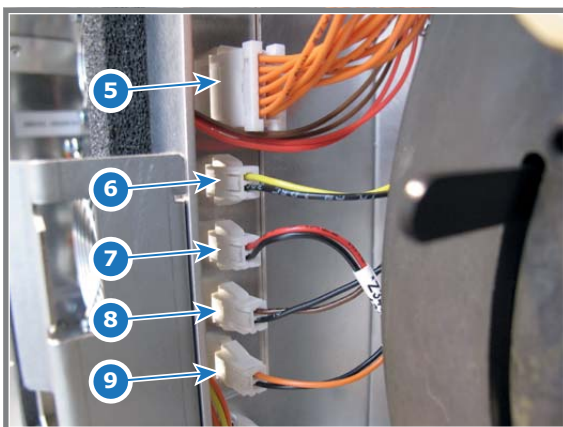


Image 16-18

3. Disconnect the EMC wire (reference 10 image 16-19) from the projector chassis. Use a 5.5mm nut driver.

16. Lens Holder

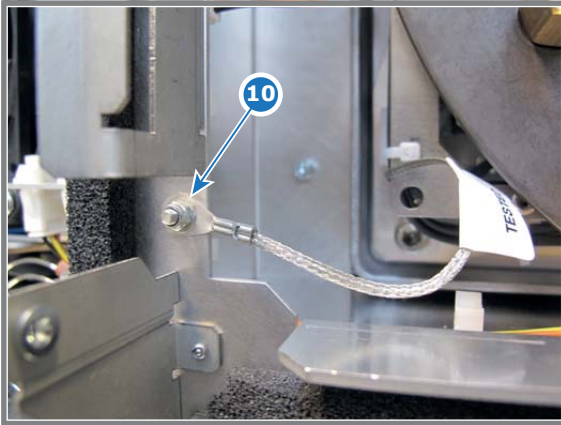


Image 16-19

4. Remove the Lens Holder from the projector chassis by loosening the 4 screws (reference 1 image 16-20) as illustrated. Use a 5mm Allen wrench. Note that each screws contains a plain washer (reference 2 image 16-20).

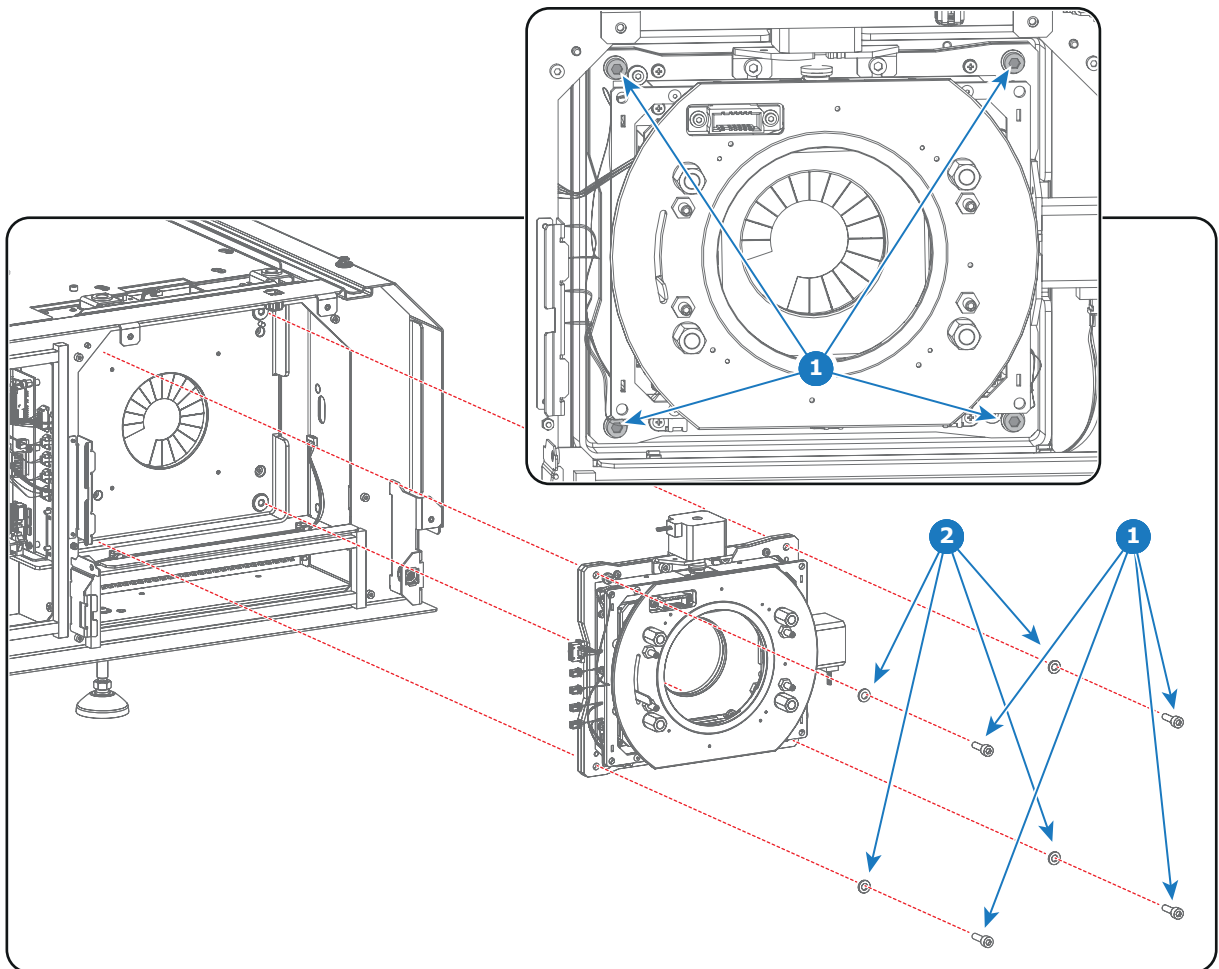


Image 16-20

16.10 Installing the Lens Holder

Necessary tools

- 5mm Allen wrench.
- 5.5mm nut driver.

How to install the Lens Holder?

1. Place the Lens Holder on the projector chassis as illustrated and fasten with the 4 screws (reference 1 image 16-21). Use a 5mm Allen wrench. Ensure to place a plain washer onto each screws (reference 2 image 16-21).

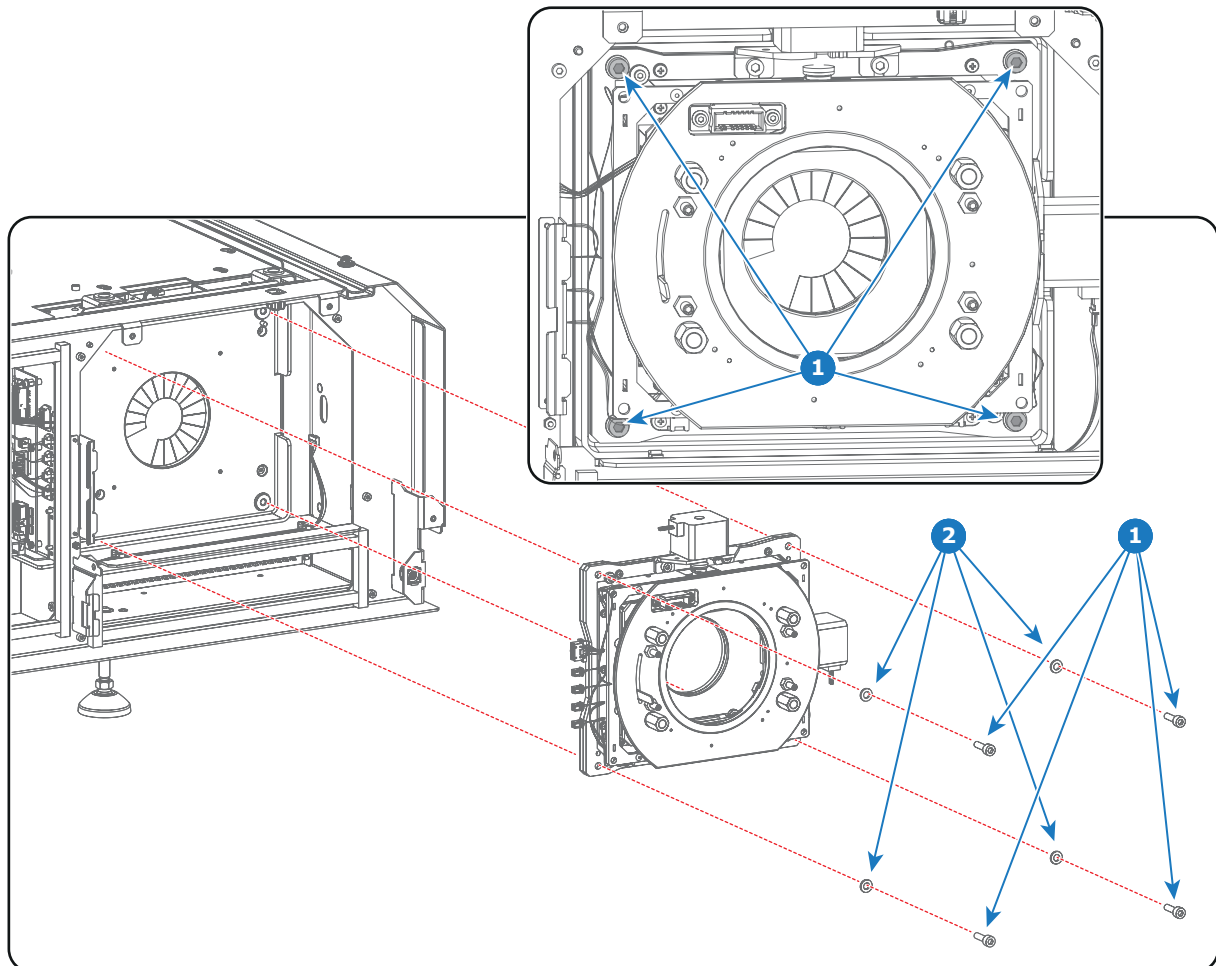


Image 16-21

2. Connect the wire unit of the vertical shift motor (reference 3 image 16-22) and the wire unit of the horizontal shift motor (reference 4 image 16-22).

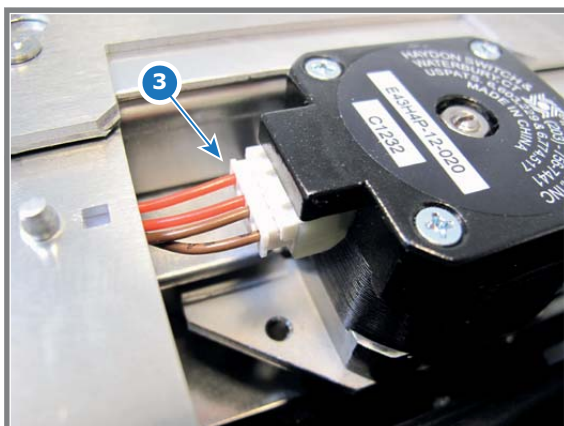
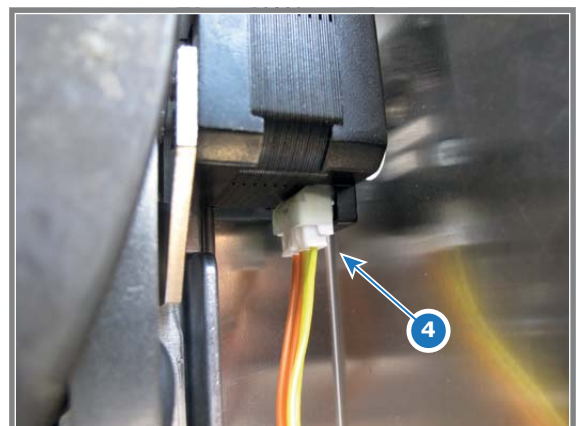


Image 16-22



3. Connect the 5 wires at the left side from the Lens Holder as illustrated:

16. Lens Holder

- reference 5 in image 16-23: Lens wires (zoom & focus) (**orange wires**).
- reference 6 in image 16-23: Horizontal-Left end loop wires (**yellow/black**).
- reference 7 in image 16-23: Vertical-Top end loop wires (**red/black**).
- reference 8 in image 16-23: Vertical-Bottom end loop wires (**brown/black**).
- reference 9 in image 16-23: Horizontal-Right end loop wires (**orange/black**).

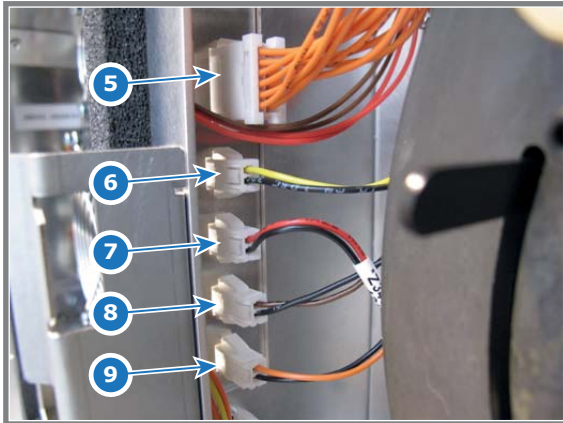


Image 16-23

4. Connect the EMC wire (reference 10 image 16-24) with the projector chassis as illustrated. Use a 5.5mm nut driver.

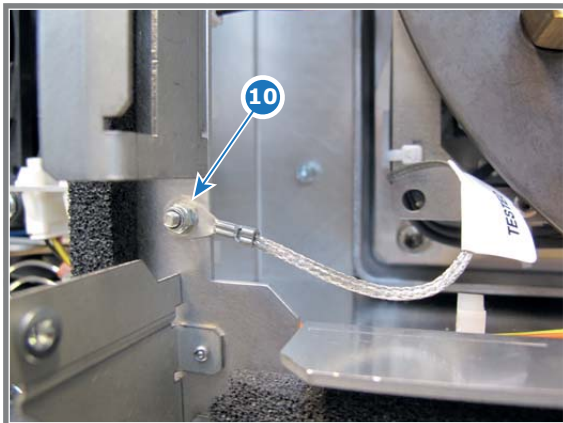


Image 16-24

5. Install all projector covers and lens.
6. Check for Scheimpflug misalignments and adjust if necessary. See "Scheimpflug", page 277.

16.11 Installation of the Lens Holder cover plate

Necessary tools

Phillips screwdriver PH2.

How to install the cover plate of the Lens Holder?

1. Place the cover plate of the Lens Holder in its place.
2. Fasten the cover plate with three screws (reference 2 image 16-25). Use a Phillips screwdriver PH2.
3. Insert the screw (reference 1 image 16-25) at the lower left side of the cover plate (seen from the front of the projector). Use a Phillips screwdriver PH2.

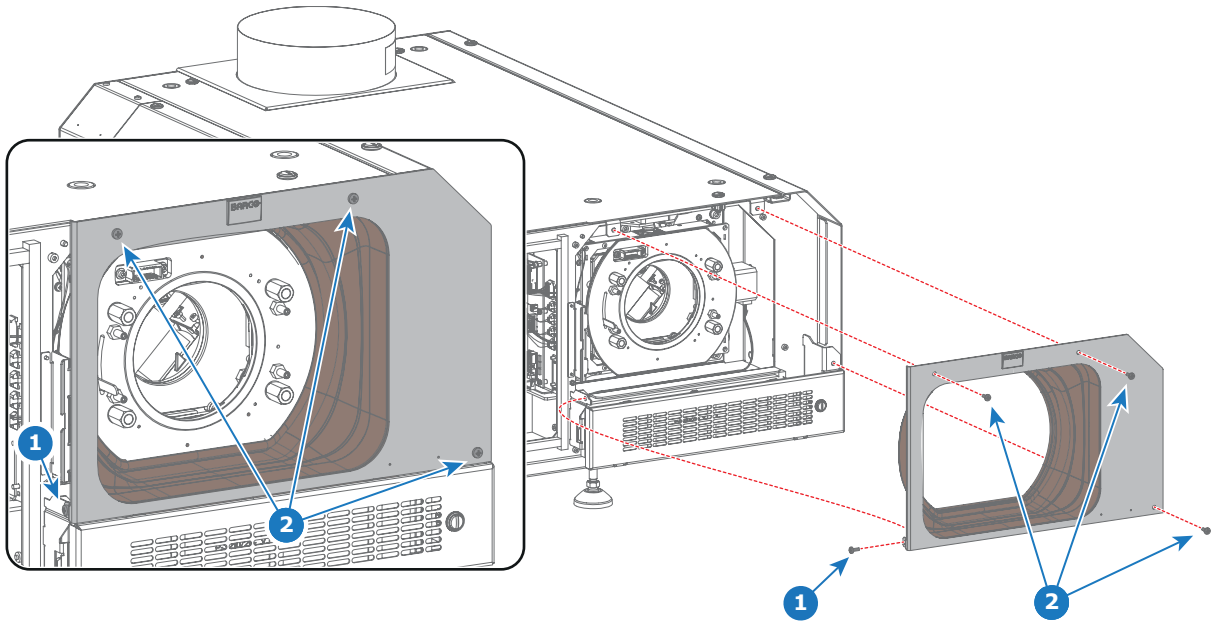


Image 16-25

4. Install the rubber dust ring around the Lens Holder front plate.

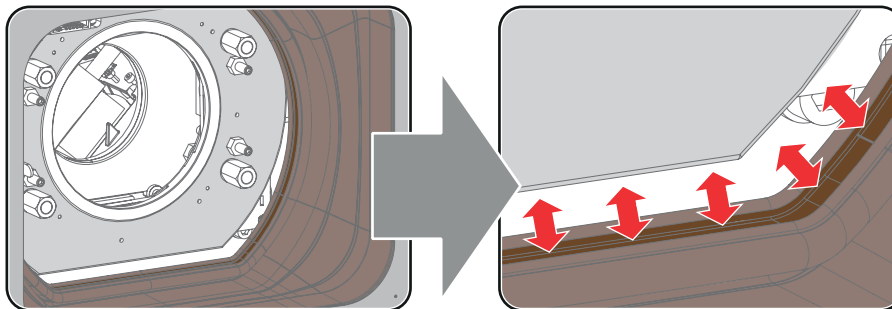


Image 16-26

16.12 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 255.

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 16-27) 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 16-27).

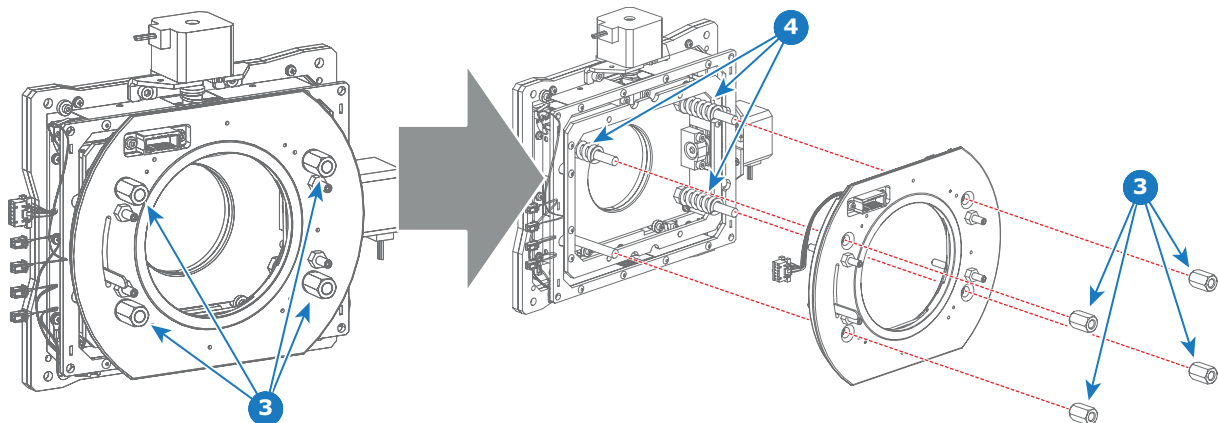


Image 16-27

2. Remove the Vertical Shift stepper motor from the assembly by loosening the four screws (reference 5 image 16-28) as indicated. Use a 3mm and 4mm Allen wrench.

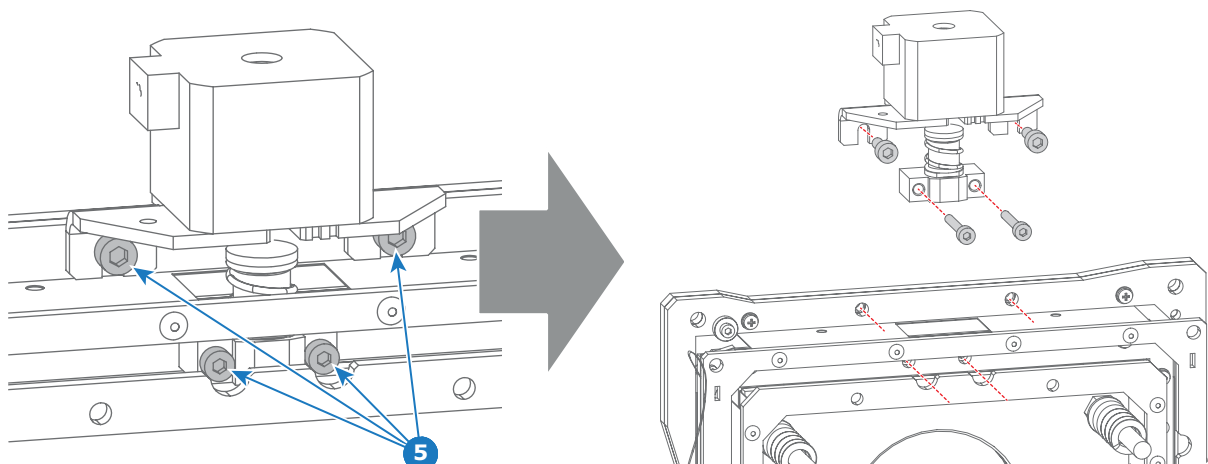


Image 16-28

3. Remove the big bracket (reference 6 image 16-29) and the small bracket (reference 8 image 16-29) 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 16-29) and a 10mm open end wrench for the small bracket (reference 9 image 16-29).

Note: The big bracket (reference 6 image 16-29) used with the Vertical Shift stepper motor has two cuts (reference 10 image 16-29).

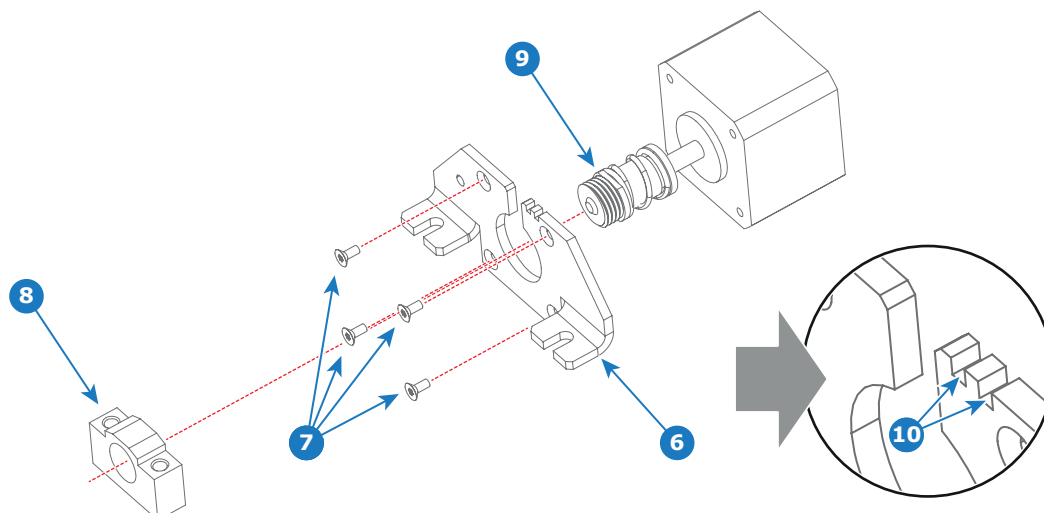


Image 16-29

4. Reinstall the stepper motor on the assembly as illustrated in image 16-28. Fasten the four screws (reference 5 image 16-28) 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 16-27). 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 16-27).



Proceed with reinstalling the Lens Holder. See procedure "Installation of the Lens Holder cover plate", page 259.



The Lens Holder has to be adjusted after installation. See chapter "Scheimpflug", page 277.

16.13 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 255.

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 16-30) 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 16-30).

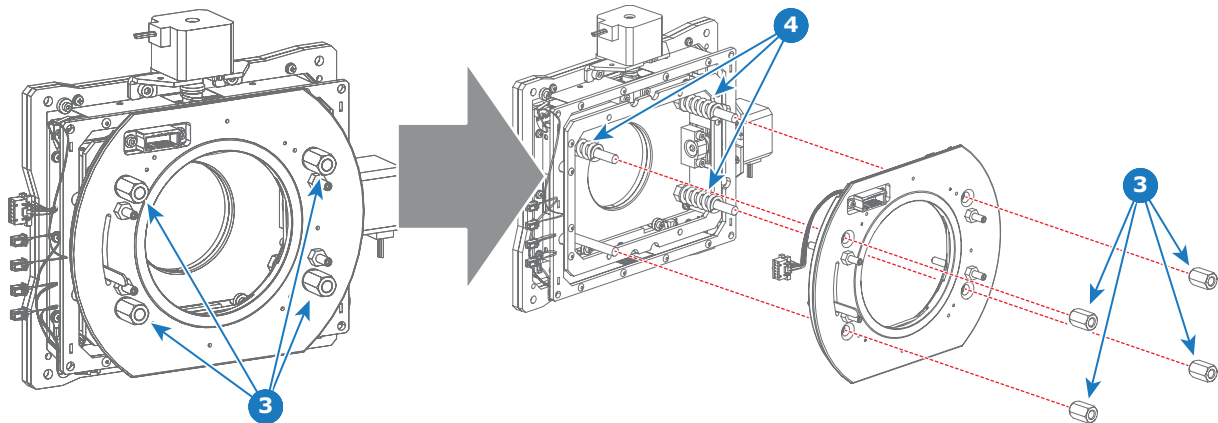


Image 16-30

2. Remove the Horizontal Shift stepper motor from the assembly by loosening the four screws (reference 5 image 16-31) as indicated. Use a 3mm and 4mm Allen wrench.

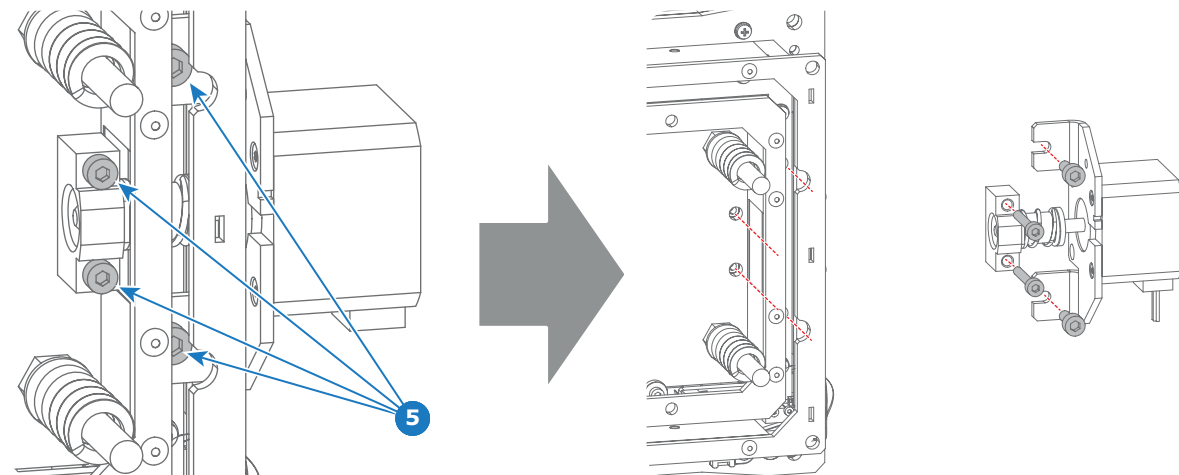


Image 16-31

3. Remove the big bracket (reference 6 image 16-32) and the small bracket (reference 8 image 16-32) 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 16-32) and a 10mm open end wrench for the small bracket (reference 9 image 16-32).

Note: The big bracket (reference 6 image 16-32) used with the Horizontal Shift stepper motor has one cut (reference 11 image 16-32).

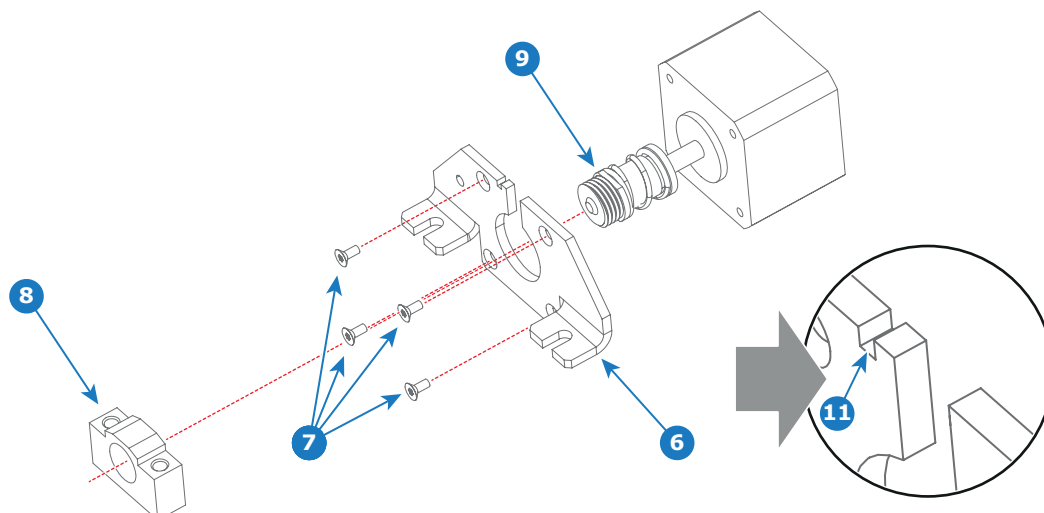


Image 16-32

4. Reinstall the stepper motor on the assembly as illustrated in image 16-31. Fasten the four screws (reference 5 image 16-31) 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 16-30). 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 16-30).



Proceed with reinstalling the Lens Holder. See procedure "Installation of the Lens Holder cover plate", page 259.



The Lens Holder has to be adjusted after installation. See chapter "Scheimpflug", page 277.

16.14 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 247.

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 16-33). Use 2.5mm Allen wrench.

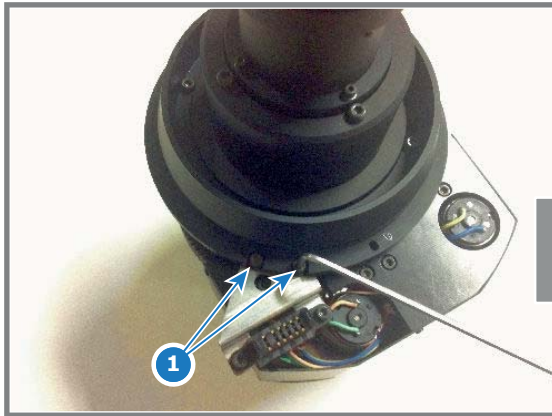
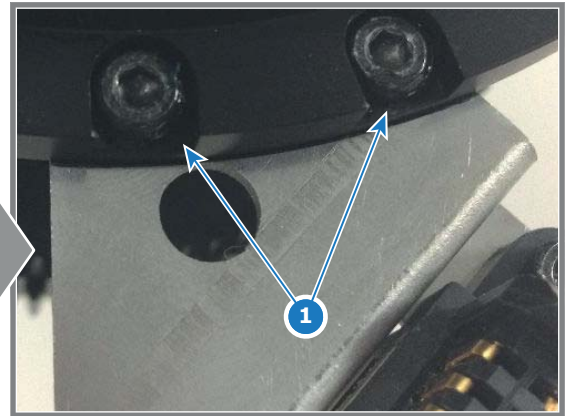


Image 16-33



3. Remove the motor unit from the lens by loosening the two screws (reference 2 image 16-34) of the motor unit. Use 2.5mm Allen wrench.



Image 16-34

4. Place the new motor unit into position and fasten **loosely** it with 2 hex socket screws M3x8 (reference 2 image 16-34) . Use a 2.5mm Allen wrench with ball end.

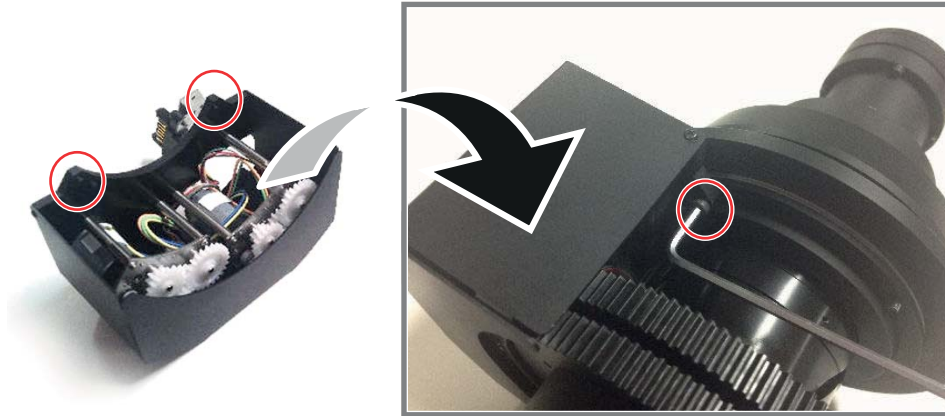


Image 16-35

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 16-35. 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 16-36). 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 16-36. Bond the head of screws not to loosen those.

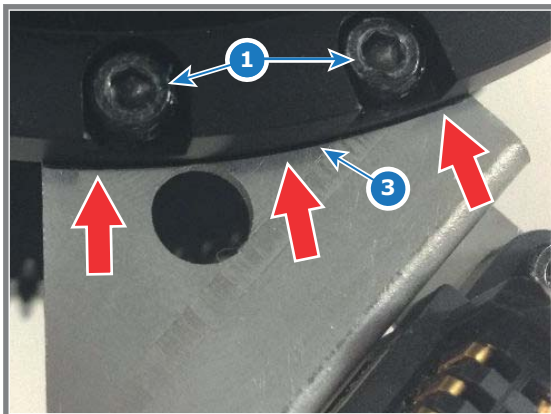


Image 16-36

16.15 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 247.

How to replace the lens motor assembly?

1. Remove the lens from the projector.
2. Remove the front cover (reference 2 image 16-37) of the lens motor assembly by releasing the three screws (reference 1 image 16-37) as illustrated.
3. Remove the top cover (reference 4 image 16-37) of the lens motor assembly by releasing the two screws (reference 3 image 16-37) as illustrated.

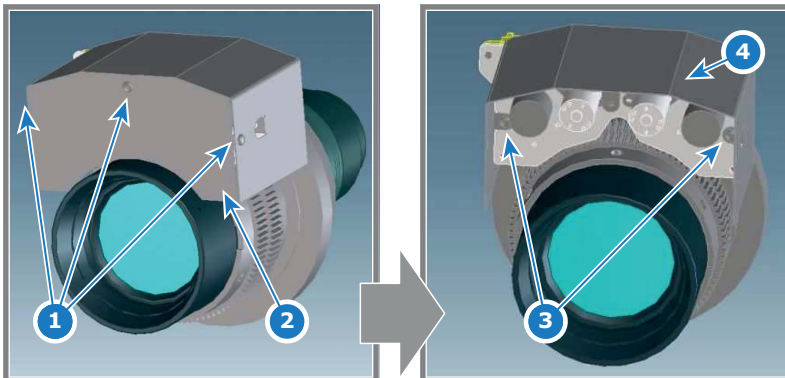


Image 16-37

4. Detach the lens motor assembly from the projection lens by releasing the three screws (reference 5 image 16-38) as illustrated.

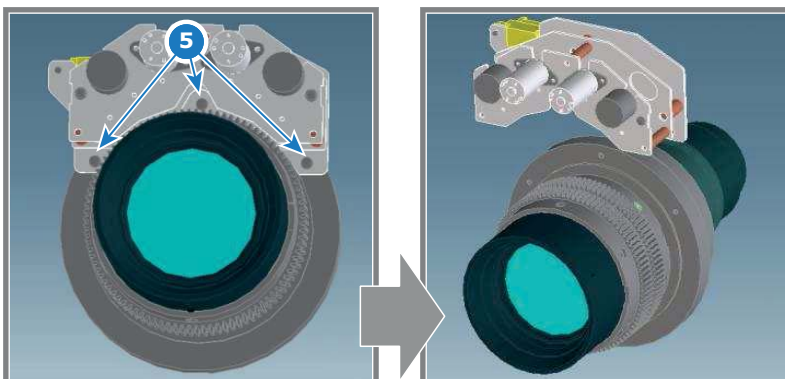


Image 16-38

5. Remove the connection plate from the lens motor assembly by releasing the five screws (reference 6 and 7 image 16-39) as illustrated.

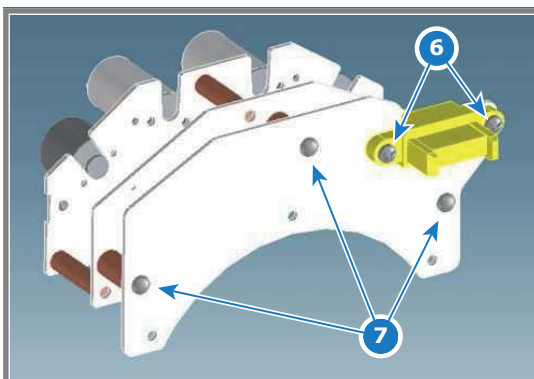


Image 16-39

6. Install the new lens motor assembly onto the connection plate. See image 16-39.
7. Mount the lens motor assembly onto the projection lens. See image 16-38.

8. Install the top cover and front cover of the lens motor assembly. See image 16-37.

16.16 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 247.

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 16-40).

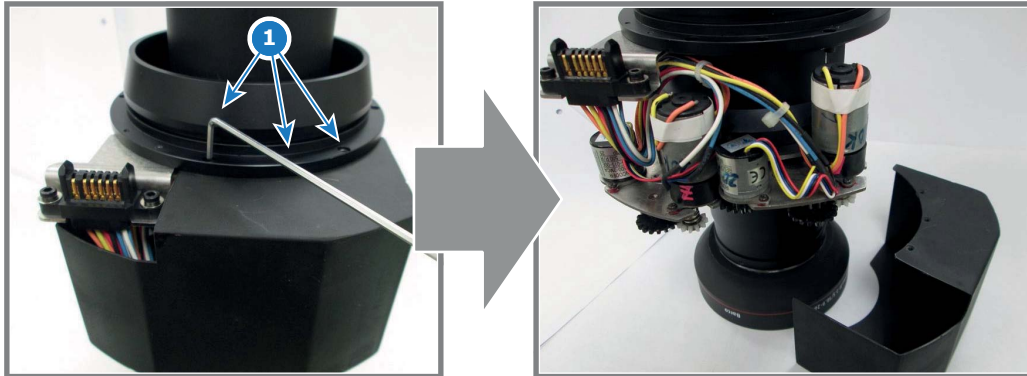


Image 16-40

3. Remove the electrical socket from the lens chassis. Use an Allen wrench to loosen the two screws (reference 2 image 16-41).

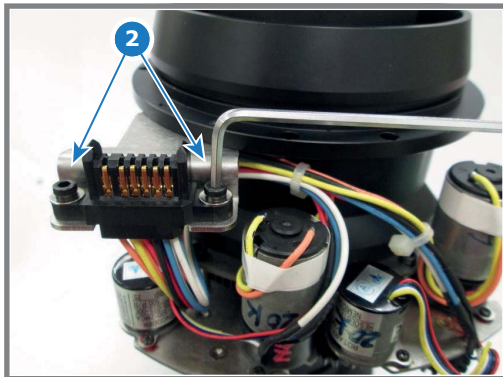


Image 16-41

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 16-42) of the motor block.

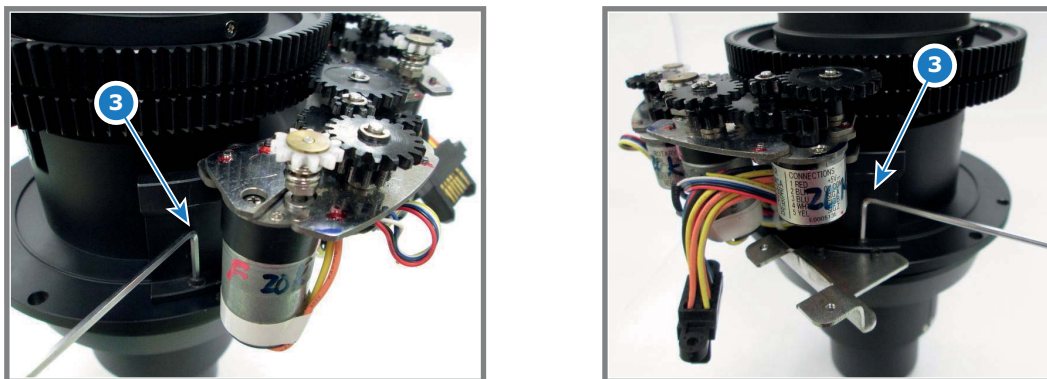


Image 16-42

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 16-42).

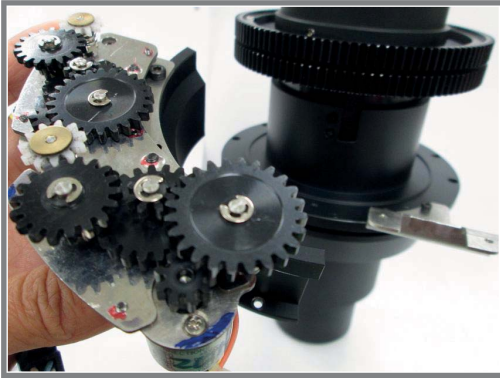


Image 16-43

6. Mount the electrical socket. Use an Allen wrench to fasten the two screws.
Caution: Ensure to orient the electrical socket as illustrated.

