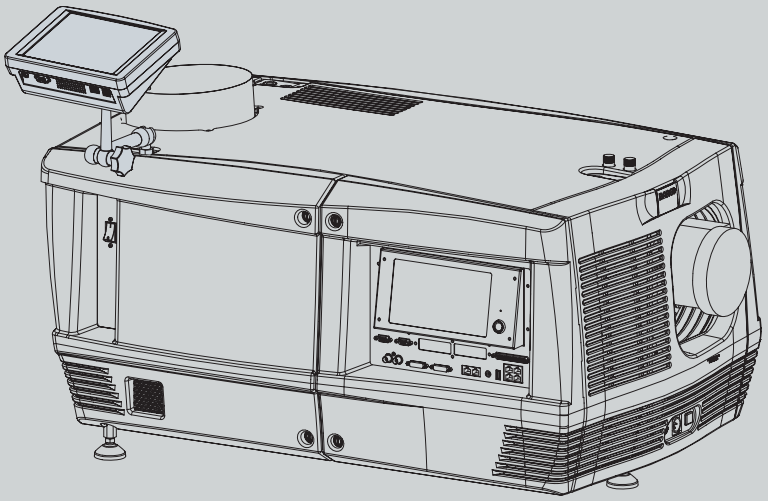
DP-2000/DP-1500



Service manual

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BARCO

Visibly yours

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TABLE OF CONTENTS

1. SAFETY

About this chapter

Read this chapter attentively. It contains important information to prevent personal injury while servicing the digital cinema projector. Furthermore, it includes several cautions to prevent damage to the digital cinema projector. Ensure that you understand and follow all safety guidelines, safety instructions and warnings mentioned in this chapter before servicing the digital cinema 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 and unplug the power cord at UPS INLET.

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.

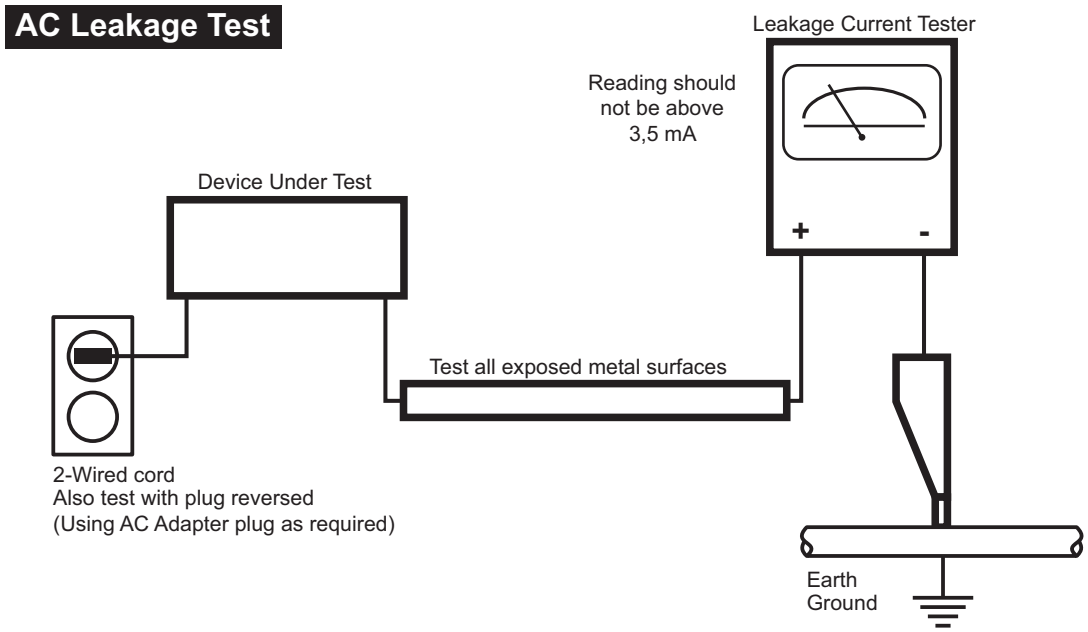


Image 1-1

   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 altercated. 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, internal wiring diagram, spare parts list, etc.

Overview

- Convention projector orientation
- Location of the main components of the projector
- Projector block diagram
- Spare part list

2.1 Convention projector orientation

Convention

This manual refer 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.

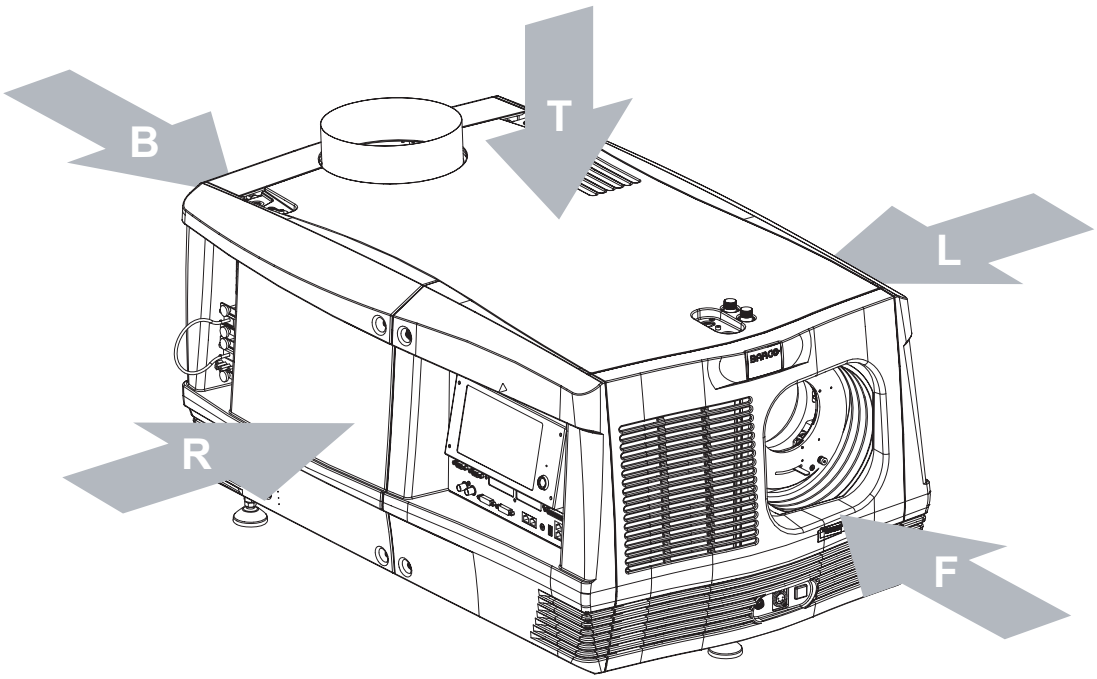


Image 2-1
T Top of the projector.
L Left side of the projector (Light Processor side).
F Front of the projector.
R Right side of the projector (Lamp side & Input side).
B Back side of the projector.

2.2 Location of the main components of the projector

Housing and air inlet filters

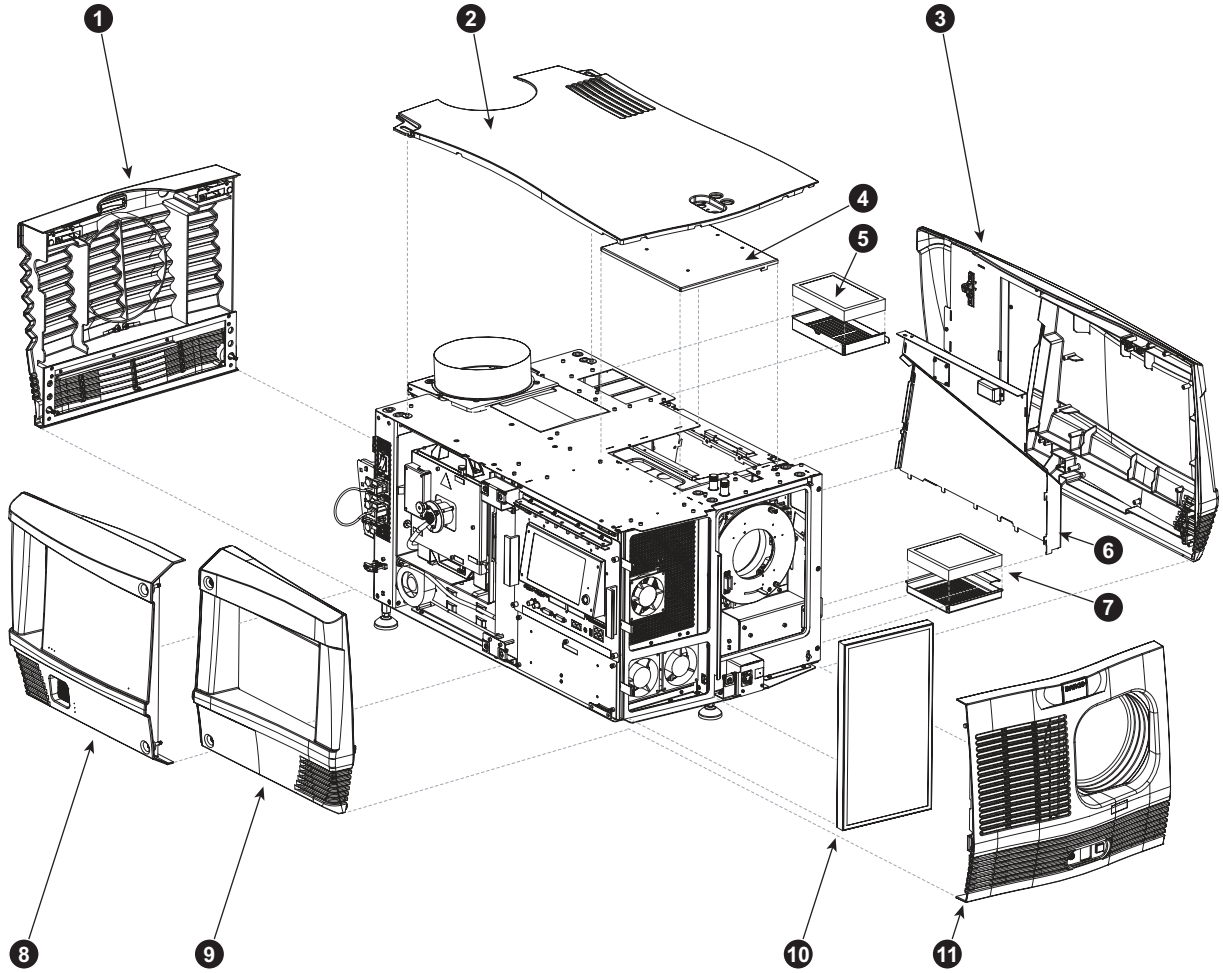


Image 2-2
1 Rear cover.
2 Top cover.
3 Left cover (Light Processor side).
4 Convergence cover plate.
5 High density filter on the top side (Cold Mirror).
6 Cover plate of sealed compartment (Light Processor compartment).
7 High density filter on the bottom side (Heat Exchanger).
8 Lamp cover.
9 Input cover (Input & Communication unit).
10 High density filter on the front side (Power compartment + Input & Communication compartment).
11 Front cover.

Main internal components

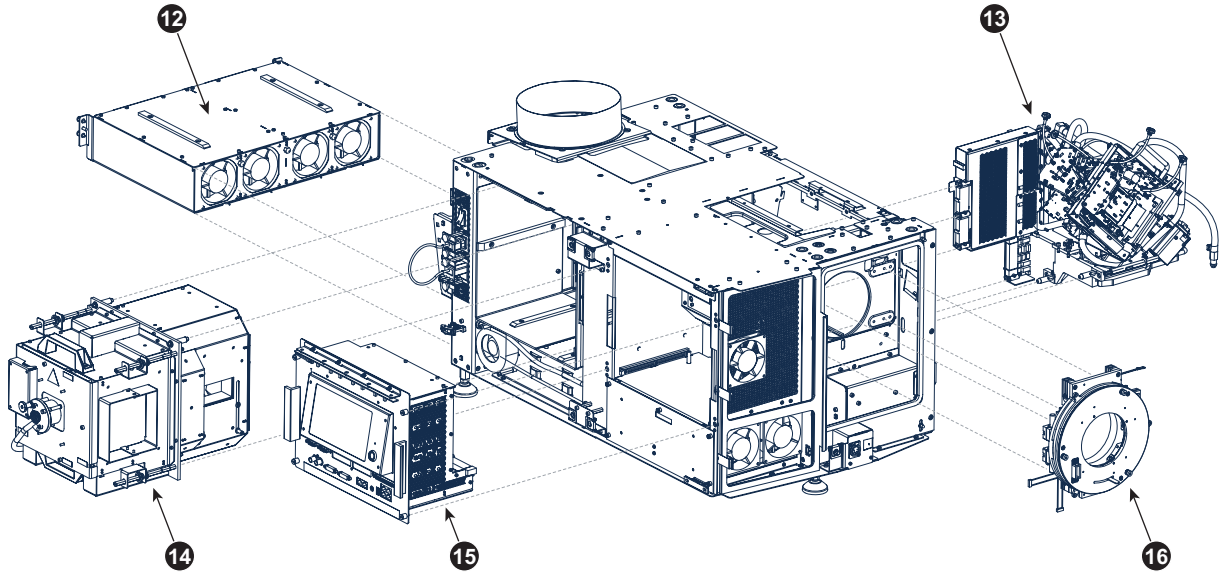


Image 2-3
12 Lamp Power Supply (LPS).
13 Light Processor Unit (Includes Light Pipe and Formatting Interface Board).
14 Lamp House.
15 Input & Communication unit.
16 Lens Holder.

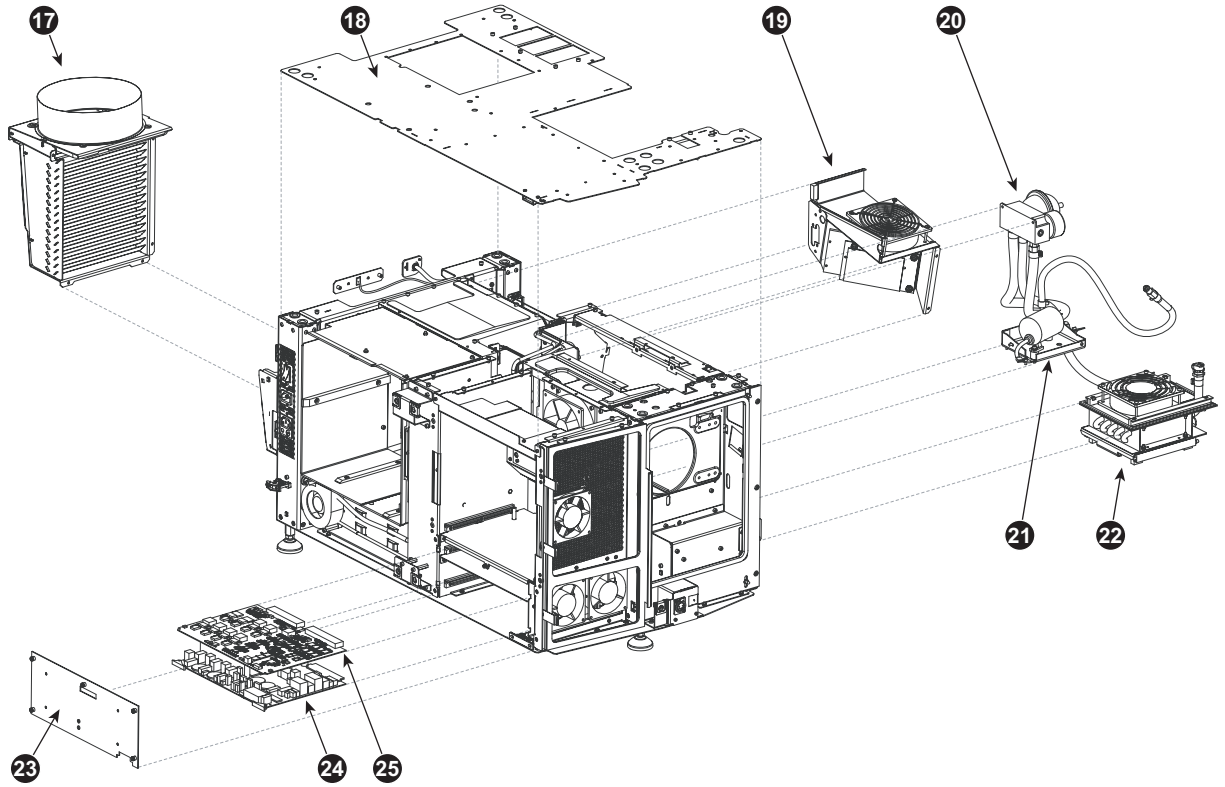


Image 2-4
17 Air outlet channel.
18 Top cover plate.
19 Cold Mirror assembly (Includes fan).
20 Pressure vessel + manometer.
21 Pump of the liquid cooling circuit.
22 Heat exchanger assembly (Includes fan).
23 Cover plate of the power compartment.
24 Switched Mode Power Supply (SMPS).
25 Fan & Motor Control Board.