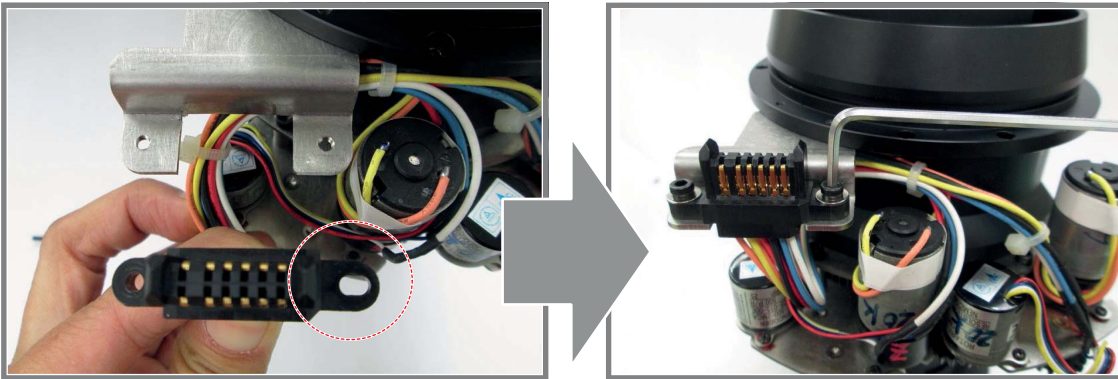


Image 16-44

7. Install the cover of the motor block. Use an Allen wrench to fasten the three screws (reference 1 image 16-40).

16.17 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 255.



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-S 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-S 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 16-45) 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 16-45).

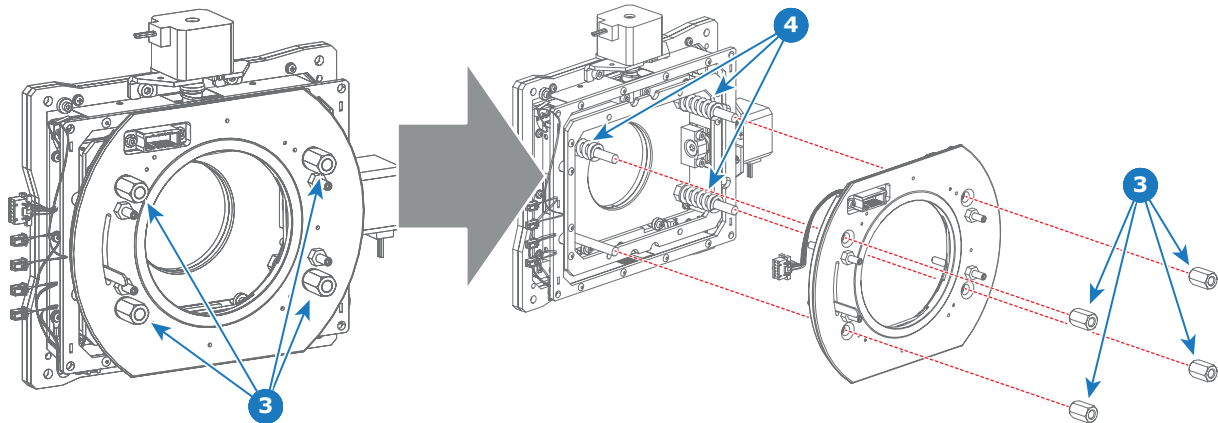


Image 16-45

2. Remove the old Lens Holder cover. Use a PH1 Phillips screwdriver to loosen the seven screws (reference 5 image 16-46) as illustrated. By doing this, you will also release the ground cable (reference 6).

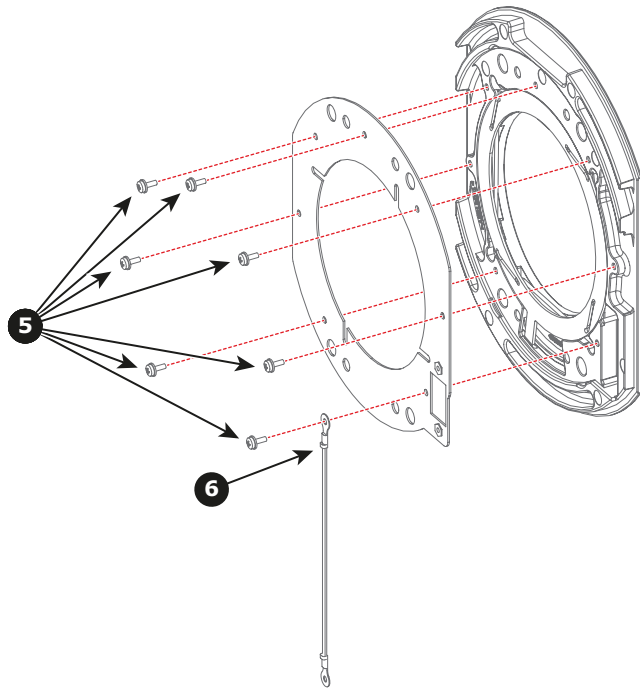


Image 16-46

- Place the inner dust rubber (reference 9 image 16-47) 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).

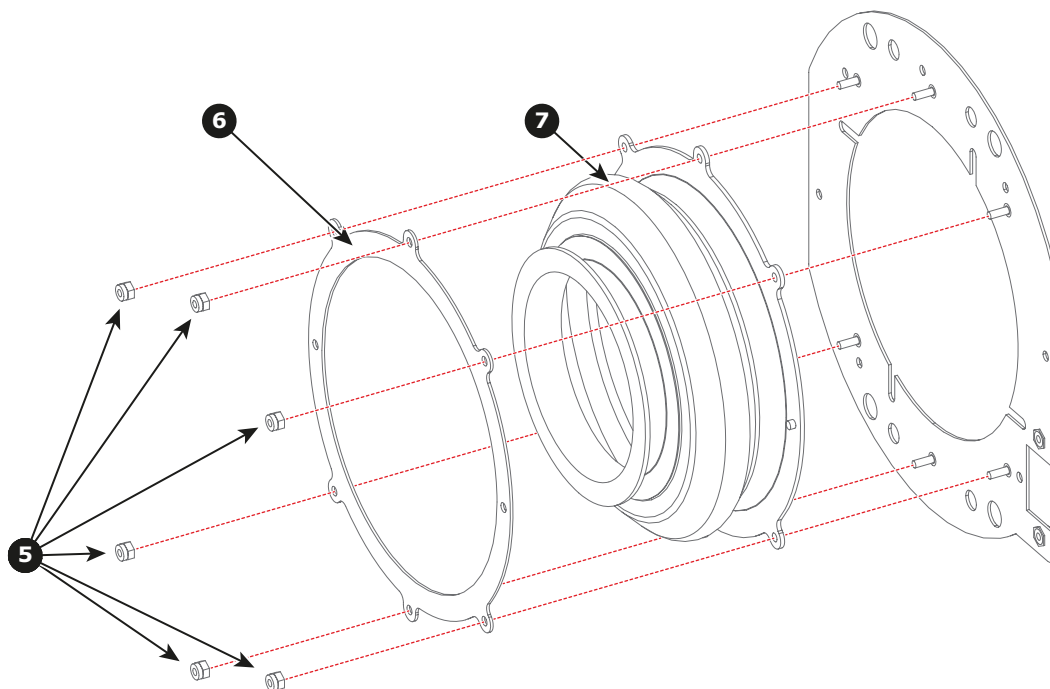


Image 16-47

- Install the new Lens Holder Cover. Use a PH1 Phillips screwdriver to tighten the seven original screws (reference 5 image 16-48). Make sure you tighten the earth wire (reference 6) back to its original place.

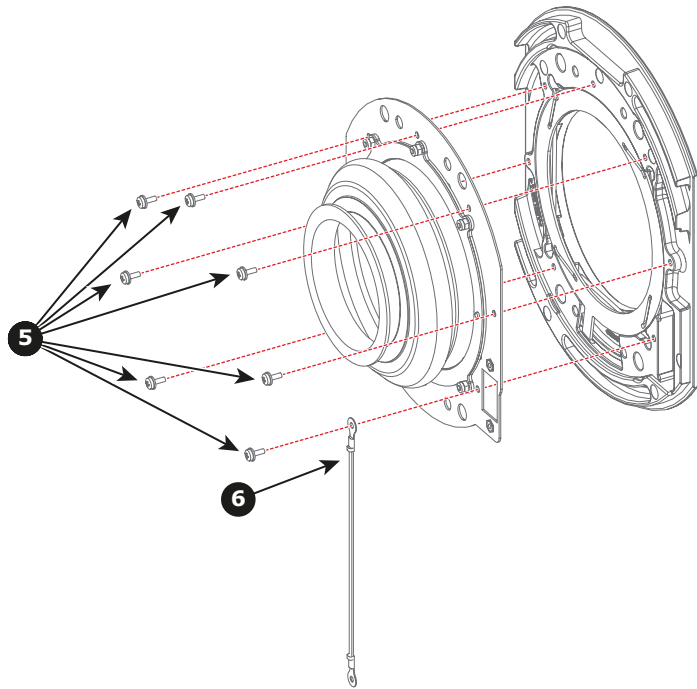


Image 16-48

5. Carefully reinstall the front plate from the Lens Holder. Help the rubber through the lens Holder onto the other side.

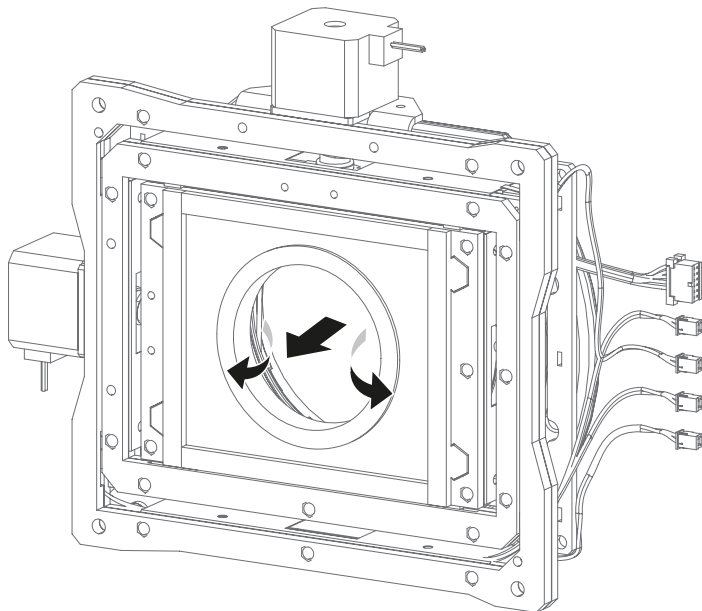


Image 16-49

6. Use a 13 mm nut driver to fasten the four Scheimpflug nuts (reference 3 image 16-50). 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).

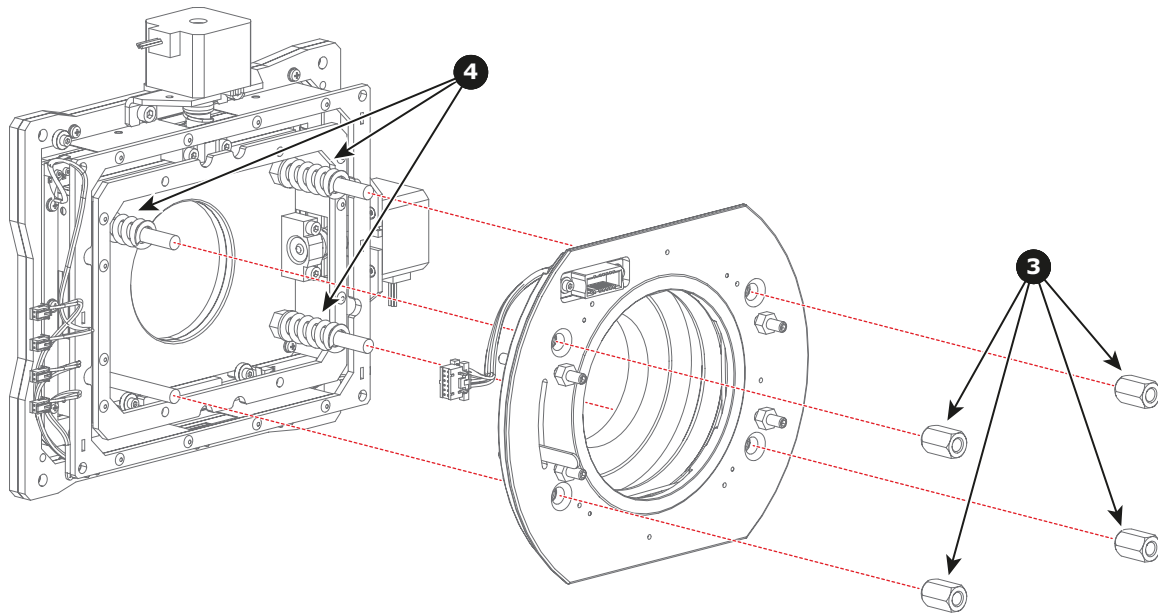


Image 16-50



Proceed with reinstalling the Lens Holder. See procedure "Installation of the Lens Holder cover plate", page 259.



The Lens Holder has to be adjusted after installation. See chapter "Scheimpflug", page 277.

16.18 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 255.



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 16-51) 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).

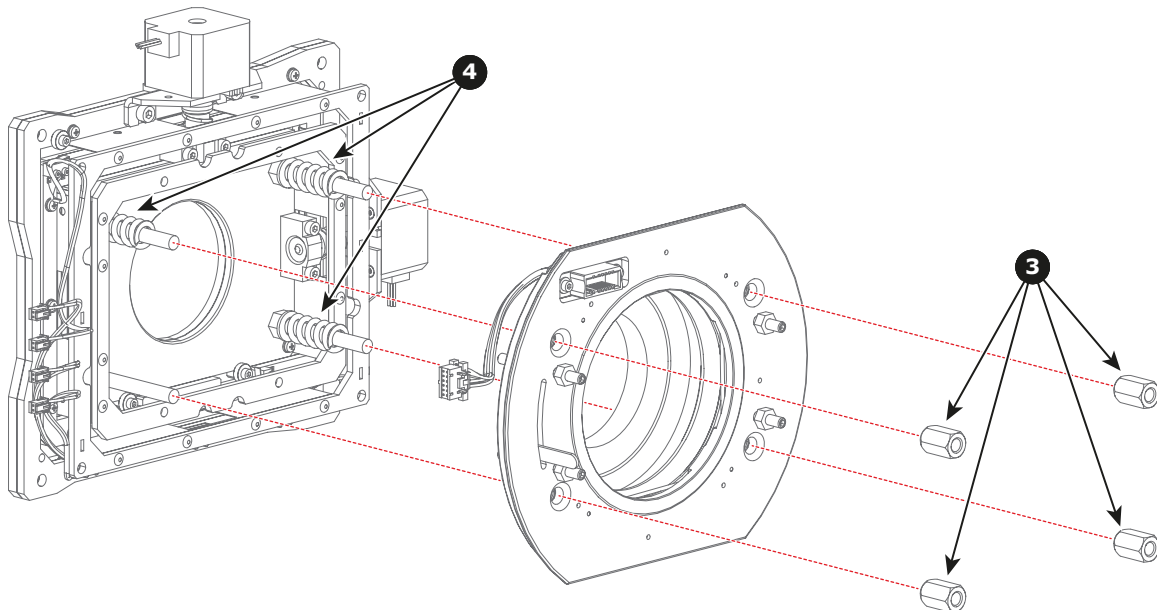


Image 16-51

2. Remove the old Lens Holder cover and inner dust rubber. Use a PH1 Phillips screwdriver to loosen the seven screws (reference 5 image 16-52) as illustrated. by doing this, you will also release the ground cable (reference 6).

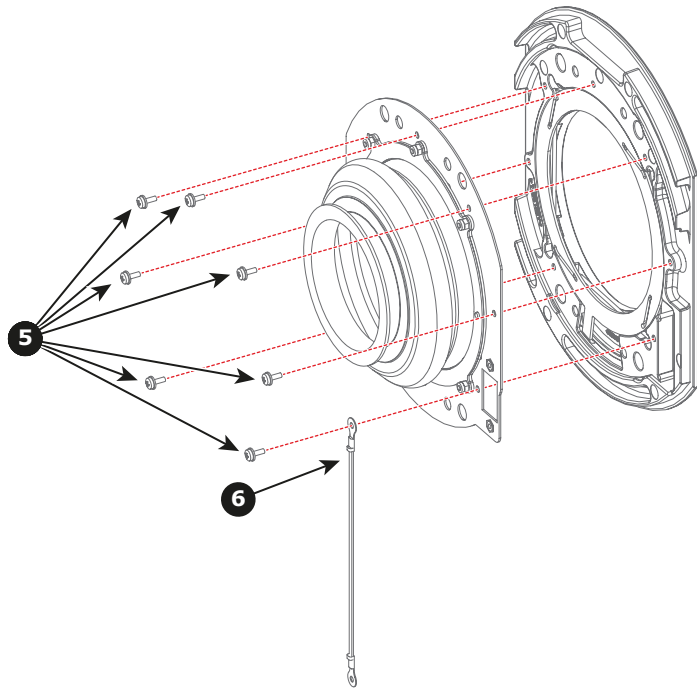


Image 16-52

3. Place the inner dust rubber (reference 9 image 16-53) 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).

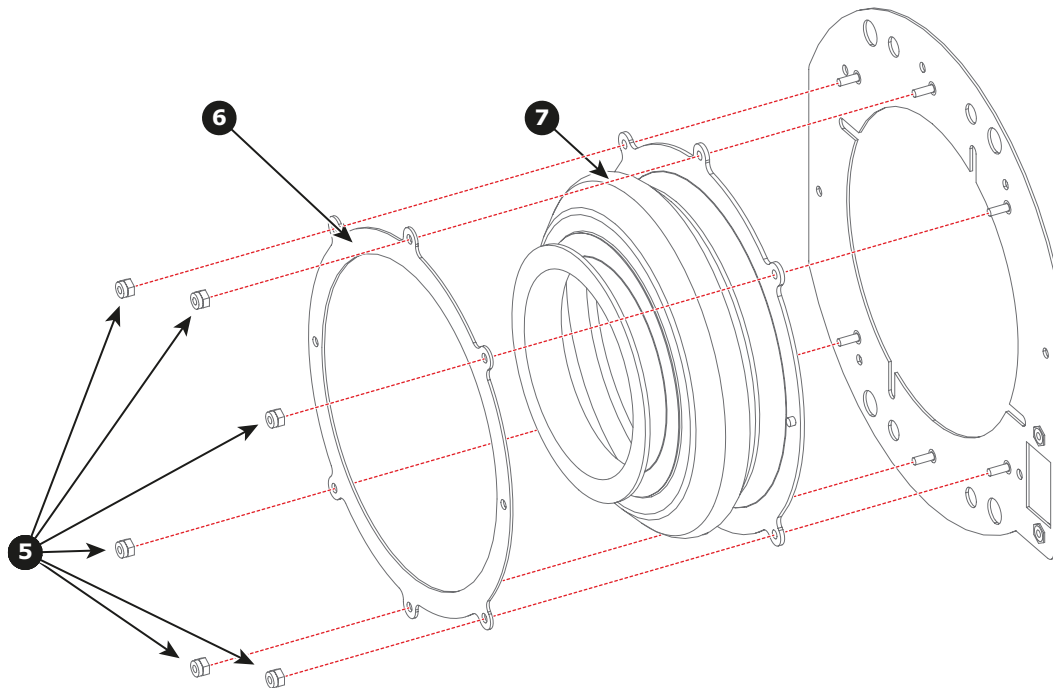


Image 16-53

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 16-52). 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.

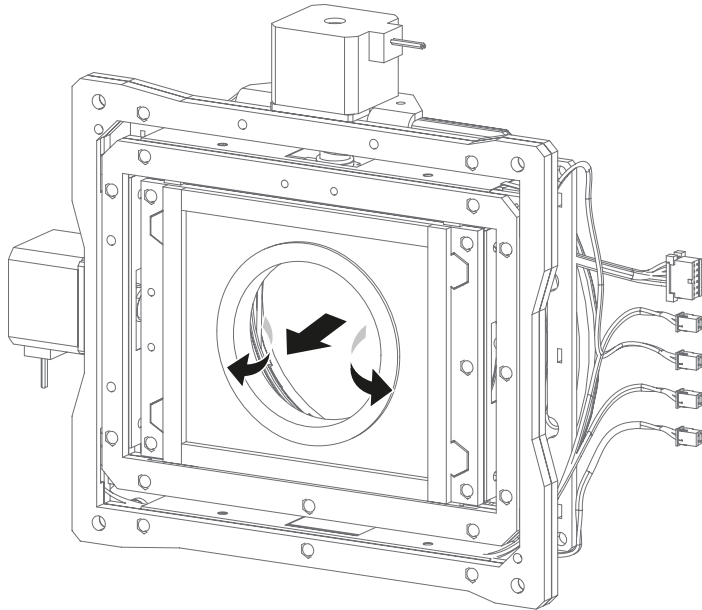


Image 16-54

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 16-51). 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 cover plate", page 259.



The Lens Holder has to be adjusted after installation. See chapter "Scheimpflug", page 277.

17. SCHEIMPFLUG

About this chapter

This chapter explains the Scheimpflug principle and when to apply Scheimpflug correction upon your DP2K-S 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

17.1 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→Fp2). This is achieved by changing the distance between the DMD plane and the lens plane (Lp1→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→Lp4).

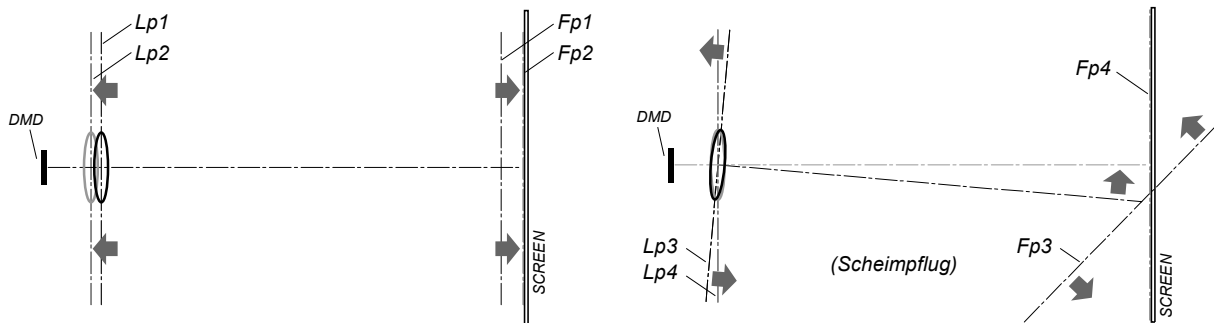


Image 17-1
Scheimpflug principle



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.

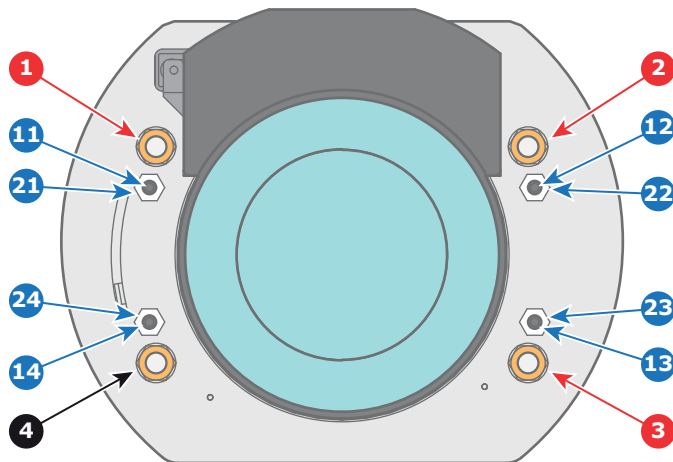


Image 17-2

- 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.

17.2 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.

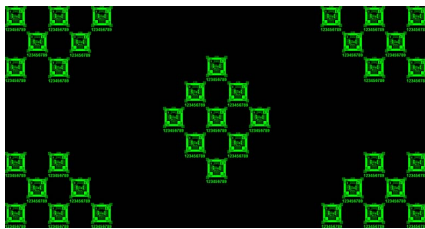


Image 17-3

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 284.
7. Unlock and turn out the 4 set screws (reference 11 image 17-4) of the Lens Holder by 1 centimeter. Use a 10mm nut driver for the lock nuts (reference 21 image 17-4) and use a 3mm Allen wrench for the set screws.

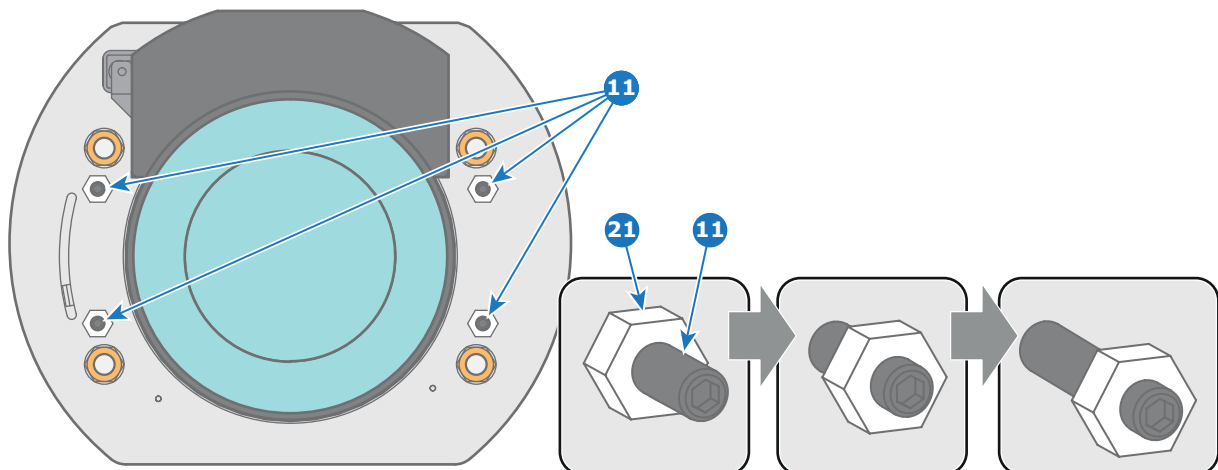


Image 17-4

8. Fully loosen the Scheimpflug nut at the lower left of the Lens Holder (reference 4 image 17-5). 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).

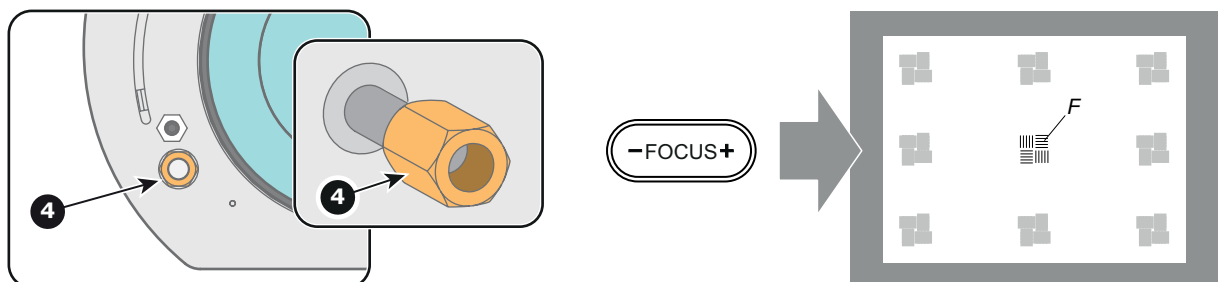


Image 17-5

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 17-6). As a result the focus in the center will fade a bit but that's normal.

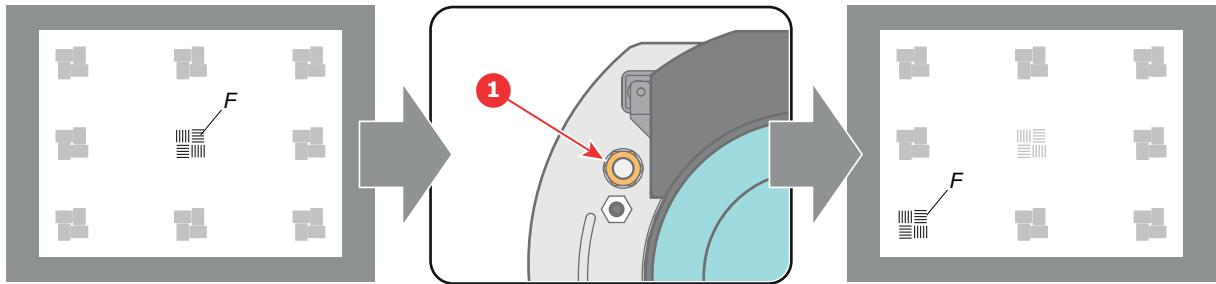


Image 17-6

2. Sharpen the image at the top right corner of the screen by turning the lower right Scheimpflug adjustment nut (reference 3 image 17-7).

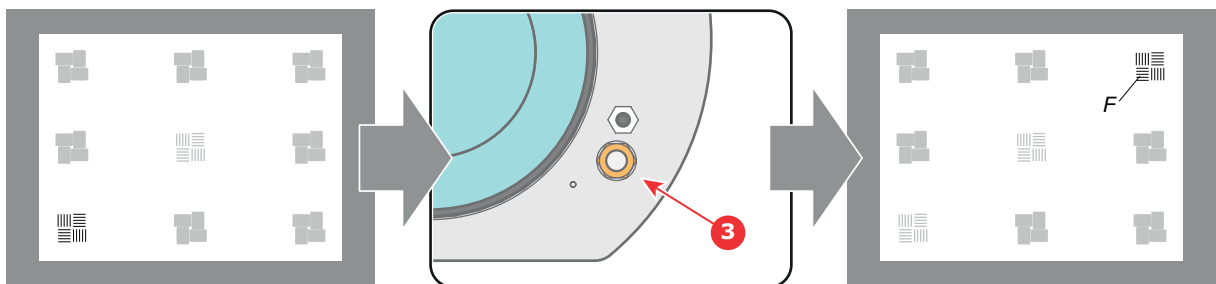


Image 17-7

3. Sharpen the image at the bottom right corner of the screen by turning the upper right Scheimpflug adjustment nut (reference 2 image 17-7).

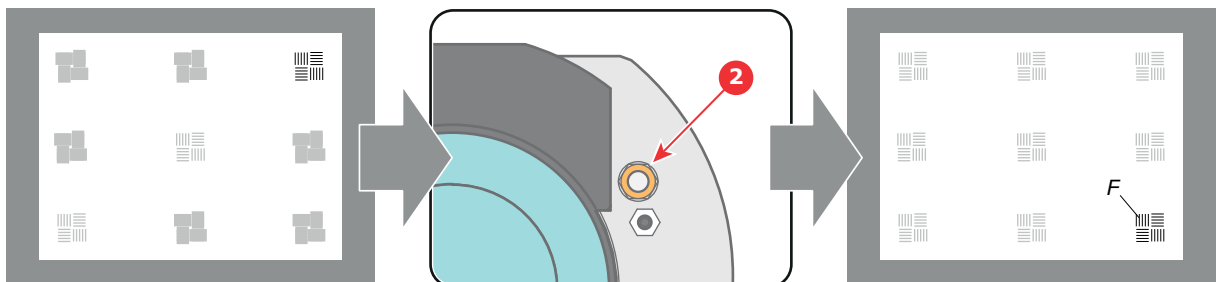


Image 17-8

4. Optimize the focus of the projected image in the center of the screen using the motorized focus control (Local Keypad).

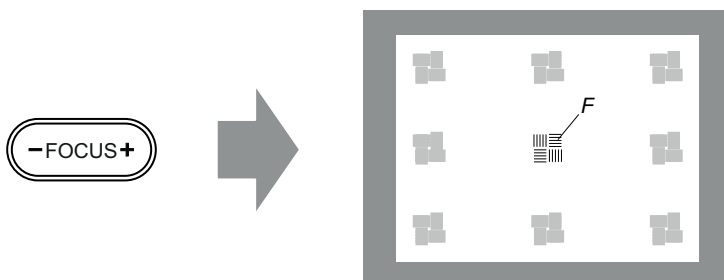


Image 17-9

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 282.

17.3 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.

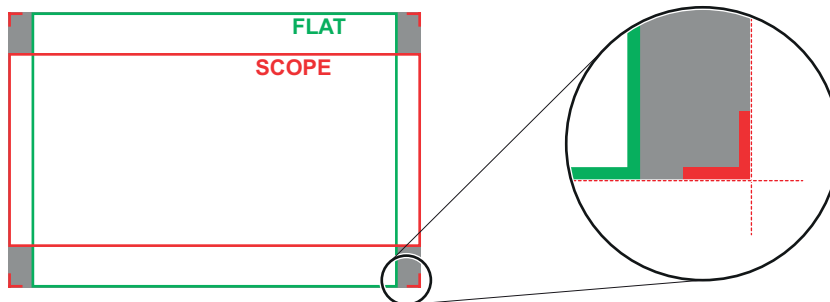


Image 17-10

3. Turn in the three set screws indicated with reference 11 image 17-11 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 17-11) of the three set screws. Use a 10mm nut driver. Ensure the image doesn't move.

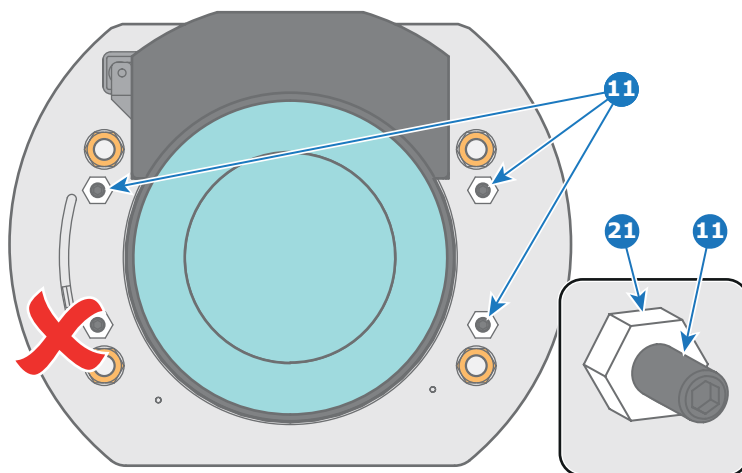


Image 17-11

5. Gently turn (by hand) the Scheimpflug adjustment nut at the lower left of the Lens Holder (reference 4 image 17-12) 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 17-12) 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.

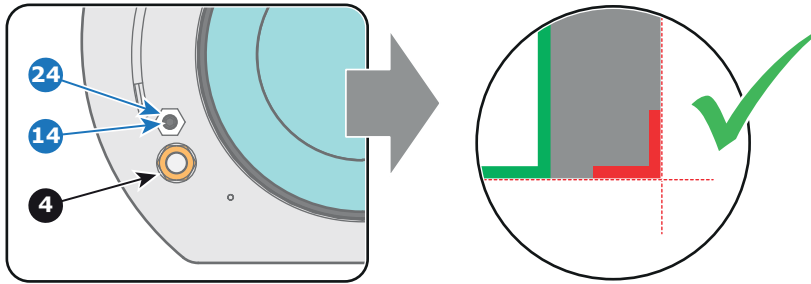


Image 17-12

7. Fasten the lock nut at the lower left of the Lens Holder. Use a 10mm nut driver.

17.4 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-S series projector 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.

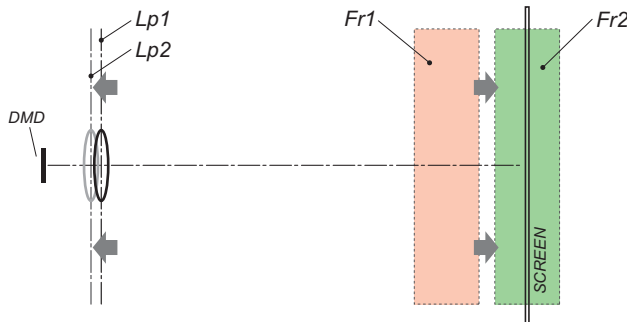


Image 17-13



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")

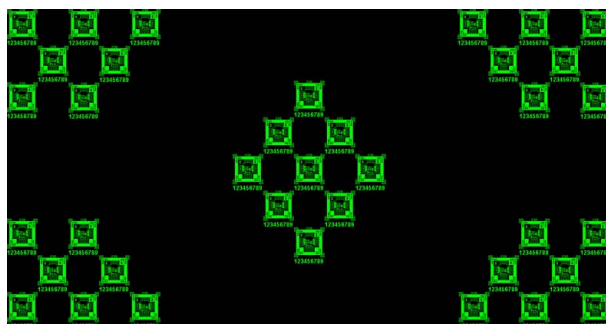


Image 17-14

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 17-15) of the Lens Holder by 1 centimeter. Use a 10mm nut driver for the lock nuts (reference 21 image 17-15) and use a 3mm Allen wrench for the set screws.

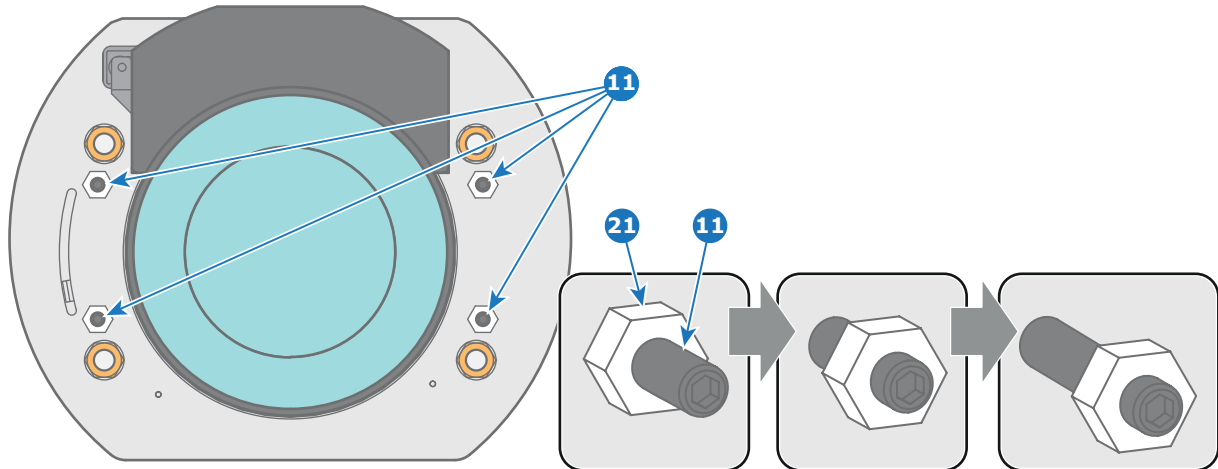


Image 17-15

2. Fully loosen the Scheimpflug nut at the lower left of the Lens Holder (reference 4 image 17-16). Use a 13mm nut driver.

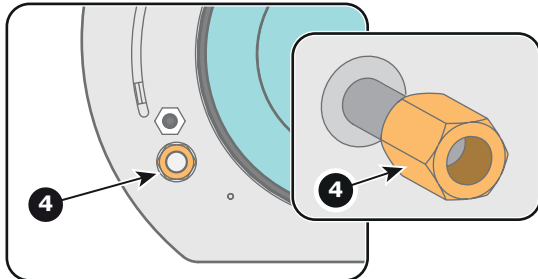


Image 17-16

3. Turn the three Scheimpflug adjustment nuts, reference 1, 2 and 3 image 17-17, until the front of the nut (reference 5 image 17-17) is equally aligned with the front of the threaded rod (reference 6 image 17-17). Use a 13mm nut driver.

Note: This is the nominal position of the Lens Holder.

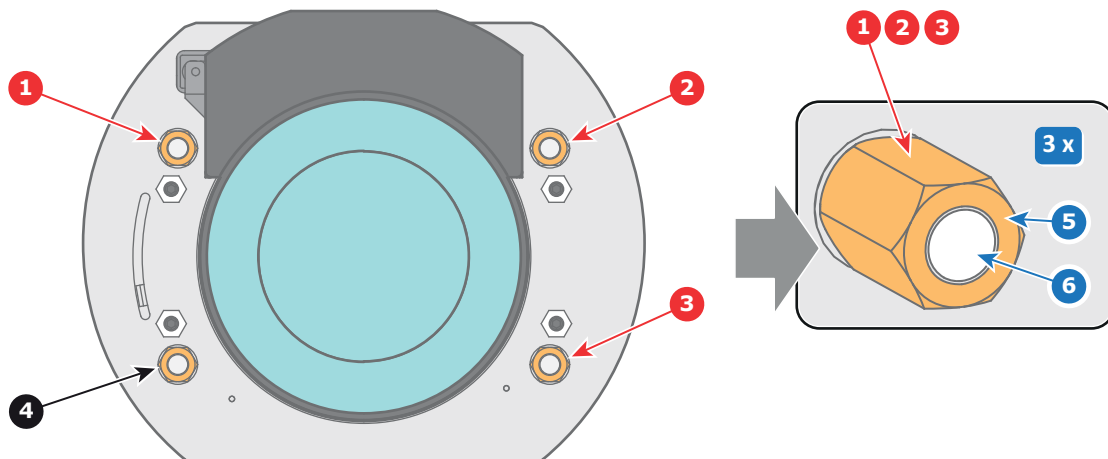


Image 17-17

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).

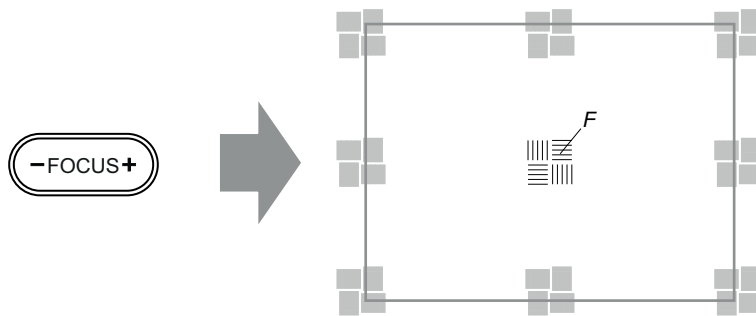


Image 17-18

- 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 17-19, 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.

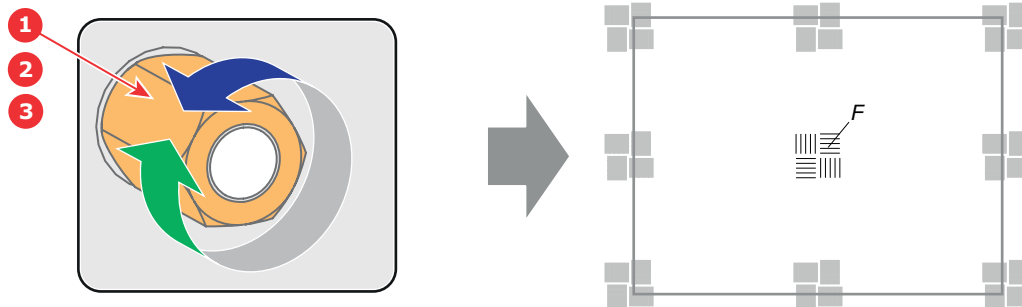


Image 17-19

- 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).

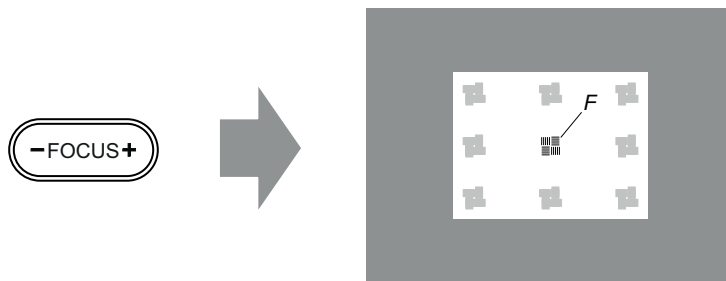


Image 17-20

- 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 17-21, equally in or out until the center of the projected image is sharp. **Note:** the same turning direction as in step 4 is applicable.

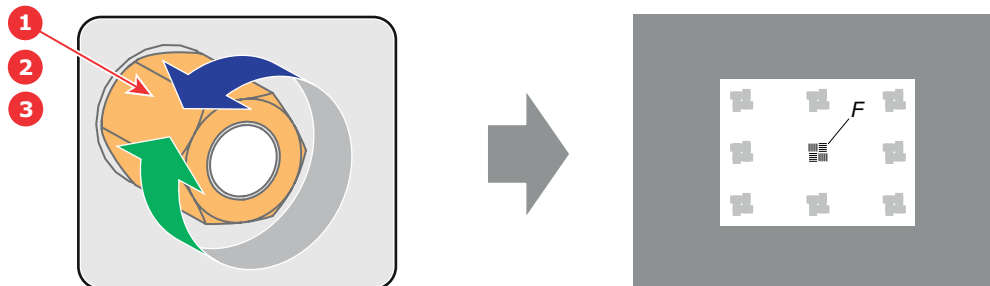


Image 17-21

- 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 282.

If no, Scheimpflug adjustment is required. See procedure "Scheimpflug adjustment", page 280, 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!

18. CARD CAGE

About this chapter

This chapter gives a brief introduction of the Card Cage, the different boards inside the Card Cage, and how to access the Card Case and these boards. Furthermore, the board replacement and fan replacement procedures are included as well.



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.

Overview

- Introduction Card Cage
- Integrated Cinema Processor (ICP)
- Cinema Controller
- Replacement of the ICP board
- Replacement of the RTC battery of the ICP board
- Replacement of the HDSDI board
- Replacement of the Link Decryptor
- Replacement of the Cinema Controller
- Battery replacement on the Cinema Controller Board
- 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

18.1 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

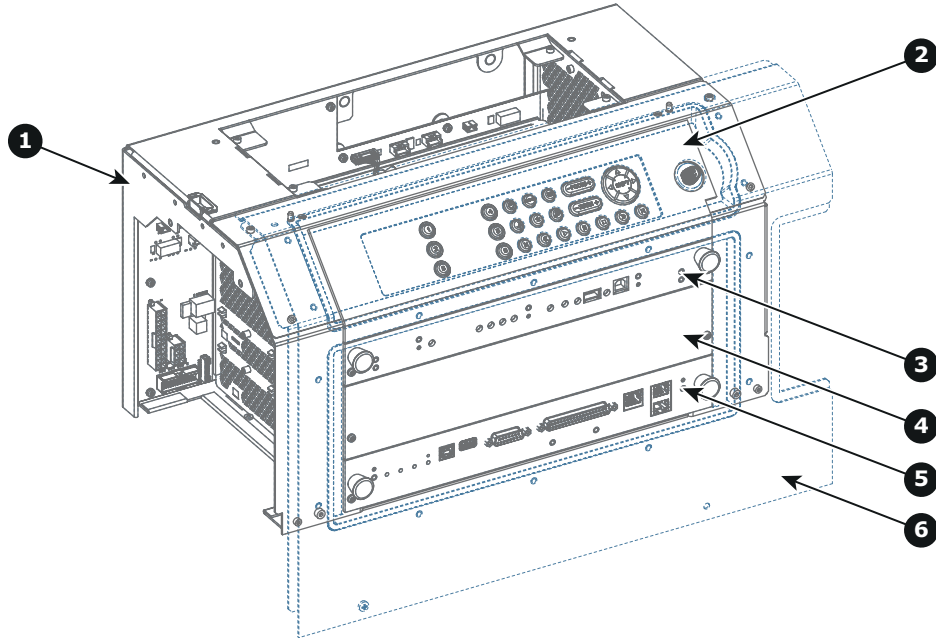


Image 18-1

- 1 Card Cage frame.
- 2 Button Interface.
- 3 Slot with ICP board.
- 4 Slot (optional) for IMB, IMS or ICMP⁶
- 5 Slot for Cinema Controller board.
- 6 Card Cage cover.

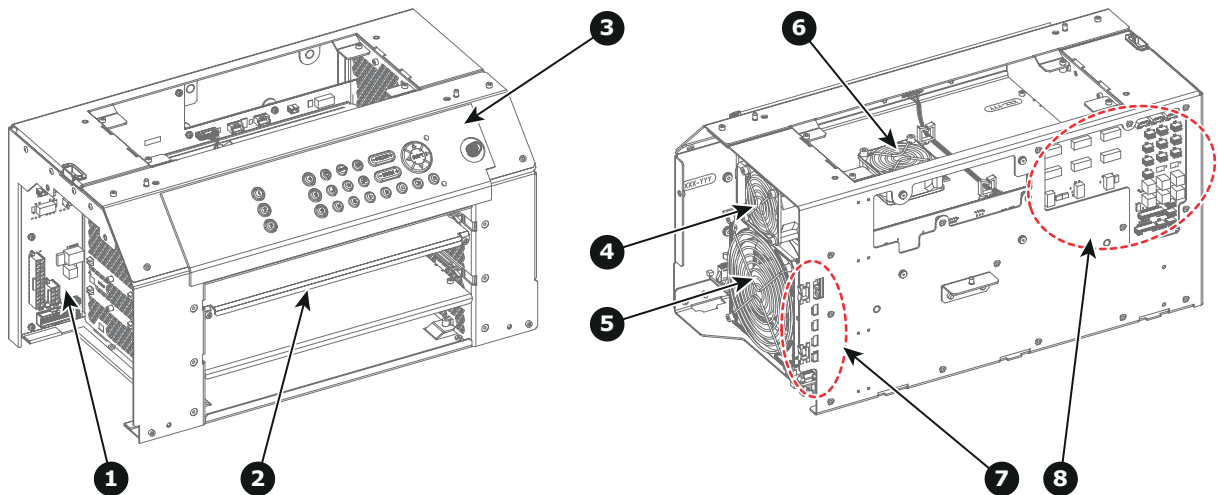


Image 18-2

- 1 Signal Backplane.
- 2 Removable partition plate.
- 3 Button Interface.
- 4 Card Cage top fan (small).
- 5 Card Cage bottom fan (large).
- 6 Card Cage ICP fan.
- 7 Sockets for Lens Holder connections.
- 8 Sockets for Light Processor connections.

6. To install the ICMP the ICP board has to be removed.

18.2 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

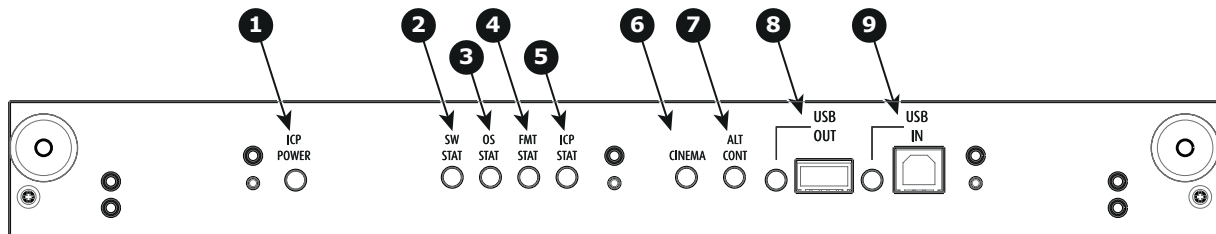


Image 18-3

- 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-S series projector. When using this board in a DP2K-S series projector the software must be re-installed after installation of the board.



When installing a new ICP board in a DP2K-S 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 !

18.3 Cinema Controller

Location of the communication ports

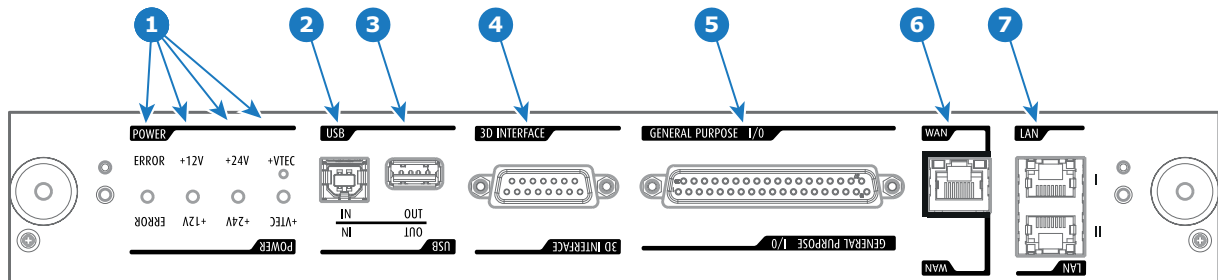


Image 18-4

Functionality

1 Diagnostic LEDs

The front plate of the Cinema Controller contains 4 diagnostic LEDs to display the status of the power supply:

- +VTEC supply (not used on DP2K-S series projector).
- +24V supply.
- +12V supply.
- general power supply (ERROR).

2 USB IN port

The Cinema Controller is equipped with a USB port, type "B" connector to connect upstream devices (E.g. PC). This USB port is used to communicate with the projector via RS232 commands (Virtual comport).

3 USB OUT port

The Cinema Controller is equipped with a USB port, type "A" connector which can be used to power handheld devices within USB spec (MAX 500mA/5V). No other functionality supported (Future expansion).

4 3D INTERFACE

3D interface port can be used to connect external 3D devices to the projector. All signals necessary for 3D projection can be provided via this connector.

5 GENERAL PURPOSE INPUT/OUTPUT (GPIO)

This 37 pin connector 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. 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.

6 Wide Area Network (WAN)

Wide Area Network (WAN: 10/100/1000 base-T). Use this Ethernet port (reference 6 image 7-8) 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). 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.

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
- StoresSNMPkey
- Stores Barco IP address and host name
- Handles reporting of errors, version info & Barco logs to Communicator
- Controls Dolby 3D color wheel
- Controls and monitors keypad (Button module)
- Controls and monitors status lights
- StoresMacrofiles, 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 the projector. This way you can configure and control the 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.

18.4 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.

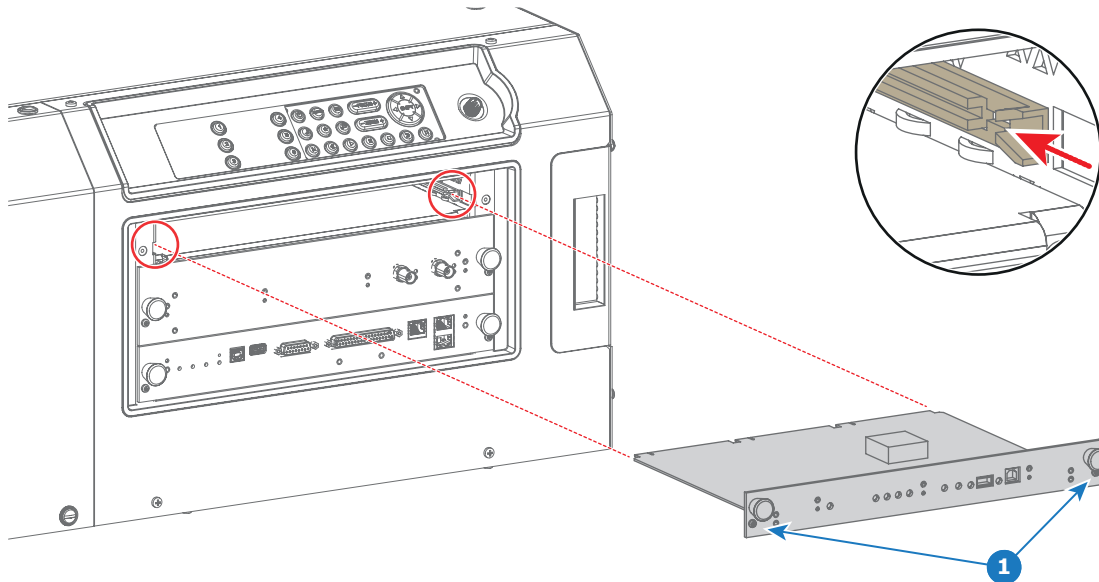


Image 18-5

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:
 - o Reinstall the clone file. See Communicator User Guide chapter "Installation" where 'cloning' is explained.
 - o Upload the LUT-SCC file into the projector file system. (e.g. 1110351581.LUT-SCC). See procedure on page 234.
 - o Activate the LUT-SCC file. See procedure on page 235.
 - b) If NOT available: perform the same additional actions as for a new Light Processor (see "Light Processor replacement process", page 172).

18.5 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.

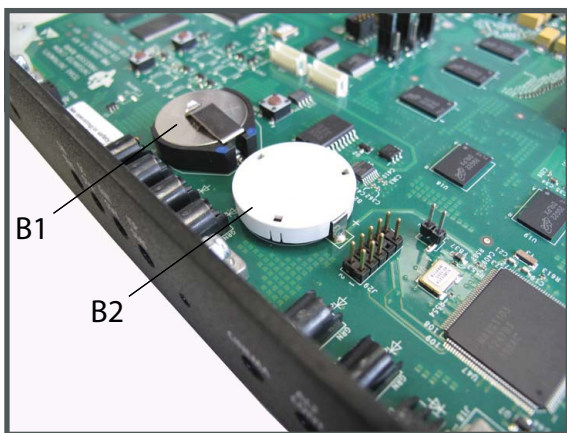


Image 18-6

5. Remove the RTC battery 'B1' from the battery holder and insert the new battery in the battery holder.

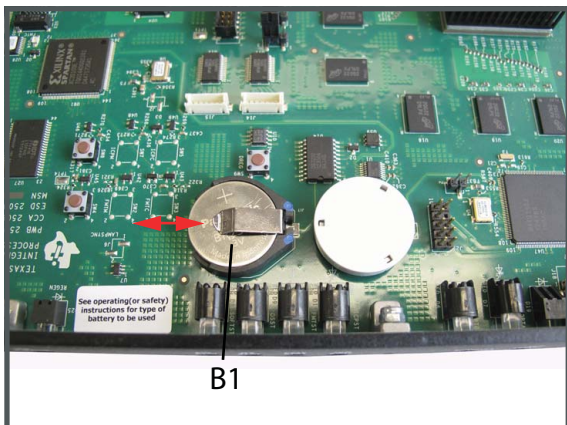


Image 18-7

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.

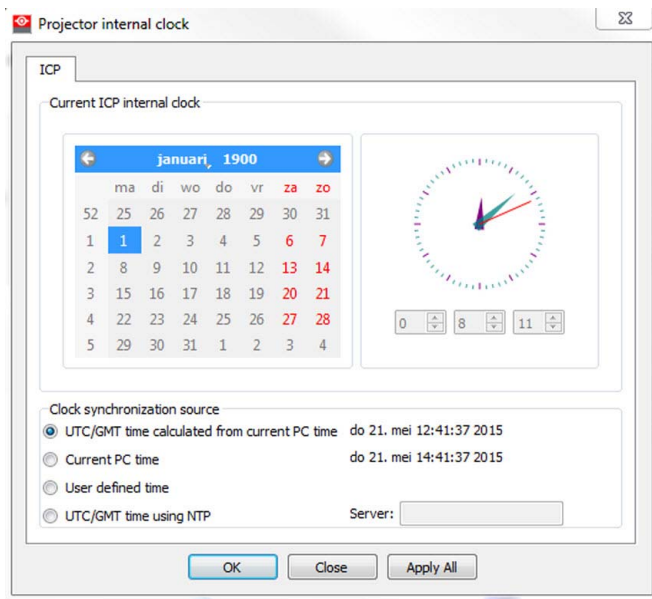


Image 18-8

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”.

18.6 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.

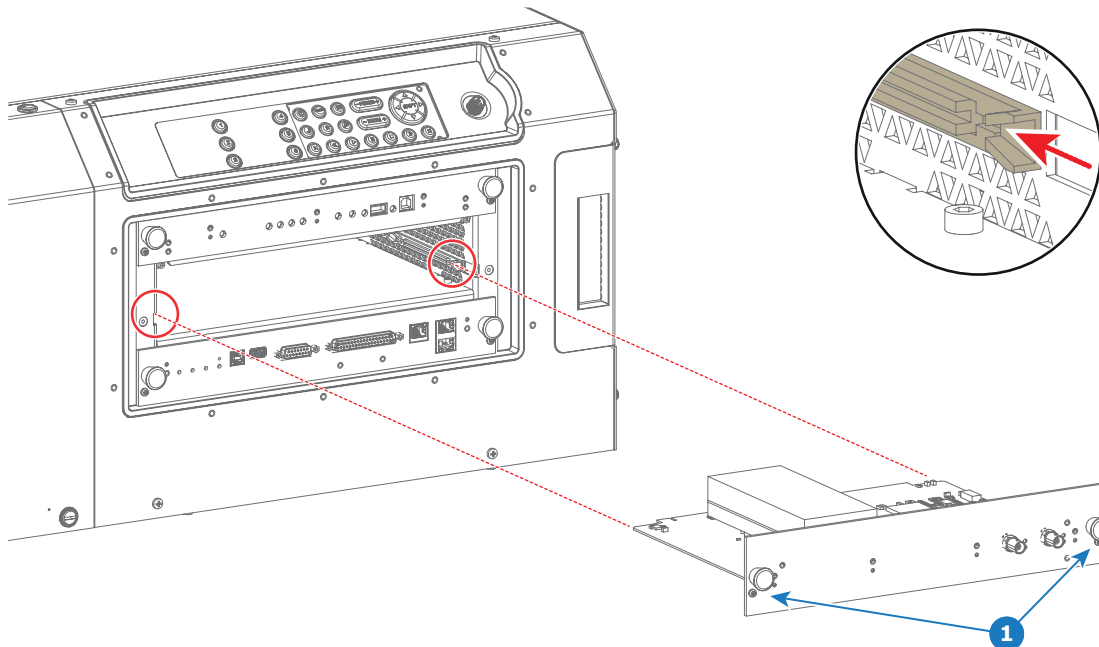


Image 18-9

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 189.

18.7 Replacement of the Link Decryptor



The Link Decryptor board is mounted on the HSDSI board. This procedure assumes that the HSDSI board is already removed from the Card Cage.

Necessary tools

T10 Torx screwdriver.

How to replace the Link Decryptor?

1. Remove the HSDSI board from the Card Cage. See "Replacement of the HSDSI board", page 297.
2. Loosen the four screws (reference 1 image 18-10) of the Link Decryptor board. Use a T10 Torx screwdriver.

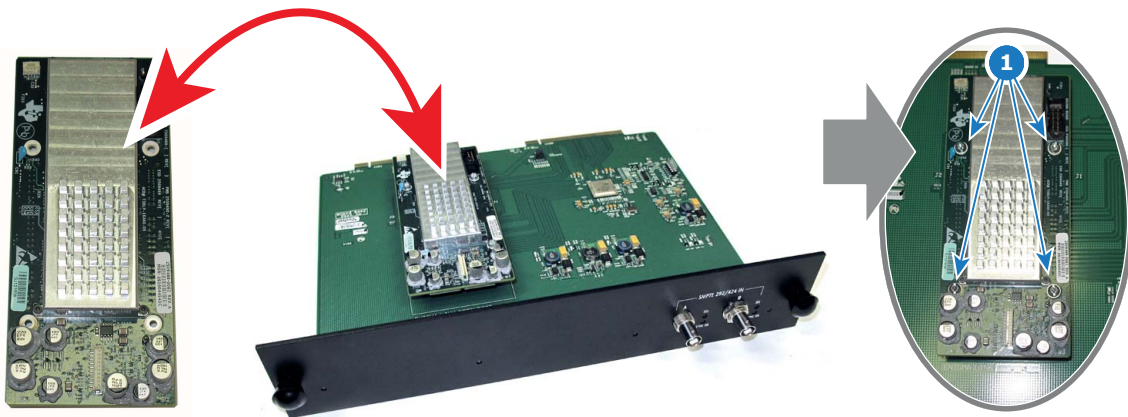


Image 18-10

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 HSDSI 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 HSDSI board in the Card Cage. See "Replacement of the HSDSI board", page 297.



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 189.



After installation of a new Link Decryptor check for latest software version. See user guide of the Communicator.

18.8 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.

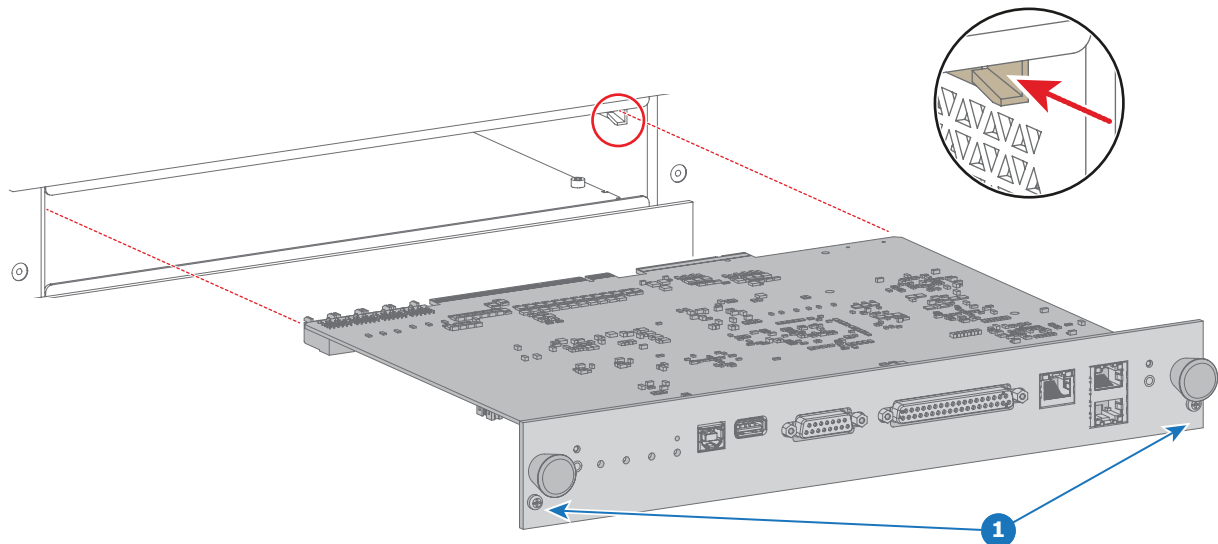


Image 18-11

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-S 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.

18.9 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. By a new one in a dedicated shop.

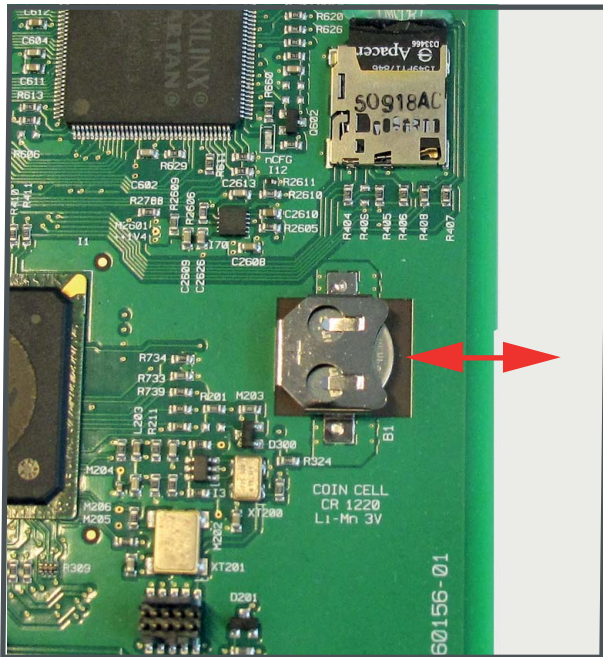


Image 18-12
Battery replacement

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).

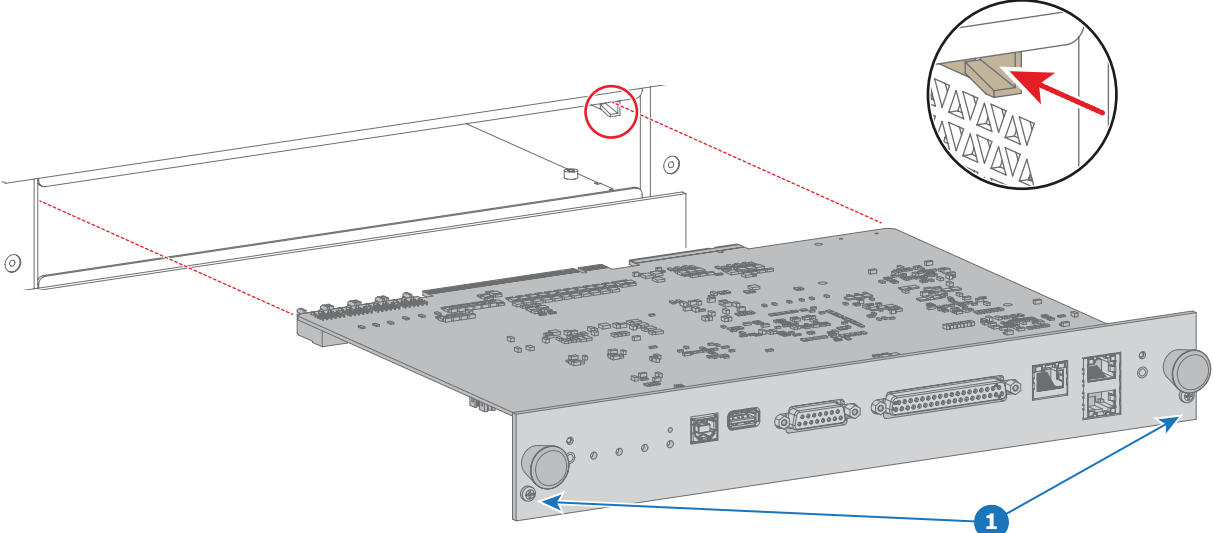


Image 18-13

18.10 Replacement of the Card Cage small fan



This procedure assumes that the large dust filter is removed from the projector. See procedure "Check the large dust filter", page 334

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 18-14) of the small fan (reference 1 image 18-14) and release the wire from the cable clamps.

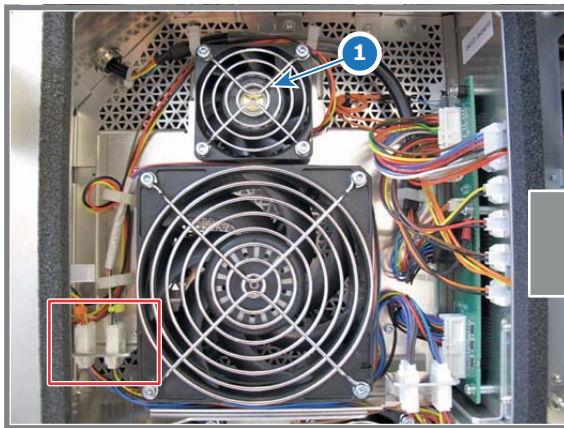
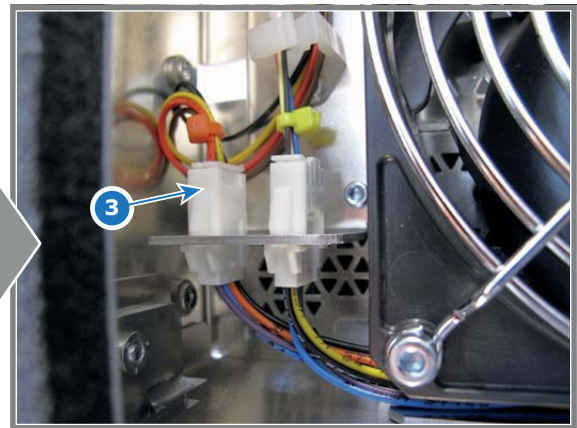


Image 18-14



2. Replace the small fan as illustrated. Use a 3mm Allen wrench to loosen/fasten the four fixation screws (reference 5 image 18-15).
Caution: Ensure to place the fan guard in front of the fan and that the airflow of the fan is towards the Card Cage.

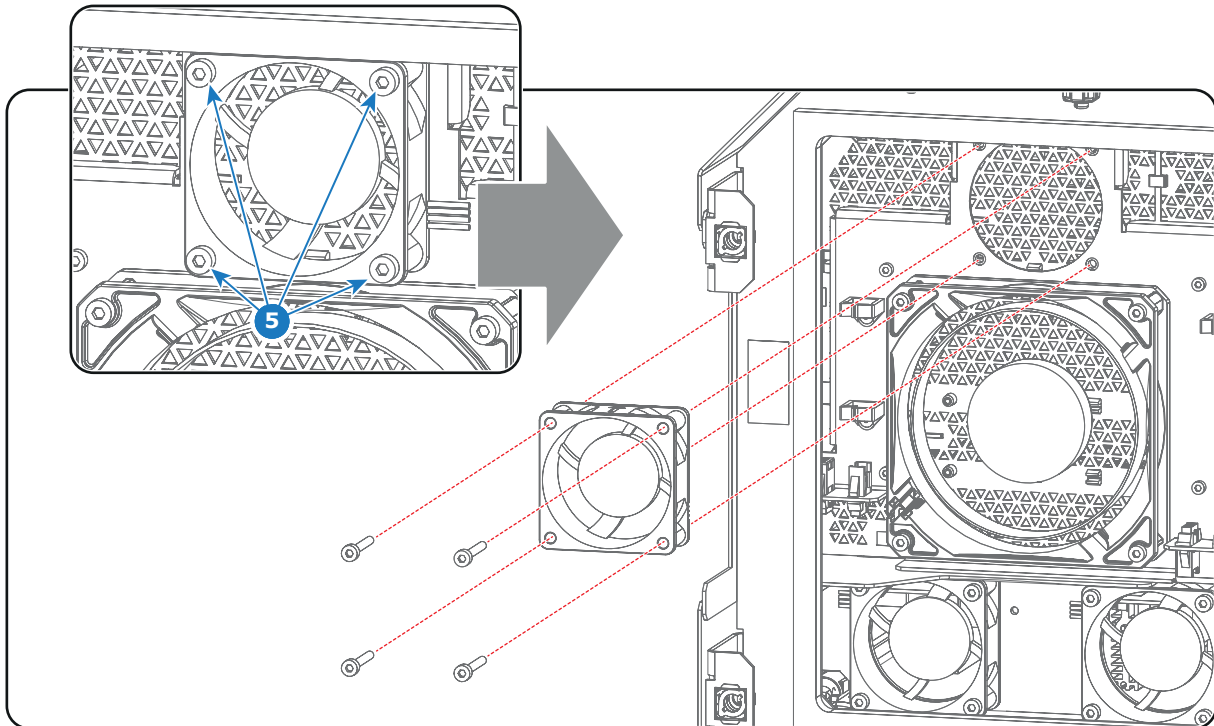


Image 18-15

3. Connect the wire of the new fan with the left socket (reference 3 image 18-14) and engage the wire in the cable clamps.

18.11 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 18-16) of the large fan (reference 2 image 18-16) and release the wire from the cable clamps.

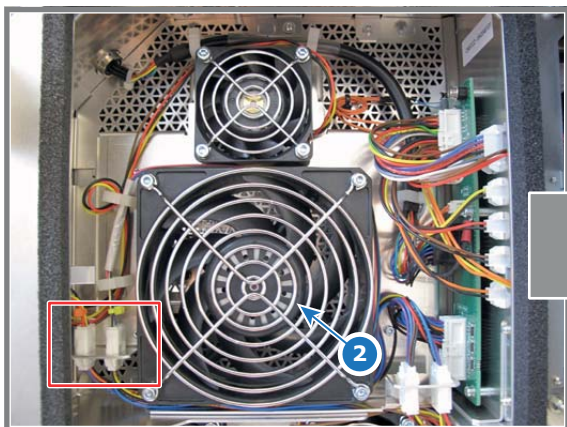
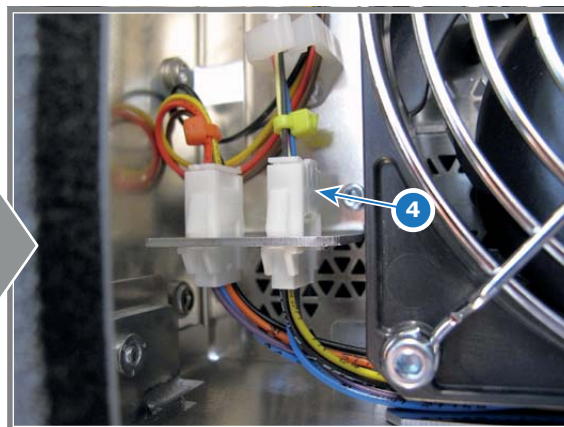


Image 18-16



2. Replace the large fan as illustrated. Use a 3mm Allen wrench to loosen/fasten the four fixation screws (reference 6 image 18-17).
Caution: Ensure to place the fan guard in front of the fan and that the airflow of the fan is towards the Card Cage.

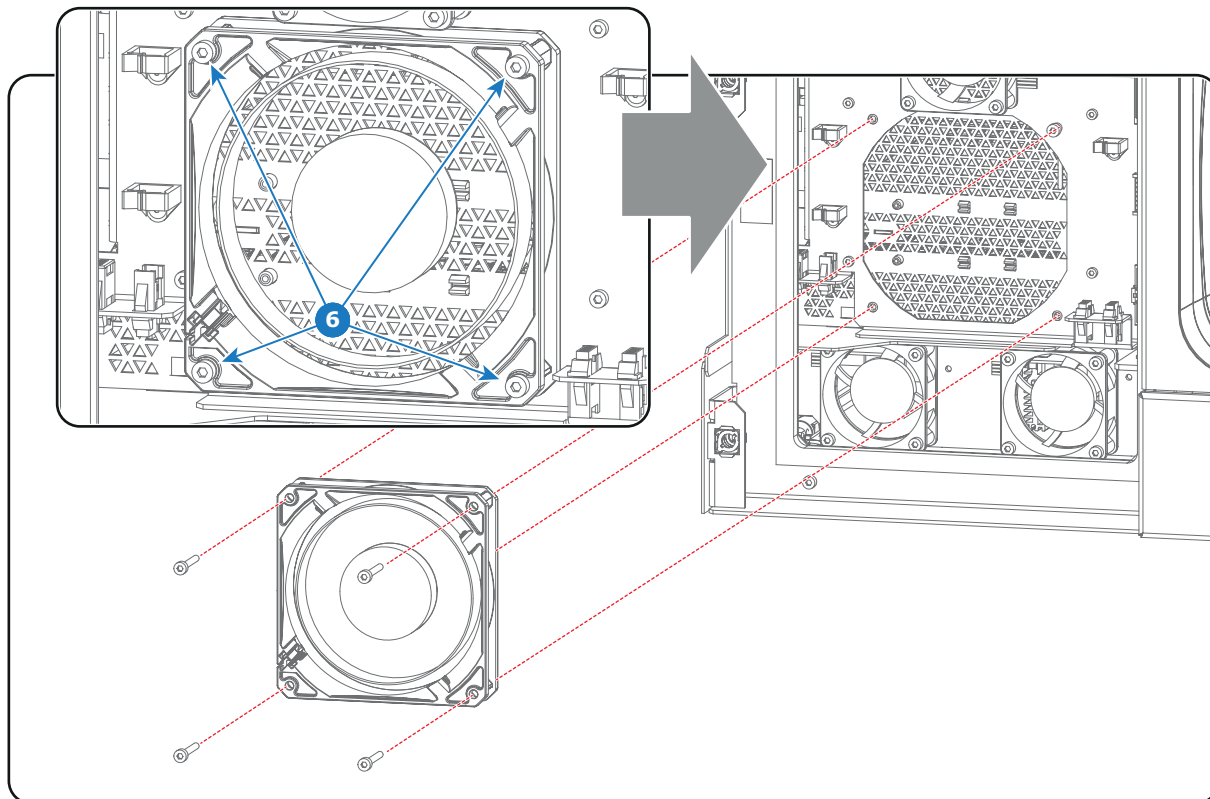


Image 18-17

3. Connect the wire of the new fan with the right socket (reference 4 image 18-16) and engage the wire in the cable clamps.

18.12 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 18-18) from the Signal Backplane and release the wire from the cable clamp (reference 2 image 18-18).

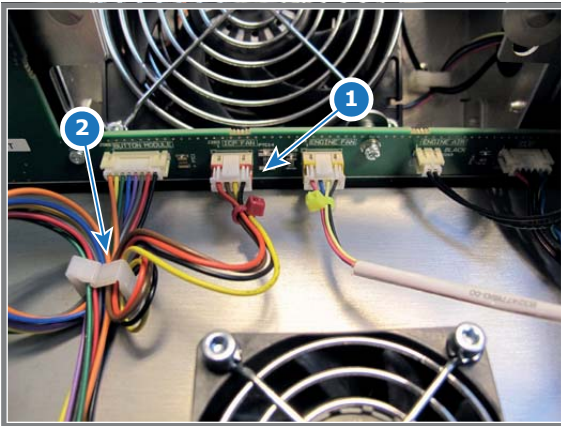


Image 18-18

2. Replace the ICP fan as illustrated. Use a 3mm Allen wrench to loosen/fasten the four fixation screws (reference 3 image 18-19).
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.

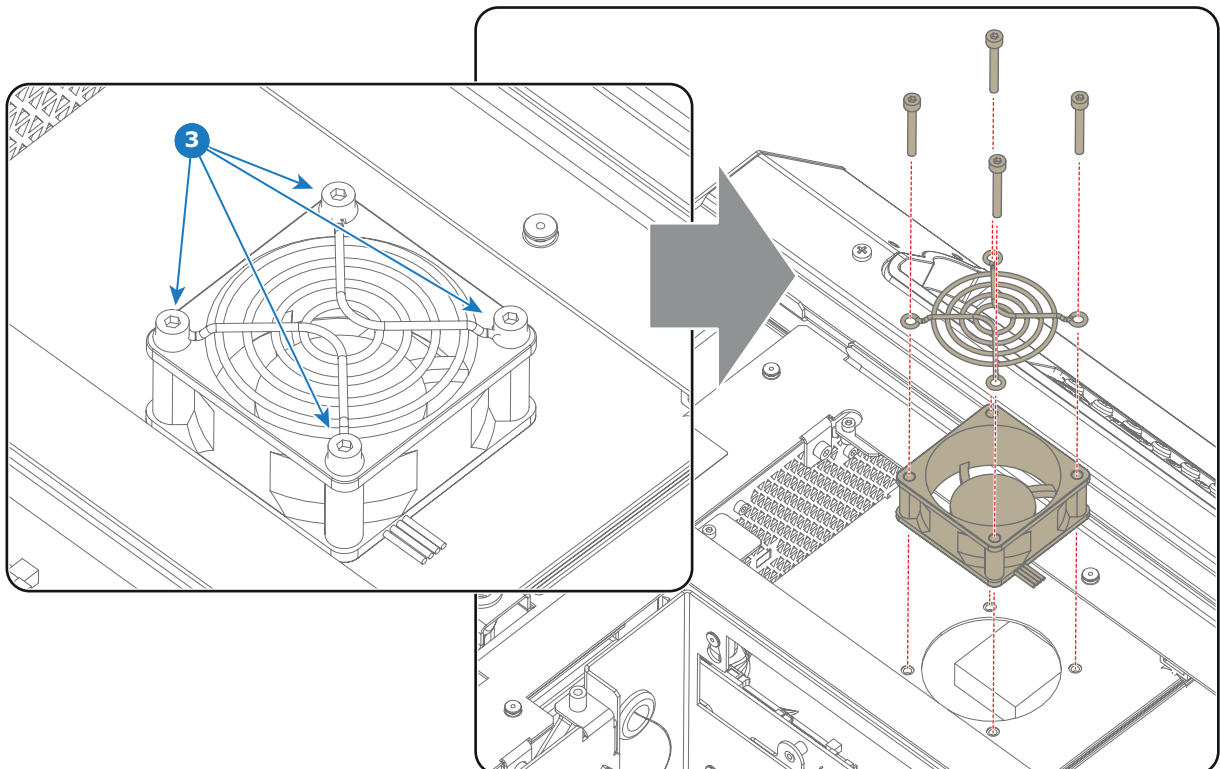


Image 18-19

3. Connect the wire of the new fan with the Signal Backplane (reference 1 image 18-18) and engage the wire in the cable clamp (reference 2 image 18-18).

18.13 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

- 3mm Allen wrench.
- 2.5mm Allen wrench.
- 15mm nut driver.

How to replace the Button Module of the projector?

1. Remove the rail from the top of the projector. Use a 3mm Allen wrench to loosen the 5 screws (reference 4 image 18-20).

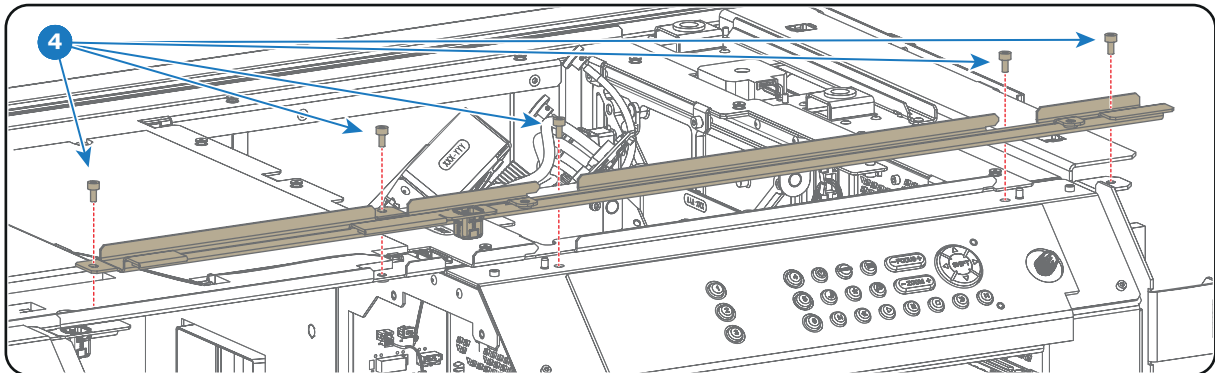


Image 18-20

2. Remove the 6 fixation screws (reference 3 image 18-21) of the projector top frame. Use a 3mm Allen wrench.
Caution: Take care not to drop the screws inside the projector.