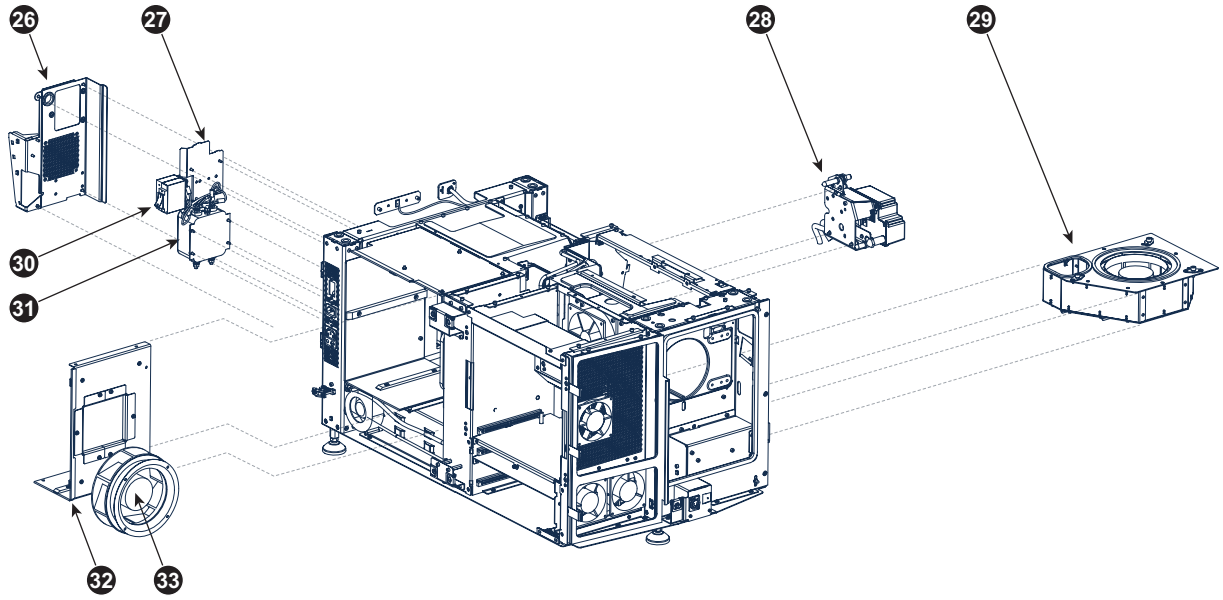


Image 2-5
26 Cover plate of the Power Input compartment.
27 Mounting plate with power distribution strip.
28 Start Pulse Generator (SPG).
29 Anode fan assembly.
30 ON/OFF switch.
31 Mains Input Filter.
32 Plate of Lamp House compartment.
33 Cathode fan.

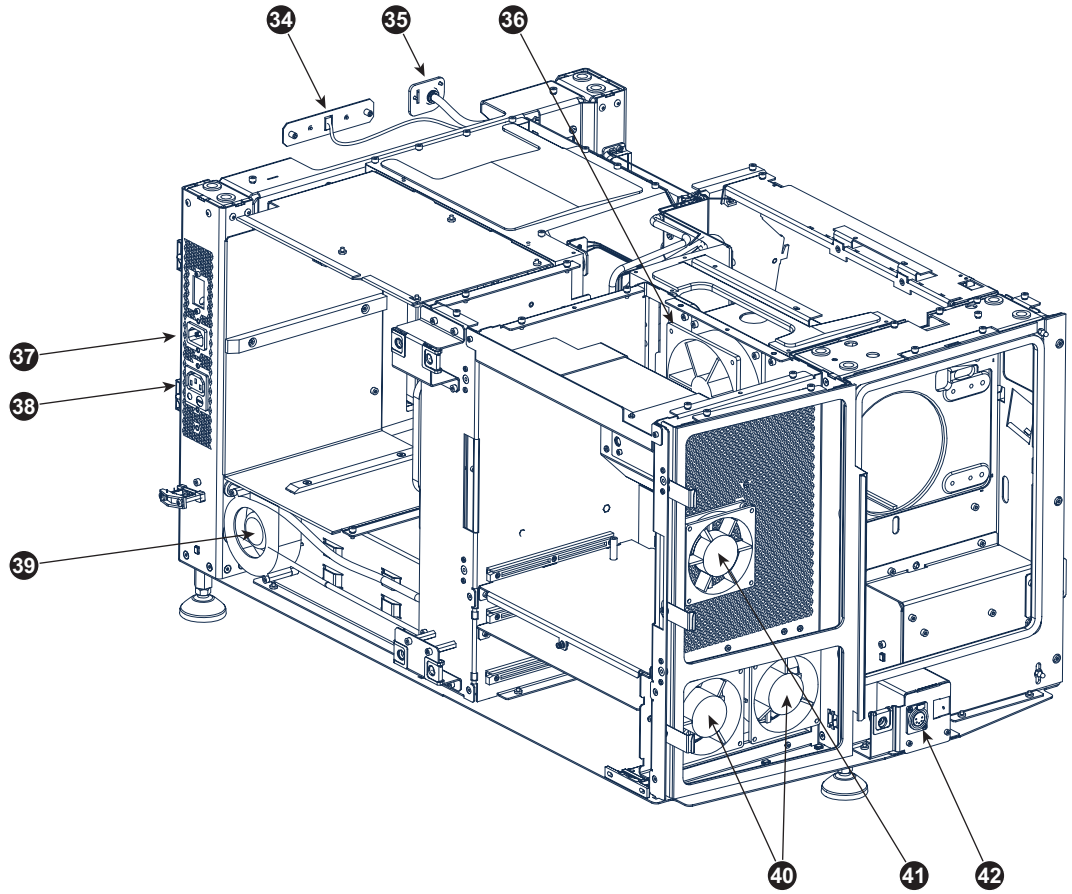


Image 2-6
34 Projector status LEDs.
35 Power/Data socket for Touch Panel.
36 Light Processor compartment fan.
37 Power input for projector electronics (UPS input).
38 Power output for projector electronics (loop through).
39 Lamp Info Module fan.
40 SMPS compartment fan.
41 Input & Communication compartment fan.
42 Peripheral port (e.g. anamorphic)

2.3 Projector block diagram

Signal flow card cage and sealed light processor

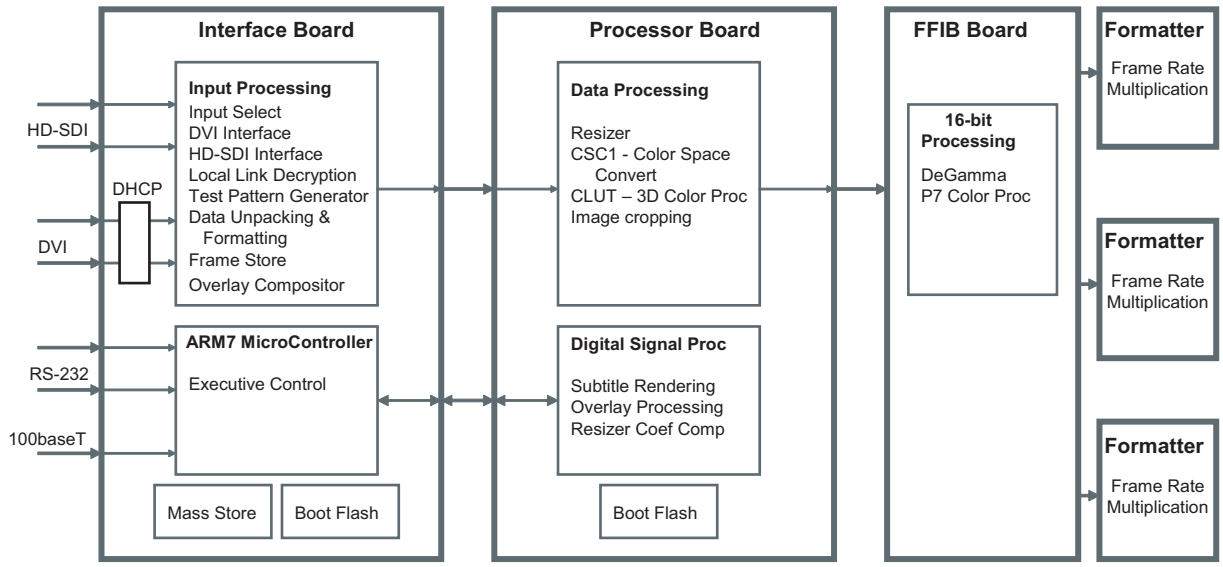


Image 2-7

Internal wiring diagram

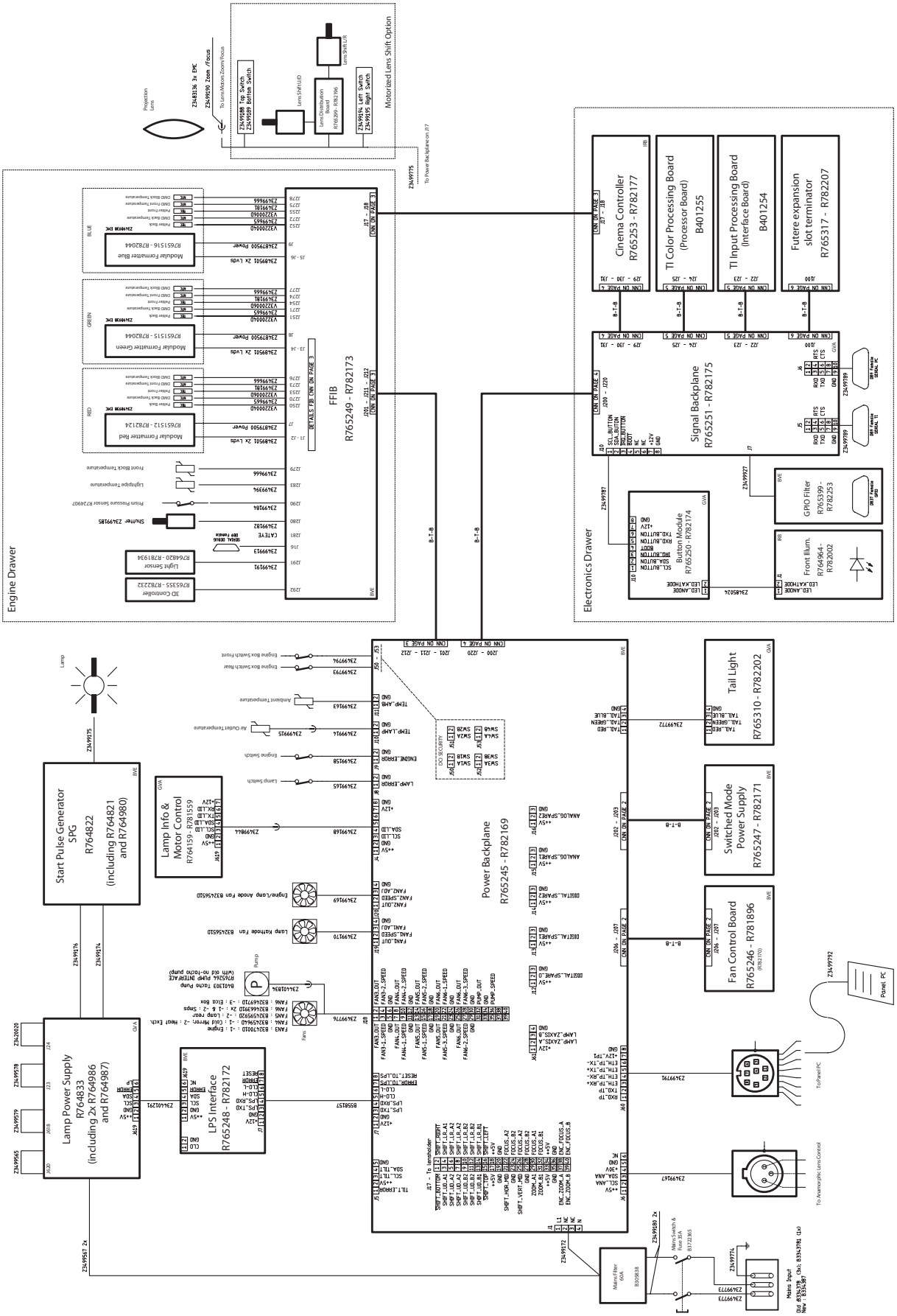


Image 2-8

2.4 Spare part list

Look at the secured Barco website https://My.Barco.com for the most recently updated spare parts list.

Optical spare parts

Order No.	Description	Applies to	Reference
R9856170	Dolby 3D color wheel for DP-2000 (Active 3D, single projector)	DP-2000	R59770256
R848401K	Lamp house reflector set.	DP-2000/DP-1500	page 124
R856898K	Light processor + Light pipe + shutter assembly.	DP-2000/DP-1500	page 165
R863207K	UV blocker with screwed anode support. Located on the lamp house.	DP-2000/DP-1500	page 121
R9855937	Osram xenon lamp of 4 kW (DHP)	DP-2000	page 97
R9855938	Osram xenon lamp of 3 kW	DP-2000/DP-1500	page 97
R9855956	Osram xenon lamp of 2 kW	DP-2000/DP-1500	page 97
R9855939	Ushio xenon lamp of 4 kW (DXL40BAF)	DP-2000	page 97
R9855940	Ushio xenon lamp of 3 kW (DXL30BAF)	DP-2000/DP-1500	page 97
R9855955	Ushio xenon lamp of 2 kW (DXL20BAF)	DP-2000/DP-1500	page 97

Electrical spare parts

Order No.	Description	Applies to	Reference
R765250K	Button module.	DP-2000/DP-1500	page 296
R765253K	Cinema Controller Board.	DP-2000	page 293
R7652531K	Cinema Controller Board.	DP-1500	page 293
R765246K	Fan & Motor Control Board.	DP-2000/DP-1500	page 346
B3245964DK	Axial Fan used: • on top of cold mirror. • on top of the heat exchanger.	DP-2000/DP-1500	page 375 page 372
B3247001DK	Fan for cooling the compartment of the Light Processor Unit. Fan is located behind the L-shaped cover plate in the compartment of the Input & Communication Unit.	DP-2000/DP-1500	page 377
B3246971DK	Fan for cooling the Input & Communication unit. Upper fan located behind the dust filter at the front of the projector.	DP-2000/DP-1500	page 392
B32459592DK	Fan for cooling the Lamp Info unit. Fan is located at the right side of the projector below the Lamp compartment.	DP-2000/DP-1500	page 387
B3245651DK	Radial Fan used: • inside compartment of the lamp anode cooling. • inside compartment of the lamp cathode cooling.	DP-2000/DP-1500	page 383 page 379
B32466391DK	Fans for cooling the SMPS. Two lower fans located behind the dust filter at the front of the projector.	DP-2000/DP-1500	page 388
R765249K	Formatting Interface Board.	DP-2000/DP-1500	page 189
B401255K	TI Interface Board. Series 1 without HDCP (without GORE).	DP-2000/DP-1500	page 293
B401673K	TI Interface Board. Series 1 with HDCP (without GORE).	DP-2000/DP-1500	page 293
B401254K	TI Processor Board.	DP-2000/DP-1500	page 293
R856439K	Input & Communication Unit. Complete unit. Includes Button module, TI boards, Controller board and Input board.	DP-2000	page 279

Order No.	Description	Applies to	Reference
R8564391K	Input & Communication Unit. Complete unit. Includes Button module, TI boards, Controller board and Input board.	DP-1500	page 279
R765365K	Lamp Info Module.	DP-2000/DP-1500	page 117
R764833K	Lamp Power Supply (LPS).	DP-2000/DP-1500	page 353
B3580253K	Lens holder shift motor.	DP-2000/DP-1500	page 268
B401303K	Liquid cooling pump.	DP-2000/DP-1500	page 246
R724934K	Local keypad. Button module not included.	DP-2000/DP-1500	page 302
R765248K	LPS communication interface.	DP-2000/DP-1500	page 361
B3722365K	Mains switch 35A UL/CSA.	DP-2000/DP-1500	page 333
R765245K	Power backplane.	DP-2000/DP-1500	page 348
R765310K	Projector status light.	DP-2000/DP-1500	page 304
R849151K	Shutter Blizzard assembly (dowser).	DP-2000/DP-1500	page 175
R765251K	Signal backplane.	DP-2000/DP-1500	page 304
R764822K	Start Pulse Generator (SPG).	DP-2000/DP-1500	page 363
R765247K	Switch Mode Power Supply (SMPS).	DP-2000/DP-1500	page 344
R765314K	Touch Panel display. Without articulated arm.	DP-2000/DP-1500	page 326

Mechanical spare parts

Order No.	Description	Applies to	Reference
B1909086K	Cooling liquid 1 liter.	DP-2000/DP-1500	page 215
R395198K	Cooling liquid refill & calibration kit (2 liter)	DP-2000/DP-1500	page 215
R9854475	Dust filters for DP-2000, DP-1500 (1 unit)	DP-2000/DP-1500	page 393
R9854470	Dust filters for DP-2000, DP-1500 (6 units)	DP-2000/DP-1500	page 393
R9854480	Dust filters for DP-2000, DP-1500 (24 units)	DP-2000/DP-1500	page 393
R9856020	Lamp house with manual lamp alignment (without lamp)	DP-2000/DP-1500	page 97
R9856030	Lamp house with motorized lamp alignment (without lamp)	DP-2000/DP-1500	page 97
K858100K	Lamp cathode adaptor	DP-2000/DP-1500	page 97
R8485002K	Manual lens holder.	DP-2000/DP-1500	page 260
R8485003K	Motorized lens holder.	DP-2000/DP-1500	page 264
R9855920	Rear exhaust.	DP-2000/DP-1500	
R859360K	Stacking points.	DP-2000/DP-1500	
R857783K	Projector rear cover (air outlet on the rear).	DP-2000/DP-1500	page 86

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

- Monthly maintenance actions
- Lamp change maintenance actions
- Six monthly maintenance actions
- Annually maintenance actions
- 4 yearly maintenance actions
- 10 yearly maintenance actions

3.1 Monthly maintenance actions

Monthly maintenance actions

The monthly 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 all HEPA dust filters of the projector. • HEPA dust filter at the front of the projector (electronics). • HEPA dust filter at the top of the projector (cold mirror). • HEPA dust filter at the bottom of the projector (heat exchanger).	Use a vacuum cleaner. Take care of orientation when reinstalling the cleaned filters. Frequency at which filters should be replaced is dependant on environmental conditions. Replace damaged filters immediately. Electronics: see page 395, cold mirror: see page 398, heat exchanger: see page 397.
2	Check the surface of the lens output side for dust. (it is not needed to remove the lens from the projector)	Clean the lens output side in case dust is clearly visible upon the surface. See "Cleaning the lens", page 257. Note that if the lens was removed from the projector, all used 'lens files' must be updated. See user guide of the Communicator software.
3	Check the porthole (both sides) for dust.	Clean the porthole in case dust is clearly visible upon the surface. Use an optical cloth.

3.2 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 bulb 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). See page 128.
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. See page 127.
3	Visual inspection of the lamp anode and cathode connectors of the lamp house.	Replace the lamp house in case of degradation, damage, etc. See page 100.
4	Visual inspection of the lamp anode and cathode cables of the lamp house.	Replace the lamp house in case of degradation, damage, etc. See page 100.

3.3 Six monthly maintenance actions

6 monthly

The 6 monthly 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	Replace all HEPA dust filters of the projector: • HEPA dust filter at the front of the projector (electronics). • HEPA dust filter at the top of the projector (cold mirror). • HEPA dust filter at the bottom of the projector (heat exchanger).	Take care of orientation when installing the new filters. Electronics: see page 395, cold mirror: see page 398, heat exchanger: see page 397.
2	Clean the air vents/inlets of the projector: • air inlet grid of the cold mirror fan (top side projector). • air inlet grid of the electronic compartment (front side projector). • air inlet grid of the Lamp Power Supply (bottom side projector). • air inlet grid of the heat exchanger (bottom side projector).	Use a vacuum cleaner.
3	Clean the cabinet of the projector. (Removal overall dust accumulation on projector covers)	See cleaning procedure page 394.
4	Pressure verification of the liquid cooling circuit.	This pressure, indicated on the internal manometer, should be between 0,5 and 1 bar. See page 219. If not, corrective action should be taken by certified service personnel.

3.4 Annually maintenance actions

Annually

The yearly 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**	Clean the metal mesh grid of the anode fan (inside sealed compartment).	Use a vacuum cleaner and brush.
2	**Dust in general**	Remove all dust inside the lamp compartment.	Use a vacuum cleaner. Do NOT touch the cold mirror.
3	**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 page 139. Replace the cold mirror in case of burn damage, degradation, cracks, etc. See page 131.
4	**Dust in general**	Check the small UV/IR blocker at the light pipe entry for dust, burn damage, degradation, cracks, etc. Remove the lamp house and look at the small UV/IR blocker via the cold mirror.	Only clean the small UV/IR blocker in case dust is clearly visible upon the surface of the small UV/IR blocker. See page 144 Replace the small UV/IR blocker in case of burn damage, degradation, cracks, etc. See page 143.
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 through the small UV/IR blocker.	Replace the integration rod and mask in case of burn damage, degradation, cracks, etc. See page 160.
6	**Dust in general**	Open the dowser (shutter) and 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 page 183. Replace the complete Light Processor Unit in case of degradation, cracks, etc. See page 170.
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!	See cleaning procedure page 394.
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 page 159. Replace the integration rod In case the integration rod causes the artifacts. See page 160. Replace the complete Light Processor Unit in case the prism causes the artifacts. See page 170.
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. See "Trouble shooting checklist", page 29.
11	**Diagnostics**	Check and save TI and projector log/history files. See user guide of the Communicator software.	Note any irregularities and follow up.
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	**Cooling circuit**	Check the condition of the tubing of the liquid cooling circuit for degradation, UV cracking, kinking of tubes, leakage.	Replace damaged parts immediately. See page 215.

No.	Component	Maintenance action	Remarks
16	**Cooling circuit**	Replace the liquid of the cooling circuit. (drain, refill, expel air and pressurize)	See chapter page 222.
17	**Cooling circuit**	Check calibration of the liquid cooling circuit.	Connect syringe to circuit to determine compensation volume (50 - 70 ml). See "Pressurizing the liquid cooling circuit", page 231.
18	**Electrical connections**	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: • Nuts (x2) of the SPG socket inside the lamp house: 9 Nm. • Cathode cable nut for the lamp cathode socket: a) Without spring (lamp house version 0 & 1) : 9 Nm. b) With spring (lamp house version 2) : 17 Nm. • Hexagon socket head cap screw at the lamp cathode socket : 2,5 Nm. • Nuts (x4) of the LAMP OUT ports of the LPS unit: a) Copper nuts and rods (old LPS) : 8 Nm. b) Brass nuts and rods (new LPS) : 4 Nm.	See circuit diagram (under construction) with all torques specified. Do not release the nuts to check the torque. Just verify.
19	**Lamp Module**	Check the UV blocker of the lamp house for dust, burn damage, degradation, cracks, etc. Note that in case of a passive 3D projection system the UV blocker has an adapted 3D coating.	Only clean the UV blocker in case dust is clearly visible upon the surface of the UV blocker (both sides). See page 128. Replace the UV blocker in case of burn damage, degradation, cracks, etc. See page 119.
20	**Lamp Module**	Check the reflector of the lamp house for dust, degradation, cracks, etc.	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 page 127. Replace the reflector in case of burn damage, degradation, cracks, etc. See page 124.
21	**Lamp Module**	Visual inspection of the lamp anode and cathode connectors of the lamp house.	Replace the lamp house in case of degradation, damage, etc. See page 100.
22	**Lamp Module**	Visual inspection of the lamp anode and cathode cables of the lamp house.	Replace the lamp house in case of degradation, damage, etc. See page 100.
23	**Lamp Module**	Check motors (not yet available) and manual adjustments. Lubricate if needed.	
24	**Lamp Module**	Check the positional integrity of automatic lamp alignment/CLO.	Perform auto alignment. Manual adjustment afterwards should not improve light output.
25	**Lens holder**	Check the lens holder shift functionality (up/down & left/right). Lubricate where needed.	In case of a motorized lens holder use the local keypad and the Communicator software to shift.
26	**Lens holder**	Check the positional integrity of motorized adjustments by switching Macro's.	Verify correct alignment on screen between flat and scope.
27	**Lens holder**	Check the focus uniformity.	Adjust the lens holder (Scheimpflug) ONLY if needed. See page 275
28	**Lens**	Check the optic surfaces of the lens input and output for dust.	Only clean the input and/or output side in case dust is clearly visible upon the surfaces. Use an optical cloth. See "Cleaning the lens", page 257. Note that a lens removal requires an update of all used 'lens files'. See user guide of the Communicator software.
29	**Lens**	Check the lens Zoom & Focus motors.	Use the local keypad and the Communicator software to Zoom and to Focus.

No.	Component	Maintenance action	Remarks
30	**Shutter**	Check the functionality of the Dowser (shutter). Loose components, wear and tear.	Use the local keypad and the Communicator software to Open and Close the shutter. Replace the shutter if needed. See page 175.
31	**3D color wheel**	Check the 3D color wheel for degradation of coatings/condition of glass segments.	Replace the 3D color wheel assembly. See page 148.
32	**3D color wheel**	Check the spinning motor and retraction mechanism of the 3D color wheel assembly.	Wheel must turn before inserted into light path.
33	**3D color wheel**	Check the calibration of the 3D color wheel	Calibrated if required. See Communicator software.
34	**Electronic boards**	Check the general condition of the electronic boards: Status LED's, dust, connections, etc. Boards to check: LPS, SMPS, Fan & Motor Control Board, TI Interface Board, TI Processor Board, Barco Controller Board, Input & Communication Board, Formatting Interface Board.	Blow out dust.
35	**Security**	Check the Tamper Switch Activation Report and Security Logs for security infringements.	Report if intruded.
36	**Security**	Verify if the Dallas key is present and working.	Report if missing, lost or damaged.
37	**Air Extraction**	Check customer air extraction system for adequate extraction.	The air extraction system must be capable of removing minimum 6,65 m³/min or 235 CFM per installed DP-2000/DP-1500 digital projector.
38	**Documentation**	Check if the projector manuals are present and up-to-date.	Download current manual version from www.My.Barco.com.
39	**Documentation**	Update projector service docket.	List all maintenance actions and remarks.

3.5 4 yearly maintenance actions

Every 4 years

The 4 yearly 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	Replace the pump of the liquid cooling circuit	Follow correct pressurize procedure after replacement. See page 246.
2	Check the lamp fans: vibrations, noise, speed, etc. (speeds: via diagnostics)	Replace if needed. See page 371.

3.6 10 yearly maintenance actions

Every 10 years

The 10 yearly 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.	Replace if needed. See page 371.

4. TROUBLE SHOOTING CHECKLIST

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.

4.1 Trouble shooting checklist

Code 5003: “light sensor - no communication” (Error)

Situation	Solution
No communication with the CLO module.	1. Reboot the projector. 2. Check if a CLO module is present. 3. Check if the wire unit of the CLO module is inserted. 4. If the problem remains, replace the CLO module.

Code 5004: “lamp - no communication” (Error)

Situation	Solution
The lamp house is not correctly installed in its compartment.	Check if the lamp house is properly installed. Ensure that the three fixation screws (reference S image 4-1) of the lamp house are fastened.
Wrong lamp house detected in lamp compartment of the projector.	Replace the lamp house with a compatible lamp house for this projector.
No communication with the lamp house.	1. Check if the blue socket (reference C1 image 4-2) of the lamp house is not damaged. 2. Check if the blue socket (reference C2 image 4-2) in the upper left corner of the lamp compartment is not damaged. 3. Check wiring at the rear side of the blue socket (reference C2 image 4-3) inside the projector. The rear side of the blue socket inside the projector is visible after removal of the left side cover (Light Processor side). 4. Check if the wire unit coming from the blue socket in the lamp compartment is plugged into its socket (reference C image 4-3) on the backplane behind the Input & Communication Unit. 5. Replace the Cinema Controller. 6. Replace the Backplane.
The projector generates Error Code 5180 as well. (Lamp house - not connected)	See trouble shooting checklist of Error Code 5180.

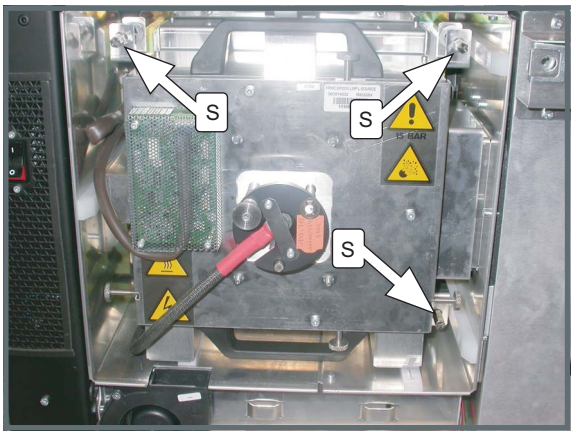
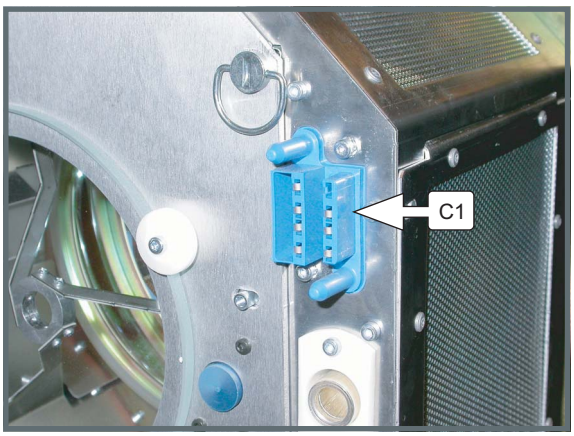


Image 4-1

S Lamp house fixation screws.



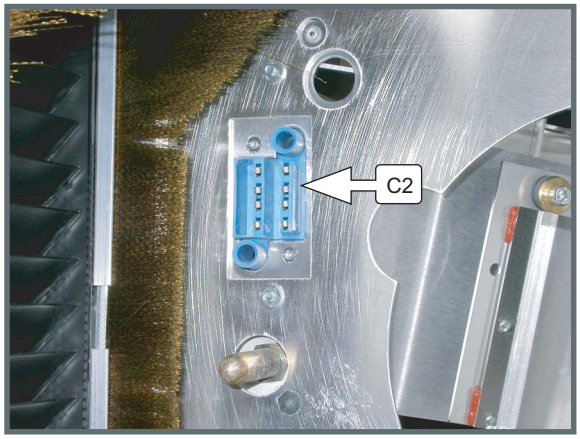
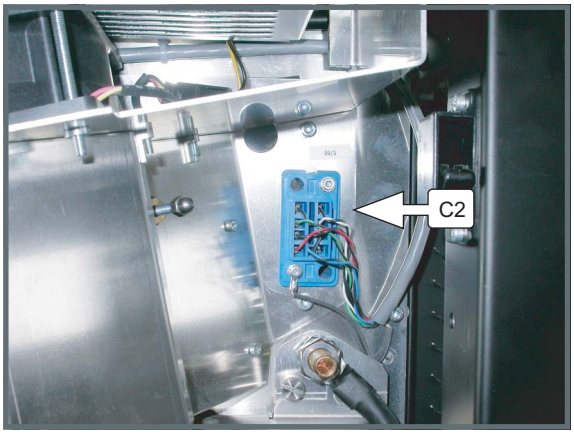


Image 4-2
C1 Blue lamp info socket on the lamp house.
C2 Blue lamp info socket in the lamp compartment of the projector.



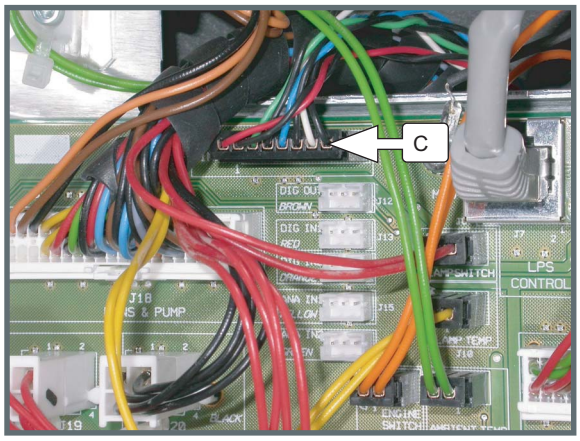


Image 4-3
C2 Rear side of the blue lamp info socket in the projector.
C Connection of the Lamp Info Module with the Power Backplane.

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

Situation	Solution
LPS communication cable disconnected from the Power Backplane.	Remove the Input & Communication unit to see the connections of the Power Backplane. Check if the LPS communication cable (reference C1 of image 4-4) is inserted in its socket.
LPS communication cable disconnected form the LPS communication interface.	Remove the back cover of the projector and check if the LPS communication cable (reference C2 of image 4-4) is connected with the LPS
Disconnected CTRL wire unit between LPS communication interface and LPS unit.	Check if the CTRL wire unit (reference C3 of image 4-4) is properly connected with the LPS unit and the LPS communication interface.
Main power cable disconnected from one of the LPS units.	Check if the main power cable is connected with the “MAINS INPUT” socket of the LPS unit.
Disconnected wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.	Reconnect the wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.
Malfunction of one of the LPS units. The red LED “ERR” of the malfunction LPS unit flashes fast.	Replace the whole LPS module.
No communication possible with both LPS units. (Check log files)	Replace the LPS communication interface.

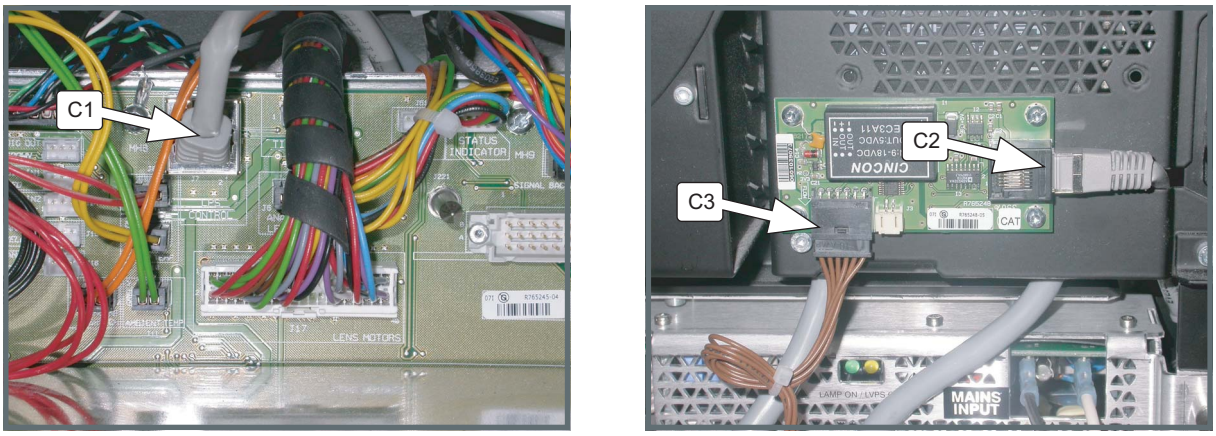


Image 4-4
C1 LPS communication cable connected with the Power Backplane.
C2 LPS communication cable connected with the LPS communication interface.
C3 CTRL wire unit between one LPS unit and LPS communication interface.

Code 5010: “pump - refill mode is on” (Warning)

Situation	Solution
The projector stands in “Refill mode”. Only the cooling pump is working.	When cooling liquid refreshing is finished, tip on “Exit refill mode” in the Communicator software. (Installation > Advanced > Refill mode)

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

This error code is probably preceded by the warning code 5043 : “cold mirror fan - speed low”. The same troubleshooting table can be applied.

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

Situation	Solution
Wire unit (reference C image 4-5) of the cold mirror fan disconnected.	Remove the left cover of the projector and check the connection of the wire unit of the fan above the cold mirror.
Wire unit of the fans and motor units (reference W image 4-5) disconnected from the Power Backplane.	Remove the Input & Communication unit and check if the wire unit is inserted in the Power Backplane.
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely.
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 "Cold mirror fan", page 375.
Malfunction Fan Control Board	Replace the Fan Control Board.
Other fans are also not spinning.	Replace the SMPS Board.
Defect Power Backplane	Replace the Power Backplane.