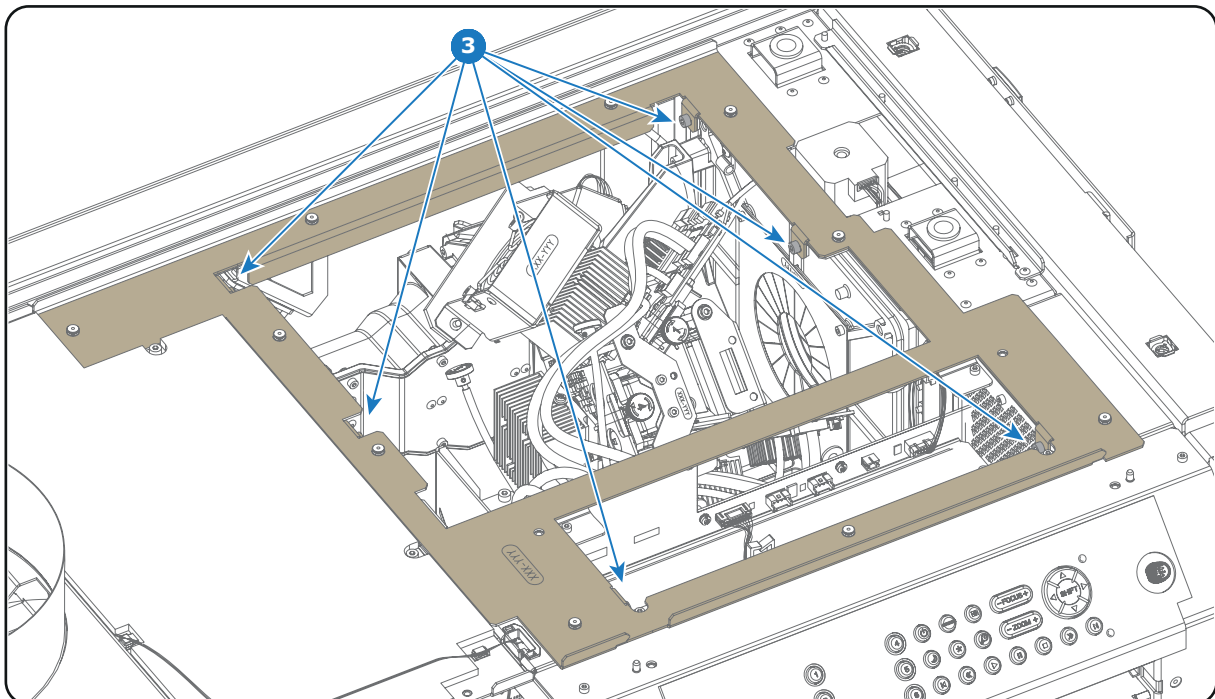


Image 18-21

3. Remove the top frame from the projector chassis.

18. Card Cage

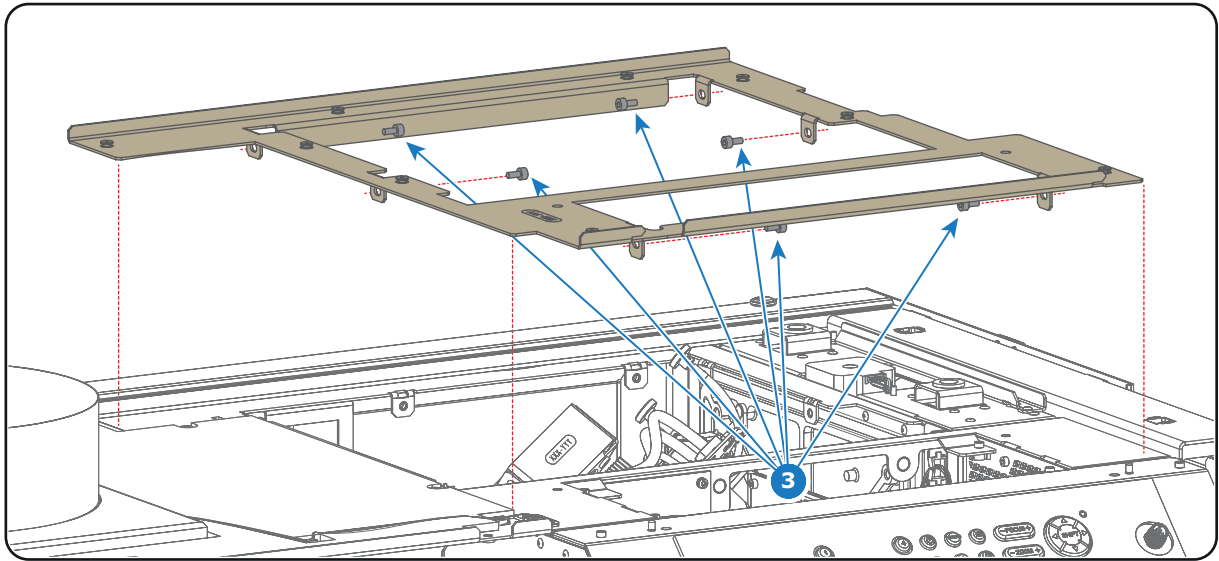


Image 18-22

4. Disconnect the wire of the Button Module (reference 2 image 18-23).

Note: If it is too difficult to disconnect the wire then release the wire from the two cable clamps (reference 1 image 18-23) and disconnect the wire unit in a later phase (step 6) when the Button Module is detached from the projector chassis.

5. Remove the nut (reference 3 image 18-23) from the circular connector (reference 4 image 18-23) . Use a 15mm nut driver.

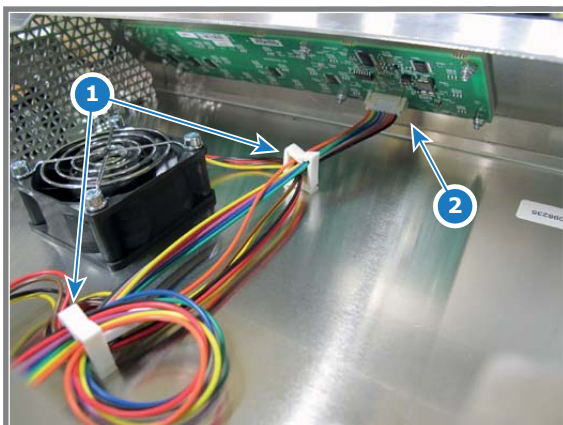
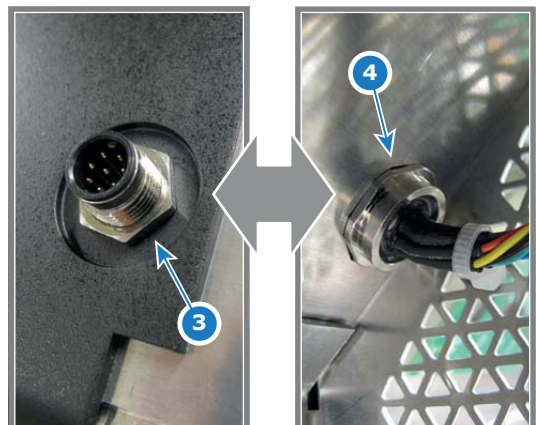


Image 18-23



6. Replace the Button Module. Use a 2.5mm Allen wrench to loosen/fasten the four screws (reference 5 image 18-24).

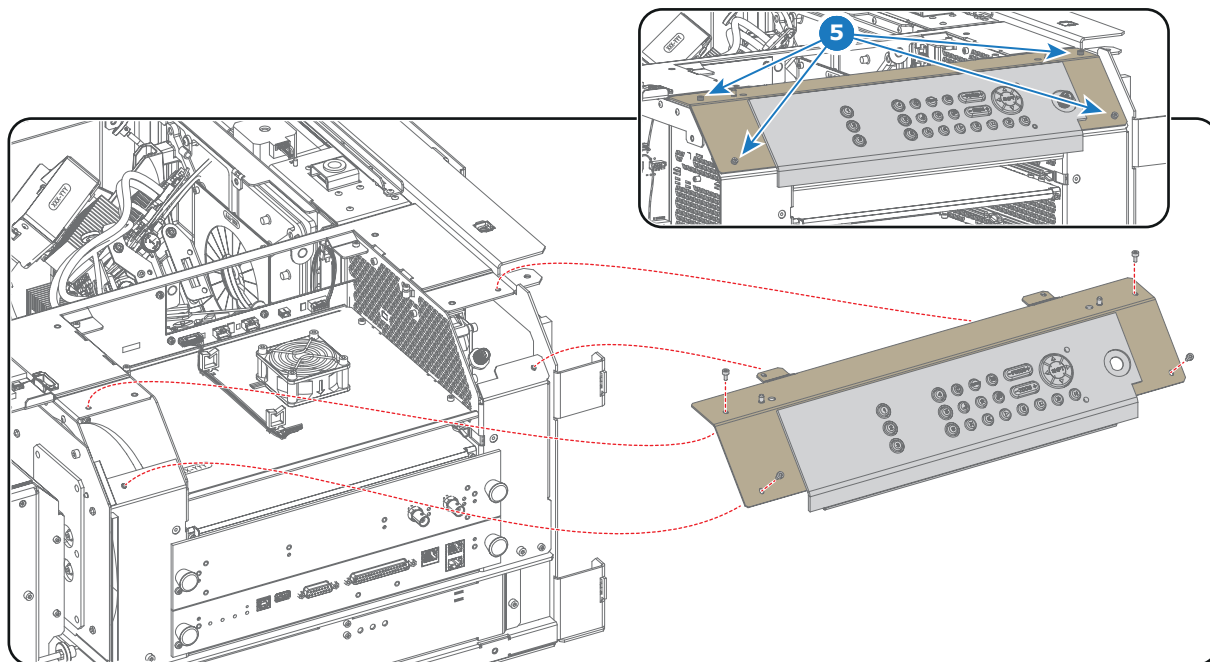


Image 18-24

7. Reconnect the wire (reference 2 image 18-23) with the Button Module and engage the wire into the two cable clamps (reference 1 image 18-23).
8. Install the circular connector (reference 4 image 18-23) and fasten the nut (reference 3 image 18-23).
9. Place the top frame in its position on top of the projector.

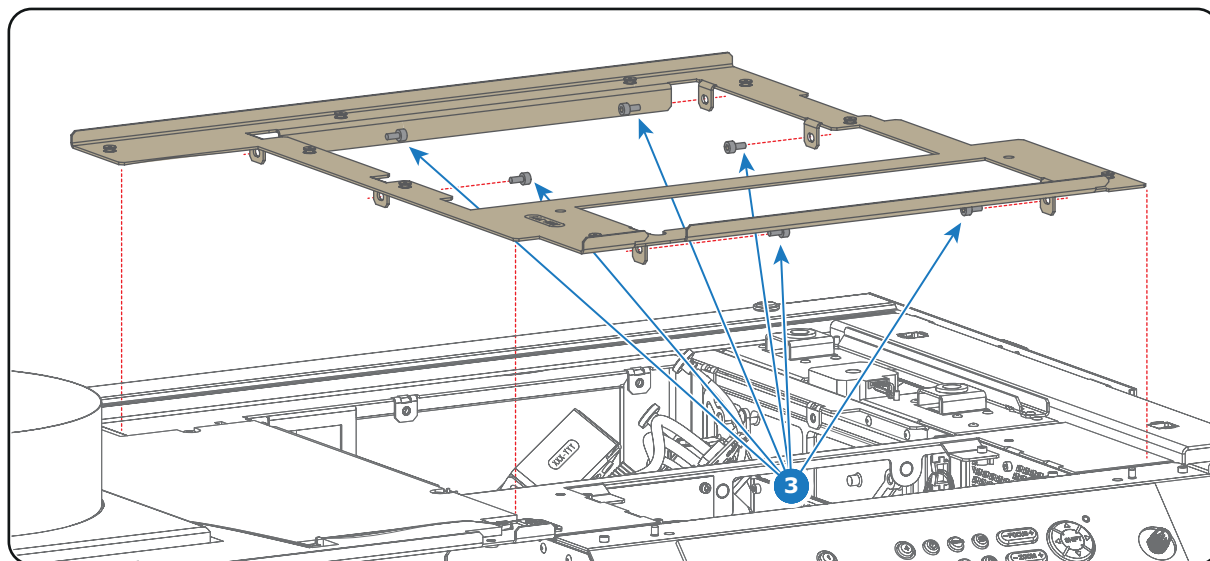


Image 18-25

10. Secure the top frame with 6 fixation screws (reference 3 image 18-26) as illustrated. Use a 3mm Allen wrench.
Caution: Take care not to drop the screws inside the projector.

18. Card Cage

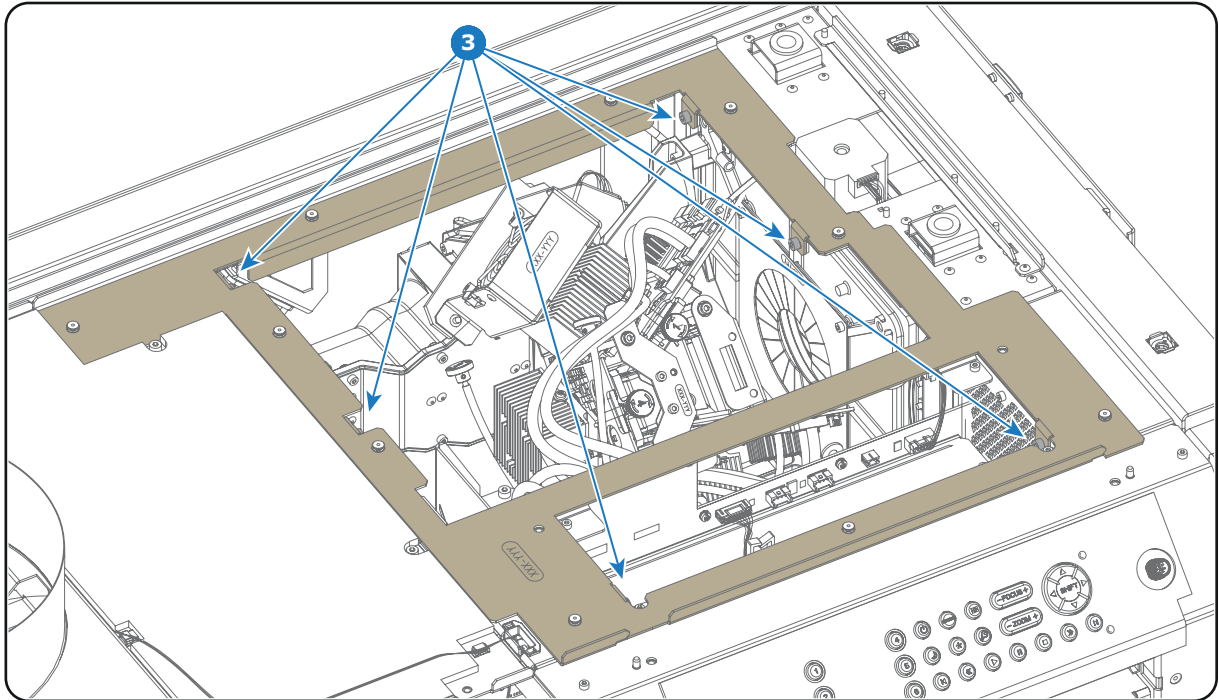


Image 18-26

11. Install the rail on the top of the projector as illustrated. Use a 3mm Allen wrench to fasten the 5 screws (reference 4 image 18-27).

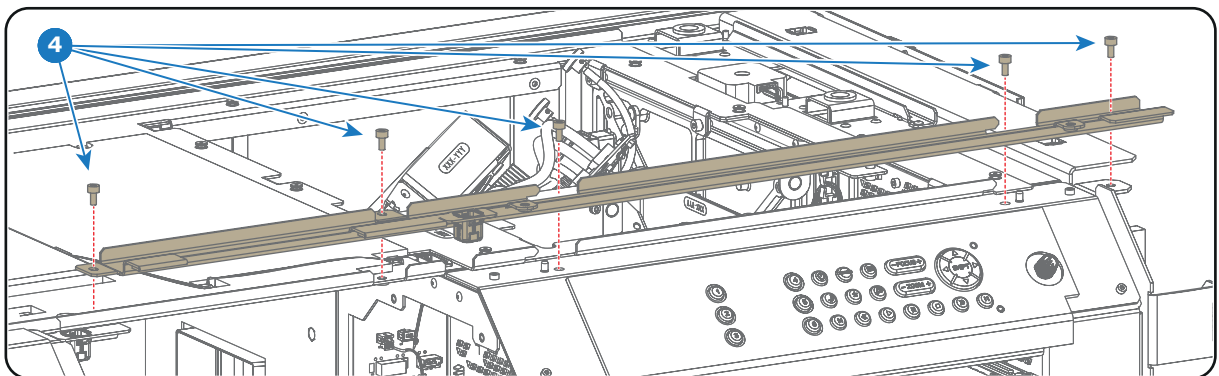


Image 18-27

12. Install all projector covers.

18.14 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) prior to proceed with the next stage of this process.
2. Remove the large dust filter from the projector front. See page 334.
3. Remove the projector top cover. See page 364.
4. Remove the top cover plate. See page 366.
5. Remove the projector Lamp House cover. See page 362.
6. Remove the Lamp House. See page 117.
7. Remove the Lamp Cathode Fan. See page 156.
8. Remove the Card Cage cover. See page 310.
9. Disconnect the Card Cage wires. See page 311.
10. Remove the Card Cage from the projector. See page 314.
11. Remove the Signal Backplane from the Card Cage. See page 317.
12. Install the new Signal Backplane into the Card Cage. See page 320.
Note: Ensure to install the SIM card, containing the projector ID, from the old Signal Backplane into the new Signal Backplane.
13. Install the Card Cage into the projector. See page 323.
14. Connect the Card Cage wires. See page 326.
15. Install the Card Cage cover. See page 330.
16. Install the Lamp Cathode Fan. See page 156.
17. Install the Lamp House. See page 128.
18. Install the projector Lamp House cover. See page 375.
19. Install the top cover plate. See page 370.
20. Install the projector top cover. See page 373.
21. Install the large dust filter from the projector front. See page 334.
22. Connect the power cord of the projector with the power net and switch on the projector.

18.15 Removal of the Card Cage cover



This procedure assumes that Lamp House cover and large dust filter are removed from the projector.

Necessary tools

PH2 Phillips screwdriver.

How to remove the Card Cage cover from the projector?

1. Remove the four fixation screws (reference 1 image 18-28) of the Card Cage cover as illustrated. Use a PH2 Phillips screwdriver.
2. Remove the Card Cage cover from the projector.

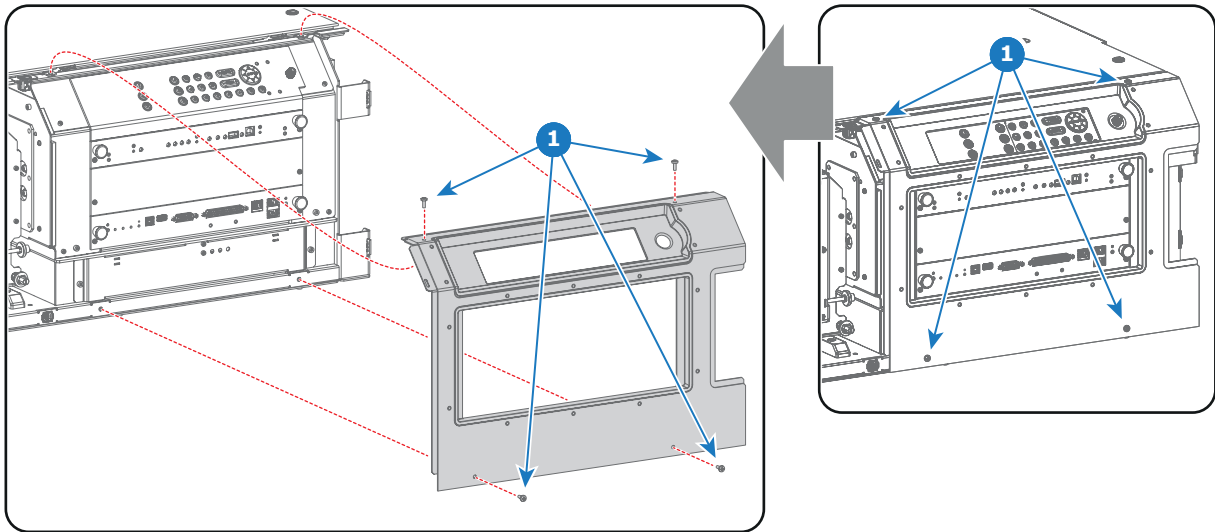


Image 18-28

18.16 Disconnecting the Card Cage wires



This procedure assumes that the top cover, top cover plate, large dust filter, Lamp House cover, Lamp House, cathode fan, 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 18-29).

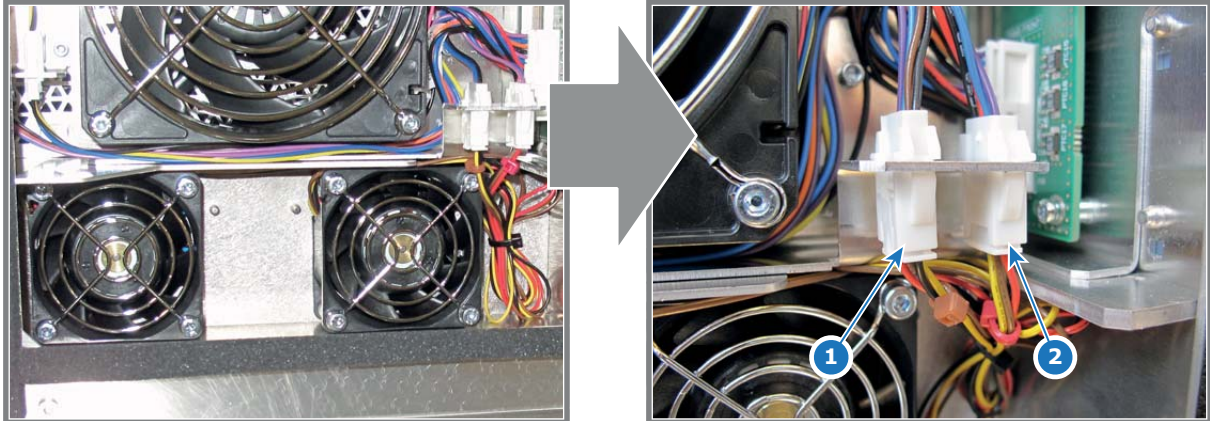


Image 18-29

2. Disconnect the 5 wires of the lens motors (reference 5, 6, 7, 8 & 9 image 18-30) from the sockets at the left side of the Lens Holder compartment.

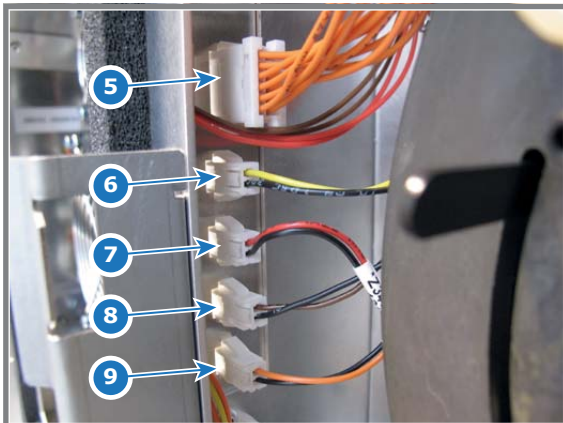


Image 18-30

3. Disconnect the big wire plug (reference 3 image 18-31) of the lens motors from the Signal Backplane and disengage the five wire sockets (reference 4 image 18-31) from the projector chassis as illustrated.

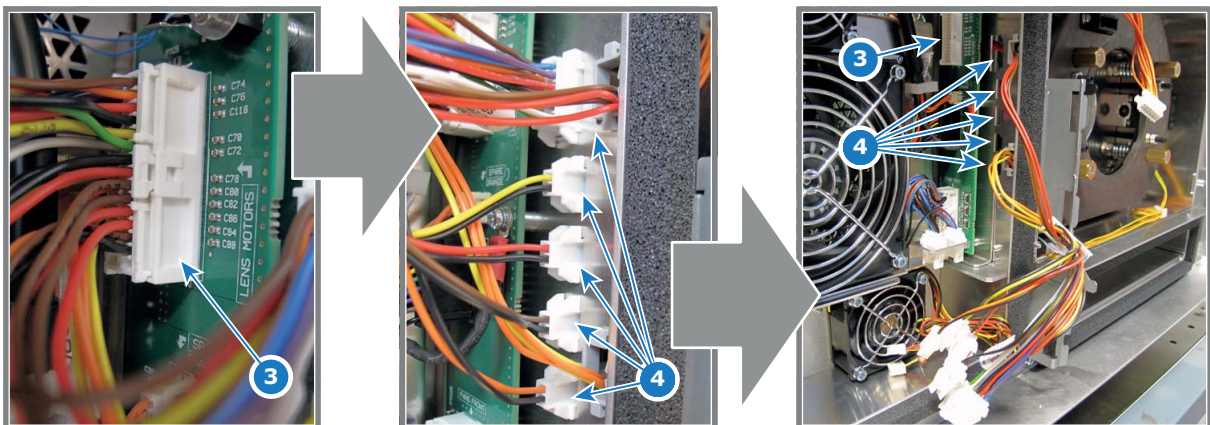


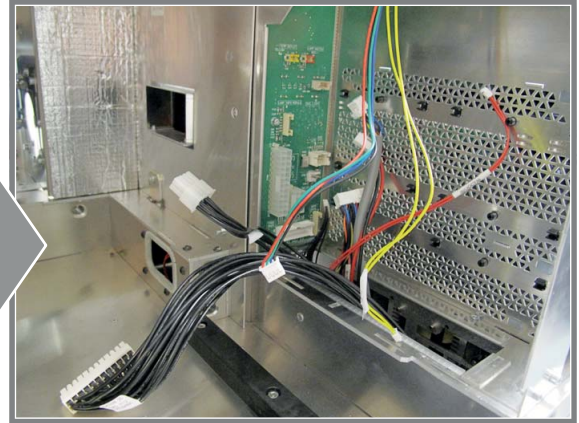
Image 18-31

4. Disconnect all seven wires from the left side of the Signal Backplane.

18. Card Cage



Image 18-32



5. Disconnect the CLO wire (reference 10 image 18-33) from the Signal Backplane.

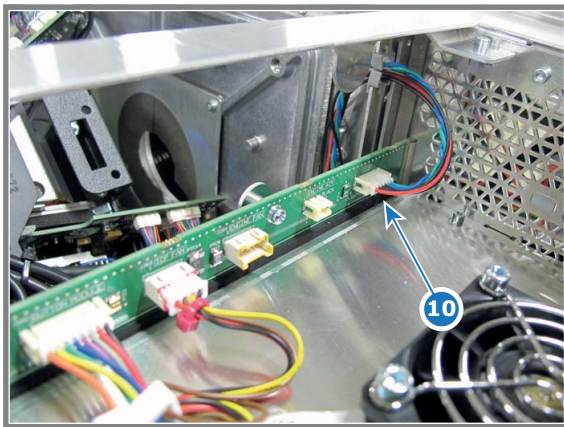


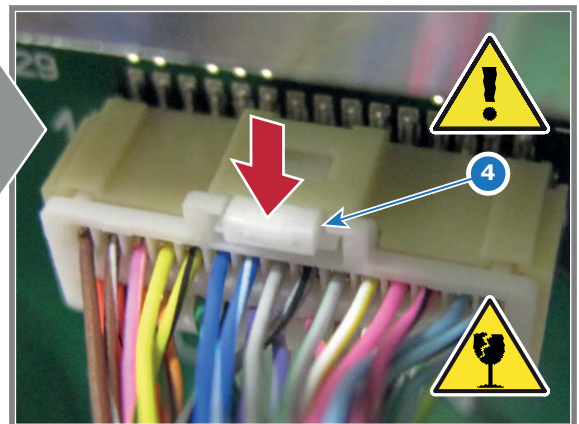
Image 18-34

6. Disconnect the nine RGB connectors (reference 3 image 18-34) from the Signal Distribution board. Push the little tab (reference 4 image 18-34) 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 18-35



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).

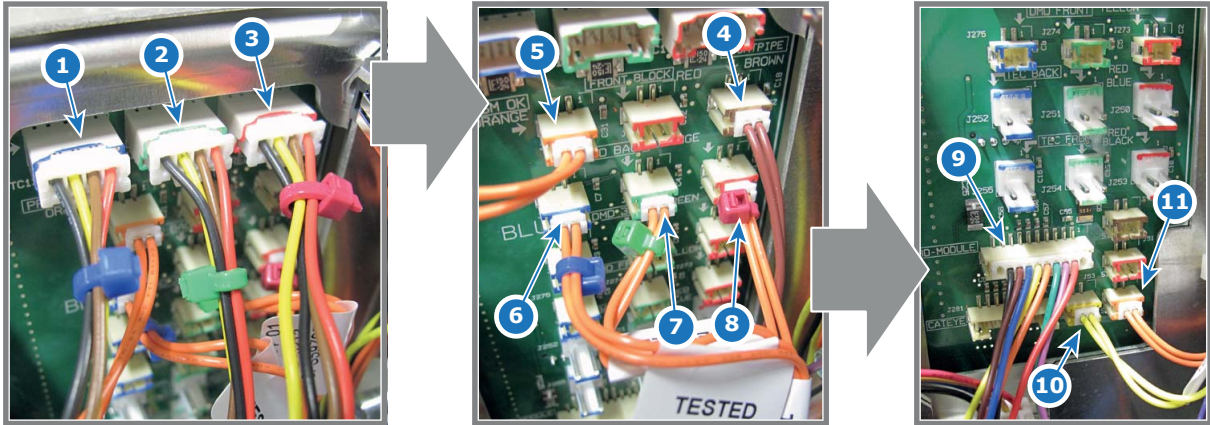


Image 18-35

18.17 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 311.

Necessary tools

3mm Allen wrench.

How to remove the Card Cage from the projector?

1. Remove the rail from the top of the projector. Use a 3mm Allen wrench to loosen the 5 screws (reference 4 image 18-36).

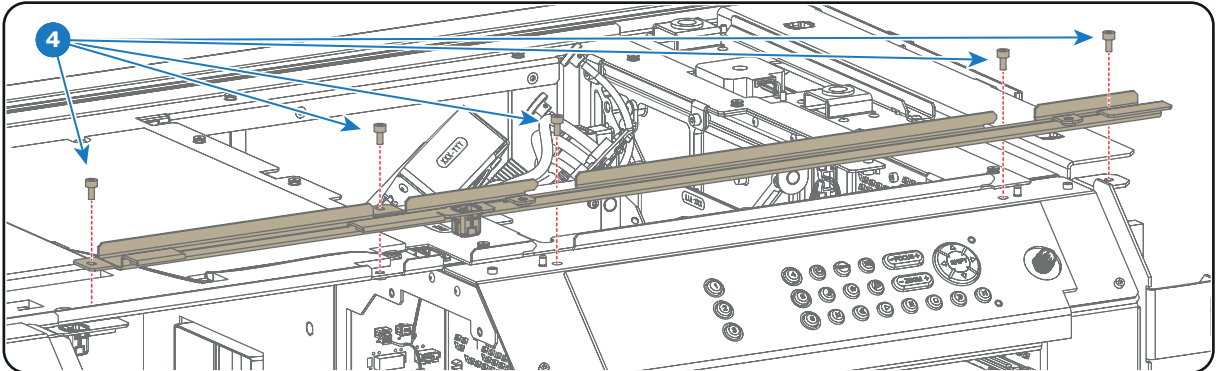


Image 18-36

2. Remove the 6 fixation screws (reference 3 image 18-37) of the projector top frame. Use a 3mm Allen wrench.
Caution: Take care not to drop the screws inside the projector.

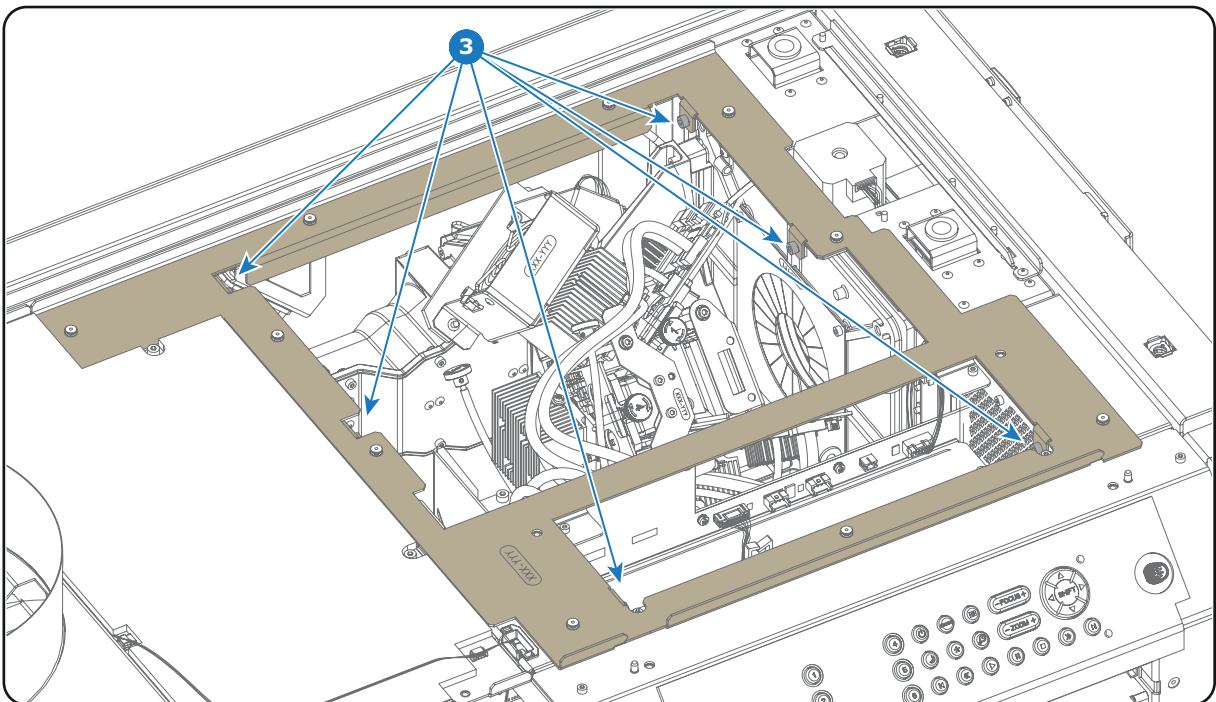


Image 18-37

3. Remove the top frame from the projector chassis.

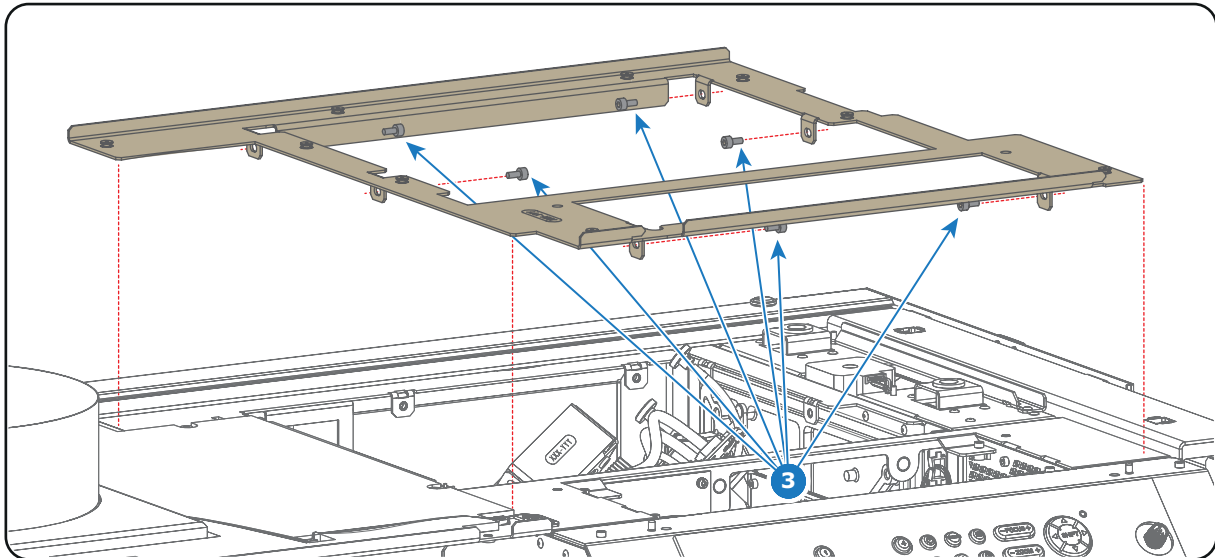


Image 18-38

4. Remove the two fixation screws (reference 2 image 18-39) from the base of the Card Cage.
 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 18-39). The front bottom of the Card Cage is engaged into the projector chassis with two vertical slots (reference B1 and B2 image 18-39).

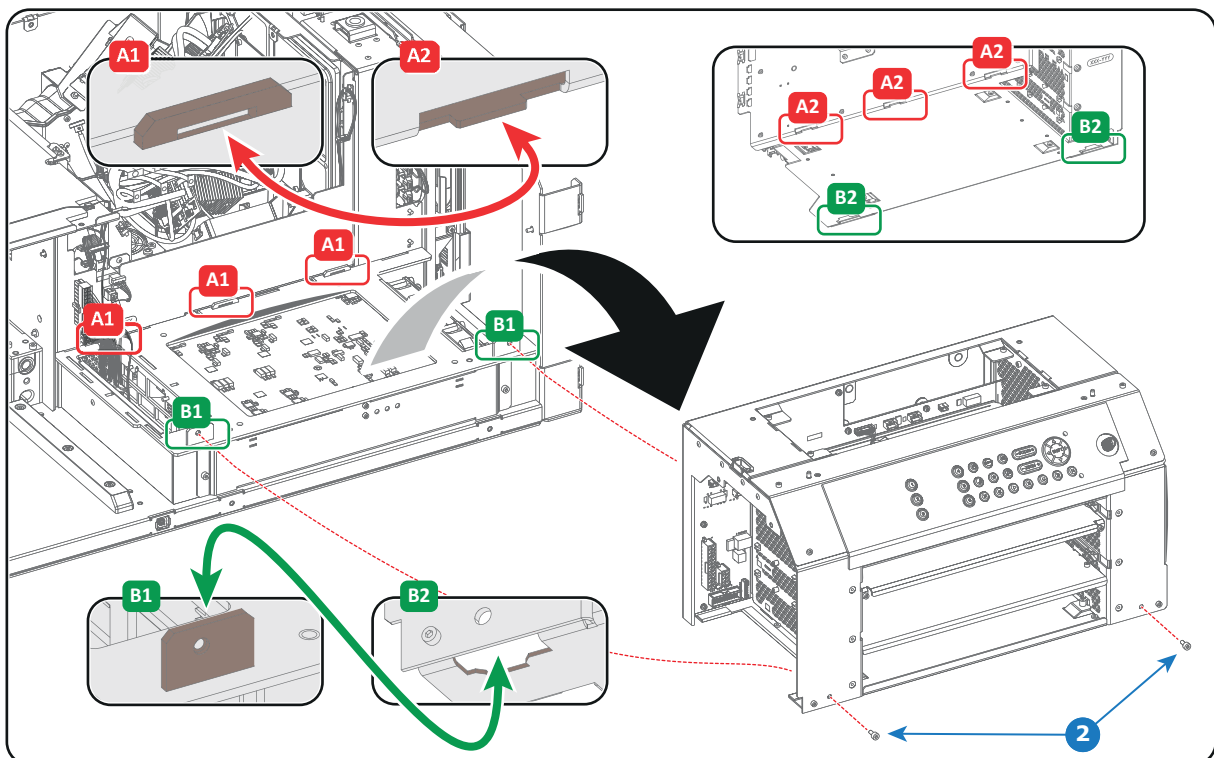


Image 18-39

Caution: The right side of the Card Cage contains two cable clamps (reference 1 image 18-40) 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.

18. Card Cage

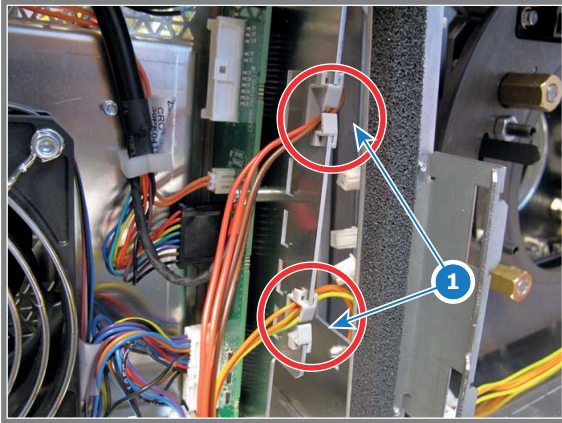


Image 18-40

18.18 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 18-41), the wire of the ICP fan (reference 11 image 18-41), 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.