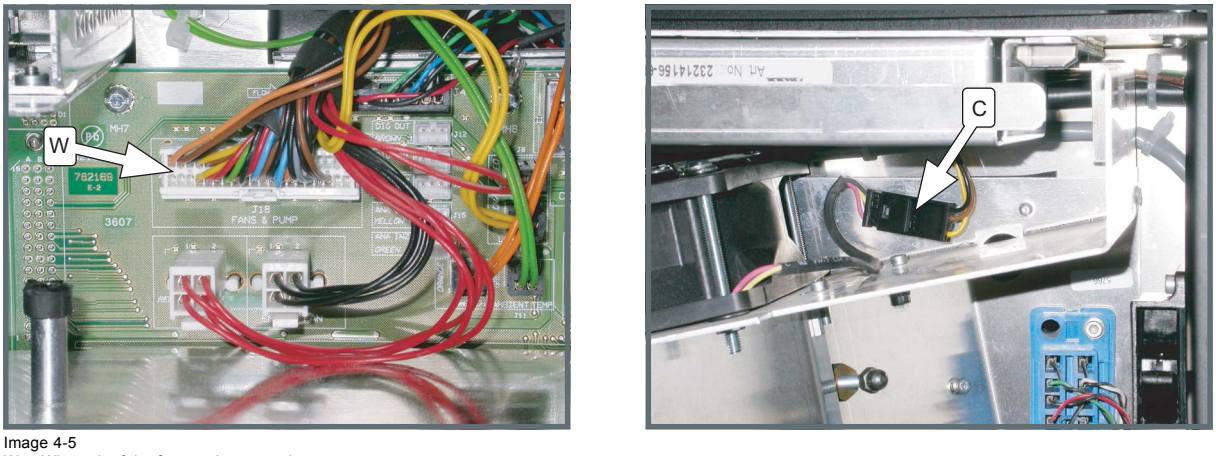


Image 4-5
W Wire unit of the fans and motor units.
C Cold mirror fan connection.

Code 5052: “engine fan - speed too low” (Error)

This error code is probably preceded by the warning code 5053: “engine fan - speed low”. The same troubleshooting table can be applied.

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

Situation	Solution
Wire unit (reference C image 4-6) of the fan (reference F3) in the compartment of the Light Processor Unit is disconnected. Note that this fan is located between the compartment of the Input & Communication Unit and the Compartment of the Light Processor Unit.	Check the connection of the wire unit of the fan. The fan is accessible by removing a small cover plate inside the compartment of the Input & Communication Unit.
Wire unit of the fans and motor units (reference W image 4-7) disconnected from the Power Backplane.	Remove the Input & Communication unit and check if the wire unit is inserted in the Power Backplane.
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely.
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 "Light Processor fan", page 377.
Malfunction Fan Control Board	Replace the Fan Control Board.
Other fans are also not spinning.	Replace the SMPS Board.
Defect Power Backplane	Replace the Power Backplane.

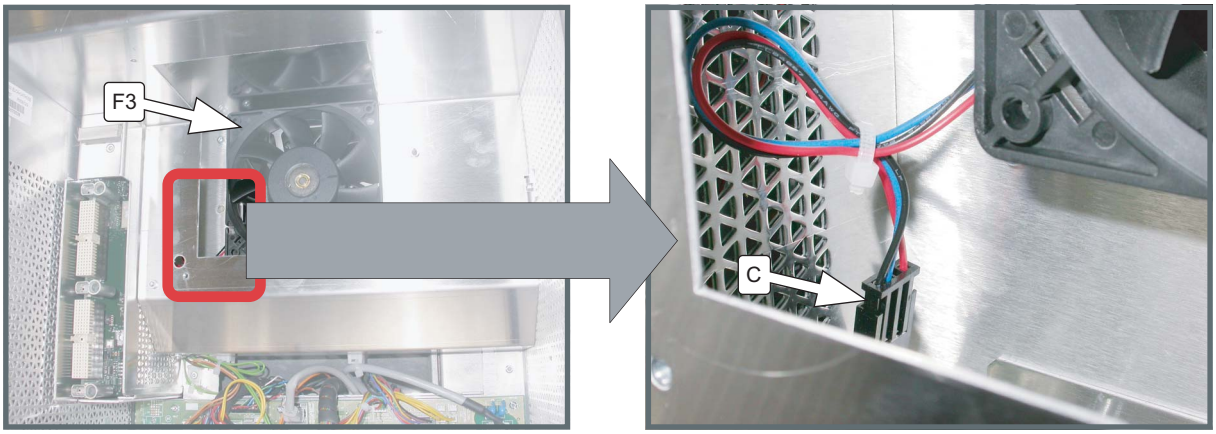


Image 4-6

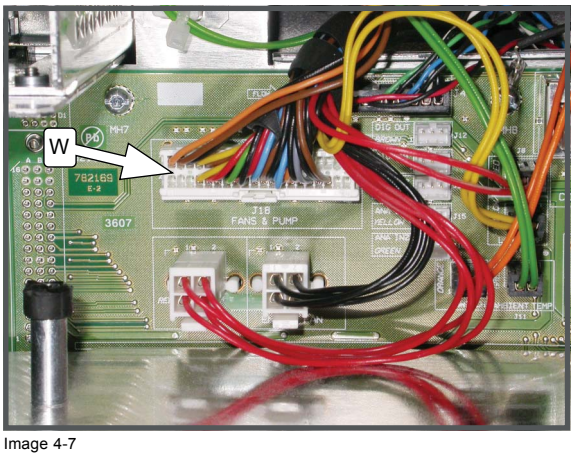


Image 4-7

Code 5062: “heat exchanger fan - speed too low” (Error)

This error code is probably preceded by the warning code 5063: “heat exchanger fan - speed low”. The same troubleshooting table can be applied.

Code 5063: “heat exchanger fan - speed low” (Warning)

Situation	Solution
Wire unit (reference C image 4-8) of the fan of the heat exchanger is disconnected.	Check the connection of the wire unit of the fan above the heat exchanger.
Wire unit of the fans and motor units (reference W image 4-7) disconnected from the Power Backplane.	Remove the Input & Communication unit and check if the wire unit is inserted in the Power Backplane.
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely.
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 "Heat exchanger fan", page 372.
Malfunction Fan Control Board	Replace the Fan Control Board.
Other fans are also not spinning.	Replace the SMPS Board.
Defect Power Backplane	Replace the Power Backplane.

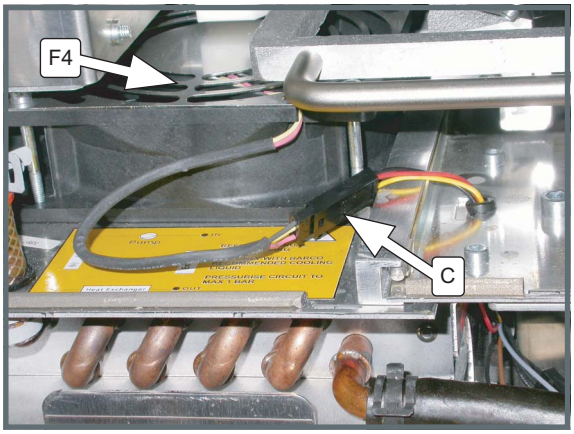


Image 4-8
F4 Fan for the heat exchanger.
C Wire unit of the fan.

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

This error code is probably preceded by the warning code 5073: “lamp anode fan - speed low”. The same troubleshooting table can be applied.

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

Situation	Solution
The wire unit (reference C image 4-9) of the anode fan (reference FA image 4-9) is disconnected.	Reconnect the wire unit of the anode fan. The anode fan is located below the sealed compartment of the Light Processor Unit.
The wire unit (reference FA image 4-10) is disconnected from the Power Backplane.	Remove the Input & Communication unit and check if the wire unit is inserted in the Power Backplane.
Blocked fan.	Unblock the fan. Ensure the fan can turn freely.
Damaged wire unit of the fan.	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.
Malfunction Fan Control Board	Replace the Fan Control Board.
Other fans are also not spinning.	Replace the SMPS Board.
Defect Power Backplane	Replace the Power Backplane.

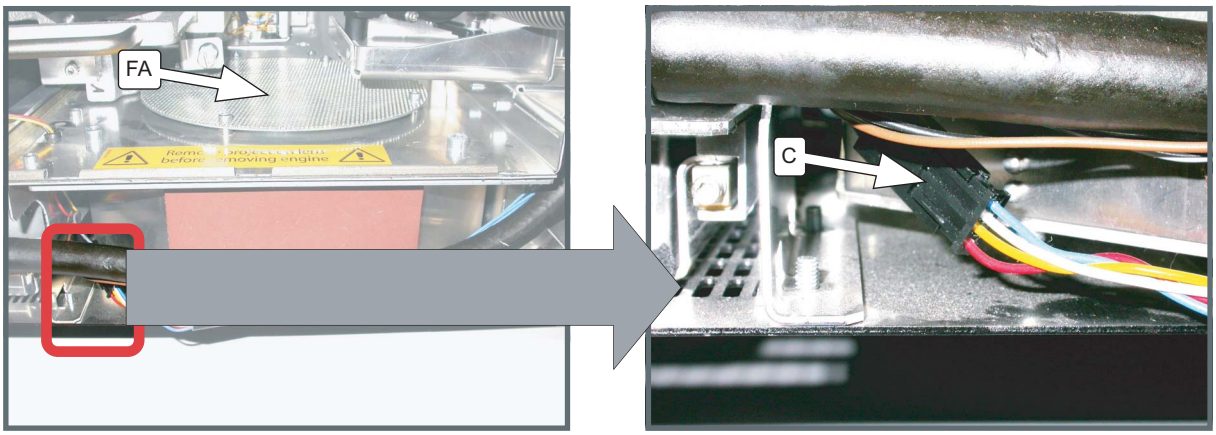


Image 4-9
FA Lamp anode fan. Located below the sealed compartment of the Light Processor Unit.
C Wire unit connection of the lamp anode fan.

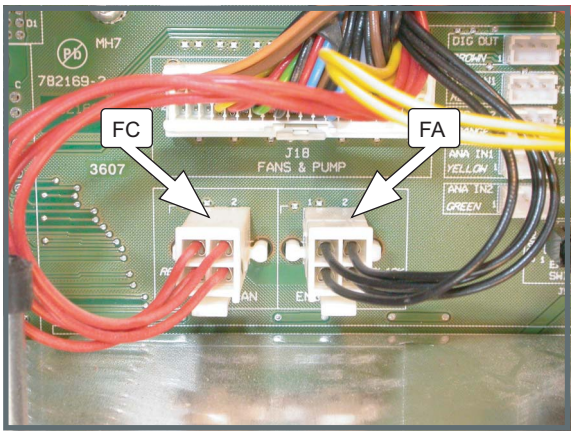


Image 4-10
FC Lamp cathode fan connection with the Power Backplane.
FA Lamp anode fan connection with the Power Backplane.

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

This error code is probably preceded by the warning code 5083: “lamp cathode fan - speed low”. The same troubleshooting table can be applied.

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

Situation	Solution
The wire unit (reference C image 4-11) of the cathode fan (reference FC image 4-11) is disconnected.	Reconnect the wire unit of the cathode fan. The cathode fan is located between the lamp compartment and the Input & Communication Unit.
The wire unit (reference FC image 4-10) is disconnected from the Power Backplane.	Remove the Input & Communication unit and check if the wire unit is inserted in the Power Backplane.
Blocked fan.	Unblock the fan. Ensure the fan can turn freely.
Damaged wire unit of the fan.	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.
Malfunction Fan Control Board	Replace the Fan Control Board.
Other fans are also not spinning.	Replace the SMPS Board.
Defect Power Backplane	Replace the Power Backplane.

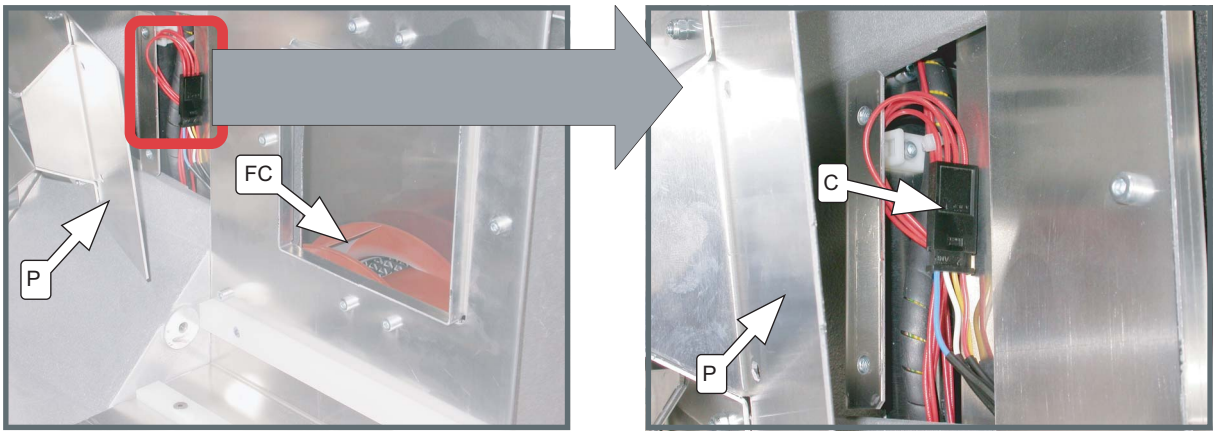


Image 4-11
P Cover plate.
FC Lamp cathode fan. Located between the lamp compartment and the Input & Communication Unit.
C Wire unit connection of the lamp cathode fan.

Code 5102: “smps fan 1 - speed too low” (Error)

This error code is probably preceded by the warning code 5103: “smps fan 1 - speed low”. The same troubleshooting table can be applied.

Code 5103: “smps fan 1 - speed low” (Warning)

Situation	Solution
Wire unit (reference FC of image 4-12) of the SMPS fan disconnected.	Remove the left cover of the projector and check both connections of the SMPS fans. Note: SMPS fan 1 is the fan which is connected with the brown wire unit. SMPS fan 2 is the fan which is connected with the red wire unit.
Wire unit of the fans and motor units (reference W image 4-7) disconnected from the Power Backplane.	Remove the Input & Communication unit and check if the wire unit is inserted in the Power Backplane.
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely.
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 page 388 and page 391.
Malfunction Fan Control Board	Replace the Fan Control Board.
Other fans are also not spinning.	Replace the SMPS Board.
Defect Power Backplane	Replace the Power Backplane.

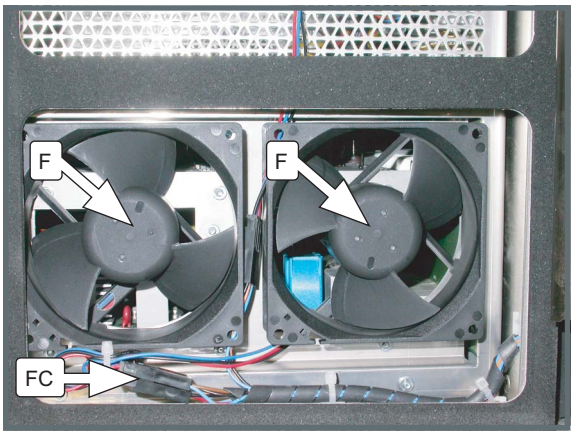


Image 4-12
F SMPS fans 1 & 2.
FC Wire unit of the SMPS fans.

Code 5112: “smps fan 2 - speed too low” (Error)

This error code is probably preceded by the warning code 5113: “smps fan 2 - speed low”. The same troubleshooting table can be applied.

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

Situation	Solution
Wire unit (reference FC of image 4-12) of the SMPS fan disconnected.	Remove the left cover of the projector and check both connections of the SMPS fans. Note: SMPS fan 1 is the fan which is connected with the brown wire unit. SMPS fan 2 is the fan which is connected with the red wire unit.
Wire unit of the fans and motor units (reference W image 4-7) disconnected from the Power Backplane.	Remove the Input & Communication unit and check if the wire unit is inserted in the Power Backplane.
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely.
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 page 388 and page 391.
Malfunction Fan Control Board	Replace the Fan Control Board.
Other fans are also not spinning.	Replace the SMPS Board.
Defect Power Backplane	Replace the Power Backplane.

Code 5122: “lamp rear fan - speed too low” (Error)

This error code is probably preceded by the warning code 5123: “lamp rear fan - speed low”. The same troubleshooting table can be applied.

Code 5123: “lamp rear fan - speed low” (Warning)

Situation	Solution
The wire unit (reference C image 4-13) of the fan (reference FL image 4-13) is disconnected.	Reconnect the wire unit of the cathode fan. The cathode fan is located between the lamp compartment and the Input & Communication Unit.
Wire unit of the fans and motor units (reference W image 4-7) disconnected from the Power Backplane.	Remove the Input & Communication unit and check if the wire unit is inserted in the Power Backplane.
Blocked fan.	Unblock the fan. Ensure the fan can turn freely.
Damaged wire unit of the fan.	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.
Malfunction Fan Control Board	Replace the Fan Control Board.
Other fans are also not spinning.	Replace the SMPS Board.
Defect Power Backplane	Replace the Power Backplane.

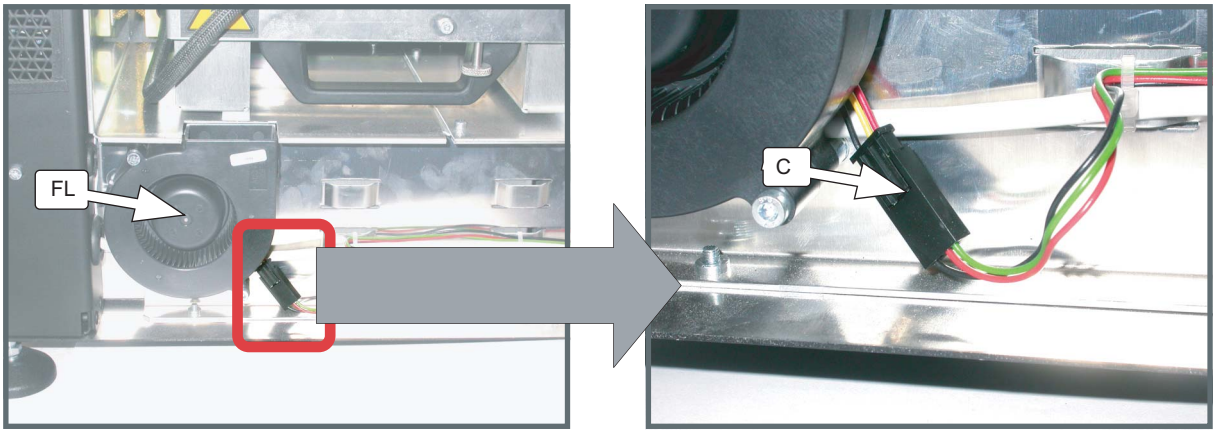


Image 4-13
FL Fan Lamp Info Module at the rear of the lamp house.
C Connection fan wire unit.

Code 5132: “elcabox fan - speed too low” (Error)

This error code is probably preceded by the warning code 5133: “elcabox fan - speed low”. The same troubleshooting table can be applied.

Code 5133: “elcabox fan - speed low” (Error)

Situation	Solution
Disconnected wire unit (reference C image 4-14) of the fan (reference F2 image 4-14) for the Input & Communication unit. The fan is located behind the high density dust filter at the front of the projector.	Remove the high density filter at the front side of the projector and check the connection of the wire unit of the fan.
Wire unit of the fans and motor units (reference W image 4-7) disconnected from the Power Backplane.	Remove the Input & Communication unit and check if the wire unit is inserted in the Power Backplane.
Blocked fan.	Unblock the fan. Ensure that the fan can turn freely.
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 "Input & Communication compartment fan", page 392.
Malfunction Fan Control Board	Replace the Fan Control Board.
Other fans are also not spinning.	Replace the SMPS Board.
Defect Power Backplane	Replace the Power Backplane.

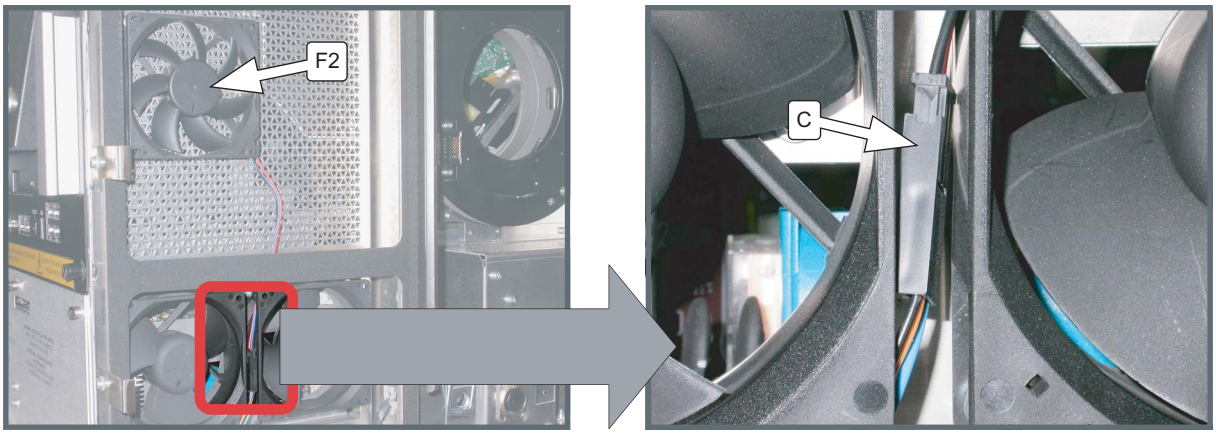


Image 4-14
F2 Fan for cooling the Input & Communication unit.
C Fan connection with wire tree.

Code 5160: “engine switch - not ok” (Error)

Situation	Solution
The Light Processor Unit is not correctly installed.	Check if the Light Processor Unit is properly installed. Ensure that both fixation screws at the foot of the Light Processor Unit are fastened. Check if the Formatting Interface Board is well inserted and secured.
Switch disconnected.	Check connection of engine switch at the Power Backplane, if connections are OK, measure switch at connector for continuity.
Damaged switch.	Remove the Light Processor Unit and check that switch is not damaged. The switch is located behind left hand side set pin which guides the engine into place. Replace switch if needed.
Malfunction Fan Control Board.	Replace the Fan Control Board.
Defect Power Backplane.	Replace the Power Backplane.

Code 5170: “fib - not connected” (Error)

Situation	Solution
The Formatting Interface Board is not correctly installed.	Check if the Formatting Interface Board is properly installed. Ensure that both fixation screws of the Formatting Interface Board are fastened.
Broken pins on Cinema Controller Board.	Check for broken pins on the Cinema Controller at the back side of the Input & Communication unit. Replace the boards with broken pins.

Situation	Solution
Malfunction Cinema Controller Board.	Replace the Cinema Controller Board.
Malfunction Light Processor Unit	Replace the Light Processor Unit.

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

Situation	Solution
The lamp house is not correctly installed in its compartment.	Check if the lamp house is properly installed. Ensure that the three fixation screws (reference S image 4-15) of the lamp house are fastened.
Switch damaged.	Check lamp house detection switch for damage. The switch is located behind upper right locking bolt insertion area on projector. Replace if damaged.
Switch disconnected.	Check connection of lamp house detection switch at the Power Backplane, if connections are OK then measure switch cable for continuity.
Malfunction Fan Control Board.	Replace the Fan Control Board.
Defect Power Backplane.	Replace the Power Backplane.

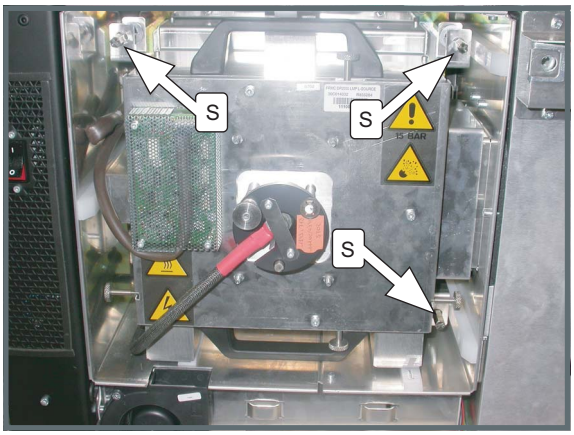


Image 4-15
S Lamp house fixation screws.

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

Situation	Solution
Lens is touching the sensor (reference PR of image 4-16) 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.

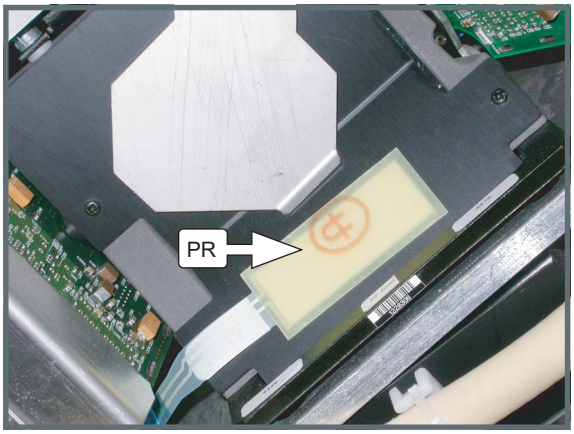


Image 4-16
PR Prism switch.

Code 5212: “pump - speed too low” (Error)

This error code is probably preceded by the warning code 5213: “pump - speed low”. The same troubleshooting table can be applied.

Code 5213: “pump - speed low” (Warning)

Situation	Solution
The pump of the water cooling is electrical disconnected.	Check if the wire unit (reference A image 4-17) of the pump is properly connected.
Malfunction pump of the cooling circuit. You don’t feel any vibrations when touching the pump after activating the “Refill mode” via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor (reference Bimage 4-17) and clean the bearings of the pump. See service manual chapter "Cleaning the cooling pump", page 240.
Wire unit of the fans and motor units (reference W image 4-7) disconnected from the Power Backplane.	Remove the Input & Communication unit and check if the wire unit is inserted in the Power Backplane.
Malfunction Fan & Motor Control board	Replace the Fan & Motor Control board. See service manual chapter "Replacement of the Fan & Motor Control board", page 346.
Pump end of life.	Replace the pump. See service manual chapter "Replacement of the complete cooling pump", page 246.
Malfunction SMPS board.	Measure voltage on pump wire while in refill mode. Voltage should be at least 20V. If voltage is incorrect then replace the SMPS board.

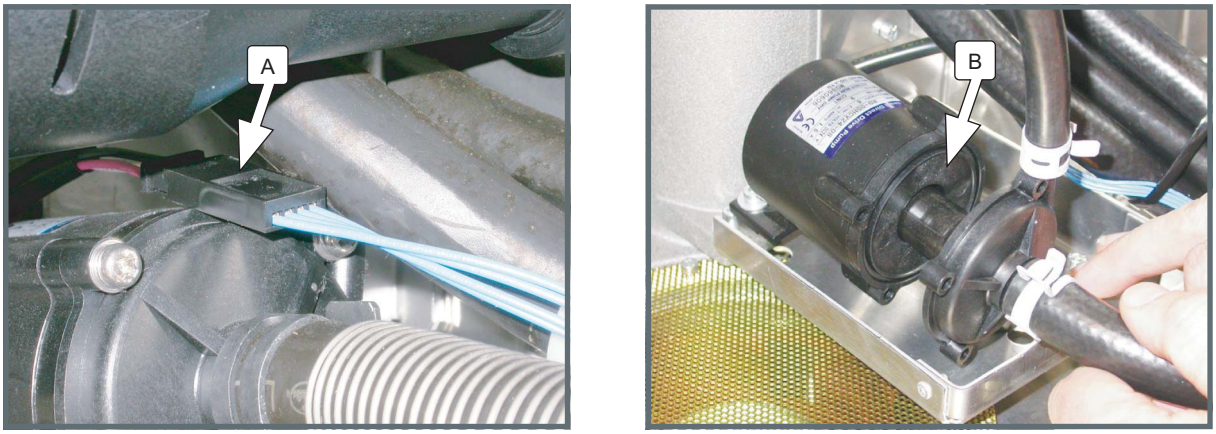
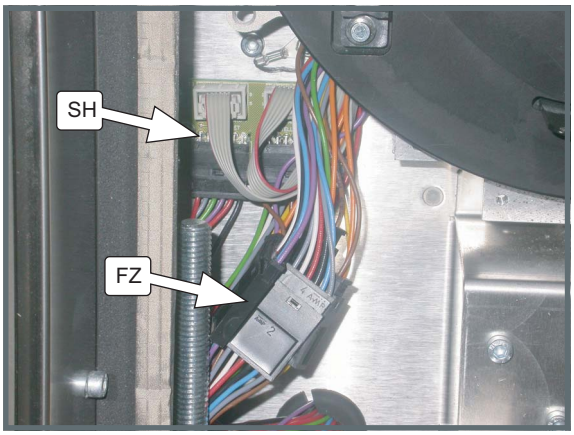


Image 4-17

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

Situation	Solution
Manual lens installed.	Replace the manual lens with a motorized lens.
Corrupt lens file.	Delete all current lens files and create new lens files. Note that each time the lens is removed new lens files has to be created. 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.
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. 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 unit of the zoom motor of the motorized lens.	Remove the front cover of the projector and check if all wire units at the left bottom of the lens holder are connected. See reference FZ of image 4-18.
Disconnected wire unit, of the lens and lens holder motors, from the Power Backplane	Remove the Input & Communication Unit and check if the wire unit of the lens and lens holder motors is inserted. See reference LC of image 4-18.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction zoom motor of the lens.	Use the local keypad to focus the image on the screen. If unsuccessful, replace the motorized lens.

Situation	Solution
Malfunction Power Backplane (bad connection).	Replace the Power Backplane.
Malfunction SMPS board which supplies power to the lens.	Replace the SMPS board.



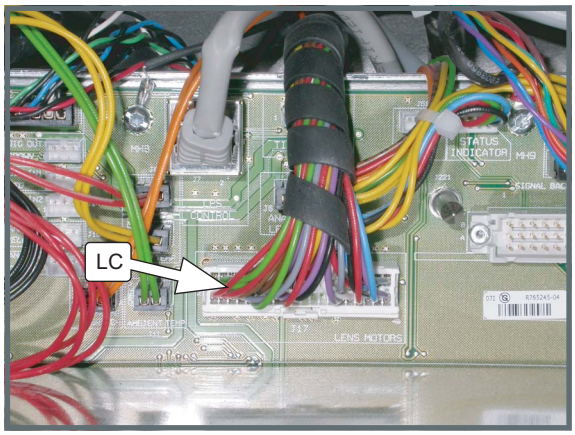


Image 4-18
SH Wire units of the shift motors of the lens holder.
FZ Wire units of the focus and shift motors of the motorized lens.
LC Wire unit connection of the lens motors with the Power Backplane.

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

Situation	Solution
Manual lens installed.	Replace the manual lens with a motorized lens and recreate the lens files.
The activated lens file does not correspond with the lens mounted on the projector.	Program correct lens type into communicator under Advanced/lens parameters and recreate the lens files.
Corrupt lens file.	Delete all current lens files and create new lens files. Note that each time the lens is removed new lens files has to be created. 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.
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. 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 unit of the focus motor of the motorized lens.	Remove the front cover of the projector and check if all wire units at the left bottom of the lens holder are connected. See reference FZ of image 4-18.
Disconnected wire unit, of the lens and lens holder motors, from the Power Backplane.	Remove the Input & Communication Unit and check if the wire unit of the lens and lens holder motors is inserted. See reference LC of image 4-18.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction focus motor of the lens.	Use the local keypad to focus the image on the screen. If unsuccessful, replace the motorized lens.
Malfunction Power Backplane (bad connection).	Replace the Power Backplane.
Malfunction SMPS board which supplies power to the lens.	Replace the SMPS board.

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

Situation	Solution
Corrupt lens file.	Delete all current lens files and create new lens files. Note that each time the lens is removed new lens files has to be created. 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.

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. 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 unit of the horizontal shift motor of the motorized lens holder.	Remove the front cover of the projector and check if all wire units at the left bottom of the lens holder are connected. See reference SH and FZ of image 4-18.
Disconnected wire unit, of the lens and lens holder motors, from the Power Backplane	Remove the Input & Communication Unit and check if the wire unit of the lens and lens holder motors is inserted. See reference LC of image 4-18.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction shift motor of the motorized lens holder.	Use the local keypad to shift the image on the screen horizontally. If unsuccessful, replace the horizontal shift motor of the motorized lens holder.
Malfunction Power Backplane (bad connection).	Replace the Power Backplane.
Malfunction SMPS board which supplies power to the lens.	Replace the SMPS board.

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

Situation	Solution
Corrupt lens file.	Delete all current lens files and create new lens files. Note that each time the lens is removed new lens files has to be created. 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.
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. 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 unit of the vertical shift motor of the motorized lens holder.	Remove the front cover of the projector and check if all wire units at the left bottom of the lens holder are connected.
Disconnected wire unit, of the lens and lens holder motors, from the Power Backplane	Remove the Input & Communication Unit and check if the wire unit of the lens and lens holder motors is inserted.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction shift motor of the motorized lens holder.	Use the local keypad to shift the image on the screen vertically. If unsuccessful, replace the vertical shift motor of the motorized lens holder.
Malfunction Power Backplane (bad connection).	Replace the Power Backplane.
Malfunction SMPS board which supplies power to the lens.	Replace the SMPS board.

Code 5237: “lens position - clear requested target time out failed” (Warning)

Situation	Solution
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

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

Situation	Solution
Blocked high density filter at the front side of the projector.	Replace the front high density filter with a new one. See service manual chapter page 395.

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).
Malfunction air extraction system.	Check the condition of the air extraction system. The air extraction system must be capable of removing minimum 6,65 m³/min or 235 CFM per installed DP-2000/DP-1500 digital projector.
Defect temperature sensor.	Replace the ambient temperature sensor.
Malfunction Fan Control board.	Replace the Fan Control board.
Defect Power Backplane.	Replace the Power Backplane.

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

Situation	Solution
Blocked high density filter at the front side of the projector.	Replace the front high density filter with a new one. See service manual chapter page 395.
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 6,65 m³/min or 235 CFM per installed DP-2000/DP-1500 digital projector.

Code 5283: “ambient - temperature low” (Warning)

Situation	Solution
Ambient temperature is too low.	Check the ambient temperature at the air inlets of the projector. Makes sure that the ambient temperature is not lower than 0°C (32°F).
Defect temperature sensor.	Replace the ambient temperature sensor.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction Power Backplane.	Replace the Power Backplane.

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

Situation	Solution
Wire unit of the temperature sensor disconnected from the power backplane. To access the power backplane you have to remove the Input & Communication unit.	Check the connection (reference B image 4-19).
Damaged wire unit of the ambient temperature sensor (reference A image 4-19) causing an open circuit. The ambient temperature sensor is located in the air channel behind the compartment of the Input & Communication unit.	1. Repair the wire unit. 2. If not repairable, replace the hole wire unit and temperature sensor.
Defect temperature sensor (reference A image 4-19).	Replace the temperature sensor.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction Power Backplane.	Replace the Power Backplane.

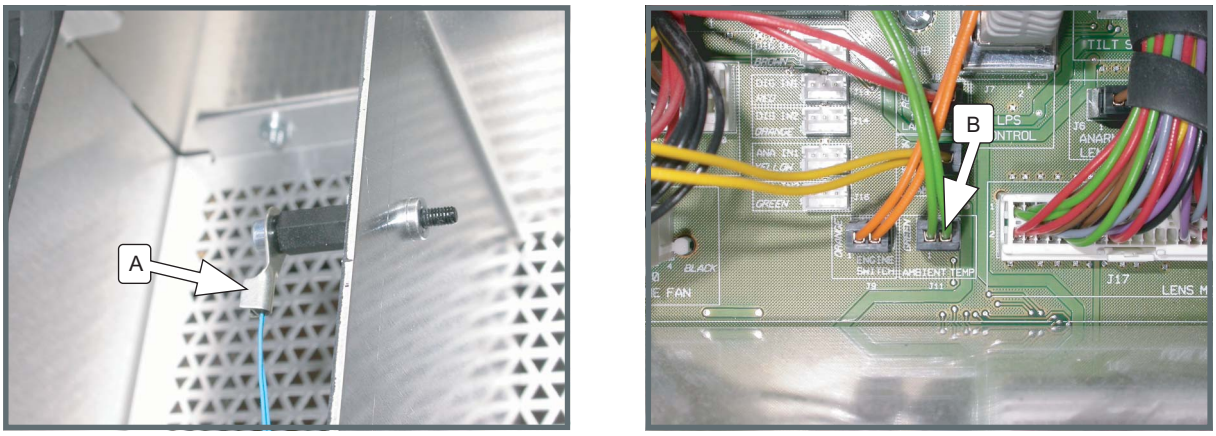


Image 4-19
A Ambient temperature sensor.
B Ambient temperature sensor connection with the power backplane.