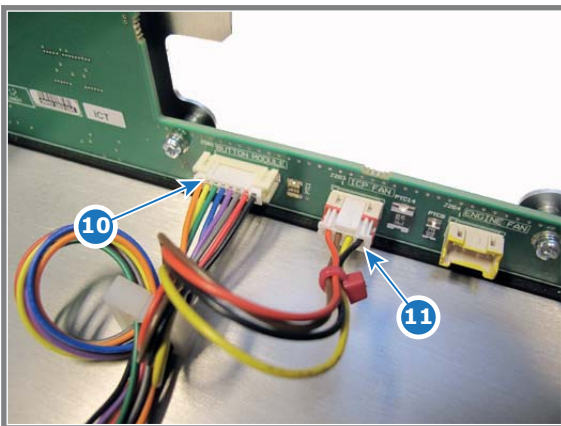
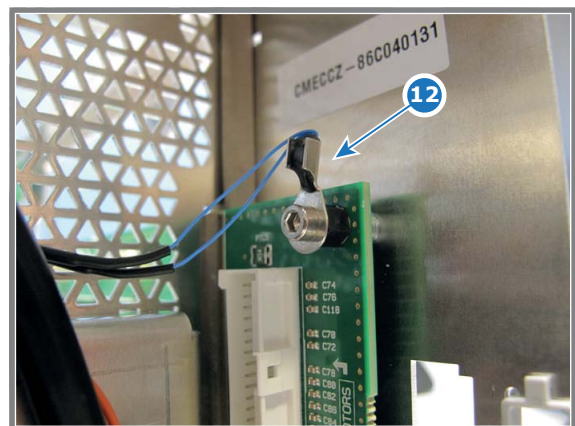


Image 18-41



3. Disconnect the touch panel wire (reference 13 image 18-42) and the orange wire (reference 14 image 18-42) from the Signal Backplane.
4. Disconnect the black PE wire (reference 15 image 18-42) from the Signal Backplane. Use a T10 Torx screw driver.
5. Disconnect the wire plug of the front fans (reference 16 image 18-42) from the Signal Backplane.

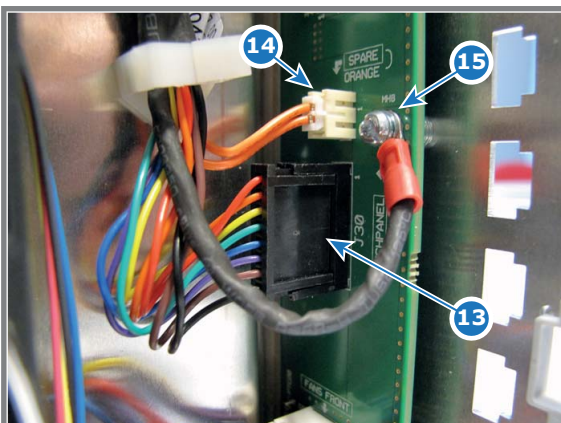
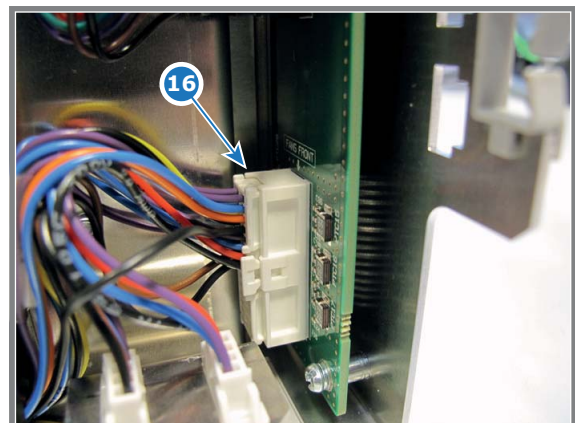


Image 18-42



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 18-43) as indicated on the drawing.

18. Card Cage

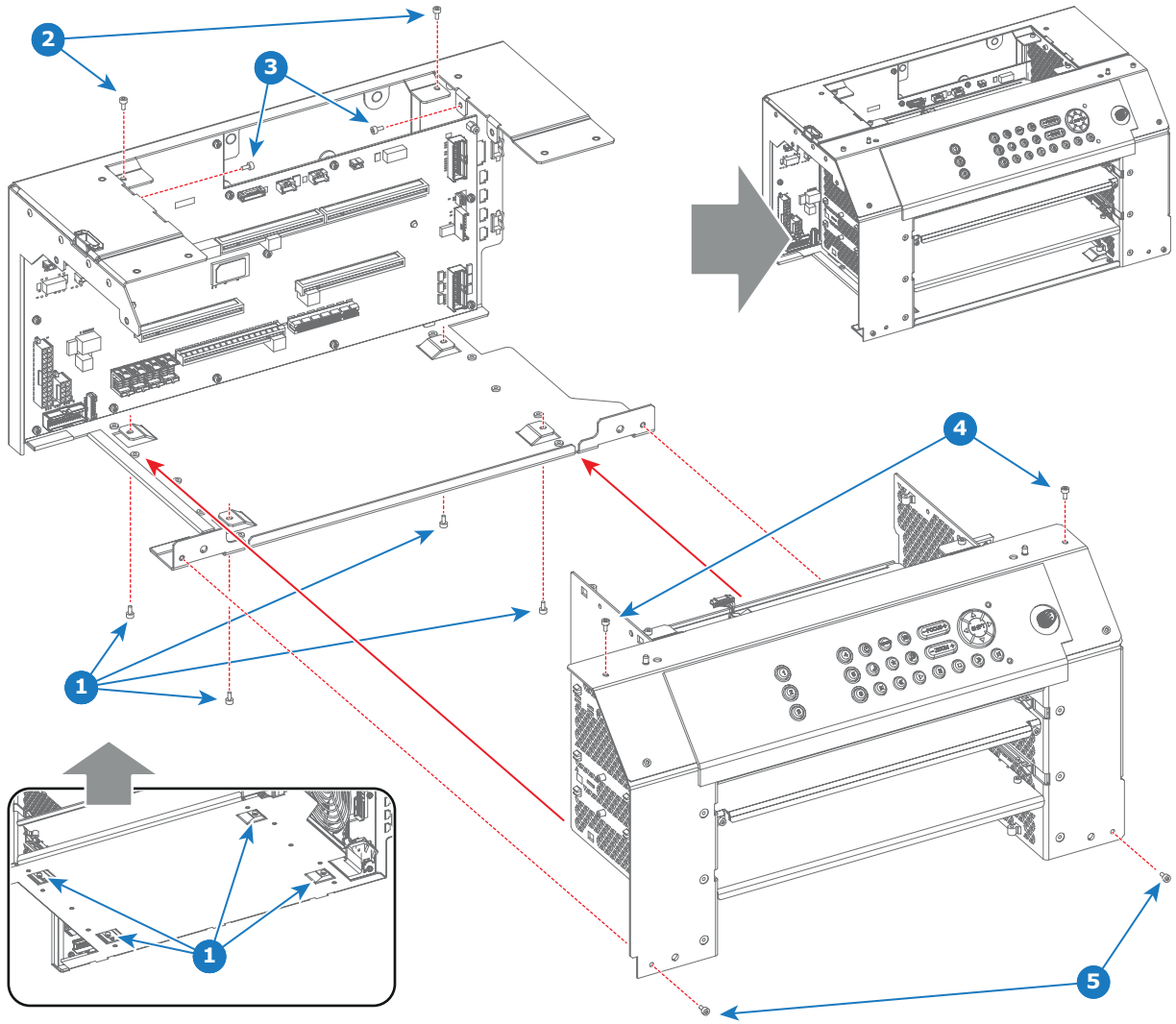


Image 18-43

7. Remove the Signal Backplane board from the sub-assembly. Use a T10 Torx driver to loosen the 14 screws (reference 6 image 18-44) and use a 5.5 mm nut driver to loosen the plastic spacer (reference 7 image 18-44)

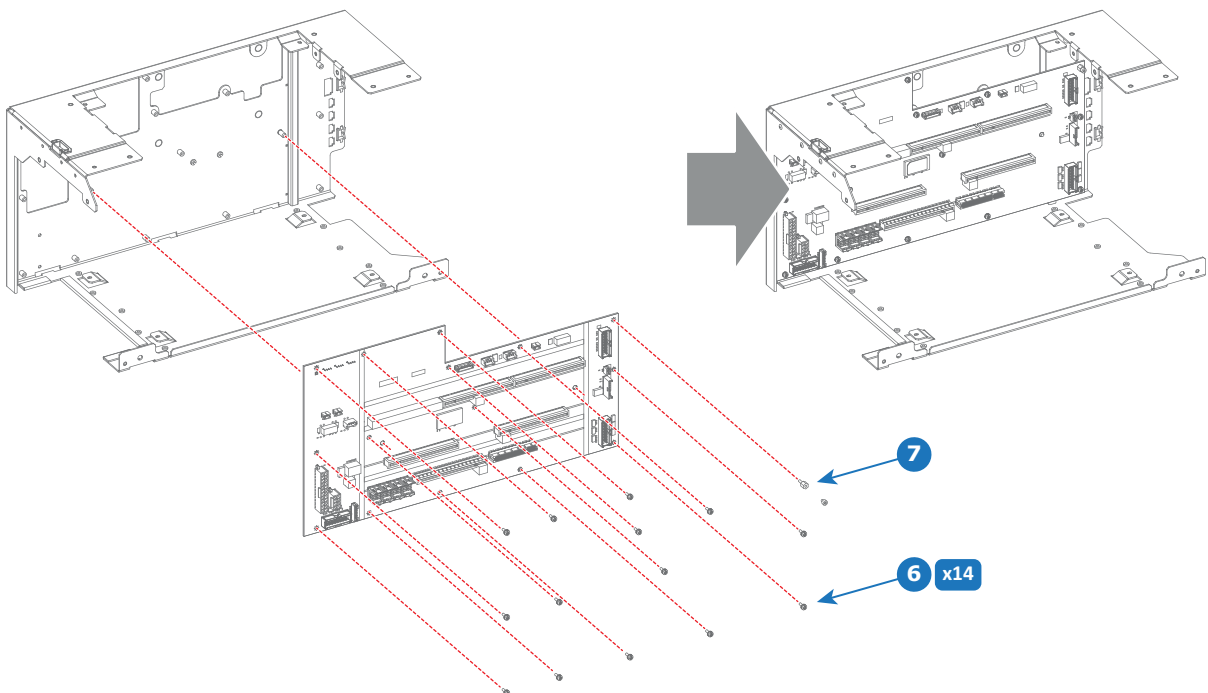


Image 18-44

- Remove the SIM card (reference 8 image 18-45) 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.

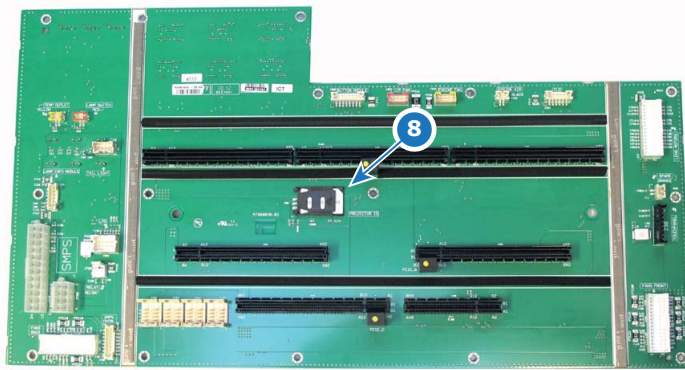
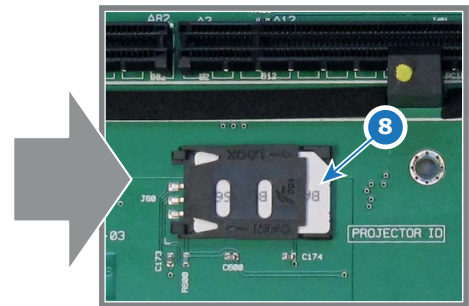


Image 18-45



18.19 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 18-46) 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 18-46

2. Install the Signal Backplane board onto the sub-assembly. Use a T10 Torx driver to fasten the 14 screws (reference 6 image 18-47) and use a 5.5 mm nut driver to fasten the plastic spacer (reference 7 image 18-47)
Note: *The plastic spacer is needed at the upper right corner of the Signal Backplane to mount the temperature sensor afterwards.*

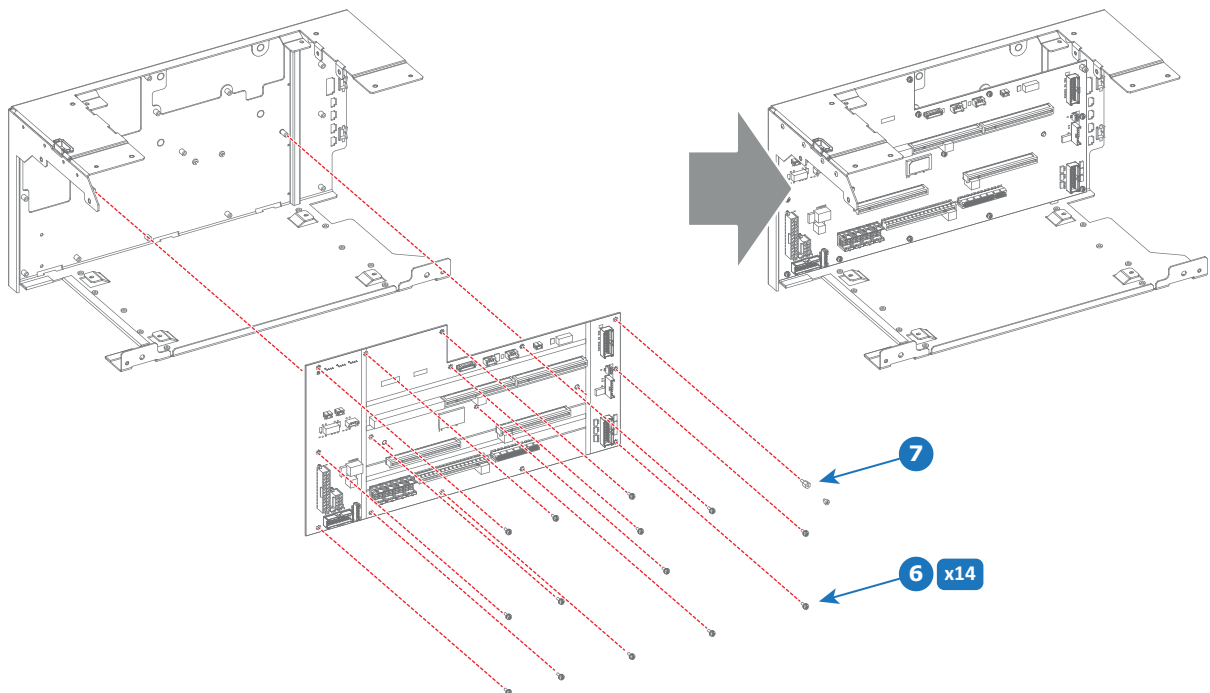


Image 18-47

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 18-48) as indicated on the drawing.

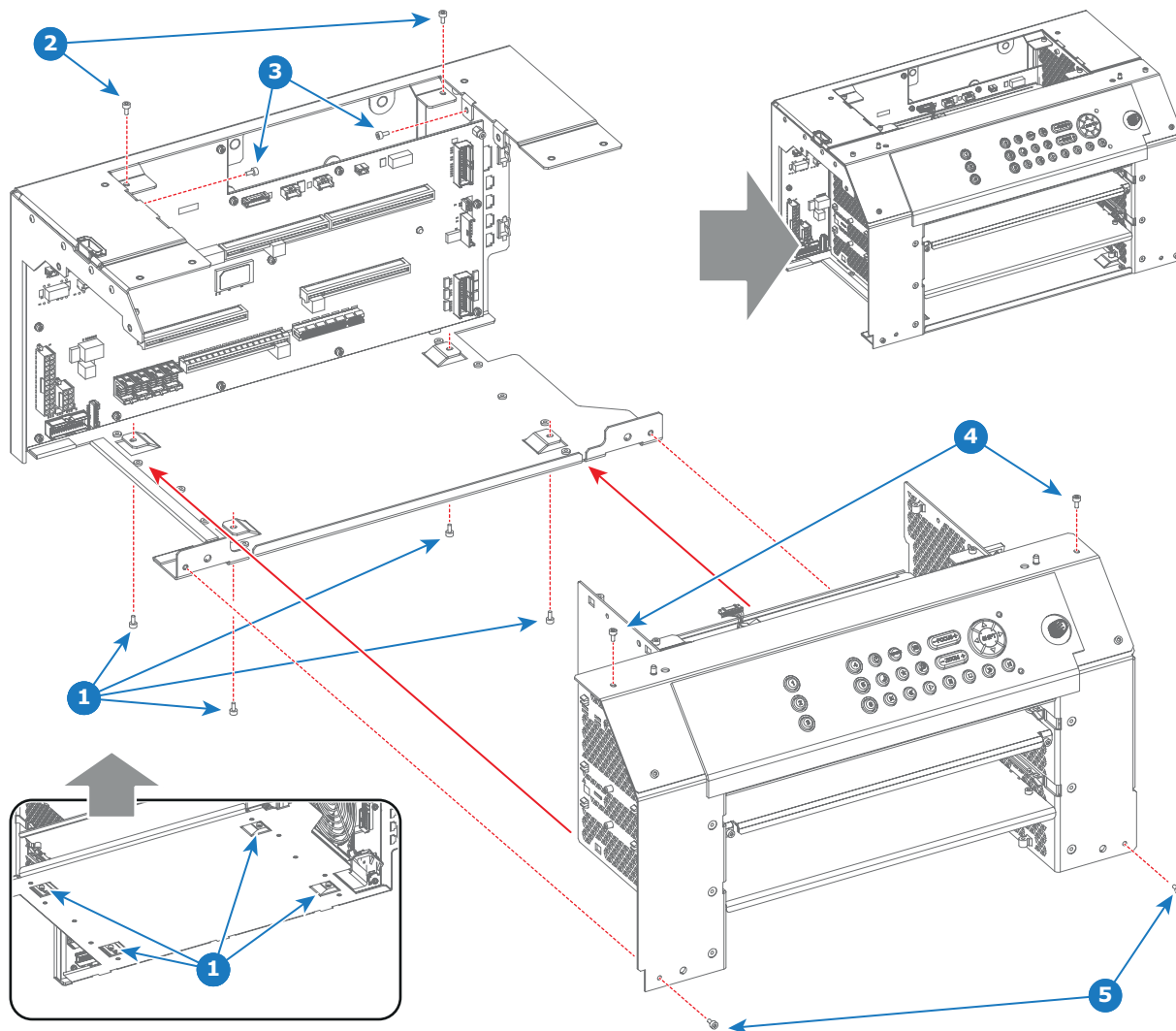


Image 18-48

4. Connect the touch panel wire (reference 13 image 18-49) and the orange wire (reference 14 image 18-49) with the Signal Backplane.
5. Connect the black PE wire (reference 15 image 18-49) with the Signal Backplane as illustrated. Use a T10 Torx screw driver.
6. Connect the wire plug of the front fans (reference 16 image 18-49) with the Signal Backplane.

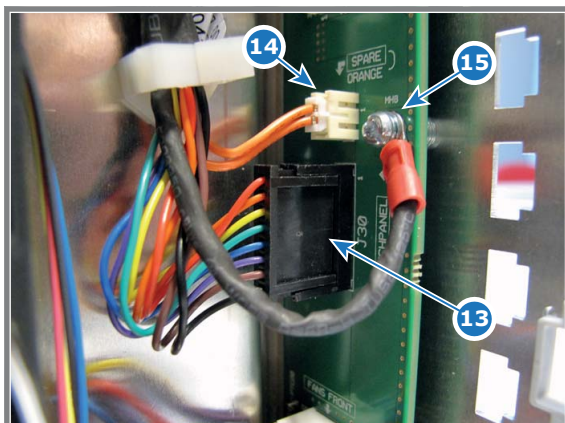
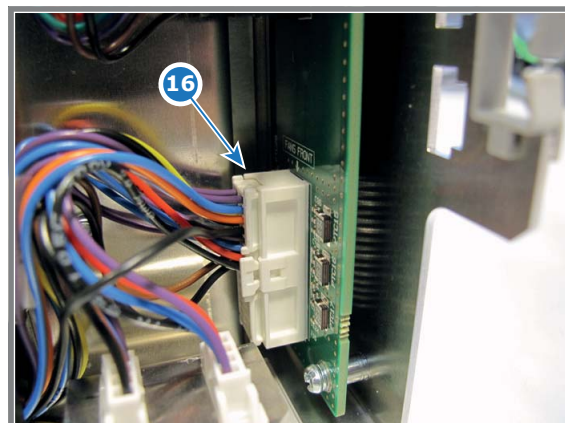


Image 18-49



7. Connect the wire of the Button Module (reference 10 image 18-50) and the wire of the ICP fan (reference 11 image 18-50) with the Signal Backplane.
8. Install the temperature sensor (reference 12 image 18-50) onto the plastic spacer at the upper right corner of the Signal Backplane. Use a 2.5mm Allen wrench to fasten the screw.

18.20 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 18-51) 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.

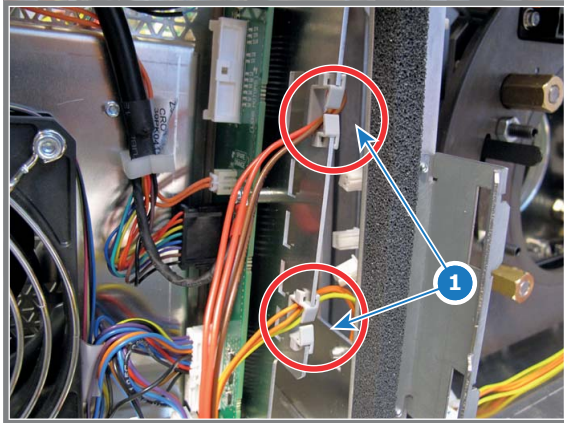


Image 18-51

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).

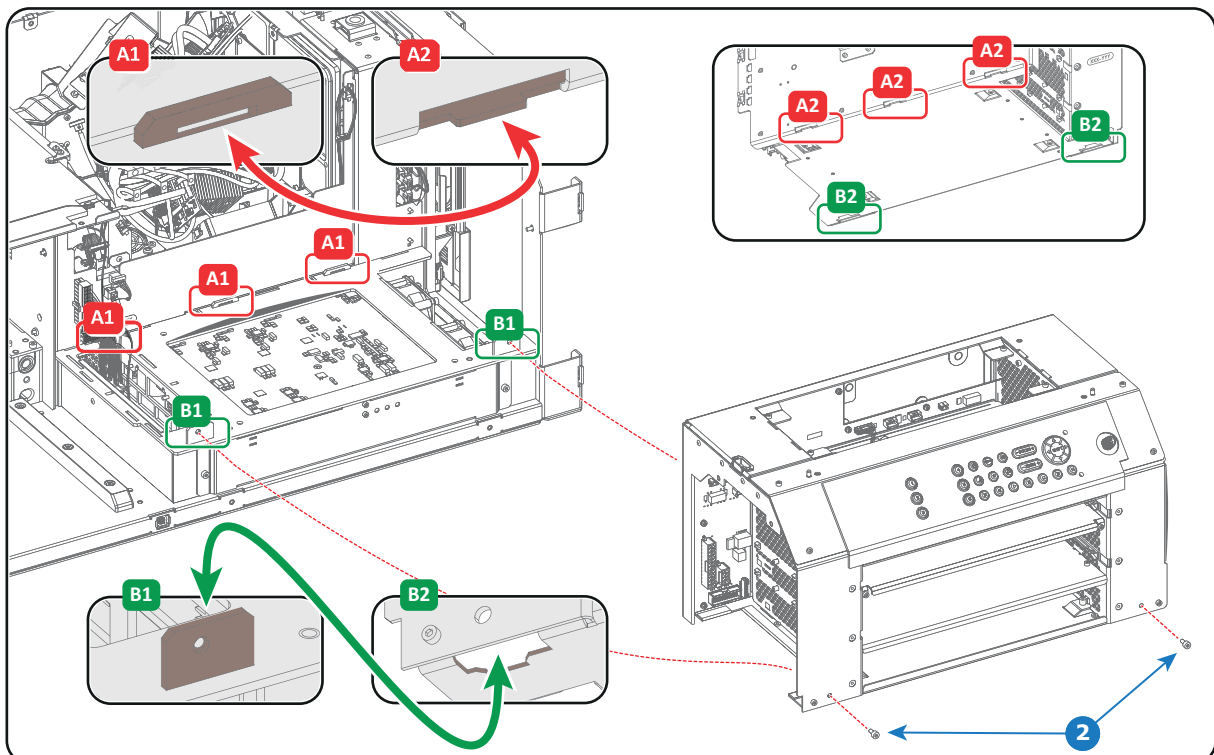


Image 18-52

Note: The rear bottom of the Card Cage is engaged into the projector chassis with three horizontal slots (reference A1 and A2 image 18-52). The front bottom of the Card Cage is engaged into the projector chassis with two vertical slots (reference B1 and B2 image 18-52).

3. Secure the Card Cage with two screws at the base of the Card Cage (reference 2 image 18-52). Use 3mm Allen wrench.
4. Place the top frame in its position on top of the projector.

18. Card Cage

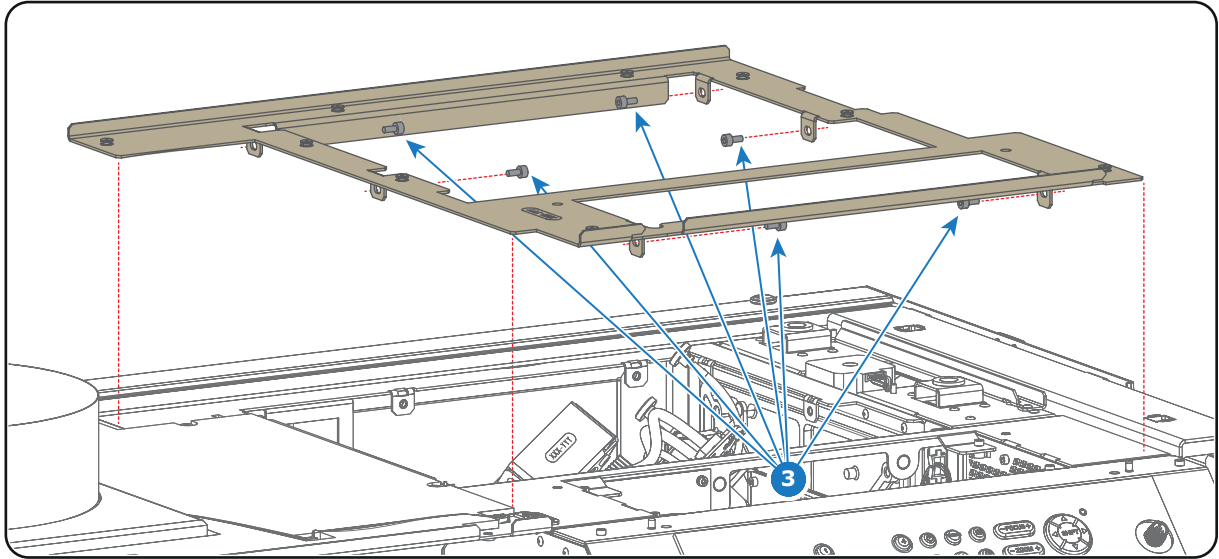


Image 18-53

5. Secure the top frame with 6 fixation screws (reference 3 image 18-54) as illustrated. Use a 3mm Allen wrench.
Caution: Take care not to drop the screws inside the projector.

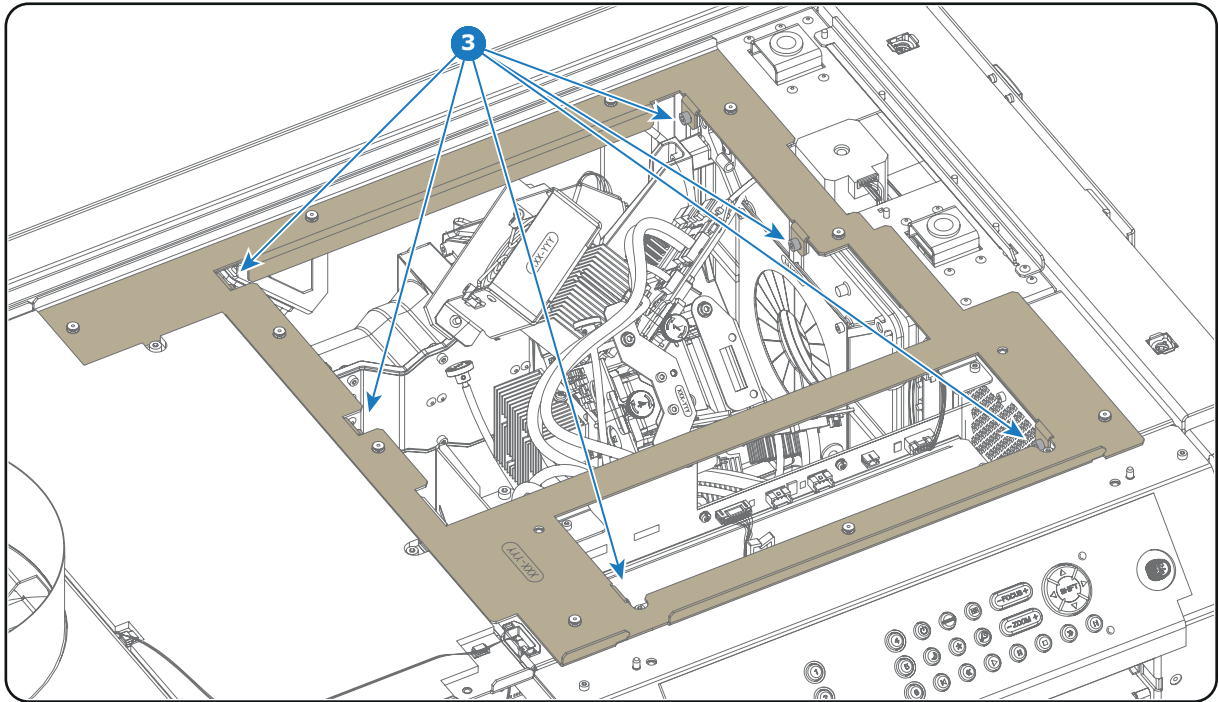


Image 18-54

6. Install the rail on the top of the projector as illustrated. Use a 3mm Allen wrench to fasten the 5 screws (reference 4 image 18-55).

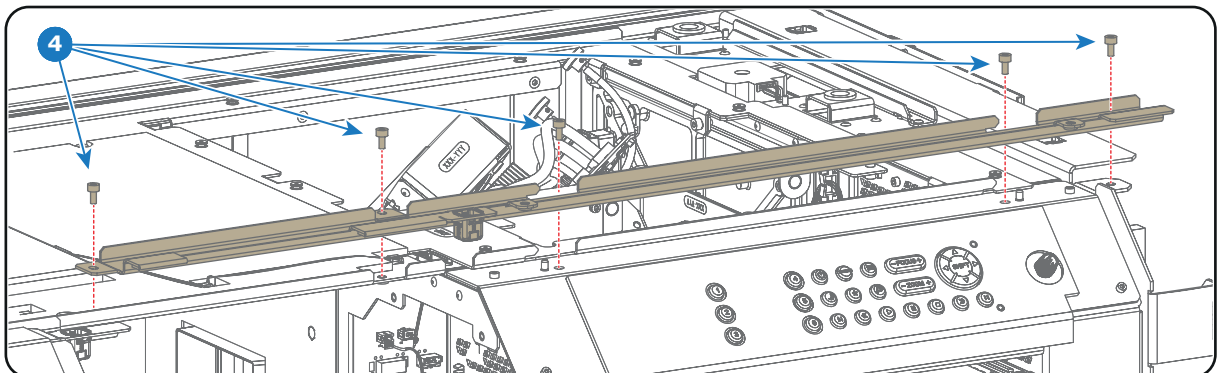


Image 18-55



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 326.

18.21 Connecting the Card Cage wires

Connecting the Card Cage wires

1. Connect the three wires (reference 9, 10 and 11 image 18-56) 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 18-56.
 - 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 18-56) 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.

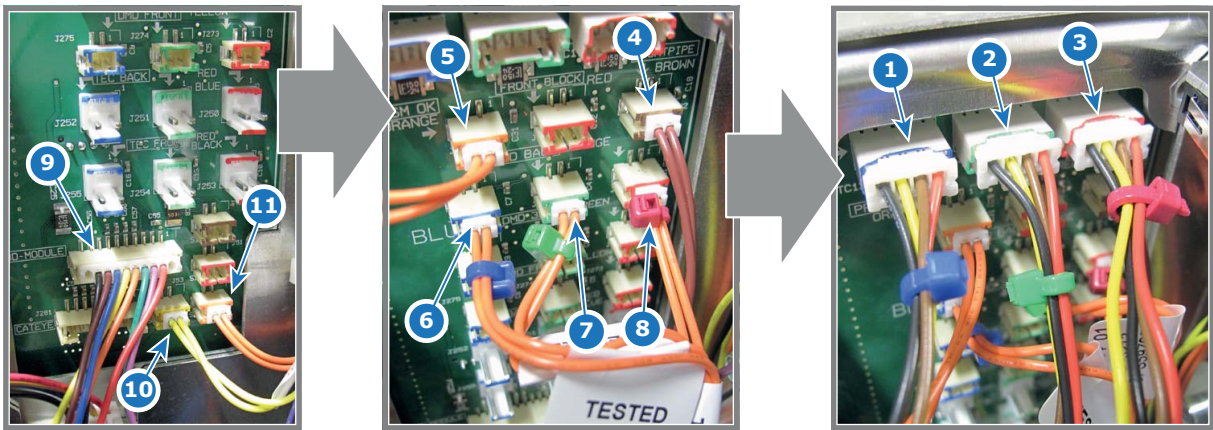


Image 18-56

4. Connect the nine RGB connectors (reference 1 to 9 of image 18-57) 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.

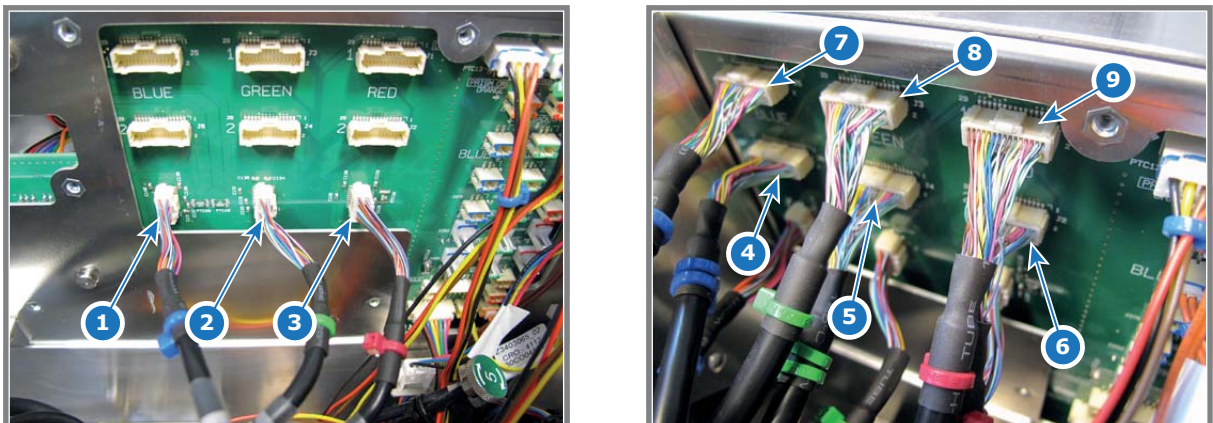


Image 18-57

5. Connect the CLO wire (reference 10) with the Signal Backplane.

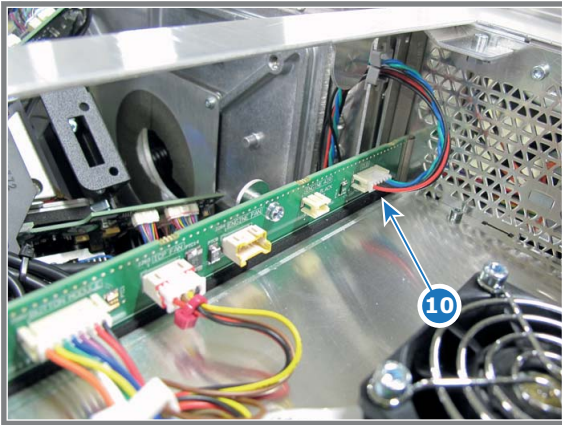


Image 18-58

6. Connect the four wires (reference 1, 2, 3 and 4 image 18-59) 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 18-59) then insert the larger plug (reference 6 image 18-59).

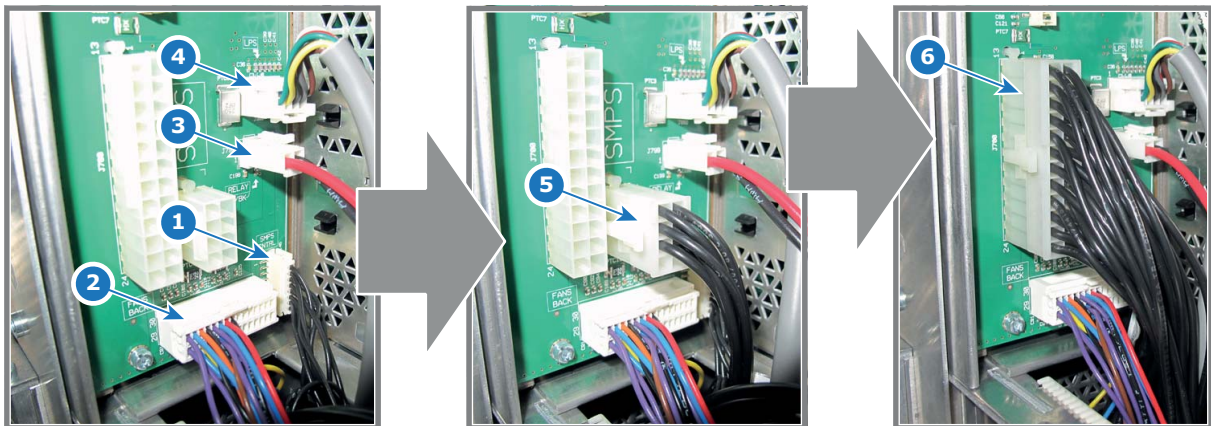


Image 18-59

8. Connect the three wires (reference 7, 8 and 9 image 18-59) 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)

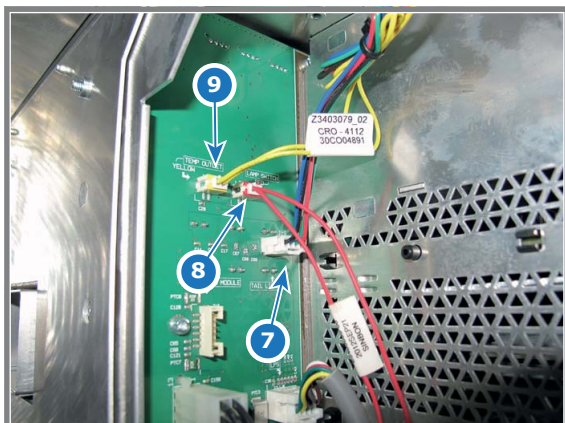


Image 18-60

18. Card Cage

9. Connect the big wire plug (reference 3 image 18-61) of the lens motors with the Signal Backplane.
10. Engage the five wire sockets (reference 5, 6, 7, 8 and 9 image 18-61) 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**).

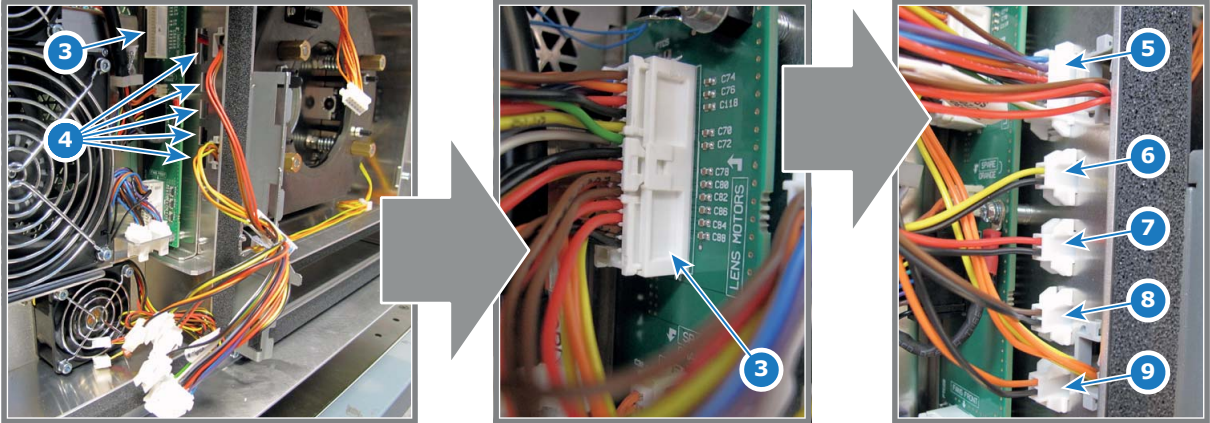


Image 18-61

11. Connect the 5 wires (reference 5, 6, 7, 8 and 9 image 18-62) 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**).

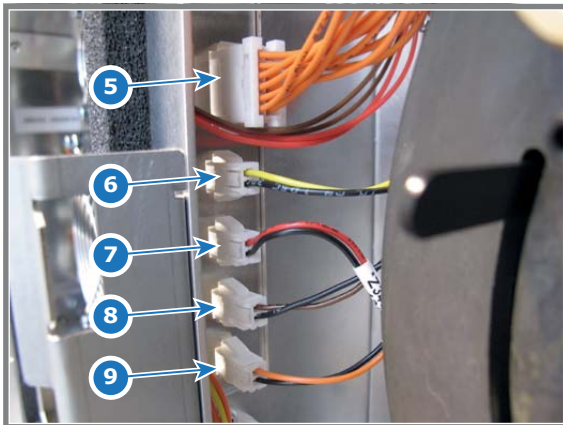


Image 18-62

12. Connect the wire of both SMPS fans (reference 1 & 2 image 18-63).

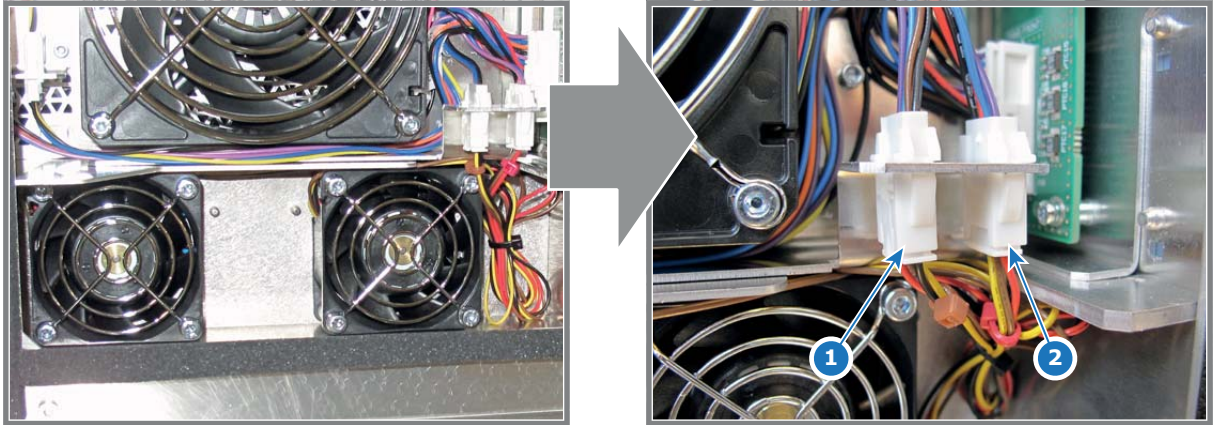


Image 18-63



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.

18.22 Installation of the Card Cage cover



This procedure assumes that Lamp House cover and large dust filter are removed from the projector.

Necessary tools

PH2 Phillips screwdriver.

How to Install the Card Cage cover onto the projector?

1. Place the Card Cage cover in its place.
2. Fasten the four fixation screws (reference 1 image 18-64) of the Card Cage cover as illustrated. Use a PH2 Phillips screwdriver.

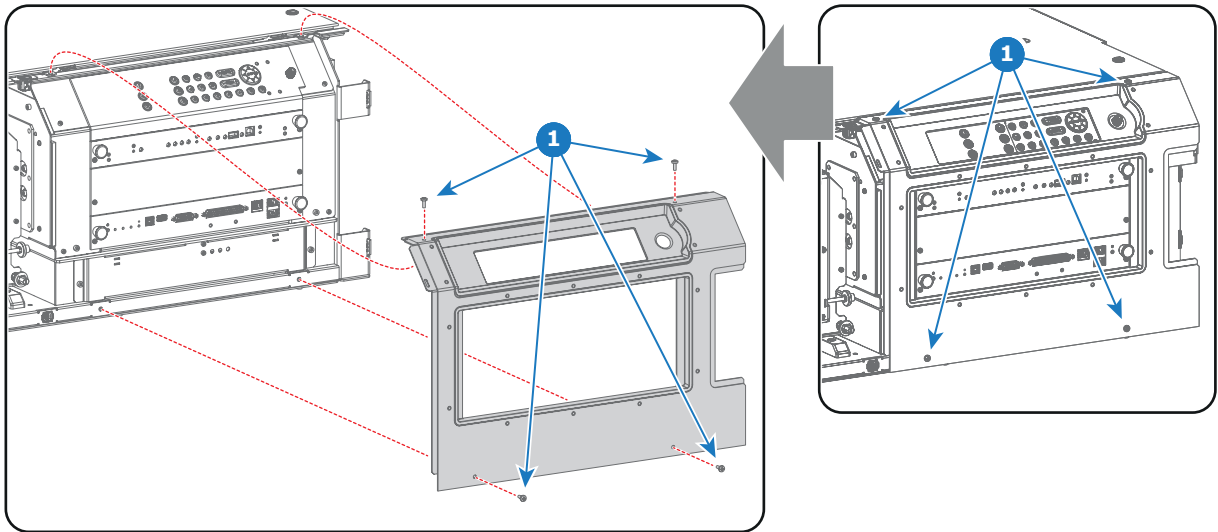


Image 18-64

18.23 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 18-65) as illustrated. Use a 2.5mm Allen wrench.

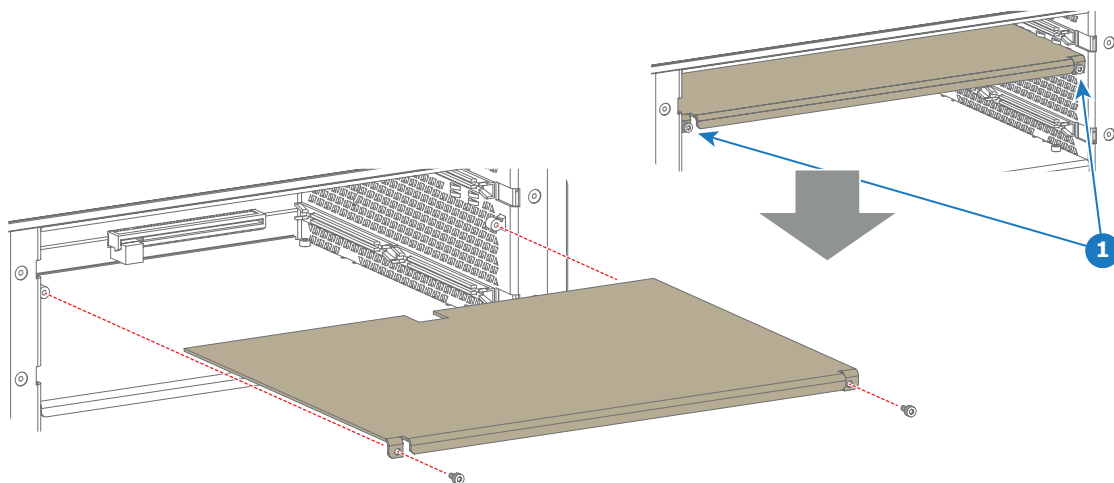


Image 18-65

2. Pull the partition plate out of the Card Cage.

18.24 Replacement of the Status Light



This procedure assumes that the projector rear cover is removed.

Necessary tools

2.5mm Allen wrench.

How to replace the Status Light of the projector?

1. Disconnect the wire (reference 1 image 18-66) from the Status Light board.

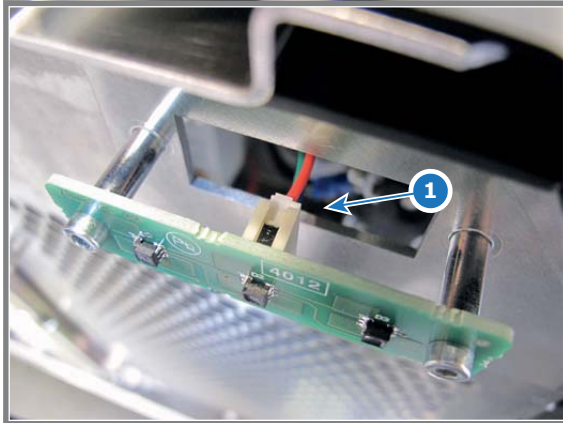


Image 18-66

2. Replace the Status Light board. Use a 2.5mm Allen wrench to release/fasten the two screws (reference 2 image 18-67).

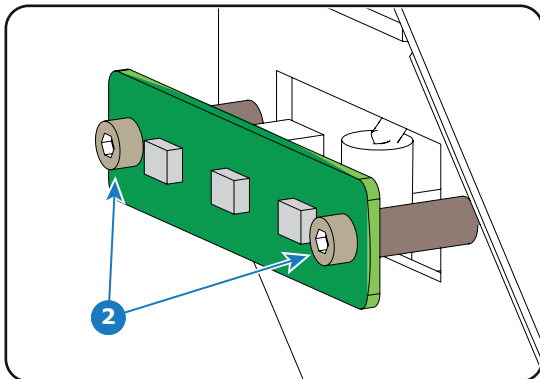
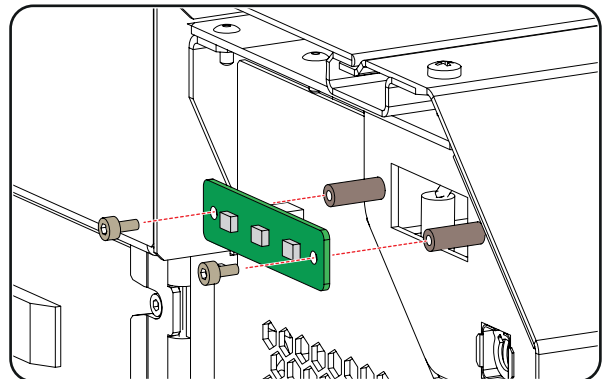


Image 18-67



19. DUST FILTERS

About this chapter

This chapter describes how to check, clean, and replace the dust filters of the projector.

Overview

- Check the large dust filter
- Check the small dust filter
- Vacuum cleaning of the dust filters
- Washing and drying the dust filters

19.1 Check the large dust filter

Necessary tools

7mm flat screwdriver.

How to check the large dust filter?

1. Loosen the two captive screws (reference 1 image 19-1) of the large dust filter assembly using a 7mm flat screwdriver.
2. Remove the dust filter assembly from the projector by pivoting the assembly away from the projector as illustrated. Note that the other side of the assembly contains two mounting lips (reference 2 image 19-1) which are engaged in the projector chassis.

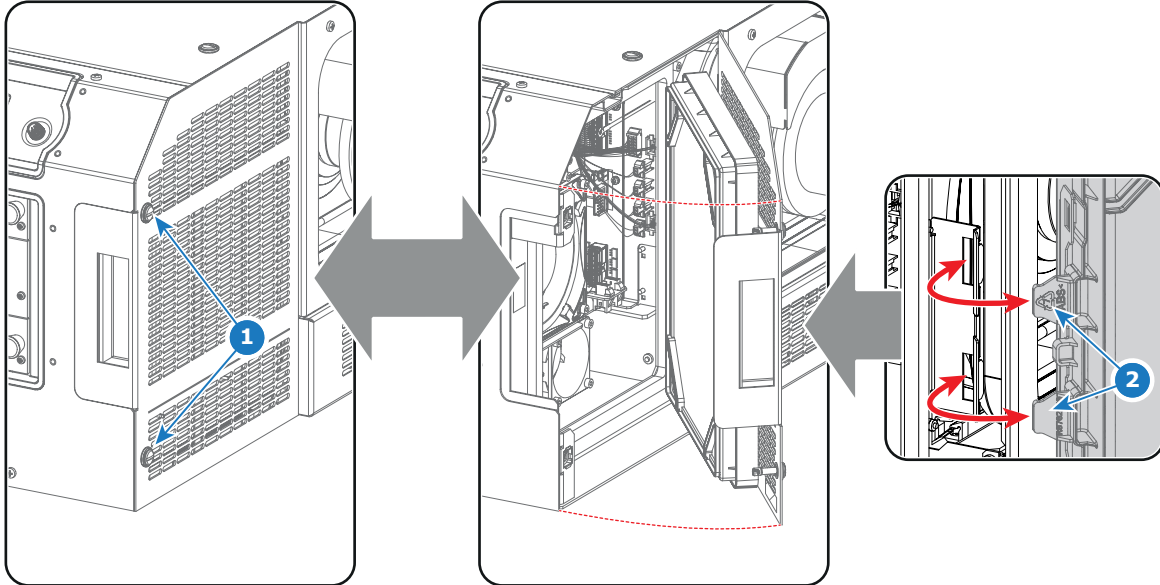


Image 19-1

3. Detach the dust filter from the cover plate. Do this by pushing the two latches (reference 3 image 19-2) of the dust filter inwards.
4. **Check** the "air in" side of the dust filter for **dust** and/or **grease**.

In case the filter is contaminated with grease wash and dry the dust filter. See cleaning procedure "Washing and drying the dust filters", page 339.

In case the filter contains dust but doesn't feel greasy then vacuum clean the dust filter. See procedure "Vacuum cleaning of the dust filters", page 338.

Note: Grease on the filter 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 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.

5. Attach a clean dust filter to the cover plate. Ensure that both latches and both mounting lips (reference 4 image 19-2) of the dust filter are engaged.

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.

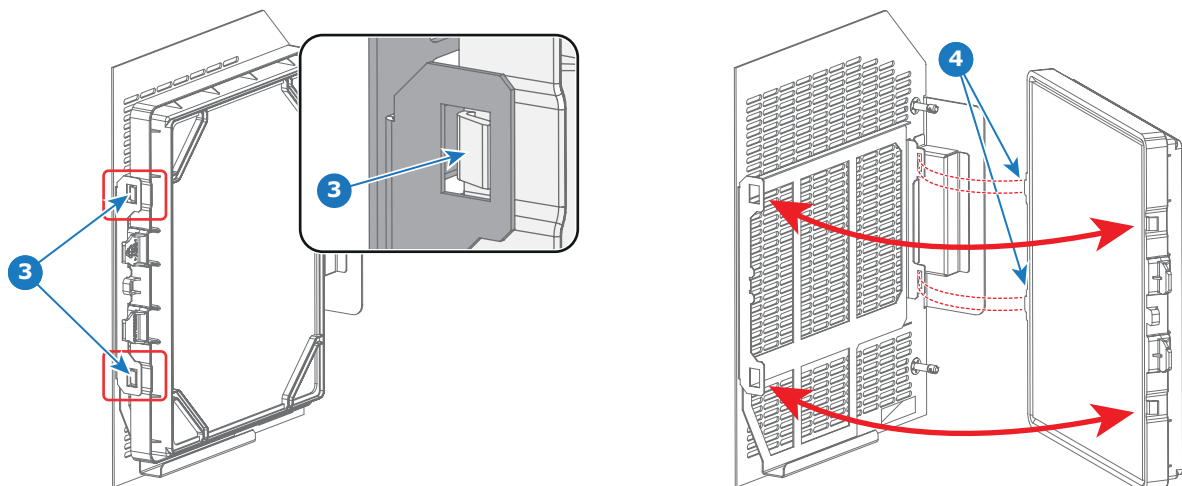


Image 19-2

6. Install the dust filter assembly back at the front side of the projector. Use a 7mm flat screwdriver to fasten the two captive screws. Ensure that the two mounting lips (reference 2 image 19-1) of the assembly are engaged in the projector chassis.



The dust filter is cleanable. See cleaning procedure for correct cleaning and drying instructions.

19.2 Check the small dust filter

Necessary tools

7mm flat screwdriver.

How to check the small dust filter?

1. Loosen the captive screw (reference 1 image 19-3) of the small dust filter assembly using a 7mm flat screwdriver.
2. Remove the dust filter assembly from the projector by pivoting the assembly away from the projector as illustrated. Note that the other side of the assembly contains a mounting lip (reference 2 image 19-3) which is engaged in the projector chassis.

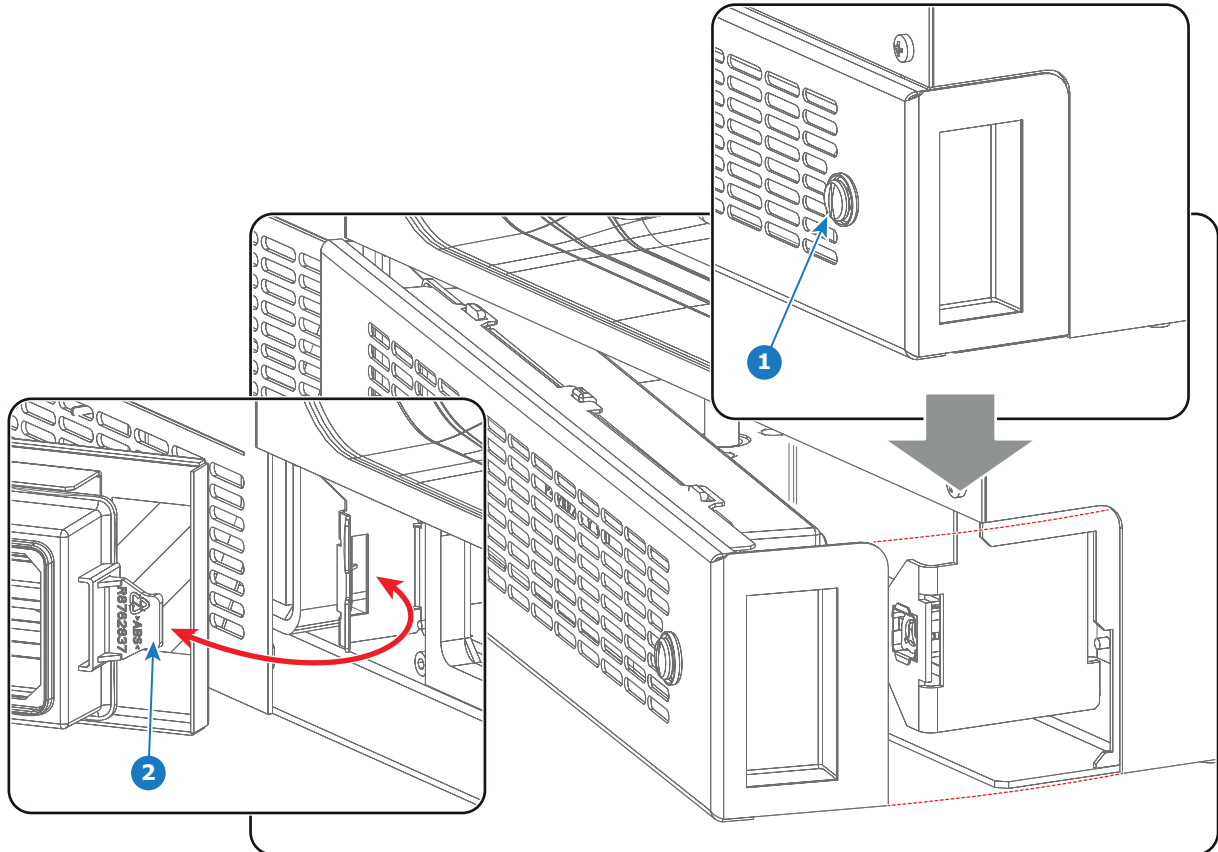


Image 19-3

3. Detach the dust filter from the cover plate. Do this by pushing the two latches (reference 3 image 19-4) of the dust filter inwards.
4. **Check** the "air in" side of the dust filter for **dust** and/or **grease**.
In case the filter is contaminated with grease wash and dry the dust filter. See cleaning procedure "Washing and drying the dust filters", page 339.
In case the filter contains dust but doesn't feel greasy then vacuum clean the dust filter. See procedure "Vacuum cleaning of the dust filters", page 338.
Note: Grease on the filter 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 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.
5. Attach a clean dust filter to the cover plate. Ensure that both latches (reference 4 image 19-4) of the dust filter are engaged.
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.

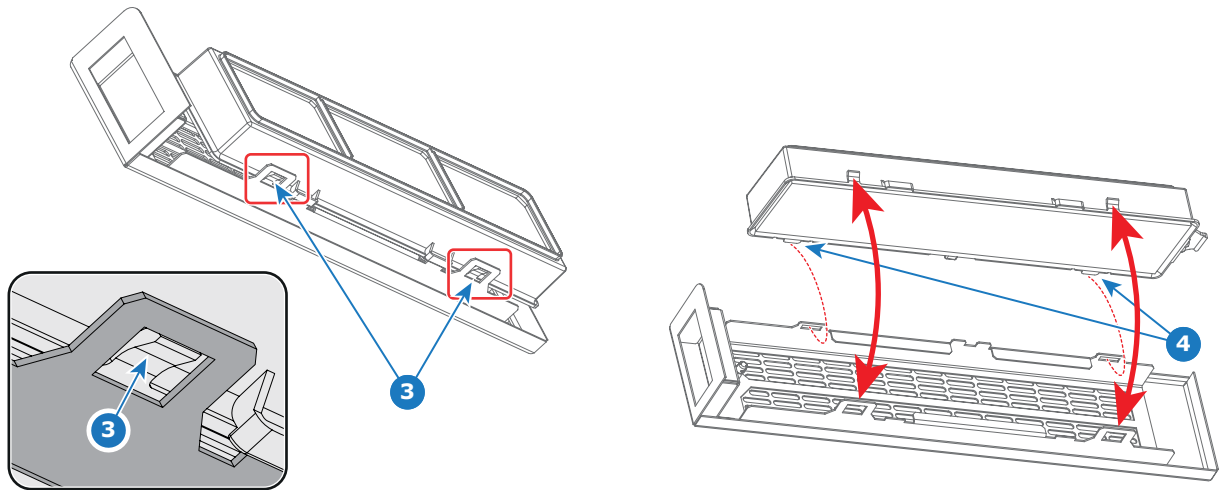


Image 19-4

6. Install the dust filter assembly back at the front side of the projector. Use a 7mm flat screwdriver to fasten the captive screw.



The dust filter is cleanable. See cleaning procedure for correct cleaning and drying instructions.

19.3 Vacuum cleaning of the dust filters

When vacuum the dust filters?

The dust filters should be checked every month. If the filters are contaminated with dust then cleaning the filters with a vacuum cleaner should be sufficient. In case the filters feel greasy these must be washed. See cleaning procedure "Washing and drying the dust filters", page 339.



Grease on the filter 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 are removed from their slots.

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.*

19.4 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 390.



Image 19-5
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

20. EXHAUST SYSTEM

About this chapter

This chapter describes the requirements of the exhaust system and how to replace the standard top exhaust stack with the optional rear exhaust kit.

Overview

- Installation of the exhaust system
- Installation of the Rear Exhaust

20.1 Installation of the exhaust system

About Exhaust

The exhaust stack at the top side of the projector is designed to fit a 201mm (7.91inch) diameter duct. This size must be used throughout the entire system and installed to eliminate any possibility of downdraft or rain dripping into the lamp house.



CAUTION: The exhaust system must be capable of removing minimum 4m³/min (140 CFM), measured at the projector's exhaust opening. Although not obligatory, Barco also advises to 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.



CAUTION: The connection between the projector duct and the exhaust system should be done with a flexible connection piece. This to prevent that vibrations of the external exhaust system disturbs the projected image.



WARNING: The exhaust system must match the duct of the projector seamless. No gap may exist between the connection of the duct and the exhaust system. This to prevent personal injury due to the UV light that comes out of the duct of the projector.

Never look into the exhaust output on the top of the projector. High luminance and UV radiation could result in damage to the eye. The installation of an exhaust system on top of the projector is mandatory before operating the projector.



CAUTION: If more than one projector is installed in a common projection booth, the above exhaust air flow requirements are valid for EACH individual projector head exhaust stack. Note that inadequate air extraction will result in decreased life expectancy of the projector as a whole as well as causing premature lamp failure.



WARNING: Temperature of exhaust air can approach 100°C.

How to install the Exhaust stack?

See illustration below:

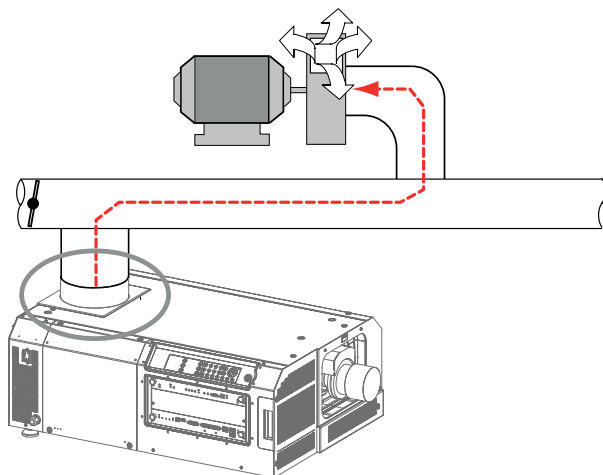


Image 20-1



To ensure maximum lamp life, operate the lamp house blower and the exhaust system for at least ten minutes after extinguishing the lamp.



Ensure good condition of the lamp house blower. Keep the blower inlet clean for unrestricted air flow.

20.2 Installation of the Rear Exhaust

Necessary tools

- Flat blade screwdriver.
- 3mm Allen wrench.

How to install the Rear Exhaust?

1. Remove the top cover of the projector.
2. Remove the standard top exhaust from the projector. Use a 3mm Allen wrench to loosen the four screws (reference 1 image 20-2).

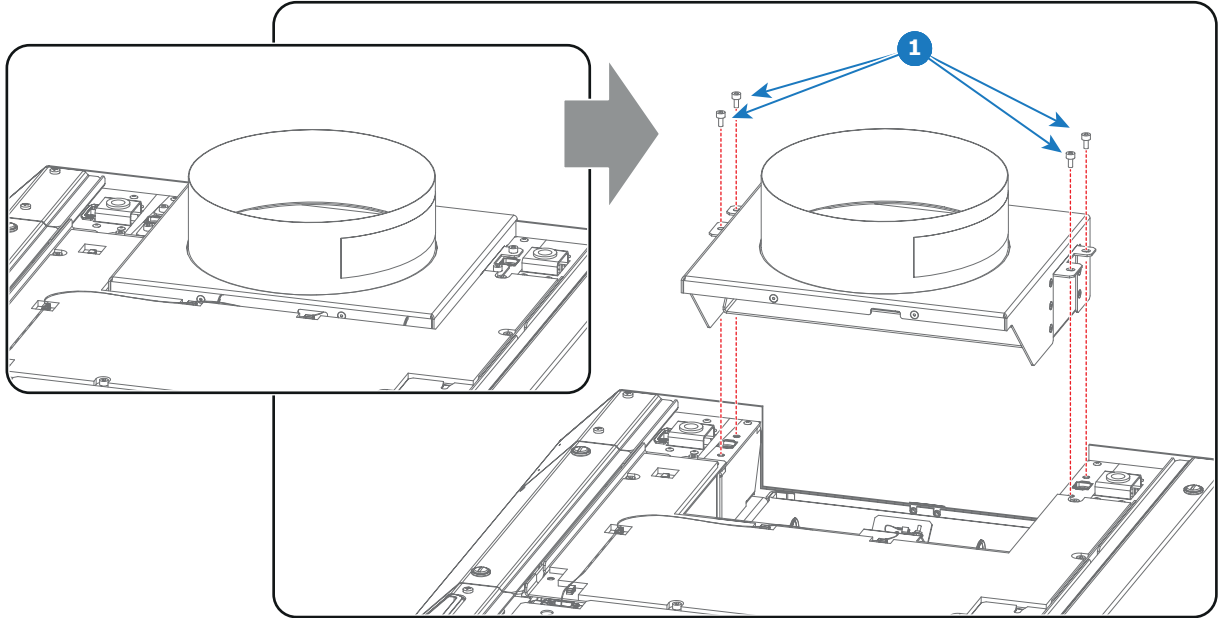


Image 20-2

3. Install the rear exhaust as illustrated. Use a 3mm Allen wrench to fasten the four screws (reference 2 image 20-3).

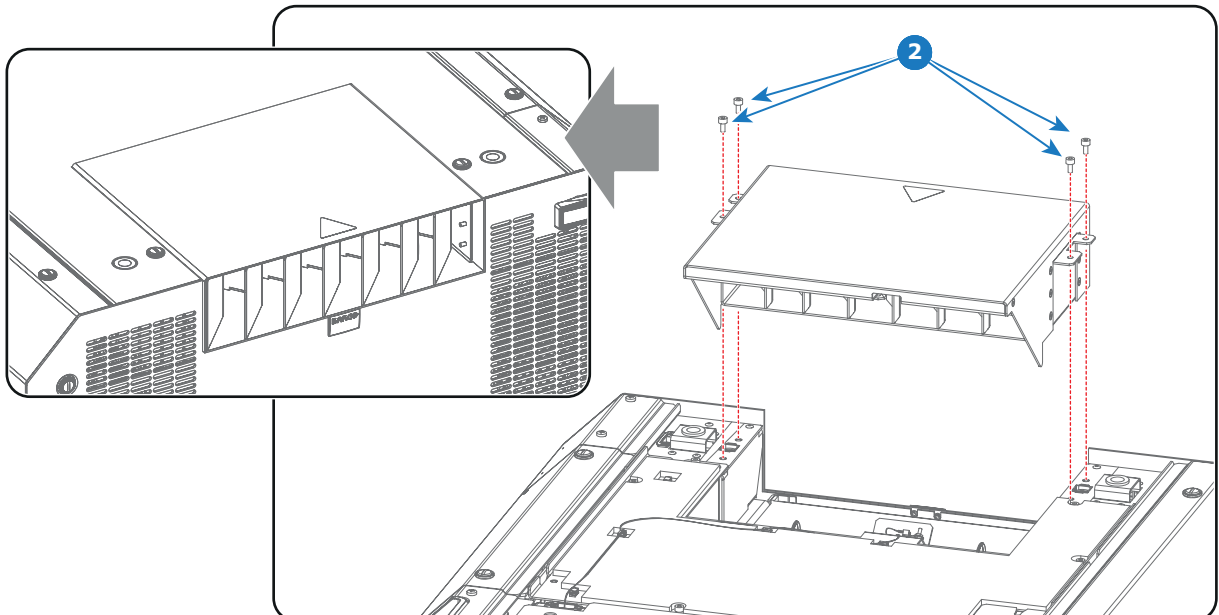


Image 20-3

4. Install the top cover of the projector.

21. 3D COLOR WHEEL

About this chapter

This chapter gives a brief introduction of the 3D color wheel and explains with detailed step by step instructions how to install the 3D color wheel in a DP2K S series digital projector.



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



WARNING: The projector must be cooled down before removing any of the projector covers: wait for the cool down cycle to finish after switching the projector to standby (the sound of the fans comes to a very low level) and wait for 15 more minutes before starting any of the procedures below.



WARNING: Always switch off the projector and unplug the power cord before removing one of the covers, unless otherwise stated.



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

Overview

- Introduction
- Unpacking
- Parts location
- Initial inspection
- Installation process overview on DP2K S series digital projector
- Cut off the tubes from the 3D color wheel assembly
- Installation of the 3D color wheel assembly
- Installation of the Light Pipe with 3D color wheel

21.1 Introduction

Introduction of the 3D color wheel

This 3D color wheel upgrade kit is designed by Barco and fits precisely onto the light pipe entrance of the DP2K S series digital projector.

When 3D content is applied to the digital projector, a rotating filter wheel is inserted between the lamp and the picture element. As a result, the digital projector projects alternating full color images for the left eye and the right eye that are not quite identical with respect to their primary color frequencies. The audience wears passive glasses with filtering coatings that are precisely tuned to these differences, thereby preventing each eye from seeing the images intended for the other eye. Note that the rotating filter wheel is retracted for 2D projection. This technology eliminates the need for the impractical silver screens or the active-shutter glasses of other systems.

The entrance and exit of the liquid cooling circuit, which passes through the 3D color wheel assembly, are equipped with respectively a short and a long tube with a valved fitting for DP2K and DP4K projectors. Extra valved fittings for the DP-xx00 series are delivered separately and can be used to replace the current mounted fittings.

For the DP2K S series and the DP2K-12C, the cooling tubes have to be removed from the assembly. These projectors do not have a liquid cooling circuit!

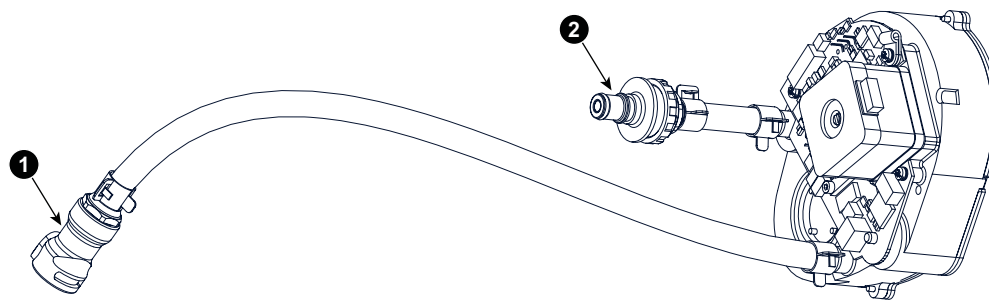


Image 21-1

- 1 Female valved fitting on the tube of the liquid cooling circuit exit side.
- 2 Male valved fitting on the tube of the liquid cooling circuit entrance side.

21.2 Unpacking

Color wheel protection

To protect the color wheel during transport from scratches and dust, the color wheel is sealed with two covers (reference 2 & 5 image 21-2). These must be removed prior to installation. Note that all screws need to be reused.

Necessary tools

Torx screwdriver T10.

Unpacking the 3D color wheel assembly

1. Remove the three counter sunk screws (reference 1 image 21-2) which fasten the large cover (reference 2 image 21-2). Use a Torx screwdriver T10.
2. Remove the large cover (reference 2 image 21-2).
3. Remove the two counter sunk screws (reference 3 image 21-2). Use a Torx screwdriver T10.
Caution: *Makes sure that the color wheel is retracted (non acting position) so you can freely look through the light path opening. Any contact with the integration rod may cause damage.*
4. Remove the two counter sunk screws (reference 4 image 21-2) which fasten the small cover (reference 5 image 21-2). Use a Torx screwdriver T10.
5. Remove the small cover (reference 5 image 21-2).

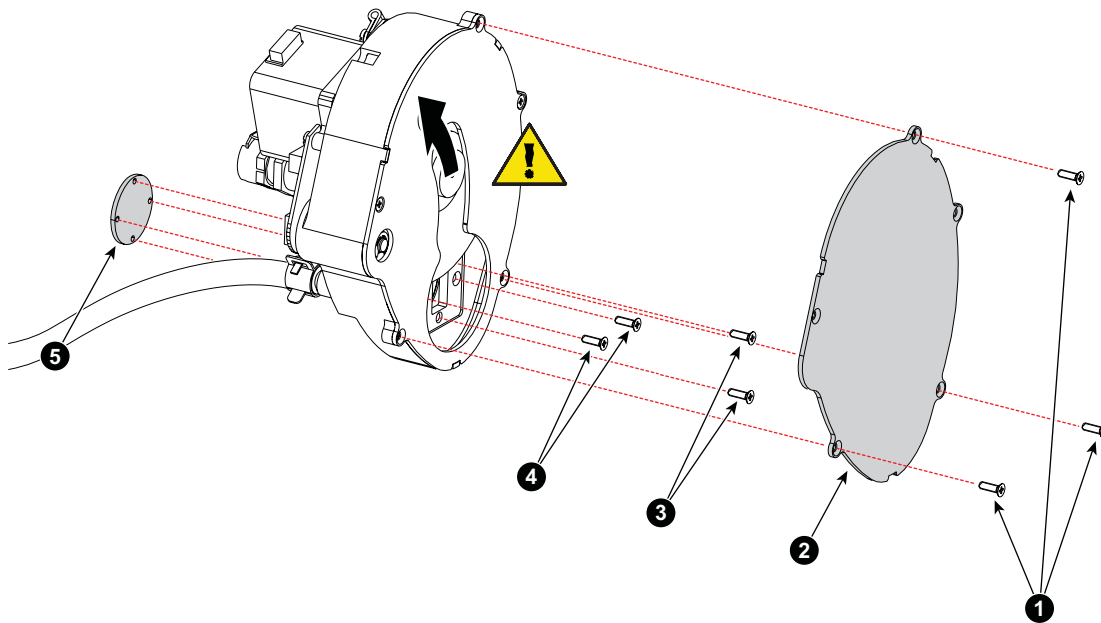


Image 21-2

6. Reinsert the three counter sunk screws (reference 1 image 21-3) as illustrated. Use a Torx screwdriver T10.

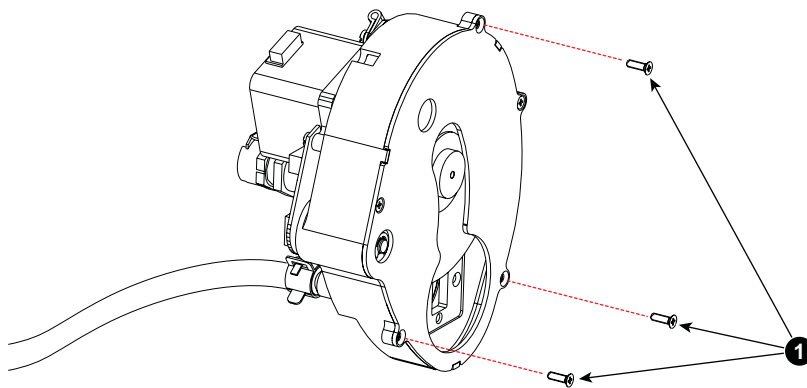


Image 21-3



CAUTION: Do not touch the optical part of the color wheel.

21.3 Parts location

Parts location of the 3D color wheel assembly

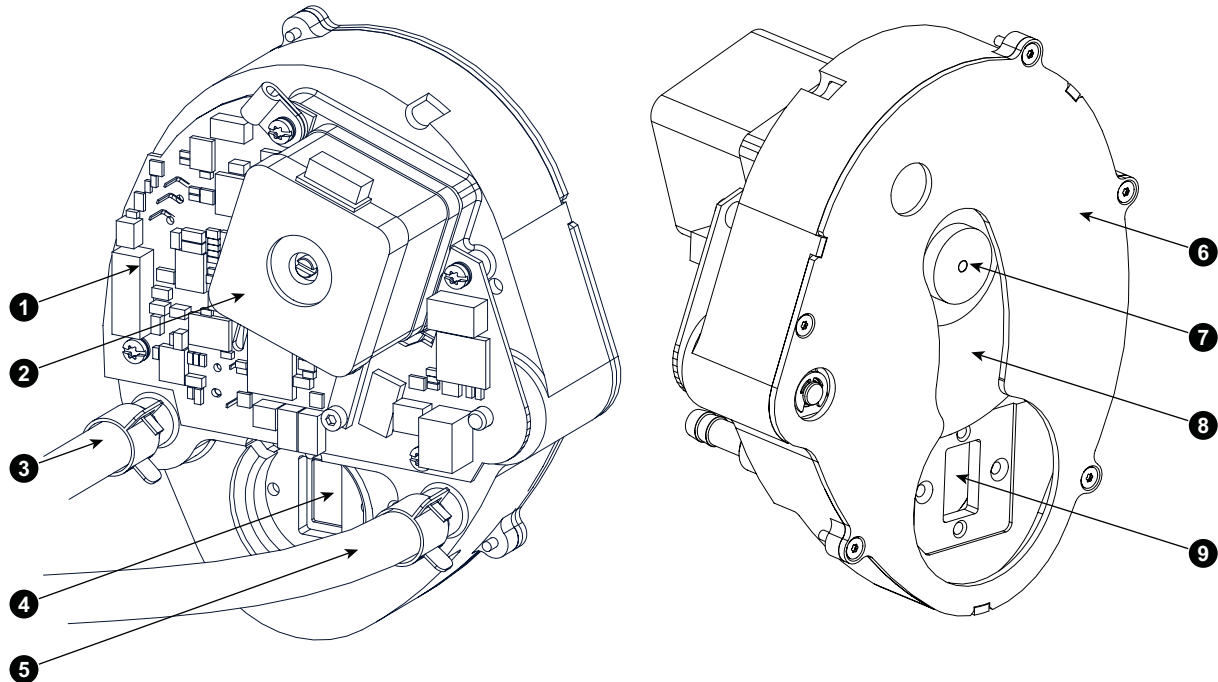


Image 21-4

- 1 Socket for connection with the Formatter Interface Board (FIB) on a DP-xx00 series projector or with the backplane on a DP2K C series, DP2K/DP4K B series, or DP2K-S series.
- 2 Color wheel retraction motor.
- 3 Liquid cooling circuit entrance (tube needs to be removed from assembly if the projector is not equipped with a liquid cooling circuit)⁷.
- 4 Light path exit.
- 5 Liquid cooling circuit exit (tube needs to be removed from assembly if the projector is not equipped with a liquid cooling circuit)⁷.
- 6 Cover plate 3D color wheel.
- 7 Spinning motor 3D color wheel.
- 8 3D color wheel.
- 9 Light path entrance.

7. DP2K-12C and DP2K-S series are not water cooled

21.4 Initial inspection

Initial inspection

Before shipping, the kit was inspected and found free of mechanical and electrical defects. As soon as the 3D color wheel is unpacked, inspect for any damage that may have occurred in transit. Save all packing material until the inspection is completed. If damage is found, file claim with carrier immediately. The Barco sales and service office should be notified as soon as possible.



CAUTION: Do not touch the optical part of the color wheel.

Color wheel rotation and retraction check

- Check if the 3D color wheel turns freely around its axis (spinning motor). Do not touch the optical part of the color wheel. (reference 1 image 21-5)
- Check if the 3D color wheel actuator moves up and down unhindered when turning the axis of the stepper motor with a flat screw driver. (reference 2 image 21-5)

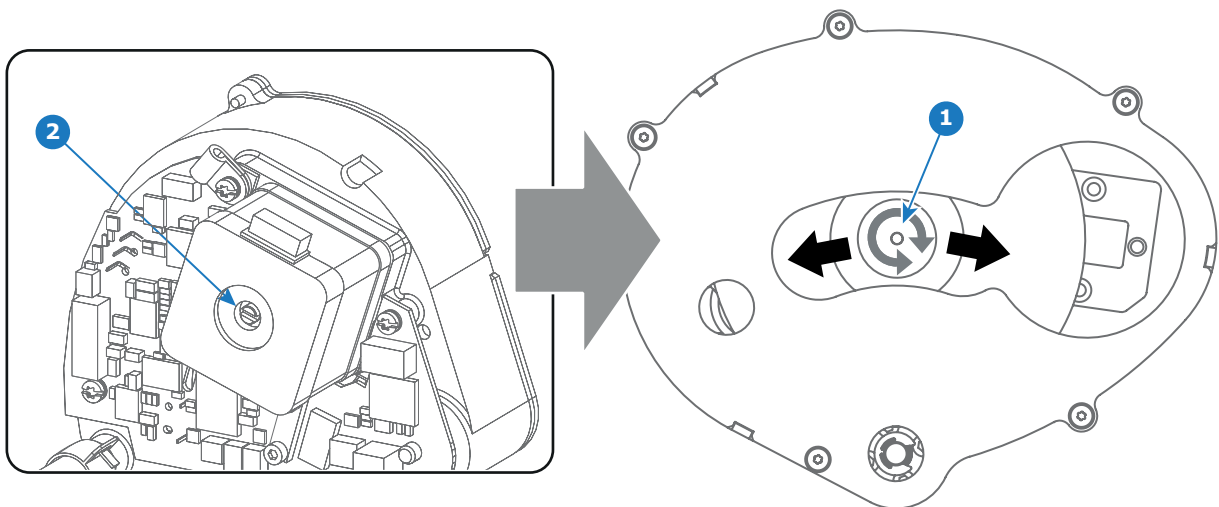


Image 21-5



CAUTION: Ensure that the 3D color wheel is retracted prior to install the 3D color wheel assembly onto the Light Pipe.



CAUTION: Ensure that the 3D color wheel is dust free.

21.5 Installation process overview on DP2K S series digital projector



CAUTION: It is important to strictly follow the prescribed process to successfully install the 3D color wheel.