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

Situation	Solution
Damaged insulation of the wire unit of the ambient temperature sensor (reference A image 4-19) causing a short circuit.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor (reference A image 4-19). When disconnecting the wire unit of the temperature sensor from the power backplane (reference B image 4-19) the error code is changed to “ambient - temperature sensor open”.	Replace the temperature sensor.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction Power Backplane.	Replace the Power Backplane.

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.

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

Situation	Solution
Blocked high density filter of the heat exchanger. The other DMD temperatures are too high as well.	Replace the blocked high density filter of the heat exchanger with a new high density filter. See service manual chapter "Replacement of the dust filter on the bottom side", page 397.
The liquid cooling circuit of the light processor is mistakenly excluded from the main liquid cooling circuit. Most likely the other DMD temperatures are too high as well.	Check of the cooling circuit of the light processor is connected with the pump and heat exchanger.
The Peltier element (TEC) of the DMD in the blue channel is disconnected from the Formatting Interface Board.	Check if the wire unit (reference TB image 4-20) of the Peltier element (TEC) of the DMD in the blue channel is connected with the Formatting Interface Board.
The wire unit of the temperature sensor (NTC) of the DMD in the blue channel is disconnected from the Formatting Interface Board.	Check if the wire unit (reference SB image 4-20) of the temperature sensor (NTC) of the DMD in the blue channel is connected with the Formatting Interface Board.
The wire units of two Peltier elements (TEC) or there respective temperature sensors (NTC’s) have been swapped. While the temperature of one DMD is too high, the other will most likely be too low.	Check if the wire units of all Peltiers (TEC) and all temperature sensors (NTC’s) are plugged in there respective connector sockets on the Formatting Interface Board. See image 4-20. Note that there are three temperature sensors per channel. The first sensor is visible on top of the cooling block. The second sensor (reference SB) fits between the Peltier element and DMD. The third sensor is located at the front of the DMD.

Situation	Solution
Malfunction Fan & Motor Control board. The LED “+VTEC” on the Fan & Motor Control board remains off.	Replace the Fan & Motor Control board.
Malfunction Peltier element (TEC) of the involved DMD. Use the “diode test” of a multi-meter to check out the Peltier. Polarity doesn’t matter. The Peltier is not OK in case the measured value is higher then 0,01 volt.	Remove the light processor from its compartment and replace the malfunction Peltier element. If problem persist contact Barco for further instructions.
Poor assembly of DMD or Peltier + cooler block.	Reinstall the Peltier element.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the blue channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

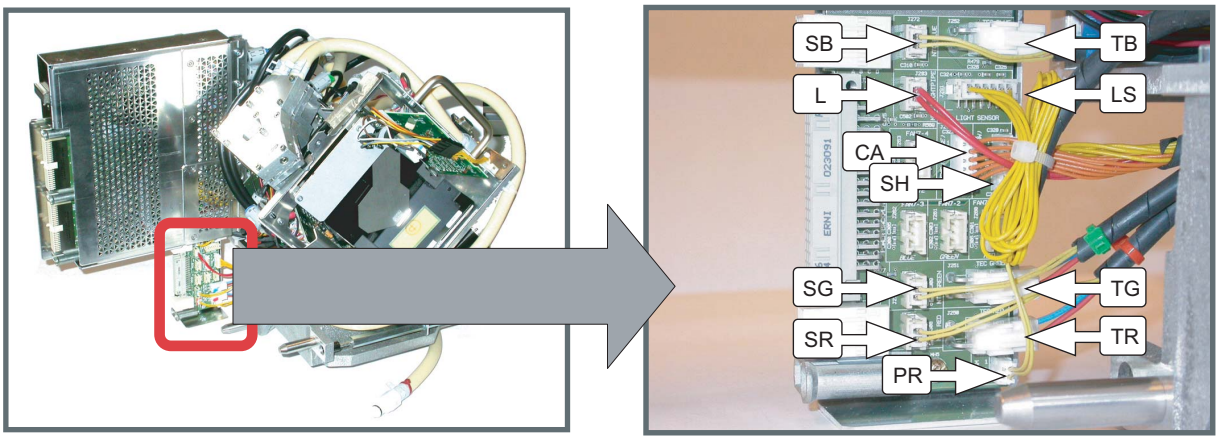


Image 4-20
SB Wire unit of temperature sensor at the rear of the DMD of the blue channel.
SG Wire unit of temperature sensor at the rear of the DMD of the green channel.
SR Wire unit of temperature sensor at the rear of the DMD of the red channel.
TB Wire unit of Peltier element at the rear of the DMD of the blue channel.
TG Wire unit of Peltier element at the rear of the DMD of the green channel.
TR Wire unit of Peltier element at the rear of the DMD of the red channel.
L Wire unit of the temperature sensor on the cooling block at the light pipe entrance.
CA Wire unit of the cat eye (contrast plate).
SH Wire unit of the shutter.
LS Wire unit of the light sensor inside the light pipe (behind the fold mirror).

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

Situation	Solution
The electronics of the Light Processor Unit remains off due to a low DMD temperature.	Make sure that the ambient temperature is within specs. Let the projector acclimate. Do not ignite the lamp, otherwise there is a risk for condensate.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the blue channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

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

Situation	Solution
Wire unit (reference SB image 4-20) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug in the wire unit of the temperature sensor into its socket on the Formatting Interface Board.

Situation	Solution
Damaged wire unit of the temperature sensor (Reference SB image 4-20) which measures the temperature at the rear side of the DMD of the blue channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the blue channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

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

Situation	Solution
Damaged wire unit of the temperature sensor (Reference SB image 4-20) which measures the temperature at the rear side of the DMD of the blue channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the blue channel. When disconnecting the wire unit (Reference SB image 4-20) of the temperature sensor from the Formatting Interface Board the error code is changed to “dmd blue - temperature sensor open”.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

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

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

Situation	Solution
Blocked high density filter of the heat exchanger. The other DMD temperatures are too high as well.	Replace the blocked high density filter of the heat exchanger with a new high density filter. See service manual chapter "Replacement of the dust filter on the bottom side", page 397.
The liquid cooling circuit of the light processor is mistakenly excluded from the main liquid cooling circuit. Most likely the other DMD temperatures are too high as well.	Check of the cooling circuit of the light processor is connected with the pump and heat exchanger.
The Peltier element (TEC) of the DMD in the green channel is disconnected from the Formatting Interface Board.	Check if the wire unit (reference TG image 4-20) of the Peltier element (TEC) of the DMD in the blue channel is connected with the Formatting Interface Board.
The wire unit of the temperature sensor (NTC) of the DMD in the green channel is disconnected from the Formatting Interface Board.	Check if the wire unit (reference SG image 4-20) of the temperature sensor (NTC) of the DMD in the blue channel is connected with the Formatting Interface Board.
The wire units of two Peltier elements (TEC) or there respective temperature sensors (NTC’s) have been swapped. While the temperature of one DMD is too high, the other will most likely be too low.	Check if the wire units of all Peltiers (TEC) and all temperature sensors (NTC’s) are plugged in there respective connector sockets on the Formatting Interface Board. See image 4-20. Note that there are three temperature sensors per channel. The first sensor is visible on top of the cooling block. The second sensor (reference SG) fits between the Peltier element and DMD. The third sensor is located at the front of the DMD.

Situation	Solution
Malfunction Fan & Motor Control board. The LED “+VTEC” on the Fan & Motor Control board remains off.	Replace the Fan & Motor Control board.
Malfunction Peltier element (TEC) of the involved DMD. Use the “diode test” of a multi-meter to check out the Peltier. Polarity doesn’t matter. The Peltier is not OK in case the measured value is higher then 0,01 volt.	Remove the light processor from its compartment and replace the malfunction Peltier element. If problem persist contact Barco for further instructions.
Poor assembly of DMD or Peltier + cooler block.	Reinstall the Peltier element.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the green channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

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

Situation	Solution
The electronics of the Light Processor Unit remains off due to a low DMD temperature.	Make sure that the ambient temperature is within specs. Let the projector acclimate. Do not ignite the lamp, otherwise there is a risk for condensate.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the green channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

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

Situation	Solution
Wire unit (reference SG image 4-20) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug in the wire unit of the temperature sensor into its socket on the Formatting Interface Board.
Damaged wire unit of the temperature sensor (Reference SG image 4-20) which measures the temperature at the rear side of the DMD of the red channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the green channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

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

Situation	Solution
Damaged wire unit of the temperature sensor (Reference SG image 4-20) which measures the temperature at the rear side of the DMD of the green channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the green channel. When disconnecting the wire unit (Reference SG image 4-20) of the temperature sensor from the Formatting Interface Board the error code is changed to “dmd green - temperature sensor open”.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

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

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

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

Situation	Solution
Ambient temperature too high.	Check the ambient temperature at the air inlets of the projector. Make sure that the ambient temperature does not exceed 35°C (95°F).
Blocked high density filters.	Check all high density filters. Replace filthy high density filters with new ones.
Malfunction air extraction system.	Check customer air extraction system for adequate extraction. The air extraction system must be capable of removing minimum 6,65 m³/min or 235 CFM per installed DP-2000/DP-1500 digital projector.
Malfunction lamp anode fan or lamp cathode fan.	Check the speed and voltage of the lamp anode and lamp cathode fan. Replace any malfunction fan.

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

Situation	Solution
Wire unit (reference C image 4-21) of the temperature sensor is disconnected from the Power Backplane.	Plug the wire unit of the temperature sensor into its socket on the Formatting Interface Board.
Disconnected wire (reference C image 4-22) units between Power Backplane and temperature sensor in the air outlet channel of the lamp house.	Check the connection between the wire units. To access this connection you have to remove the SPG light shield at the rear of the projector. See image 4-22.
Damaged wire unit of the temperature sensor (reference L image 4-21).	1. Repair the wire unit. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor (reference L image 4-21).	Replace the temperature sensor.

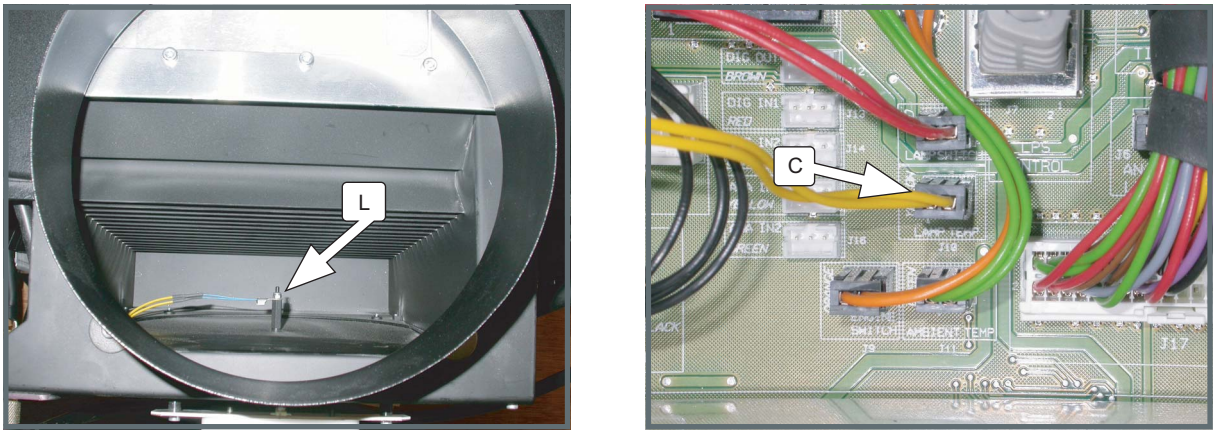


Image 4-21
L Temperature sensor air outlet lamp house.
C Connection temperature sensor air outlet lamp house with Power Backplane.

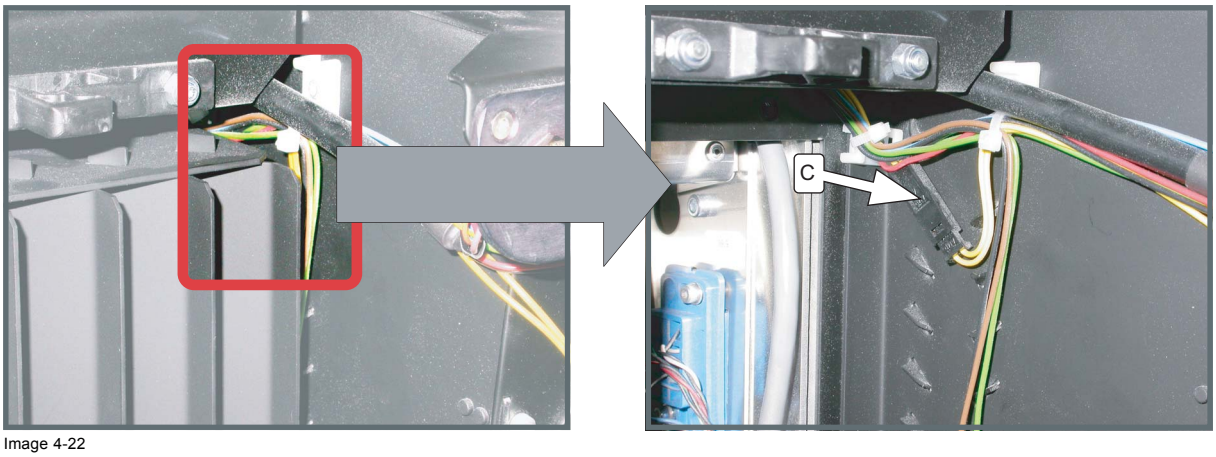


Image 4-22

C Connection between wire unit to Power Backplane and wire unit temperature sensor in the air outlet channel of the lamp house.

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

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (reference L image 4-21), 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 Power Backplane (reference C image 4-21) the error code is changed to “lamp - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor (reference L image 4-21), 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 Power Backplane (reference C image 4-21) the error code is changed to “lamp - temperature sensor open”.	Replace the whole wire unit and temperature sensor.

Code 5320: “fcb - force lps off” (Error)

Situation	Solution
The Fan & Motor Control board forces to switch off the Lamp Power Supply due to an Error.	Look for other errors in the log files and try to solve them.
Malfunction Fan Control board.	Replace the Fan Control board.

Code 5330: “pfc heatsink - temperature too high” (Error)

This error code is probably preceded by the warning code 5331: “pfc heatsink - temperature high”. The same troubleshooting table can be applied.

Code 5331: “pfc 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 front filter.	Replace the high density filter at the front side of the projector with a new one.
Malfunction SMPS module	Replace the SMPS module.
Malfunction Fan Control board.	Replace the Fan Control board.

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

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

Code 5341: “dmd red - temperature high” (Warning)

Situation	Solution
Blocked high density filter of the heat exchanger. The other DMD temperatures are too high as well.	Replace the blocked high density filter of the heat exchanger with a new high density filter. See service manual chapter "Replacement of the dust filter on the bottom side", page 397.
The liquid cooling circuit of the light processor is mistakenly excluded from the main liquid cooling circuit. Most likely the other DMD temperatures are too high as well.	Check of the cooling circuit of the light processor is connected with the pump and heat exchanger.
The Peltier element (TEC) of the DMD in the red channel is disconnected from the Formatting Interface Board.	Check if the wire unit (reference TR image 4-20) of the Peltier element (TEC) of the DMD in the red channel is connected with the Formatting Interface Board.

Situation	Solution
The wire unit of the temperature sensor (NTC) of the DMD in the red channel is disconnected from the Formatting Interface Board.	Check if the wire unit (reference SR image 4-20) of the temperature sensor (NTC) of the DMD in the red channel is connected with the Formatting Interface Board.
The wire units of two Peltier elements (TEC) or there respective temperature sensors (NTC's) have been swapped. While the temperature of one DMD is too high, the other will most likely be too low.	Check if the wire units of all Peltiers (TEC) and all temperature sensors (NTC's) are plugged in there respective connector sockets on the Formatting Interface Board. See image 4-20. Note that there are three temperature sensors per channel. The first sensor is visible on top of the cooling block. The second sensor (reference SR) fits between the Peltier element and DMD. The third sensor is located at the front of the DMD.
Malfunction Fan & Motor Control board. The LED "+VTEC" on the Fan & Motor Control board remains off.	Replace the Fan & Motor Control board.
Malfunction Peltier element (TEC) of the involved DMD. Use the "diode test" of a multi-meter to check out the Peltier. Polarity doesn't matter. The Peltier is not OK in case the measured value is higher then 0,01 volt.	Remove the light processor from its compartment and replace the malfunction Peltier element. If problem persist contact Barco for further instructions.
Poor assembly of DMD or Peltier + cooler block.	Reinstall the Peltier element.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

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

Situation	Solution
The electronics of the Light Processor Unit remains off due to a low DMD temperature.	Make sure that the ambient temperature is within specs. Let the projector acclimate. Do not ignite the lamp, otherwise there is a risk for condensate.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

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

Situation	Solution
Wire unit (reference SR image 4-20) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug in the wire unit of the temperature sensor into its socket on the Formatting Interface Board.
Damaged wire unit of the temperature sensor (Reference SR image 4-20) which measures the temperature at the rear side of the DMD of the red channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

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

Situation	Solution
Damaged wire unit of the temperature sensor (Reference SR image 4-20) which measures the temperature at the rear side of the DMD of the red channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor which measures the temperature at the rear side of the DMD of the red channel. When disconnecting the wire unit (Reference SR image 4-20) of the temperature sensor from the Formatting Interface Board the error code is changed to “dmd red - temperature sensor open”.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit. It is too critical to replace this temperature sensor in the field. The replacement of this temperature sensor must be done at factory or at an authorized service center.

Code 5350: “smps primary heatsink - temperature too high” (Error)

This error code is probably preceded by the warning code 5351: “smps primary heatsink - temperature high”. The same troubleshooting table can be applied.

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 front filter.	Replace the high density filter at the front side of the projector with a new one.
Malfunction SMPS module	Replace the SMPS module.
Malfunction Fan Control board.	Replace the Fan Control board.

Code 5360: “smps secundary heatsink - temperature too high” (Error)

This error code is probably proceeded by the warning code 5361: “smps secundary heatsink - temperature high”. The same troubleshooting table can be applied.

Code 5361: “smps secundary 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 front filter.	Replace the high density filter at the front side of the projector with a new one.
Malfunction SMPS module	Replace the SMPS module.
Malfunction Fan Control board.	Replace the Fan Control board.