Process overview

1. **Prepare the 3D color wheel assembly.** See detailed procedures:
 - a) Remove the two protection covers from the 3D color wheel assembly. See procedure: "Unpacking", page 347.
 - b) Inspect the rotating parts of the 3D color wheel assembly and ensure that the color wheel is dust free. See procedure "Initial inspection", page 349.
 - c) Remove both tubes from the 3D color wheel assembly. Cut the tubes 3cm from the edge. The tubes need be cut because it is impossible to pull off the tubes from the assembly. Note that these tubes are useless because the DP2K S series digital projector is not liquid cooled. See "Cut off the tubes from the 3D color wheel assembly", page 351.
2. **Access to the Light Processor compartment of the projector.** To get access to the Light Pipe you have to remove the projector side cover and the side cover plate of the sealed compartment wherein the Light Processor Unit is located. See following detailed procedures:
 - a) "Removal of the left side cover", page 365.
 - b) "Removal of the side cover plate of the Light Processor compartment", page 368.
3. **Remove the Light Pipe from the projector.** See detailed procedures "Removal of the Light Pipe", page 194.
4. **Install the 3D color wheel onto the Light Pipe entrance.** For that the Mask plate and Rod heatsink has to be removed from the Light Pipe entrance first. See following detailed procedures:
 - a) "Removal of the Mask plate and Rod heatsink", page 224.
 - b) "Installation of the 3D color wheel assembly", page 352.
5. **Install the Light Pipe with 3D color wheel assembly into the projector.** See detailed procedure "Installation of the Light Pipe with 3D color wheel", page 354.
6. **Check the light path of the installation.** Before closing the projector the light path must be checked. In normal circumstances no adjustments are required if the installation procedure is correctly done. Nevertheless, check the light path while the adjustment point of the integration rod is accessible and adjust if required. See service manual.
7. **Close the projector.** See detailed procedures:
 - a) "Installation of the side cover plate of the Light Processor compartment", page 369.
 - b) "Installation of the left side cover", page 372.
 - c) Start up the projector and clear the tamper event. See "Authorization to clear security warning on the projector", page 189.
8. **Calibrate the 3D color wheel.** The 3D calibration process is described in the user guide of the Communicator Touch Panel. The user guide of the Communicator Touch Panel can be downloaded from the secured Barco web site <https://mybarco.com>.

21.6 Cut off the tubes from the 3D color wheel assembly

Necessary tools

Knife.

How to cut off the tubes?

1. Cut both tubes 3cm from the edge.

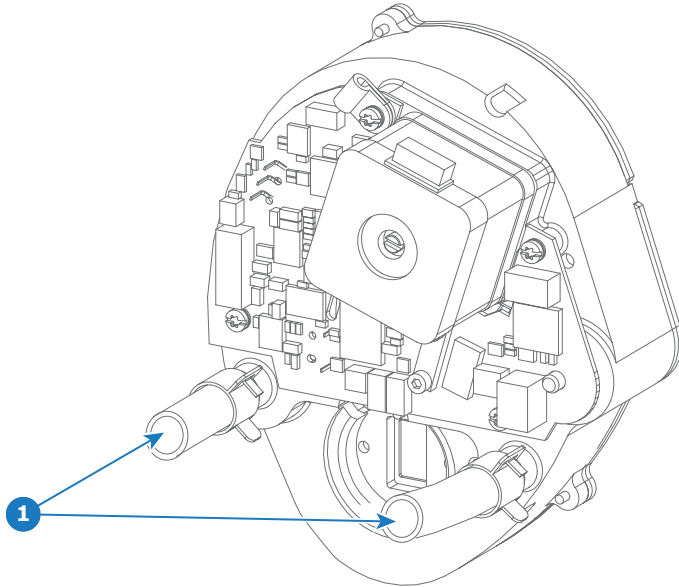


Image 21-6

21.7 Installation of the 3D color wheel assembly



This procedure assumes that the two cover plates and the two tubes of the cooling circuit are removed from the 3D color wheel assembly and that the original Rod heatsink is removed from the Light Pipe.



It is possible to mount the 3D color wheel assembly into the DP2K S series digital projector without cutting the two tubes of the cooling circuit of the 3D color wheel assembly. For that the two tubes have to be coupled with each other and guided below the Light Pipe in the Light Processor compartment. However, it is easier to install the 3D color wheel assembly without tubes into the DP2K S series digital projector.

Necessary tools

- 3mm Allen wrench.
- Cotton gloves.
- TX10 Torx driver.

Necessary parts

- Permabond type A130.
- Mask plate with engraved item number R8761960 (original Mask plate removed from Light Pipe).
- Temperature sensor with connector (temperature sensor from original Rod heatsink).

How to install the 3D color wheel assembly onto the Light Pipe?

1. Mount the temperature sensor (reference 1 image 21-7) onto the 3D color wheel assembly. Use a 3mm Allen wrench.
Note: The temperature sensor is reused from the original Rod heatsink.

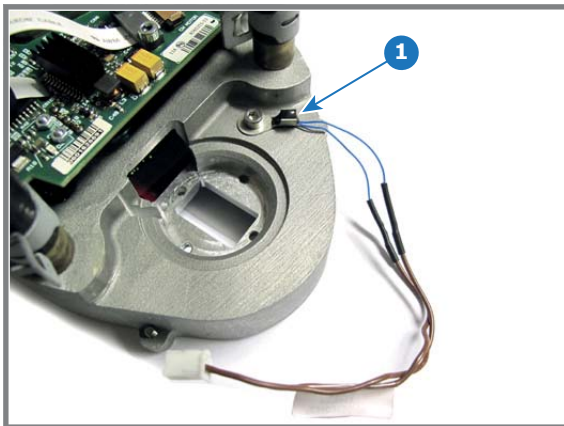


Image 21-7

2. Ensure that the color wheel is retracted (non acting position) so you can freely look through the light path opening.
3. **Carefully** bring the 3D color wheel up towards the light pipe. It is very important to **look straight into the light pipe** via the light path opening of the 3D color wheel when doing this.
The positioning pin (reference 9 image 21-8) on the Light Pipe housing must fit in the positioning hole (reference 10 image 21-8) of the 3D color wheel assembly.
Caution: Any contact with the integration rod may cause damage.

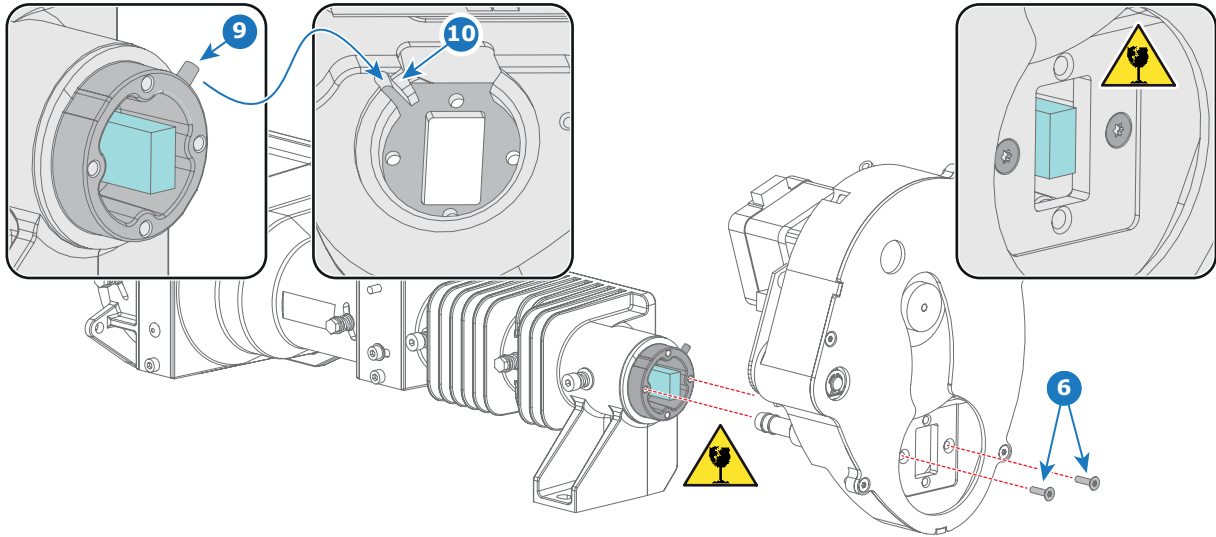


Image 21-8

4. Secure the 3D color wheel with two Torx **countersunk** head screws (reference 6 image 21-8) in combination with thread fastener, Permabond type A130. Use a TX10 Torx driver.

Caution: Before fixing the 3D color wheel module with the countersunk screws provided, it is critical that the module is seated-up fully against the light pipe reference surface. This will ensure the module is correctly positioned while allowing secure fixing. Failure to do this could result in wheel breakage.
5. Install the Mask plate (reference 5 image 21-9) into its socket with the **shiny side facing outwards** as illustrated. Use the Mask plate with engraved number **R8761960**. Fasten with two Torx **countersunk** head screws (reference 4 image 21-9). Use a TX10 Torx driver.

Caution: Ensure mask plate is seated flat in its recessed mounting slot.

Caution: Do not use any screws other than the 4 countersunk screws provided to avoid wheel breakage.

Caution: Do not touch the color wheel while inserting the mask.

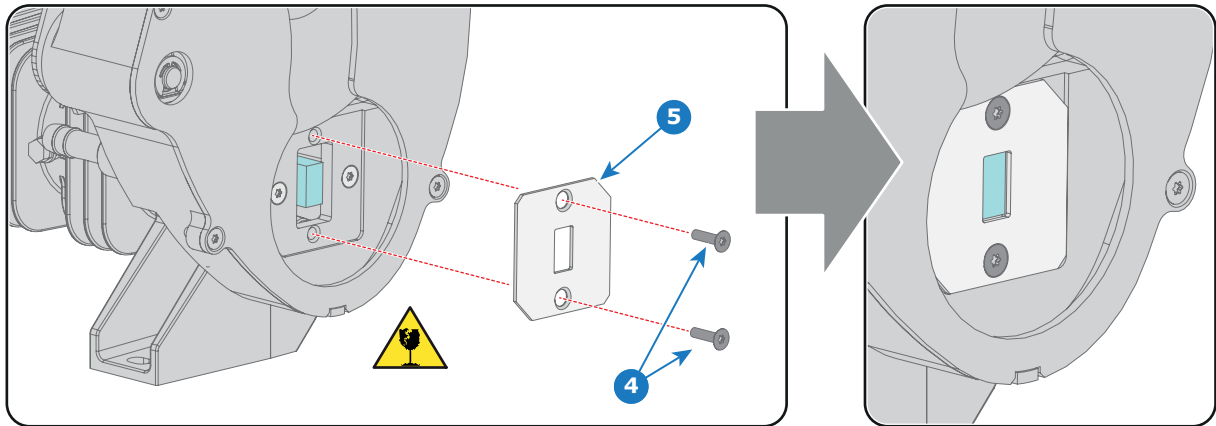


Image 21-9

21.8 Installation of the Light Pipe with 3D color wheel

Necessary tools

3mm Allen wrench.

How to install the Light Pipe with 3D color wheel onto the corner block?

1. Carefully insert the Light Pipe with 3D color wheel into the compartment and engage the Light Pipe in the corner block.
Caution: Do not bump (accidentally) with the lens (reference 3 image 21-10) of the Light Pipe against the projector chassis.

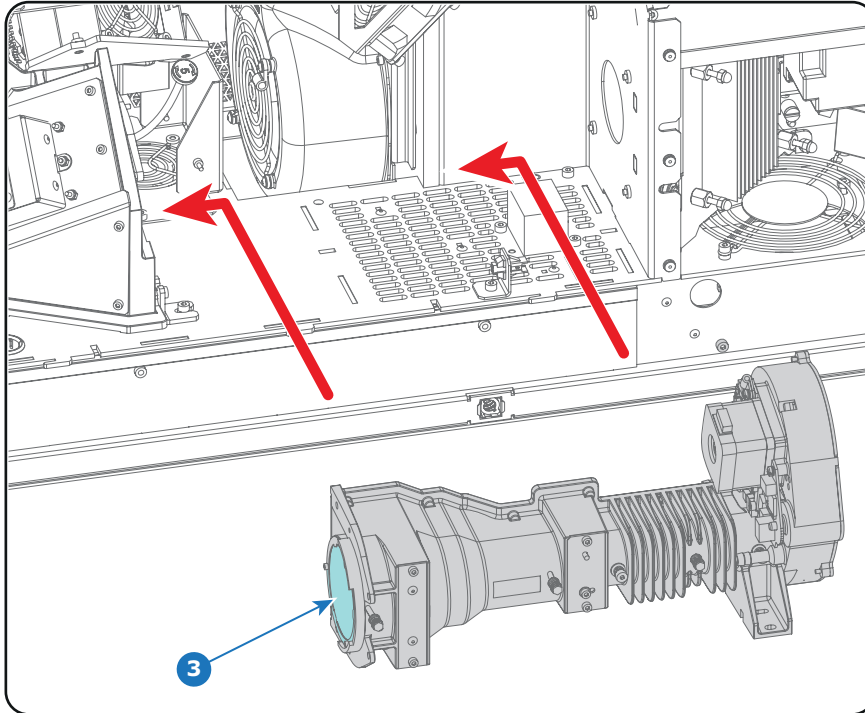


Image 21-10

2. Fixate the Light Pipe with five screws (reference 2 image 21-11). Use a 3mm Allen wrench.

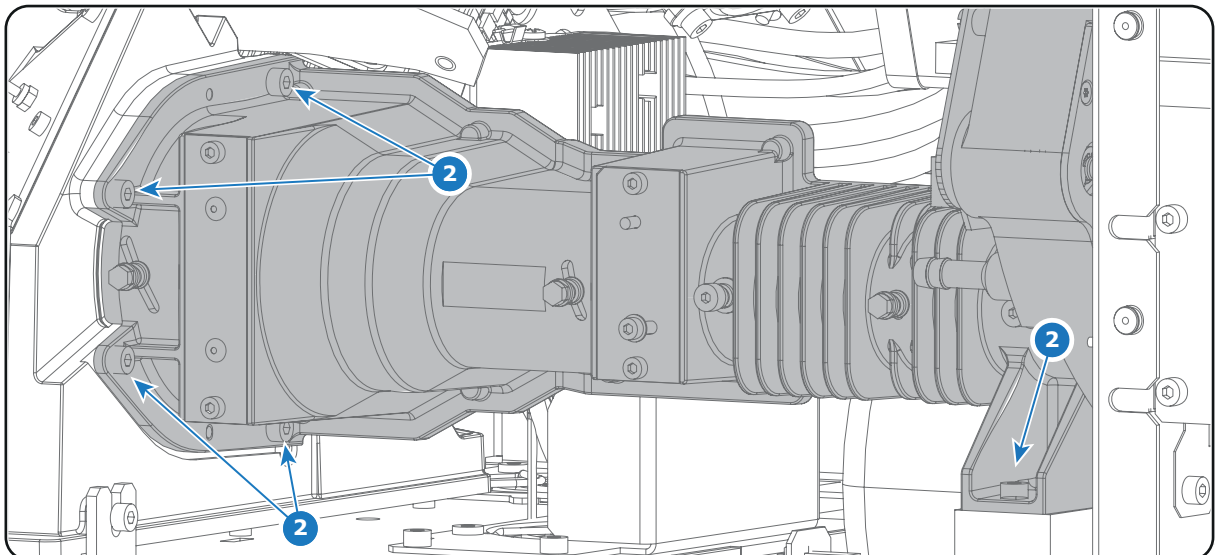


Image 21-11

3. Connect the wire (reference 1 image 21-12) of the temperature sensor.
4. Connect the wire (reference 4 image 21-12) of the 3D color wheel module. This wire is pre-assembled in the projector!

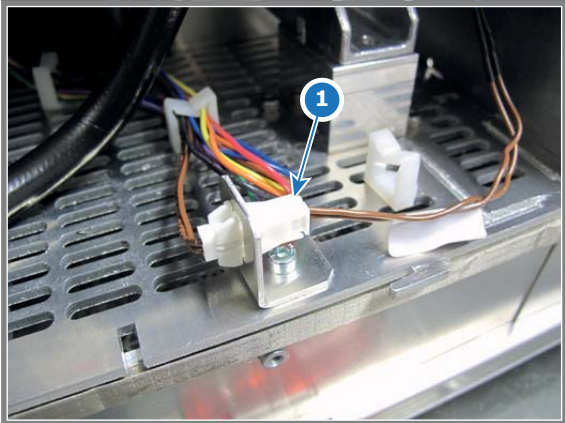
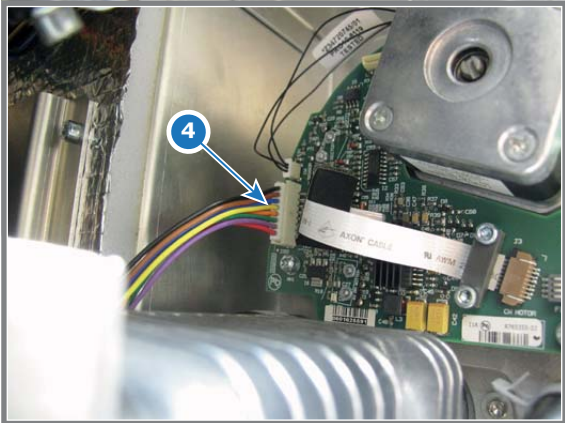


Image 21-12



22. BOARD DIAGNOSTIC LEDES

Overview

- LPS module diagnostic LED's

22.1 LPS module diagnostic LED's

Status LED's on the LPS module

There are 8 diagnostic LED's on the LPS module. Four orange, three green and one red LED.

The orange LED "LVPS OK" lights up immediately after the projector is switched on. At the same time, the heartbeat LED starts blinking. All other status LEDs of the LPS unit remain off. This is the standby status of the LPS unit. Once the command is sent to the LPS units to start up the projection lamp, the green LEDs are lighting up one after the other. First the green LED "PFC OK", then the green LED "LPS OK" and finally, when the lamp is ignited, the green LED "LAMP ON". The right orange of the upper row blinks. This is the heartbeat signal.

The red LED "ERR" remains off unless an error is detected inside the LPS unit or when the LPS unit is ordered to shutdown due to a malfunction somewhere else inside the projector.

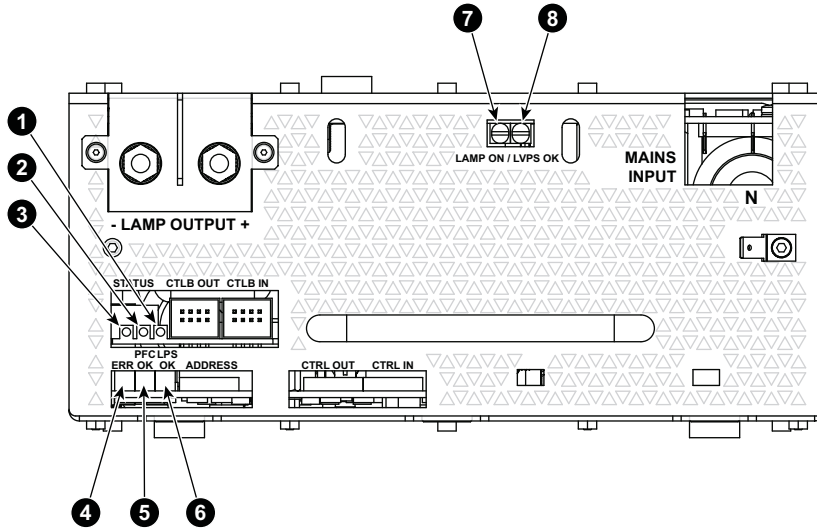


Image 22-1

- 1 Diagnostic LED "LPS HEARTBEAT" (orange).
- 2 Diagnostic LED (internal use only) (orange).
- 3 Diagnostic LED "LPS TRANS" (orange).
- 4 Diagnostic LED "ERROR" (red).
- 5 Diagnostic LED "PFC OK" (green).
- 6 Diagnostic LED "LPS OK" (green).
- 7 Diagnostic LED "LAMP ON" (green).
- 8 Diagnostic LED "LVPS OK" (orange).

Diagnostic

About the orange LEDs next to the CTRL connectors:

LED 2 is only for internal use. LED 1 is the heartbeat LED.

LPS HEARTBEAT (Orange LED 1)	Diagnostics	Action
Blinking	Normal operation	-
OFF	12 V from backplane via CTRL IN not available on LPS unit	Check 12V out on backplane.
ON	12 V from backplane available.	Replace the LPS unit.

LPS TRANS (Orange LED 3)	Diagnostics	Action
Blinking	Normal operation, blinks each time a valid transmission has been received	-
OFF or ON	Communication fault (no reception of valid commands from primary side)	Replace LPS unit.
	Fault on primary side of LPS (E.g. fuse blown and no mains voltage available inside LPS)	Replace fuse. If the problem is not solved, replace LPS
	No mains voltage present at input of LPS mains terminals	Check main voltage.

About the diagnostic LEDs, ERR, PFC, LPS, Lamp ON and LVPS.

Orange	Green	Green	Green	Red	Diagnostic	Action
LVPS OK	PFC OK	LPS OK	LAMP OK	ERR		
OFF	OFF	OFF	OFF	OFF	No input voltage.	Switch on the projector.
ON	OFF	OFF	OFF	OFF	Standby modus of LPS unit.	—
ON	ON	ON	OFF	OFF	PFC and LPS seems to work normally but the lamp is not ignited. This situation can be the result of a bad lamp or SPG module.	<ul style="list-style-type: none"> Install another xenon lamp in case the voltage on the "LAMP OUT" pins is 140 volt and you hear the SPG three times clicking to ignite the lamp. Replace the SPG module in case the voltage value on the "LAMP OUT" pins is >140 volt and you do not hear the SPG module clicking to ignite the lamp. Replace the LPS module in case the voltage value on the "LAMP OUT" pins is below 140 volt and the lamp is not ignited.
ON	ON	ON	ON	OFF	LPS unit is operating normally. Projector lamp is ignited.	—
ON	OFF	OFF	OFF	ON	LPS internal temperature is too high.	<ul style="list-style-type: none"> Check if the LPS air inlet inside the projector is not blocked. Check if the air outlet at the rear of the projector is not blocked. If the problem remains, replace the LPS module.
ON	OFF	OFF	OFF	Blinking	Error detected inside this LPS unit.	Replace the LPS module.
					External error detected from Fan Control board.	<ul style="list-style-type: none"> Check projector log files for error messages (temperatures, fan speed, etc.) Check Fan Control board.

Normal conditions of diagnostic LEDs when a lamp is switched ON

- LED 1 (orange right) : flashing (heartbeat)
- LED 2 (orange center) : not defined
- LED 3 (orange left) : flashing few times / second
- ERR : OFF
- PFC OK : ON (green)
- LPS OK : ON (green)
- LAMP ON : ON (green)
- LVPS OK : ON (orange)

23. 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 Lamp House cover
- Removal of the rear cover
- Removal of the top cover
- Removal of the left 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 left side cover
- Installation of the top cover
- Installation of the rear cover
- Installation of the Lamp House cover

23.1 Removal of the Lamp House cover



WARNING: Switch off the projector prior to start with this procedure, unless otherwise specified in the procedure.

Necessary tools

7mm flat screwdriver.

How to remove the Lamp House cover?

1. Loosen the four captive screws (reference 1 image 23-1) of the Lamp House cover using a 7mm flat screwdriver.
2. Remove the Lamp House cover from the projector.

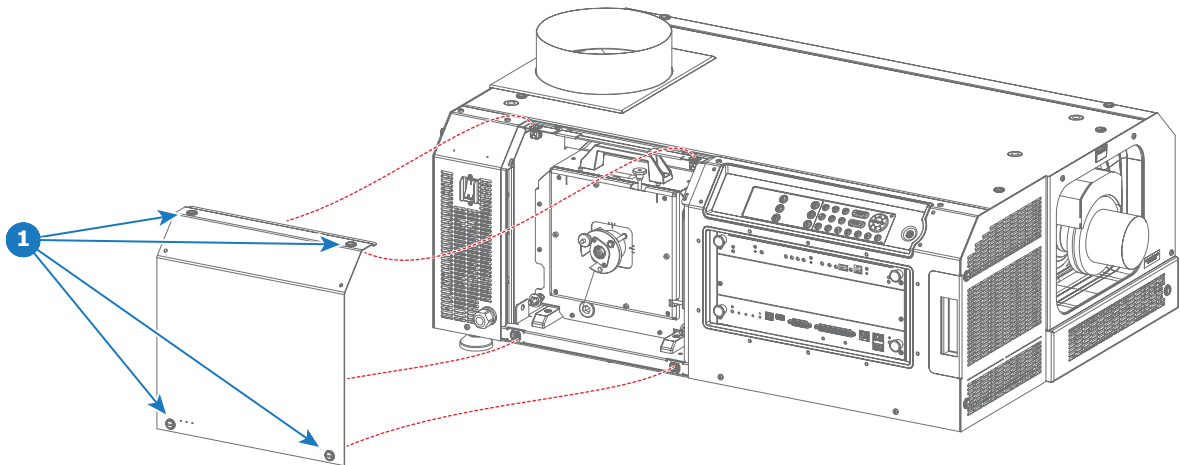


Image 23-1

23.2 Removal of the rear cover



WARNING: Switch off the projector prior to start with this procedure, unless otherwise specified in the procedure.

Necessary tools

7mm flat screwdriver.

How to remove the rear cover?

1. Loosen the four captive screws (reference 1 image 23-2) of the rear cover using a 7mm flat screwdriver.
2. Remove the rear cover from the projector.

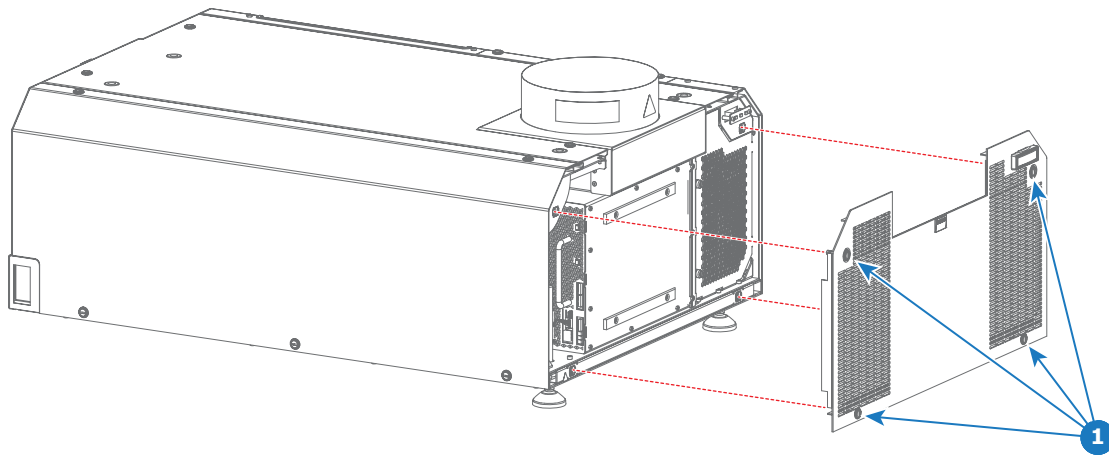


Image 23-2

23.3 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 Communicator Touch Panel must be removed first if installed on top of the projector. This procedure assumes that the Communicator Touch Panel is not installed on top of the projector.

Necessary tools

7mm flat screwdriver.

How to remove the top cover?

1. Loosen the four captive screws (reference 1 image 23-3) of the top cover using a 7mm flat screwdriver.
2. Remove the top cover from the projector.

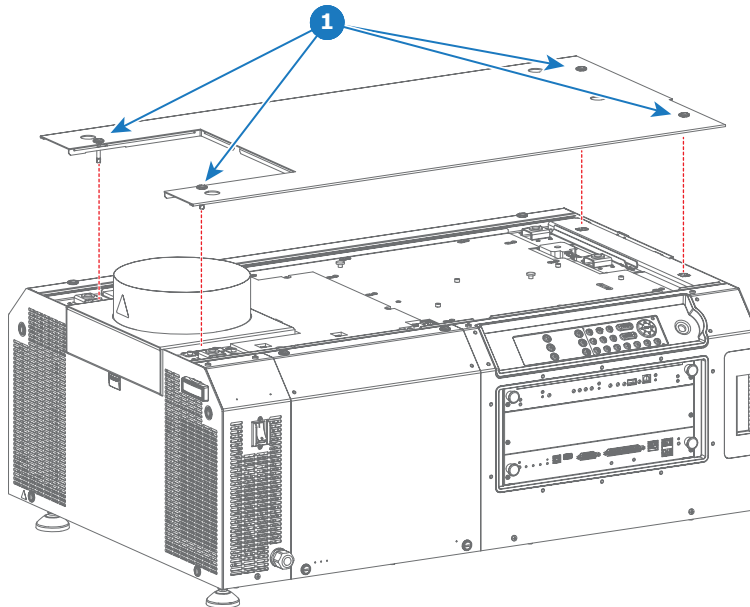


Image 23-3

23.4 Removal of the left side cover



WARNING: Switch off the projector prior to starting with this procedure, unless otherwise specified in the procedure.

Necessary tools

7mm flat screwdriver.

How to remove the left side cover?

1. Release the small dust filter assembly from the front side of the projector. Use 7mm flat screw driver to loosen the captive screw (reference 1 image 23-4) of the small dust filter assembly.

Note: The left side cover is partial captured by the sheet metal of the small filter assembly. For that, this filter has to be (partially) removed first.

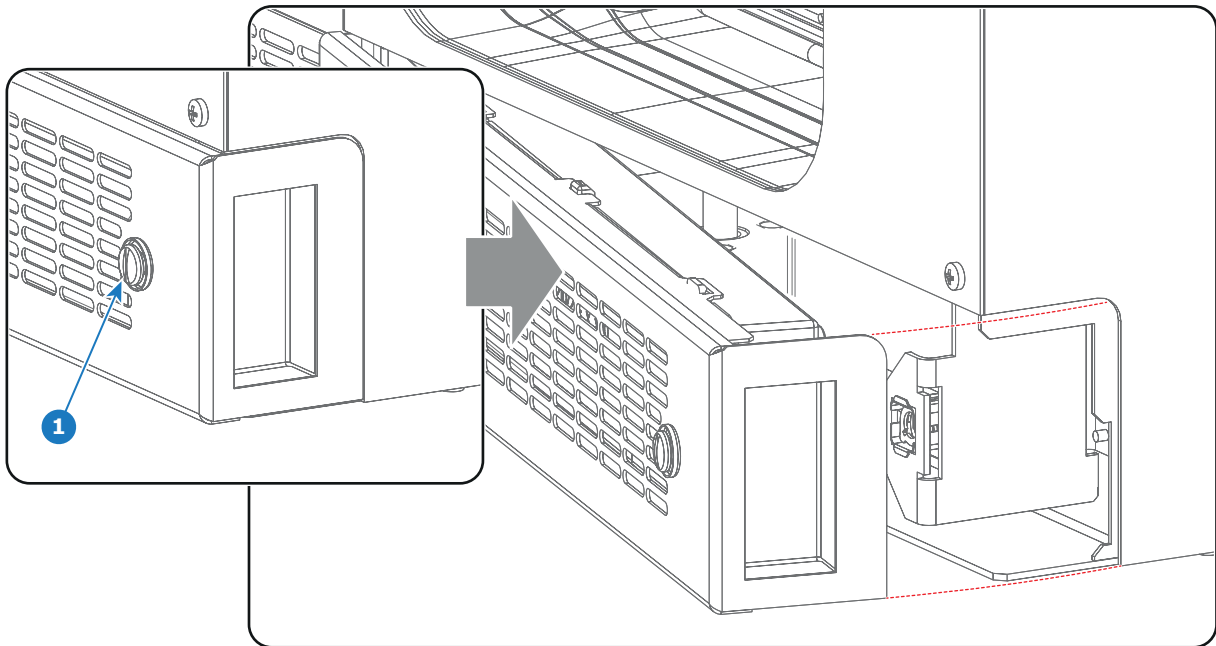


Image 23-4

2. Loosen the five captive screws (reference 2 image 23-5) of the left side cover using a 7mm flat screwdriver.
3. Remove the left side cover from the projector.

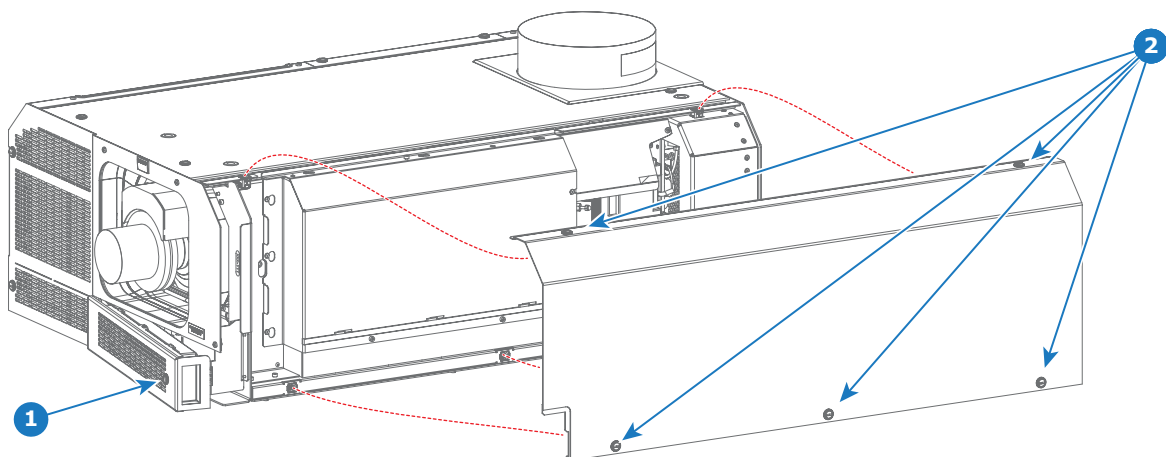


Image 23-5

23.5 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 four screws (reference 1 image 23-6) at the top of the cover plate. Use a 3mm Allen wrench.

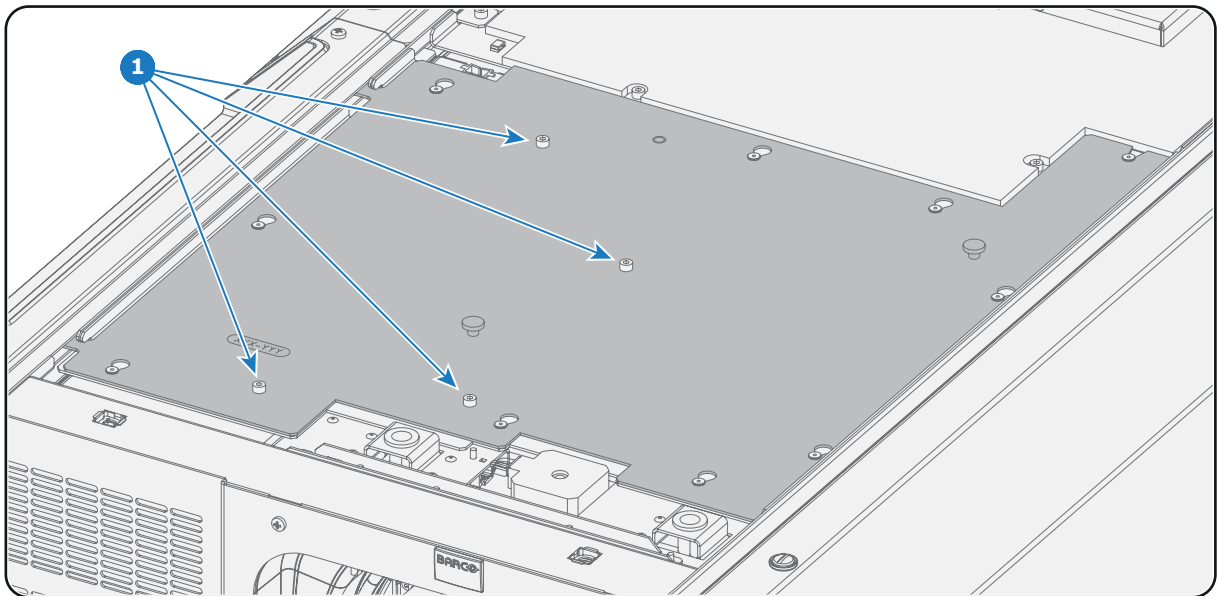


Image 23-6

2. Remove the top cover plate as follows:
 - a) Grib the top cover plate by the two handles (reference 2 image 23-7) and slide it towards the front side (lens side) of the projector. All latches (reference 3 image 23-7) must become free.
 - b) Tilt the top cover plate as illustrated.
 - c) Move the top cover plate away from the projector.

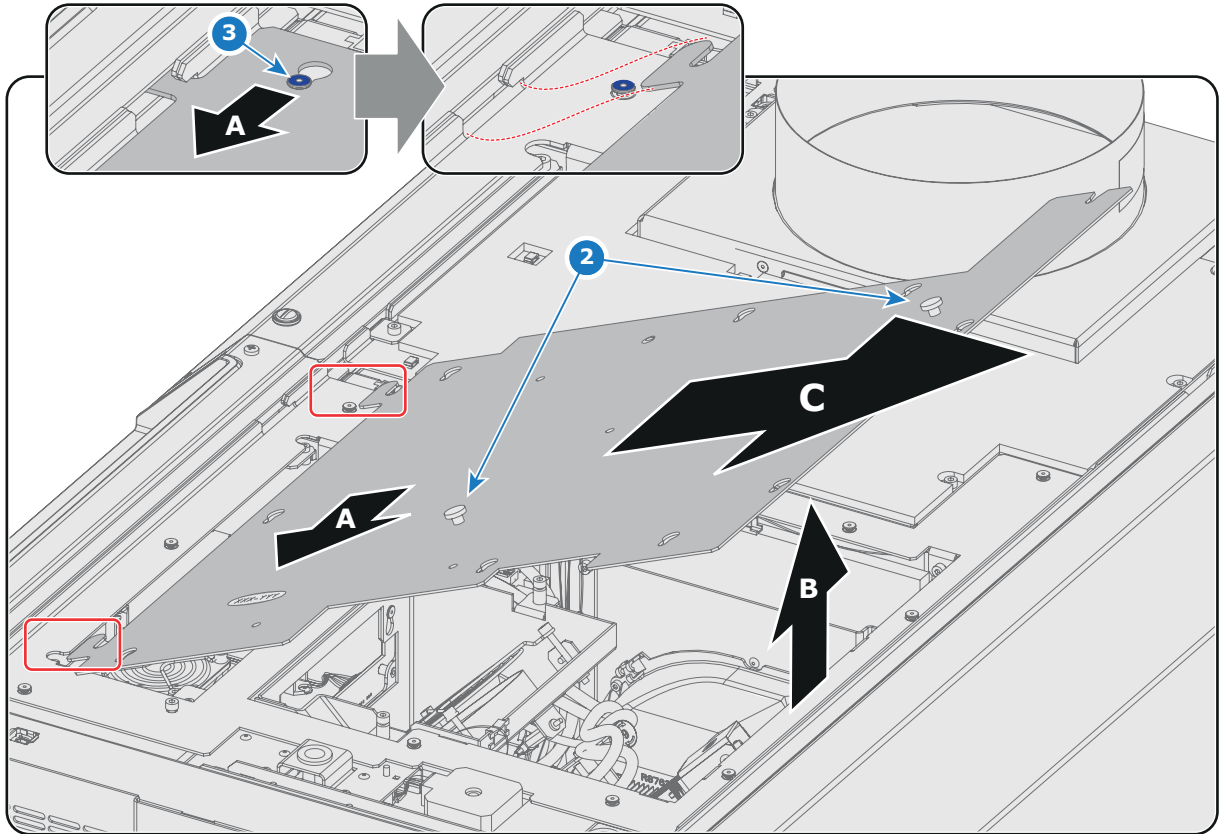


Image 23-7

23.6 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 has to be removed first. 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

3mm Allen wrench.

How to remove the side cover plate from the Light Processor compartment?

1. Remove the screw at the top of the cover plate (reference 1 image 23-8) and the two screws at the bottom of the cover plate (reference 2 image 23-8). Use a 3mm Allen wrench.
2. Remove the side cover plate left (A) then up (B) then away (C).

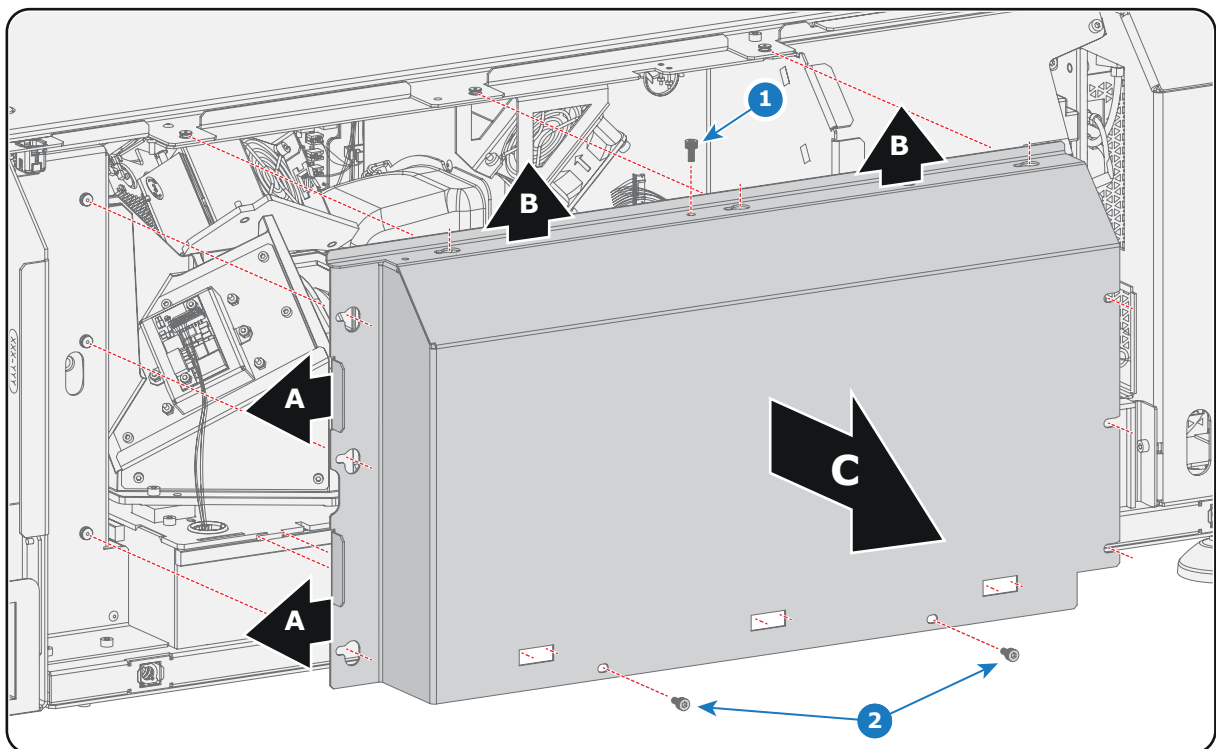


Image 23-8

23.7 Installation of the side cover plate of the Light Processor compartment

Necessary tools

3mm Allen wrench.

How to install the side cover plate from the Light Processor compartment?

1. Place the side cover plate into position as illustrated. Ensure that all 12 slots of the side cover plate are engaged (three at each side).

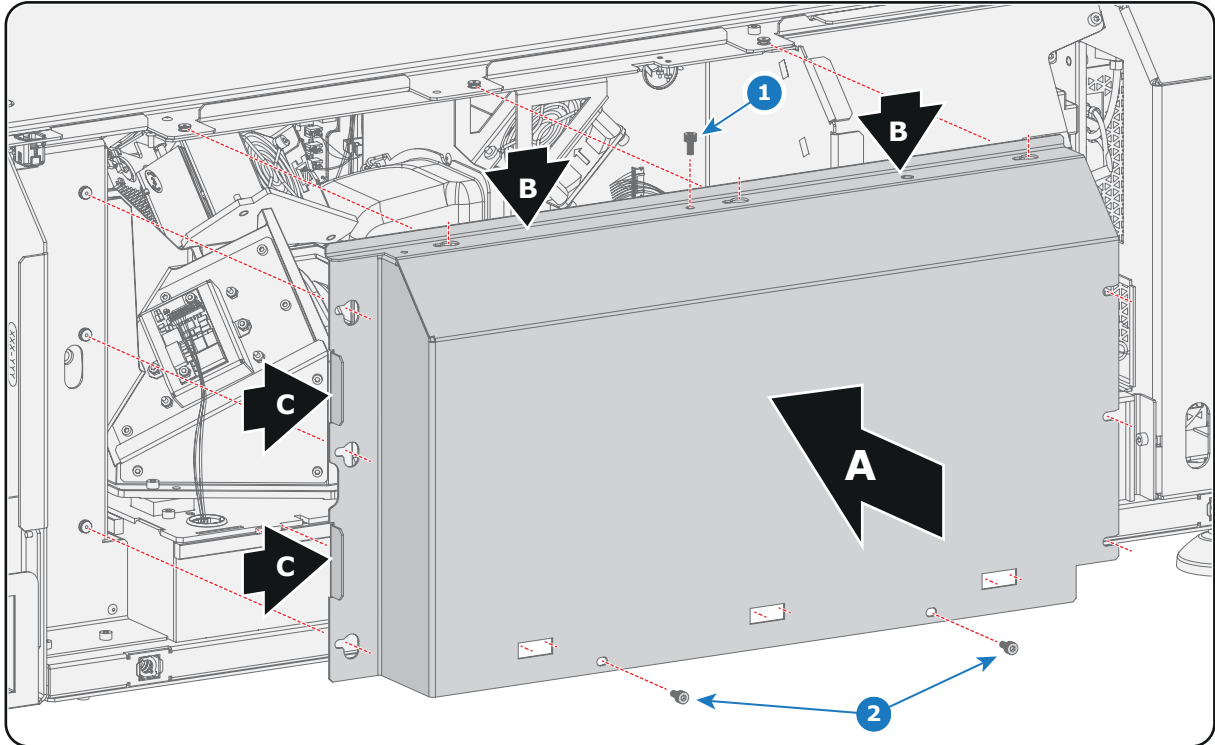


Image 23-9

2. Fasten the side cover plate with a screw at the top (reference 1 image 23-9) and the two screws at the bottom (reference 2 image 23-9). Use a 3mm Allen wrench.



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!

23.8 Installation of the top cover plate of the Light Processor compartment

Necessary tools

3mm Allen wrench.

How to install the top cover plate from the Light Processor compartment?

1. Install the top cover plate as follows:
 - a) Approach the projector with the top cover plate tilted as illustrated and insert the two hooks of the top cover plate into the projector chassis (see detailed illustration image 23-10).
 - b) Lower the top cover plate completely.
 - c) Grip the two knobs (reference 2 image 23-10) , slide the top cover plate to the rear side of the projector and ensure that all slots (reference 1 image 23-10) of the top cover plate are engaged.

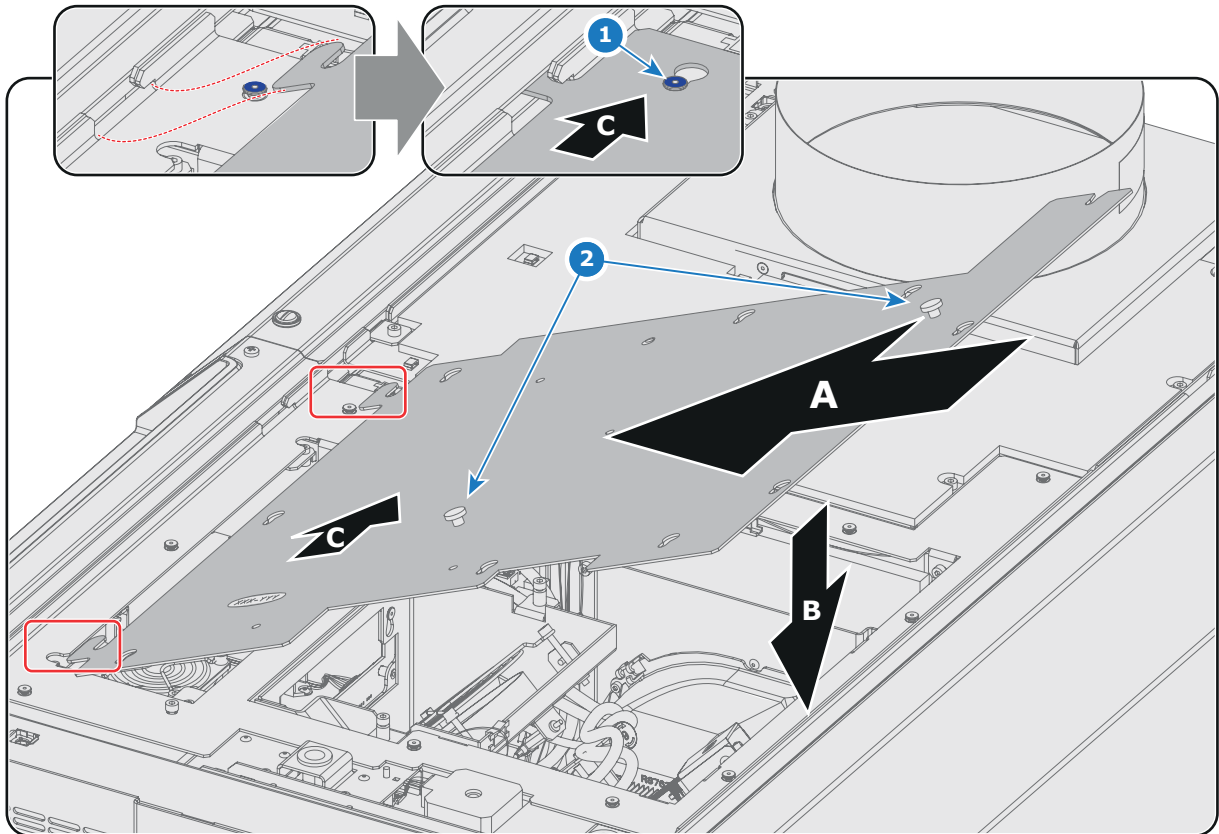


Image 23-10

2. Fasten the top cover plate with four screws (reference 1 image 23-11). Use a 3mm Allen wrench.

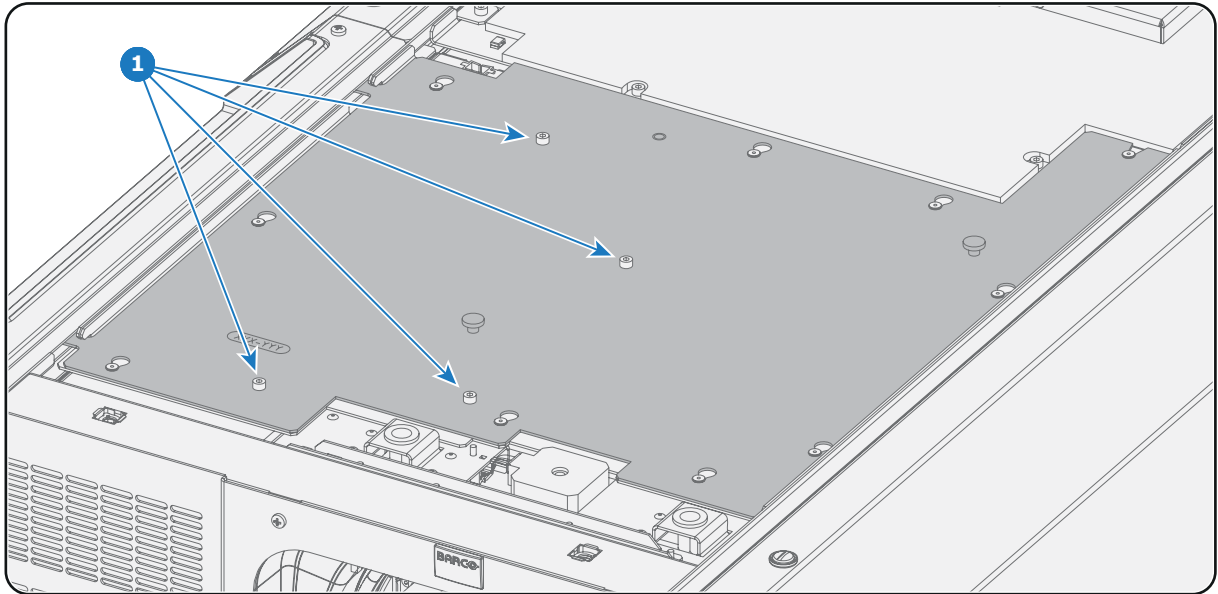


Image 23-11



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!

23.9 Installation of the left side cover

Necessary tools

7mm flat screwdriver.

How to install the left side cover?

1. Place the left side cover on the projector.

2. Fasten the five captive screws (reference 2 image 23-12) of the left side cover using a 7mm flat screwdriver.

Note: *The left side cover is partial captured by the sheet metal of the small filter assembly. For that, this filter is partially removed for the removal of the side cover.*

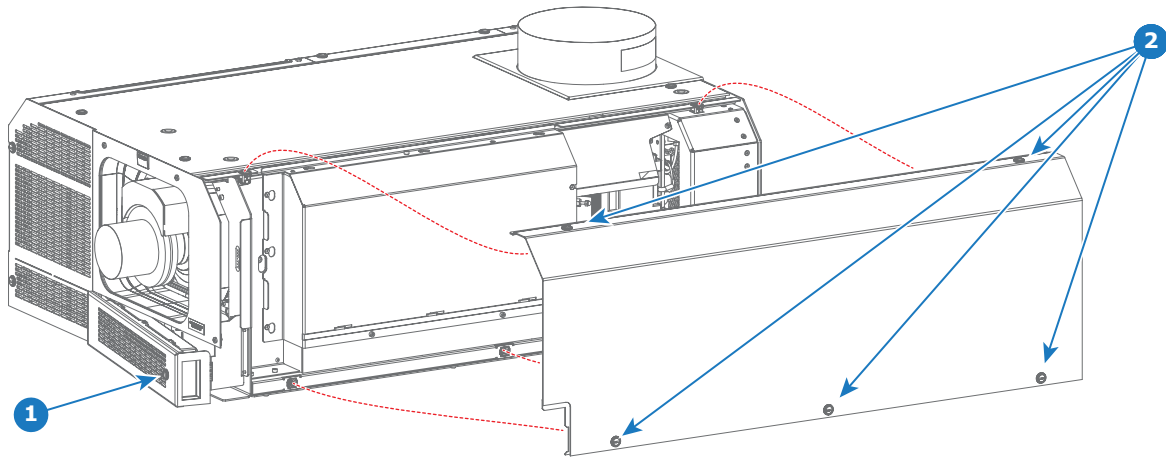


Image 23-12

3. Install the small dust filter at the front side of the projector. Use a 7mm flat screw driver to fasten the captive screw (reference 1 image 23-13) of the small dust filter assembly.

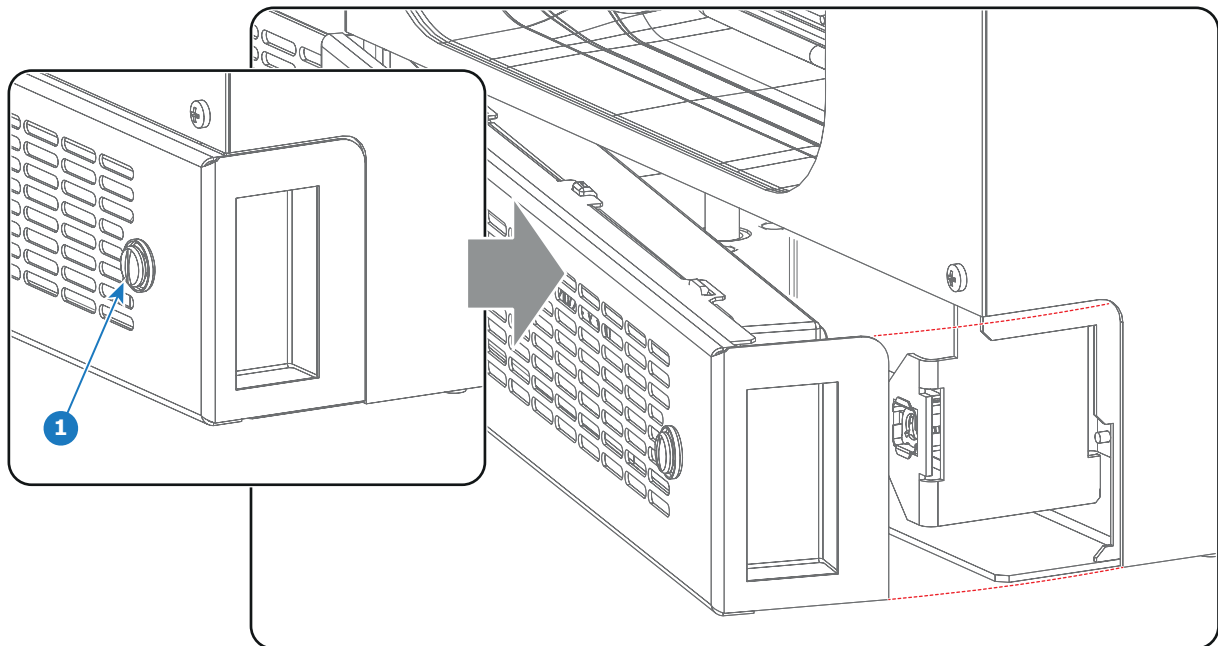


Image 23-13

23.10 Installation of the top cover

Necessary tools

7mm flat screwdriver.

How to install the top cover?

1. Install the top cover on the projector.
2. Fasten the four captive screws (reference 1 image 23-14) of the top cover using a 7mm flat screwdriver.

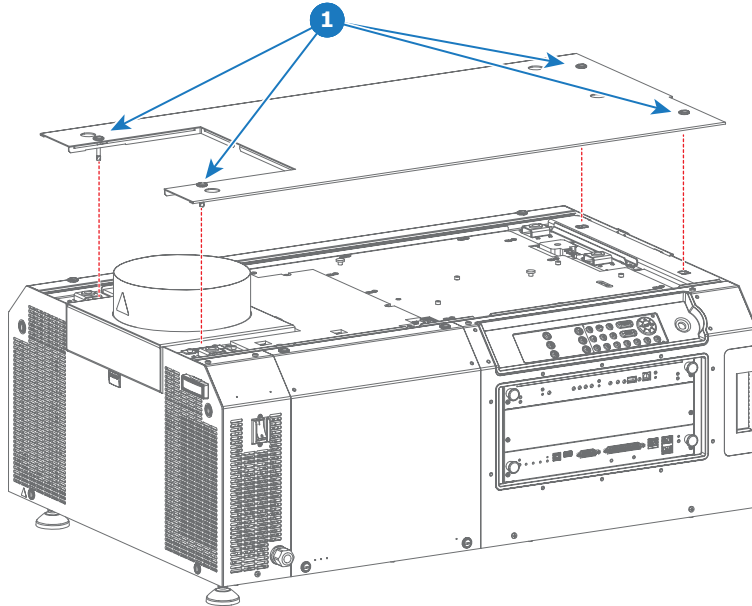


Image 23-14

23.11 Installation of the rear cover

Necessary tools

7mm flat screwdriver.

How to install the rear cover?

1. Install the rear cover on the projector.
2. Fasten the four captive screws (reference 1 image 23-15) of the rear cover using a 7mm flat screwdriver.

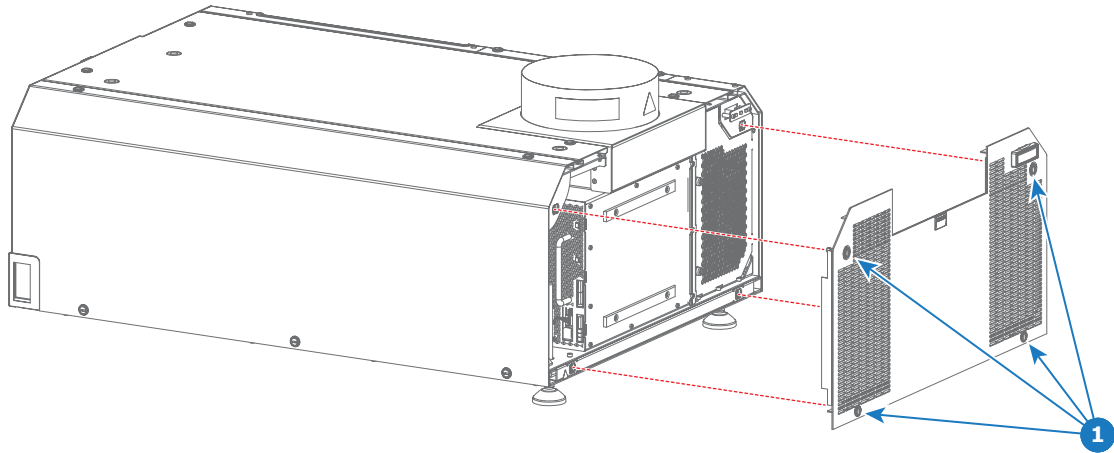


Image 23-15

23.12 Installation of the Lamp House cover

Necessary tools

7mm flat screwdriver.

How to install the Lamp House cover?

1. Install the Lamp House cover on the projector.
2. Fasten the four captive screws (reference 1 image 23-16) of the Lamp House cover using a 7mm flat screwdriver.

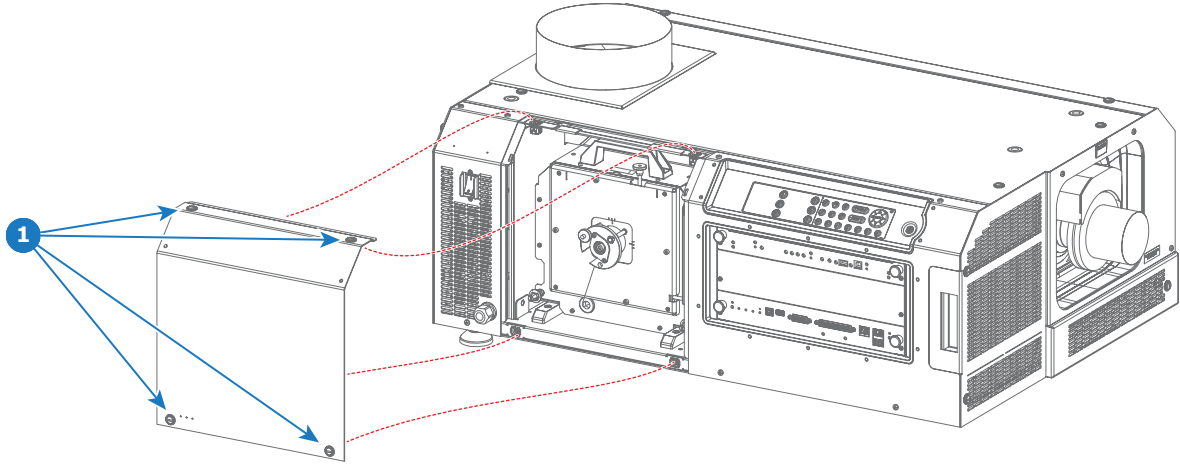


Image 23-16

24. 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 optical components
- Cleaning procedures non optical components

24.1 Necessary tools, products and tips

Tools

Only the tools necessary to clean the projector are indicated here. Tools needed to disassemble or to get access are listed in the replacement procedures which are included in the projector's service manual.

- Any micro fiber lens cleaning cloth (e.g. Toraysee® cloth(s) (R379058))
- Vacuum cleaner
- Brush
- Clean cloth(s) (never use cloths that leave particles on the surfaces)

Products

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

Tips

Ensure there is sufficient light in the cleaning environment. If necessary, add extra lights.

To protect the optical coatings, limit the number of wipe movements. It is better to wipe off the dust with one good wipe movement then with 10 soft wipe movements.

It is advised to use a lens cleaner in combination with a micro fiber lens cleaning cloth. These lens cleaners break the molecular bonds that dust, dirt and grime that adhere to the surface so that cleaning is much easier. These lens cleaners can also remove fingerprints without streaks.

Always use a clean cloth! If smears occur when cleaning optics, replace the cloth. Smears are the first indication of a dirty cloth.

Clean the light processor and light pipe in a dust free environment (best will be a clean room).

Make sure your booth environment corresponds with the environment specifications given in the projector's user and installation manual.

24.2 General cleaning procedure for optical components



This procedure describes the general steps to clean optical components.

Necessary tools

- Compressed air (spray).
- Lens cleaner (e.g. Carl Zeiss cleaner or Purasol® Optical or any water based lens cleaner)
- Clean micro fiber lens cleaning cloth (e.g. Toraysee® cloth(s))

General cleaning procedure

1. Blow off dust with **clean** compressed air (or pressurized air cans⁸).
 2. Clean with lens cleaner liquid together with 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 micro fiber lens cleaning cloth to remove left liquid or stripes. Polish using 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.
-



CAUTION: If there is a difference in cleaning a specific part, it is mentioned in the description of that specific part.

⁸. Pressurized air cans is not efficient if there is too much dust on the surface, the pressure is too low

24.3 Cleaning process for the optical path

General steps

1. Optimize the Z-axis of the lamp for highest light output.
2. Measure the light output of your projector before starting the cleaning procedure.
3. Clean the complete optical path.
4. Measure the light output again when the cleaning procedure is finished.

Write down all your results, remarks and time of measurement.

Measure always in the same environmental conditions. Put your measuring device on a fixed position and always measure from this position.

Do these measurements every time you perform an optical cleaning. Overtime you will have an overview and you will be able to compare with previous measurements.

Consult the projector's service manual to see how to remove/access any optical part.

Before starting with the cleaning of the optical parts, first clean the outside covers of the projector.

Clean the optical path in chronological order as listed here below.

Optical path cleaning order

1. **Lamp House:**
 - a) Lamp House outside cabinet
 - b) Lamp House Reflector
 - c) Lamp House UV blocker
2. **Lamp House compartment:**
 - a) Compartment interior
 - b) Cold Mirror
 - c) Compartment window (Cold Mirror side)
3. **Light Pipe:**
 - a) Compartment interior
 - b) Compartment window (Light Pipe side)
 - c) 3D color wheel (optional)
 - d) Rod inlet
 - e) Notch Filter
 - f) Light Pipe Lenses No1, No2 and No3
 - g) Light Pipe Fold Mirrors
4. **Light Processor:**
 - a) Compartment interior
 - b) Light Pipe Lenses No4
 - c) Prism inlet and outlet
5. **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 House (1), Lamp House compartment (2), Projection lens and porthole (5). Take this into account to avoid unnecessary opening of the Light Pipe and removing of the Light Processor.



We advise to measure the light output in every step, such as after cleaning the Reflector, UV blocker, Cold Mirror, compartment window, Rod inlet, ... projection lens and porthole window. At least, make sure to measure the light output before you start and at the end of the complete cleaning procedure.

24.4 Cleaning procedures optical components

Lamp House outside cabinet

1. Take the Lamp House out of its compartment. See "Removal of the Lamp House", page 117.
2. Remove contamination from the outside cabinet with a vacuum cleaner and a brush. Ensure that the air inlet and outlet grids are clean.

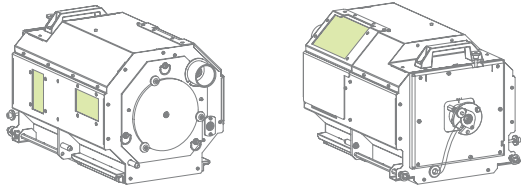


Image 24-1

Lamp House Reflector

1. Remove the lamp from the Lamp House. See "Removal of the xenon lamp from the Lamp House", page 118.
2. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379, or see "Cleaning the Reflector of the Lamp House", page 135.

Tip: To obtain the best result, it is best to use immediately a lens cleaner.

Note: Polishing the reflector is very important. It improves the light output significantly.

Caution: When reflector is cracked or damaged, replace with a new one.

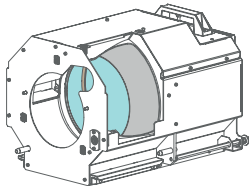


Image 24-2

Lamp House UV blocker

1. Blow the excessive dust off with compressed air. 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 379, or see "Cleaning the UV blocker of the Lamp House", page 134.
3. Reassemble the Lamp House. See "Installation of the xenon lamp into the Lamp House", page 123.

Caution: When the UV blocker is cracked or damaged, replace with a new one.

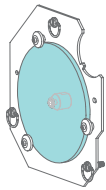


Image 24-3

Lamp House compartment interior

1. Remove all dust from the complete compartment with a vacuum cleaner and a brush.

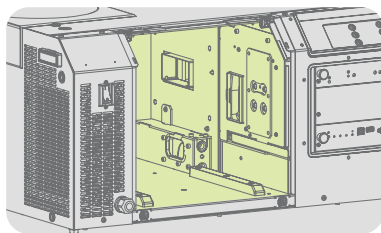


Image 24-4

Cold Mirror

1. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379, or see "Cleaning the Cold Mirror", page 165.

Caution: Do not push too hard to avoid that the mirror comes loose.

Caution: When the UV blocker is cracked or damaged, replace with a new one.

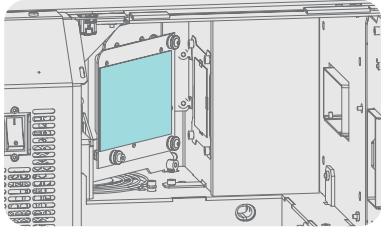


Image 24-5

Compartment window (Cold Mirror side)

1. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379.

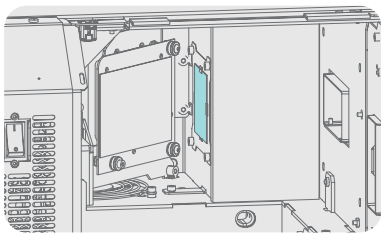


Image 24-6

Light Pipe compartment interior

1. Remove all dust from the complete compartment with a vacuum cleaner and a brush.

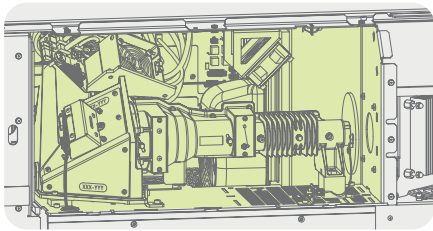


Image 24-7



CAUTION: Light Pipe cleaning

Light Pipe cleaning is a critical action and should only be done when really necessary. Try first to clean all other optical parts and measure the result. If the light output is not meeting the official specifications for 2D and 3D at this point swap the lamp. If the improvement is not enough then try to improve the light output by cleaning the Light Pipe (see next procedures). Opening and cleaning the Light Pipe may only be done by a trained service engineer and in a clean room.

Compartment window (Light Pipe side)

1. Remove the Light Pipe from the projector to access the compartment window. See "Removal of the Light Pipe", page 194.
2. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379.

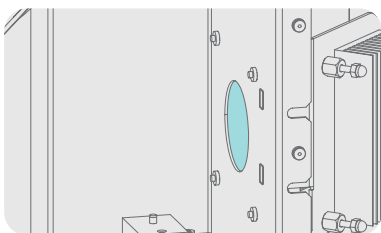


Image 24-8

3D color wheel (optional)

1. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379.
Note: *The Light Pipe with 3D color wheel has to be removed from the projector for cleaning.*

2. Bring the 3D color wheel down by turning the axis of the stepper motor with a flat screw driver. (reference 2)
Turn the color wheel a little so that it is possible to clean other areas (reference 1).
Clean the 3D color wheel itself.

Caution: *Be careful not to push too hard on the color wheel as this is a very fragile and expensive thin glass.*

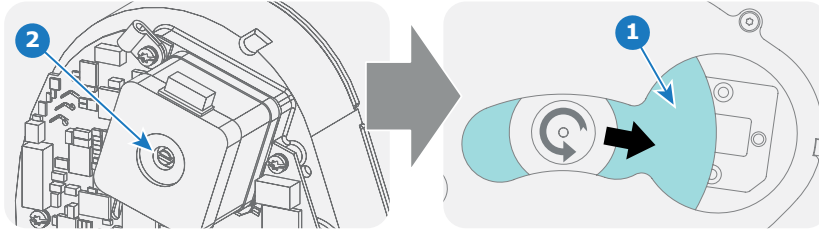


Image 24-9

3. When the color wheel was turned down manually, turn it fully back to its original position. When it was turned down by a macro, it will be automatically turned back after deactivating the 3D macro.

Rod inlet

1. Remove the Light Pipe, if not removed yet, from the projector. See "Removal of the Light Pipe", page 194.

2. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379.
Caution: *Be careful not to push too hard on the Rod inlet as this is a very fragile glass. Especially the edges of the Rod inlet.*

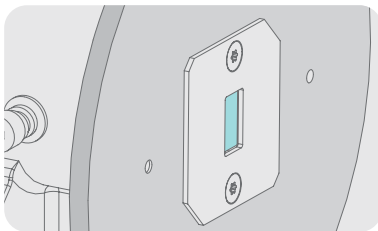


Image 24-10

3. In case a 3D color wheel is installed the color wheel has to be retracted (away from the mask plate) to access the Rod inlet.

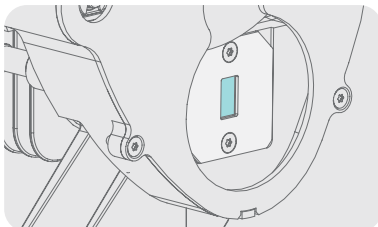


Image 24-11

Notch Filter

1. Remove the Notch Filter from the Light Pipe. See "Replacing the Notch Filter", page 209.

2. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379, or see "Cleaning the Notch Filter", page 212.

Caution: *Do not push too hard to avoid that the mirror comes loose.*

3. Install the clean Notch Filter. See "Replacing the Notch Filter", page 209.

Note: *Take into account that the Notch Filter needs to be realignment after finishing the projector cleaning process. See "Adjusting the Notch Filter", page 210.*

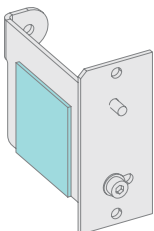


Image 24-12

Light Pipe Lenses No1, No2 and No3

1. Remove the Light Pipe from the projector, if not removed yet. See "Removal of the Light Pipe", page 194.
2. Remove contamination from the outside of the Light Pipe with a vacuum cleaner and a brush or with compressed air.
Caution: Do not touch the Rod inlet and Lens No3 outlet of the Light Pipe.
3. Remove the cover from the Light Pipe. See "Removal of the Light Pipe cover plate", page 196.
Caution: Opening and cleaning the Light Pipe may only be done by a trained service engineer and in a clean room.
4. Remove the Light Pipe Lenses No1, No2 and No3 from the Light Pipe. See procedures:
 - "Replacing Light Pipe lens No1 (focus lens)", page 197.
 - "Replacing Light Pipe lens No2", page 199.
 - "Replacing Light Pipe lens No3 (zoom lens)", page 200.**Note:** No need to remove lens No1 and No3 from its container.
Caution: Do not remove the Rod. The Rod is a very sensitive part and the risk to break off small parts is very high.
5. Blow dust off from the inner side of the Light Pipe with compressed air.
6. Clean the Light Pipe Lenses No1, No2 and No3. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379.
7. Install the Light Pipe Lenses No1, No2 and No3 into the Light Pipe. See procedures:
 - "Replacing Light Pipe lens No1 (focus lens)", page 197.
 - "Replacing Light Pipe lens No2", page 199.
 - "Replacing Light Pipe lens No3 (zoom lens)", page 200.

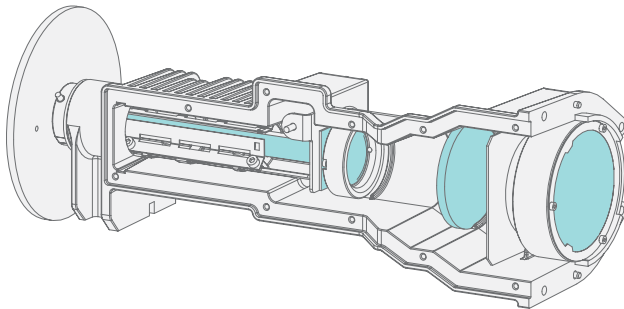


Image 24-13

8. Install the cover of the Light Pipe. See "Installing the Light Pipe cover plate", page 204.
9. Install the Light Pipe. See "Installing the Light Pipe", page 205.
Note: Take into account that the Light Pipe lens No1 and No3 needs to be realignment after finishing the projector cleaning process. See "Adjusting the Light Pipe lens No1 (focus lens)", page 207 and "Adjusting the Light Pipe lens No3 (zoom lens)", page 208.

Light Pipe Fold Mirrors

1. Remove the side cover plate and the Light Sensor assembly from the Corner Block. See "Replacing the Fold Mirror set", page 213.
2. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379, or see "Cleaning the Fold Mirrors", page 217.
Note: There are two Fold Mirrors: one fixed inside the corner block and one adjustable on the rear side of the Light Sensor assembly.
Caution: Do not push too hard to avoid a crack of the Folding Mirror.

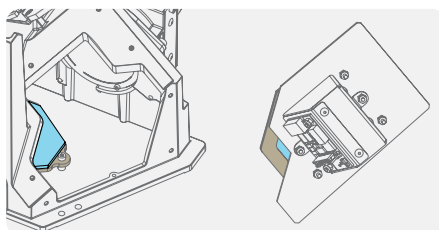


Image 24-14

3. Install the Light Sensor assembly and the side cover plate onto the Corner Block. See "Replacing the Fold Mirror set", page 213.



CAUTION: Light Processor cleaning

Light Processor cleaning is a critical action and should only be done when really necessary. Try first to clean all other optical parts and measure the result. If the light output is not meeting the official specifications for 2D and 3D at this point swap the lamp. If the improvement is not enough then try to improve the light output by cleaning the Light Processor (see next procedures). Removing and cleaning the Light Processor may only be done by a trained service engineer and in a clean room.

Light Processor compartment interior

1. Remove the lens from the projector. See "Lens removal", page 250.
2. Remove the Light Processor from the projector. See "Removing the Light Processor", page 173.
3. Remove all dust from the complete compartment with a vacuum cleaner and a brush. Ensure the lamp anode fan grid, the Light Processor compartment fan grid, and the DMD fan grids are dust free.

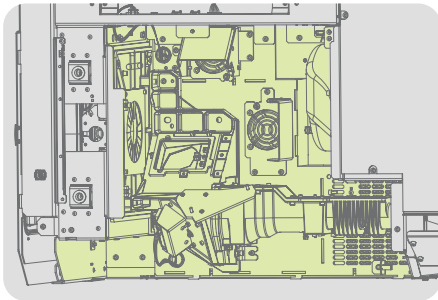


Image 24-15

Light Pipe Lense No4

1. Remove the Light Pipe Lens No4 from the corner block. See "Replacing Light Pipe lens No4", page 202.
2. Clean the Light Pipe Lens No4 according the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379.
Note: *No need to remove lens No4 from its container.*
3. Install the Light Pipe Lens No4. See "Replacing Light Pipe lens No4", page 202.

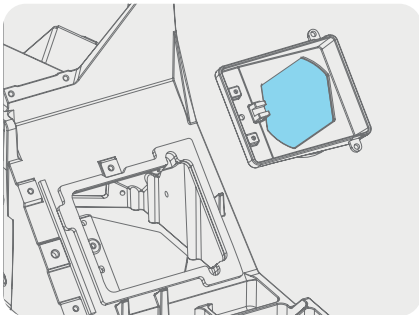


Image 24-16

Light Processor Prism inlet and outlet

1. Remove overall dust from the outside of the Light Processor with compressed air.

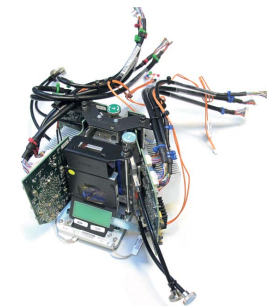


Image 24-17

2. Clean the Prism inlet according the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379.

24. Projector cleaning

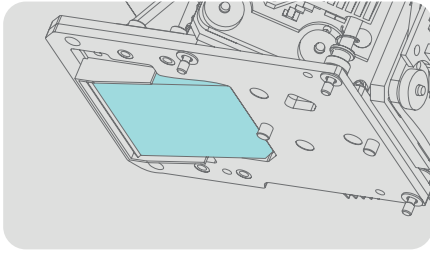


Image 24-18

3. Clean the Prism outlet according the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379.

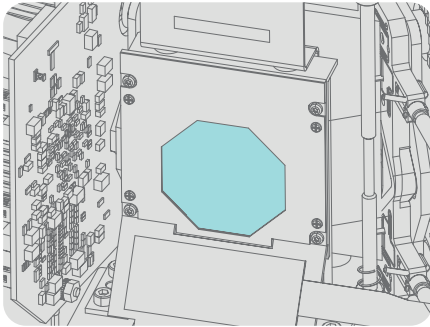


Image 24-19

4. Install the Light Processor. See "Installing the Light Processor", page 176.

Projection lens inlet

1. Remove the lens from the projector, if not removed yet. See "Lens removal", page 250.
2. Follow the general cleaning procedure for optical parts to clean the lens inlet, see "General cleaning procedure for optical components", page 379, or see "Cleaning the lens", page 253.
3. Install the lens. See "Lens installation", page 249.

Projection lens outlet

1. Follow the general cleaning procedure for optical parts to clean the lens outlet, see "General cleaning procedure for optical components", page 379, or see "Cleaning the lens", page 253.

Porthole

1. Follow the general cleaning procedure for optical parts, see "General cleaning procedure for optical components", page 379.
Tip: *Ensure to clean both sides (booth side and audience side) of the Porthole.*

24.5 Cleaning procedures non optical components

Components to clean

1. Lamp Anode Fan air intake side.
2. Card Cage air intake side.
3. Card Cage interior.
4. SMPS compartment.
5. Cold Mirror fan.
6. Lamp Power Supply.
7. Projector external covers.
8. Projector dust filters.

Lamp Anode Fan air intake side

1. Remove the small dust filter from the projector. For removal instructions see "Check the small dust filter", page 336.
2. Clean the air inlet with a vacuum cleaner and a brush.
Caution: *Do not blow with compressed air to avoid dust distribution inside the projector.*

Card Cage air intake side

1. Remove the large dust filter from the projector. For removal instructions see "Check the large dust filter", page 334.
2. Clean the metal mesh grid of the card cage fans and the fans itself with a vacuum cleaner and brush.
Caution: *Do not blow with compressed air to avoid dust distribution inside the Card Cage.*

Card Cage interior

1. Remove the projector top cover and top cover plate. See "Removal of the top cover", page 364, and "Removal of the top cover plate of the Light Processor compartment", page 366.
2. Remove all boards out of the Card Cage.
Caution: *Wear a wrist band which is connected to the ground while handling the electrostatic discharge sensitive parts.*
3. Clean the ICP fan on top of the Card Cage with a vacuum cleaner and brush.
4. Clean the mesh grid and fan grid inside the card cage with a vacuum cleaner and brush.
5. Clean the boards with compressed air, but be careful not to damage components.
6. Install all boards.
7. Install the top cover plate. See "Installation of the top cover plate of the Light Processor compartment", page 370.

SMPS compartment

1. Remove the Card Cage cover. See "Removal of the Card Cage cover", page 310.
2. Remove the cover of the SMPS compartment and the SMPS board. See "Removing the SMPS board", page 93.
3. Clean the mesh grid and fan grid inside the SMPS compartment with a vacuum cleaner and brush.
4. Install the SMPS board and the cover of the SMPS compartment. See "Installing the SMPS board", page 95.
5. Install the Card Cage cover. See "Installation of the Card Cage cover", page 330.

Cold Mirror fan

1. Remove the Cold Mirror fan assembly from the projector. See "Replacement of the Cold Mirror fan", page 166.
2. Clean the mesh grid and fan grid inside of the Cold Mirror compartment with a vacuum cleaner and brush.
3. Remove dust from the Cold Mirror fan assembly with compressed air.
4. Install the Cold Mirror fan assembly. See "Replacement of the Cold Mirror fan", page 166.

Lamp Power Supply

1. Remove the LPS unit. See "Removing the Lamp Power Supply", page 101.
2. Remove the cover of the Mains Input compartment. See "Accessing the Mains Input compartment", page 86.
3. Clean the LPS compartment and Mains Input compartment with a vacuum cleaner and brush.
Warning: *Ensure that the projector is disconnected from the power net.*
4. Clean the fans and the cabinet of the LPS unit with a vacuum cleaner and brush.
5. Install the cover of the Mains Input compartment. See "Accessing the Mains Input compartment", page 86.
6. Install the LPS unit. See "Installing the Lamp Power Supply", page 103.

Projector external covers

1. Switch off the projector and unplug the projector from the mains power net.
2. Clean the housing of the projector with a damp cloth. Stubborn stains may be removed with a cloth lightly dampened with a mild detergent solution.

Projector dust filters

1. Clean the small and large dust filters as described in the chapter "Dust Filters", page 333.

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/oecdsids/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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