Code 5364: “smps secundary heatsink - temperature sensor open” (Error)

Situation	Solution
Malfunction SMPS module	Replace the SMPS module.

Code 5365: “smps secundary heatsink - temperature sensor short” (Error)

Situation	Solution
Malfunction SMPS module	Replace the SMPS module.

Code 5401: “+30v - voltage high” (Warning)

Situation	Solution
The +30 volt supply voltage for the electronics is about to exceed its maximum limit.	Replace the Fan & Motor Control board.
Malfunction SMPS module.	Replace the SMPS module.
Defect Power Backplane.	Replace the Power Backplane.

Code 5403: “+30v - voltage low” (Warning)

Situation	Solution
The +30 volt supply voltage for the electronics is almost below its minimum limit.	1. Check if the SMPS board is working. The green LED “++15VM” should light up. If not, replace the SMPS board. 2. Replace the Fan & Motor Control board. 3. Check the power backplane for bad connections.

Code 5411: “++5v - voltage high” (Warning)

Situation	Solution
The ++5 volt supply voltage for the electronics is about to exceed its maximum limit.	Replace the Fan & Motor Control board.
Malfunction SMPS module.	Replace the SMPS module.
Defect Power Backplane.	Replace the Power Backplane.

Code 5413: “++5v - voltage low” (Warning)

Situation	Solution
The ++5 volt supply voltage for the electronics is almost below its minimum limit.	1. Check if the SMPS board is working. The green LED “++15VM” should light up. If not, replace the SMPS board. 2. Replace the Fan & Motor Control board. 3. Check the power backplane for bad connections.
Malfunction SMPS module.	Replace the SMPS module.
Defect Power Backplane.	Replace the Power Backplane.

Code 5431: “cold mirror fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5432: “cold mirror fan - voltage too low” (Error)

This error code is probably preceded by the warning code 5433: “cold mirror fan - voltage low”. The same troubleshooting table can be applied.

Code 5433: “cold mirror fan - voltage low” (Warning)

Situation	Solution
Malfunction SMPS module. All other fans also report voltage low error.	Replace the SMPS module.
Damaged insulation of the wire unit (reference C image 4-23) of the cold mirror fan.	Remove the left cover of the projector and check the insulation of the wire unit of the fan above the cold mirror. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction Power Backplane (bad connection)	Replace the Power Backplane.

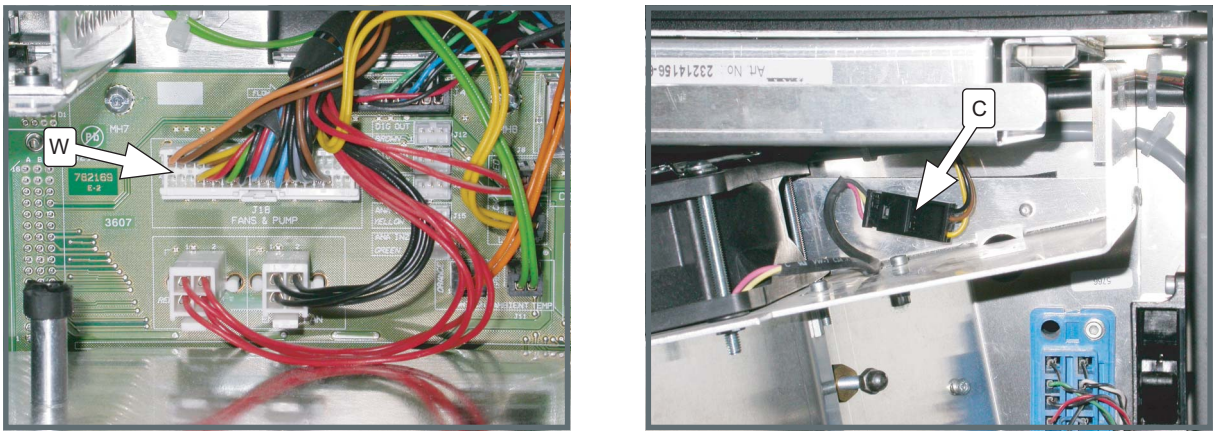


Image 4-23
W Wire unit of the fans and motor units.
C Cold mirror fan connection.

Code 5441: “engine fan - voltage high” (Warning)

Situation	Solution
Malfunction SMPS module. All other fans also report voltage high error.	Replace the SMPS module.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5442: “engine fan - voltage too low” (Error)

This error code is probably preceded by the warning code 5443: “engine fan - voltage low”. The same troubleshooting table can be applied.

Code 5443: “engine fan - voltage low” (Warning)

Situation	Solution
Malfunction SMPS module. All other fans also report voltage low error.	Replace the SMPS module.
Damaged insulation of the wire unit (reference C image 4-24) of the fan (reference F3) in the compartment of the Light Processor Unit. Note that this fan is located between the compartment of the Input & Communication Unit and the Compartment of the Light Processor Unit.	Check the insulation of the wire unit of the fan. The fan is accessible by removing a small cover plate inside the compartment of the Input & Communication Unit. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction Power Backplane (bad connection)	Replace the Power Backplane.

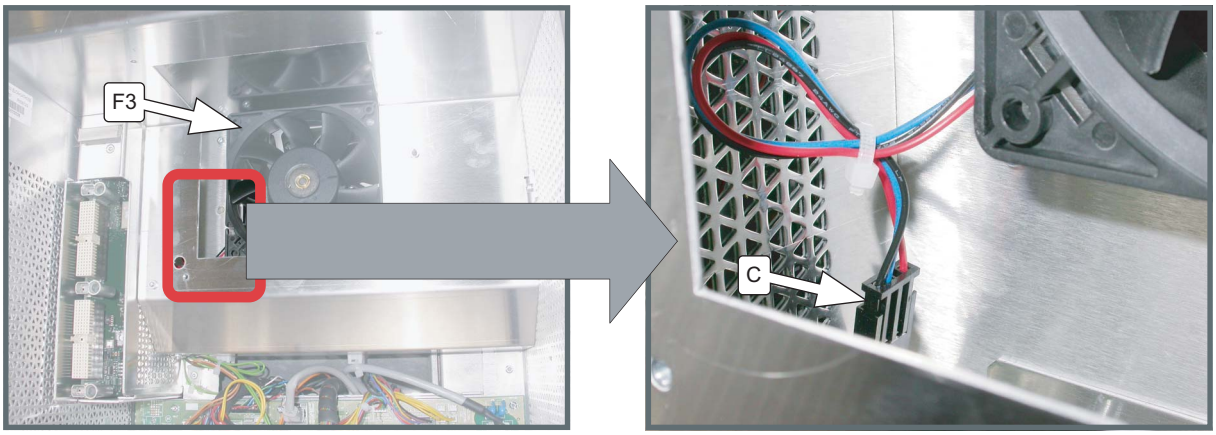


Image 4-24

Code 5451: “heat exchanger fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5452: “heat exchanger fan - voltage too low” (Error)

This error code is probably preceded by the warning code 5453: “heat exchanger fan - voltage low”. The same troubleshooting table can be applied.

Code 5453: “heat exchanger fan - voltage low” (Warning)

Situation	Solution
Malfunction SMPS module. All other fans also report voltage low error.	Replace the SMPS module.
Damaged insulation of the wire unit (reference C image 4-8) of the fan of the heat exchanger.	Check the insulation of the wire unit of the fan above the heat exchanger. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan.
Wire unit of the fans and motor units (reference W image 4-7) disconnected from the Power Backplane.	Remove the Input & Communication unit and check if the wire unit is inserted in the Power Backplane.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction Power Backplane (bad connection)	Replace the Power Backplane.

Code 5461: “lamp anode fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5462: “lamp anode fan - voltage too low” (Error)

This error code is probably preceded by the warning code 5463: “lamp anode fan - voltage low”. The same troubleshooting table can be applied.

Code 5463: “lamp anode fan - voltage low” (Warning)

Situation	Solution
Malfunction SMPS module. All other fans also report voltage low error.	Replace the SMPS module.
Damaged insulation of the wire unit (reference C image 4-9) of the anode fan (reference FA image 4-9).	Check the insulation of the wire unit of the anode fan. The anode fan is located below the sealed compartment of the Light Processor Unit. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction Power Backplane (bad connection)	Replace the Power Backplane.

Code 5471: “lamp cathode fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5472: “lamp cathode fan - voltage too low” (Error)

This error code is probably preceded by the warning code 5473: “lamp cathode fan - voltage low”. The same troubleshooting table can be applied.

Code 5473: “lamp cathode fan - voltage low” (Warning)

Situation	Solution
Malfunction SMPS module. All other fans also report voltage low error.	Replace the SMPS module.
Damaged insulation of the wire unit (reference C image 4-11) of the cathode fan (reference FC image 4-11).	Check the insulation of the wire unit of the cathode fan. The cathode fan is located between the lamp compartment and the Input & Communication Unit. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction Power Backplane (bad connection)	Replace the Power Backplane.

Code 5492: “smps fan - voltage too low” (Error)

This error code is probably preceded by the warning code 5493: “smps fan - voltage low”. The same troubleshooting table can be applied.

Situation	Solution
Malfunction SMPS module. All other fans also report voltage low error.	Replace the SMPS module.
Damaged insulation of the wire unit of the fan causing a short circuit.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and fan.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5493: “smps fan - voltage low” (Warning)

Situation	Solution
Malfunction SMPS module. All other fans also report voltage low error.	Replace the SMPS module.
Damaged insulation of the wire unit of the fan causing a short circuit.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and fan.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5501: “fib +12v - voltage high” (Warning)

Situation	Solution
The +12 volt supply voltage for the Formatting Interface Board is about to exceed its maximum limit.	Replace the Fan & Motor Control board.
Malfunction SMPS board.	Replace the SMPS board.

Code 5503: “fib +12v - voltage low” (Warning)

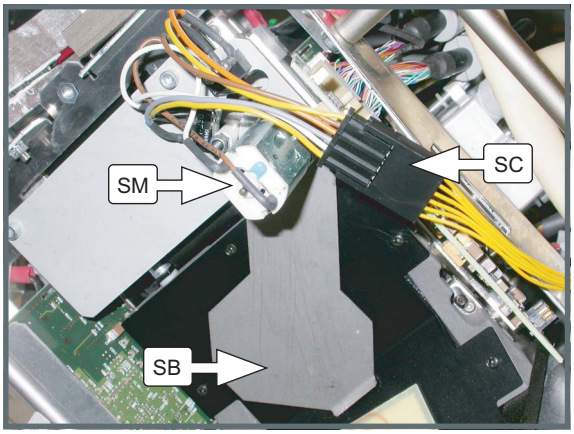
Situation	Solution
The +12 volt supply voltage for the Formatting Interface Board is almost below its minimum limit.	1. Check if the SMPS board is working. The green LED “++15VM” should light up. If not, replace the SMPS board. 2. Replace the Fan & Motor Control board. 3. Check the power backplane for bad connections.

Code 5521: “motor (lens, dowser) - voltage high” (Warning)

Situation	Solution
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction SMPS board.	Replace the SMPS board.

Code 5523: “motor (lens, dowser) - voltage low” (Warning)

Situation	Solution
Damaged insulation of the wire unit (reference SC of image 4-25) of the shutter motor (reference SM of image 4-25).	Check the insulation of the wire unit of the motor. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or motor.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction SMPS. 30 volt supply failure.	Replace the SMPS module.
Defect zoom/focus/shift/shutter motors.	Replace the defect motor.
Malfunction Power Backplane (bad connection)	Replace the Power Backplane.



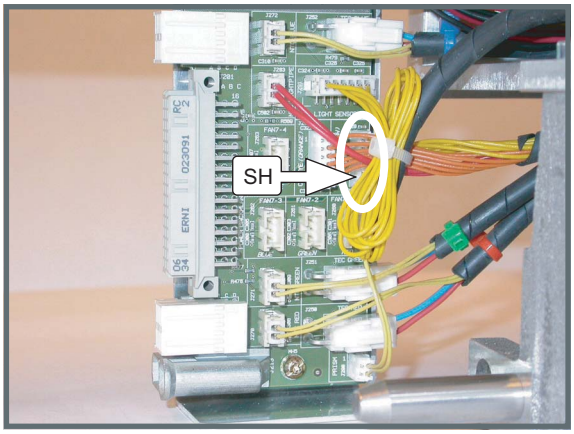


Image 4-25
SM Shutter motor.
SB Shutter blade.
SC Connection shutter motor.
SH Connection wire unit shutter motor with Formatting Interface Board.

Code 5531: “pump - voltage high” (Warning)

Situation	Solution
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction SMPS board.	Replace the SMPS board.

Code 5532: “pump - voltage too low” (Error)

This error code is probably preceded by the warning code 5533: “pump - voltage low”. The same troubleshooting table can be applied.

Code 5533: “pump - voltage low” (Warning)

Situation	Solution
Damaged insulation of the wire unit of the pump causing a short circuit.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or pump.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5551: “tec - voltage high” (Warning)

Situation	Solution
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5553: “tec - voltage low” (Warning)

Situation	Solution
Damaged insulation of the wire unit of one of the six Peltier elements (TEC) causing a short circuit with the projector chassis. Disconnecting the wire unit of the damaged Peltier element from the Formatting Interface Board will clear the warning.	Check the wire units of each Peltier element. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and Peltier element.
Malfunction SMPS module. The +VTEC diagnostic LED remains off.	Replace the SMPS module.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5561: “elcabox fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5562: “elcabox fan - voltage too low” (Error)

This error code is probably preceded by the warning code 5563 : “elcabox fan - voltage low”. The same troubleshooting table can be applied.

Code 5563: “elcabox fan - voltage low” (Warning)

Situation	Solution
Damaged insulation of the wire unit (reference C image 4-26) of the fan (reference F2 image 4-26) for the Input & Communication unit. The fan is located behind the high density dust filter at the front of the projector.	Remove the high density filter at the front side of the projector and check the insulation of the wire unit of the fan. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction Power Backplane (bad connection)	Replace the Power Backplane.
Malfunction SMPS board.	Replace the SMPS board.

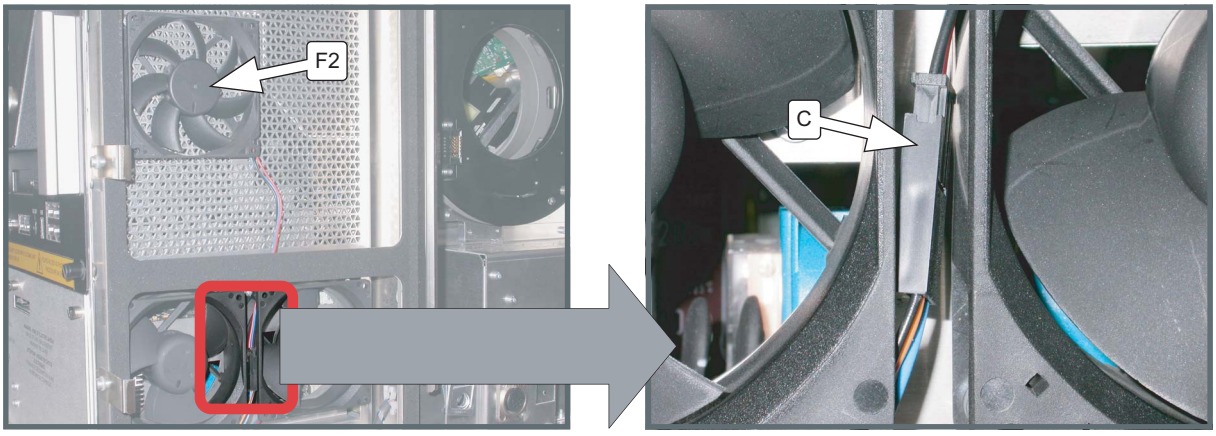


Image 4-26
F2 Fan for cooling the Input & Communication unit.
C Fan connection with wire tree.

Code 5571: “lamp rear fan - voltage high” (Warning)

Situation	Solution
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.

Code 5572: “lamp rear fan - voltage too low” (Error)

This error code is probably preceded by the warning code 5573: “lamp rear fan - voltage low”. The same troubleshooting table can be applied.

Code 5573: “lamp rear fan - voltage low” (Warning)

Situation	Solution
Damaged insulation of the wire unit (reference C image 4-27) of the fan (reference FL image 4-27).	Check the insulation of the wire unit of the cathode fan. The cathode fan is located between the lamp compartment and the Input & Communication Unit. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction Power Backplane (bad connection)	Replace the Power Backplane.
Malfunction SMPS board.	Replace the SMPS board.

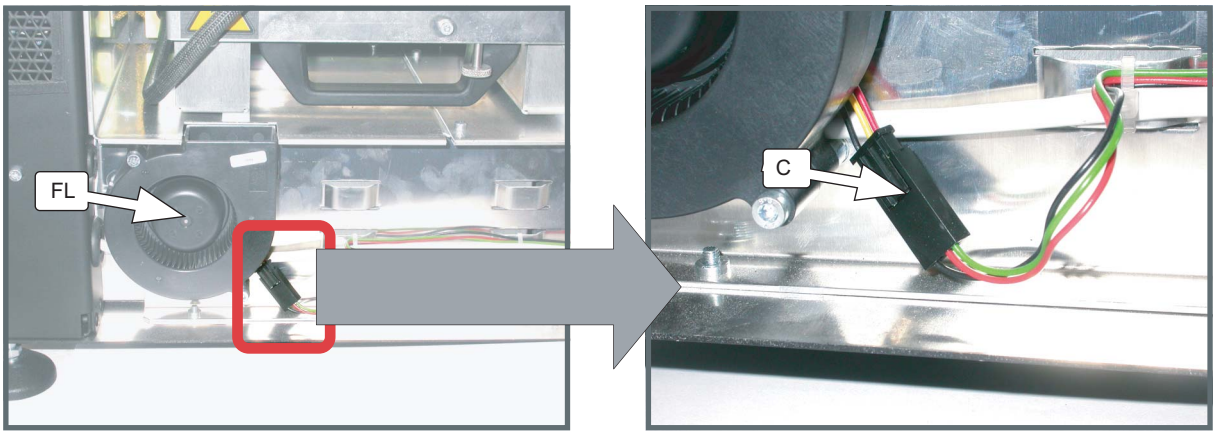


Image 4-27
FL Fan Lamp Info Module at the rear of the lamp house.
C Connection fan wire unit.

Code 5581: “+12v - voltage high” (Warning)

Situation	Solution
The +12 volt supply voltage for the electronics is about to exceed its maximum limit.	Replace the Fan & Motor Control board.

Code 5583: “+12v - voltage low” (Warning)

Situation	Solution
The +12 volt supply voltage for the electronics is almost below its minimum limit.	1. Check if the SMPS board is working. The green LED “++15VM” should light up. If not, replace the SMPS board. 2. Replace the Fan & Motor Control board. 3. Check the power backplane for bad connections.

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

Situation	Solution
Main power cable disconnected from one of the LPS units.	Check if the main power cable is connected with the “MAINS INPUT” socket of the LPS unit.
Disconnected wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.	Reconnect the wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.
Disconnected wire unit between the Power Backplane and the LPS interface board.	Reconnect the wire unit between the Power Backplane and the LPS interface board.
Malfunction LPS interface board.	Replace the LPS interface board.

Situation	Solution
Malfunction of one of the LPS units. The red LED “ERR” of the malfunction LPS unit flashes fast.	Replace the whole LPS module.
Defect Power Backplane.	Replace the Power Backplane.

Code 5641: “lamp power supplies - lamp is on, but smps is off” (Error)

Situation	Solution
Malfunction SMPS module.	Replace the SMPS module.
Malfunction LPS module.	Replace the LPS module.
Defect Power Backplane.	Replace the Power Backplane.

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

Situation	Solution
Main power cable disconnected from one of the LPS units.	Check if the main power cable is connected with the “MAINS INPUT” socket of the LPS unit.
Disconnected wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.	Reconnect the wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.
Malfunction of one of the LPS units. The red LED “ERR” of the malfunction LPS unit flashes fast.	Replace the whole LPS module.

Code 5643: “lamp power supplies - communication failed with at least one lamp power supply” (Error)

Situation	Solution
Main power cable disconnected from one of the LPS units.	Check if the main power cable is connected with the “MAINS INPUT” socket of the LPS unit.
Disconnected wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.	Reconnect the wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.
Malfunction of one of the LPS units. The red LED “ERR” of the malfunction LPS unit flashes fast.	Replace the whole LPS module.

Code 5644: “lamp power supplies - lamp is on, but at least one lamp power supply is off” (Error)

Situation	Solution
Main power cable disconnected from one of the LPS units.	Check if the main power cable is connected with the “MAINS INPUT” socket of the LPS unit.
Disconnected wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.	Reconnect the wire unit between the “CTRL IN” and “CTRL OUT” sockets of the LPS units.
Malfunction LPS communication interface. One or both LPS units suddenly stops operating. In most cases this happens after the projector is warmed up. Older LPS communication interfaces may have this problem in combination with some LPS units.	Check the revision of the LPS communication interface (reference 1 image 4-28) The module revision must be “10” or higher. In case the module revision is lower than “10” replace the LPS communication interface. See service manual chapter "Replacement of the LPS communication interface", page 361.
Malfunction of one of the LPS units. The red LED “ERR” of the malfunction LPS unit flashes fast.	Replace the whole LPS module.

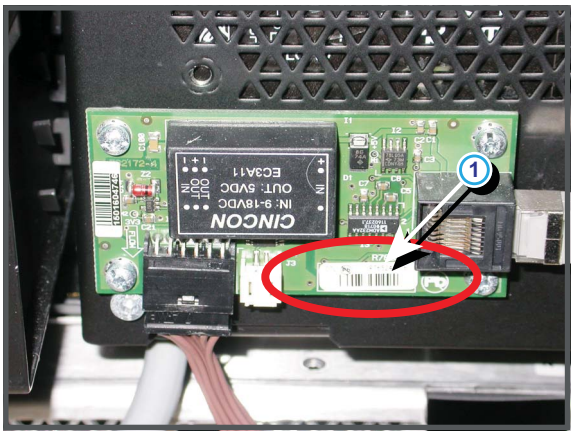


Image 4-28

Code 5646: “lamp - set lamp on failed” (Error)

Situation	Solution
The lamp goes out immediately after the ignition or does not go on at all. PFC and LPS seems to work normally. This situation can be the result of a bad lamp or SPG module. See service manual chapter "LPS diagnostic LEDs", page 355.	• Install another xenon lamp in case the voltage on the “LAMP OUT” pins is 140 volt and you hear the SPG module 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 modules in case the voltage value on the “LAMP OUT” pins is below 140 volt and the lamp is not ignited.

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.
Malfunction LPS communication interface. One or both LPS units suddenly stops operating. In most cases this happens after the projector is warmed up. Older LPS communication interfaces may have this problem in combination with some LPS units.	Check the revision of the LPS communication interface (reference 1 image 4-28) The module revision must be “10” or higher. In case the module revision is lower than “10” replace the LPS communication interface. See service manual chapter "Replacement of the LPS communication interface", page 361.
Malfunction Lamp Power Supply (LPS).	Replace the Lamp Power Supply unit.
Defect Lamp installed.	Replace the Lamp.

Code 5654: “lamp run time - read failed” (Error)

Situation	Solution
Lamp Info Module with old firmware.	Check lamp info module firmware version in the "version info" area of the communicator. If mismatch is detected then run update.
Malfunction Lamp Info Module.	Replace the Lamp Info Module.

Code 5657: “lamp run time - exceeds maximum” (Error)

Situation	Solution
The lamp inside the lamp house has exceeded its maximum run time.	Replace the lamp and reset hours and bulb type.

Code 5658: “lamp run time - read limits failed” (Error)

Situation	Solution
Lamp Info Module with old firmware.	Check lamp info module firmware version in the "version info" area of the communicator. If mismatch is detected then run update.
Malfunction Lamp Info Module.	Replace the Lamp Info Module.

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.

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
Diagnostics performed - NOK -	Check if interface board is well connected.
FPGA Code Valid - NOK -	Force software update on interface board. (DLP cinema Firmware Installation program > Special operations > Auto install cinema boards only). If the problem remains, replace the TI Interface board.
FPGA initialization - NOK -	Force software update on interface board. (DLP cinema Firmware Installation program > Special operations > Auto install cinema boards only). If the problem remains, replace the TI Interface board.
FPGA Done - NOK -	Force software update on interface board. (DLP cinema Firmware Installation program > Special operations > Auto install cinema boards only). If the problem remains, replace the TI Interface board.
FPGA Register Test - NOK -	Replace the TI Interface board.
Ethernet - NOK -	Check if the TI IP address is set for DHCP. If this is the case, check if an IP address was received from the DHCP server. Check the network, Check if a DHCP server is operational. If the IP address is on a fixed IP address, and you get this error, replace the TI Interface board.
TPM Self test failed.	Replace the TI Interface board.
Synchronous Serial Port - NOK -	Replace the TI Interface board.
File System - NOK -	Reformat the flash disk of the interface board. (DLP cinema Firmware Installation program > Special operations > Force Cinema Re-Install – all custom files will be lost. Clone the projector before performing this action if possible). If the problem remains, replace the TI Interface board.
Formatter Board - NOK -	Check if the Light Processor is well connected. Force a software update on the engine. (DLP cinema Firmware Installation program > Special operations > Auto install formatter subsystem only).
Frame Store - NOK -	Replace the TI Interface board.
Security enclosure - tamper switch activated.	Interface board security enclosure has been damaged. Replace the TI Interface board.
Security enclosure - Component side tamper lid open.	Interface board security enclosure has been damaged, on the component (upper) side. Replace the TI Interface board.
Security enclosure - Non component side tamper lid open.Replace the TI Interface board.	Interface board security enclosure has been damaged – on the component (lower) side. Replace the TI Interface board.
Security enclosure - Communication failure.	Replace the TI Interface board.
Security enclosure - battery low.	Leave the projector powered until the battery has charged again.
Security enclosure - Battery Failure.	Replace the TI Interface board.
Processor Board: Diagnostics performed - NOK -	Check if the TI Processor board is well plugged in. Force software update on the TI Processor board. (DLP cinema Firmware Installation program > Special operations > Auto install cinema boards only). If the problem remains, replace the TI Processor board.
Processor Board: FPGA Code Invalid - NOK -	Force software update on the TI Processor board (DLP cinema Firmware Installation program > Special operations > Auto install cinema boards only). If the problem remains, replace the TI Processor board.
Processor Board: FPGA initialization - NOK -	Force software update on the TI Processor board (DLP cinema Firmware Installation program > Special operations > Auto install cinema boards only). If the problem remains, replace the TI Processor board.
McBSP XRDY - NOK -	Replace the TI Processor board.
Processor Board: FPGA Done - NOK -	Replace the TI Processor board.

Situation	Solution
Processor Board: FPGA Register Test - NOK -	Replace the TI Processor board.
Serial ID Chip - NOK -	Replace the TI Processor board.
CLUT SRAM - NOK -	Replace the TI Processor board.
Overlay FrameStore SDRAM - NOK -	Replace the TI Processor board.
Resizer FIR - NOK -	Replace the TI Processor board.
Resizer FIFO - NOK -	Replace the TI Processor board.
Processor Flash Protection - NOK -	Replace the TI Processor board.
Interface/Processor Main Interconnect Test Fail - NOK -	Check if the TI Interface board and the TI Processor board are well connected in the card cage.
Interface/Processor Auxiliary Interconnect Test Fail - NOK -	Check if the TI Interface board and the TI Processor board are well connected in the card cage.
Interface/Processor Interconnect Test Setup Fail - NOK -	Check if the TI Interface board and the TI Processor board are well connected in the card cage.
Processor Datapath Test Fail - NOK -	Replace the TI Processor board.
Processor Datapath Test Setup Fail - NOK -	Replace the TI Processor board.
Processor Datapath Black Test Fail - NOK -	Replace the TI Processor board.
Processor LUT-CLUT RGB=>BRG Test Fail - NOK -	Replace the TI Processor board.
Processor LUT-CLUT RGB=>BRG Red Fail - NOK -	Replace the TI Processor board.
Processor LUT-CLUT RGB=>BRG Green Fail - NOK -	Replace the TI Processor board.
Processor LUT-CLUT RGB=>BRG Blue Fail - NOK -	Replace the TI Processor board.
Processor LUT-CLUT RGB=>BRG Setup Fail - NOK -	Replace the TI Processor board.
Processor LUT-CLUT RGB=>GBR Test Fail - NOK -	Replace the TI Processor board.
Processor LUT-CLUT RGB=>GBR Red Fail - NOK -	Replace the TI Processor board.
Processor LUT-CLUT RGB=>GBR Green Fail - NOK -	Replace the TI Processor board.
Processor LUT-CLUT RGB=>GBR Blue Fail - NOK -	Replace the TI Processor board.
Processor LUT-CLUT RGB=>GBR Setup Fail - NOK -	Replace the TI Processor board.
Processor LUT-DG Linear Test Fail - NOK -	Replace the TI Processor board.
Processor LUT-DG Linear Red Fail - NOK -	Replace the TI Processor board.
Processor LUT-DG Linear Green Fail - NOK -	Replace the TI Processor board.
Processor LUT-DG Linear Blue Fail - NOK -	Replace the TI Processor board.
Processor LUT-DG Linear Setup Fail - NOK -	Replace the TI Processor board.
Processor LUT-DG Degamma Test Fail - NOK -	Replace the TI Processor board.
Processor LUT-DG Degamma Red Fail - NOK -	Replace the TI Processor board.

Situation	Solution
Processor LUT-DG Degamma Green Fail - NOK -	Replace the TI Processor board.
Processor LUT-DG Degamma Blue Fail - NOK -	Replace the TI Processor board.
Processor LUT-DG Degamma Setup Fail - NOK -	Replace the TI Processor board.
(E)FIB Data Path Signature Test Fail - NOK -	Check if the Light Processor is well connected.
(E)FIB Data Path Signature Test::Setup Fail - NOK -	Check if the Light Processor is well connected.
(E)FIB Flash Checksum: DMD Data - NOK -	Check if the Light Processor is well connected.
(E)FIB Flash Checksum: Sequence Data - NOK -	Check if the Light Processor is well connected.
Red MF Data Path Signature Test Fail - NOK -	Check connection between the MF and the (E)FIB, Check software on the MF
Red MF Data Path Signature Test::Setup Fail - NOK -	Check connection between the MF and the (E)FIB, Check software on the MF
Red MF RDRAM signature Test Fail - NOK -	Check connection between the MF and the (E)FIB, Check software on the MF
Green MF Data Path Signature Test Fail - NOK -	Check connection between the MF and the (E)FIB, Check software on the MF
Green MF Data Path Signature Test::Setup Fail - NOK -	Check connection between the MF and the (E)FIB, Check software on the MF
Green MF RDRAM signature Test Fail - NOK -	Check connection between the MF and the (E)FIB, Check software on the MF
Blue MF Data Path Signature Test Fail - NOK -	Check connection between the MF and the (E)FIB, Check software on the MF
Blue MF Data Path Signature Test::Setup Fail - NOK -	Check connection between the MF and the (E)FIB, Check software on the MF
Blue MF RDRAM signature Test Fail - NOK -	Check connection between the MF and the (E)FIB, Check software on the MF

Other possible causes of this error code:

Situation	Solution
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 then 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. 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.	Activate the lamp to warm up the Light Processor Unit. After a few seconds the temperature of the DMD's should be higher then 10°C (50°F) which allows a successful start up of the Light Processor Unit. Or let the projector acclimate to the normal room temperature which should be higher then 10°C (50°F) and lower then 35°C (95°F).

Code 5801: “ti-boards - security error, please authorize” (Error)

Situation	Solution
The Input & Communication unit has been reinstalled.	Clear the security warning. See service manual chapter "Authorization to clear security warning on DP-1200/DP-1500/DP-2000", page 292. Brief procedure to clear the security warning: 1. Ensure the Input & Communication unit is properly installed. 2. Start up the projector. 3. Initiate authorization by holding the security key in the security socket. 4. Enter the pin code within 5 seconds.
The sealed compartment (cover plate of the Light Processor) has been opened.	Clear the security warning. See service manual chapter "Authorization to clear security warning on DP-1200/DP-1500/DP-2000", page 292. Brief procedure to clear the security warning: 1. Ensure the cover plate of the Light Processor is properly installed. 2. Start up the projector. 3. Initiate authorization by holding the security key in the security socket. 4. Enter the pin code within 5 seconds.
Defect security switches.	If all compartments and devices are installed and security error will not re authorize, replace DCI security switches.
Malfunction Power Backplane	If switch replacement cures nothing then replace power backplane.

Code 5802: “ti-boards - power up self test = fail” (Error)

Situation	Solution

Code 5803: “ti-boards - interface board arm status = fail” (Error)

Situation	Solution

Code 5804: “ti-boards - interface board fpga load status = fail” (Error)

Situation	Solution

Code 5805: “ti-boards - processor board dsp status = fail” (Error)

Situation	Solution

Code 5806: “ti-boards - processor board fpga load status = fail” (Error)

Situation	Solution

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

Situation	Solution

Code 5810: “ti-boards - read power-good failed” (Error)

Situation	Solution

Code 5811: “ti-boards - power-good = fail” (Error)

Situation	Solution

Code 5820: “ti-boards - interface board security enclosure error - replace interface board” (Error)

Situation	Solution
The GORE protection of the TI Cinema Interface board has been triggered and therefore the TI Cinema Interface board is irreversible out of order.	Replace the TI Cinema Interface board.

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 Formatting Interface Board.	Check the connection between the Dolby 3D color wheel unit and the Formatting Interface Board.
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.

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 Formatting Interface Board.	Check the connection between the Dolby 3D color wheel unit and the Formatting Interface Board. Replace wire unit 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.

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

Situation	Solution
Spinning motor disconnected.	Check the connection (reference D image 4-29) of the spinning motor. Replace wire unit if damaged.
Feedback circuit of the spinning motor disconnected.	Check the connection (reference A image 4-29) of the feedback circuit. Replace wire unit if damaged.
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.

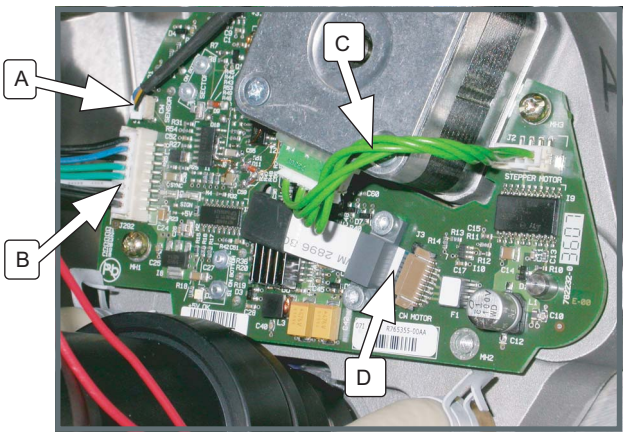


Image 4-29
Dolby 3D color wheel board connections.

A Spinning motor feedback circuit.
B Connection with Formatting Interface Board.
C Wire unit between retraction motor and electronic board.
D Wire unit between spinning motor and electronic board.

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

Situation	Solution
Exceptional software failure.	Reboot the projector.
Retraction motor disconnected.	Check if the wire unit (reference C image 4-29) 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.
Malfunction retraction motor.	Replace the whole Dolby 3D color wheel unit. Send the malfunction unit back to Barco.

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

Situation	Solution
Exceptional software failure.	Reboot the projector.
Retraction motor disconnected.	Check if the wire unit (reference C image 4-29) 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.
Malfunction retraction motor.	Replace the whole Dolby 3D color wheel unit. Send the malfunction unit back to Barco.

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

Situation	Solution
A high light pipe temperature increases the temperature of the Dolby 3D color wheel board.	Check the temperature of the light pipe.
Jammed wire unit of the spinning motor.	Check the condition of the wire unit (reference D image 4-29) 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.

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 A image 4-29) of the feedback circuit. Replace wire unit if damaged.
Spinning motor disconnected.	Check the connection (reference D image 4-29) of the spinning motor. Replace wire unit if damaged.
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.

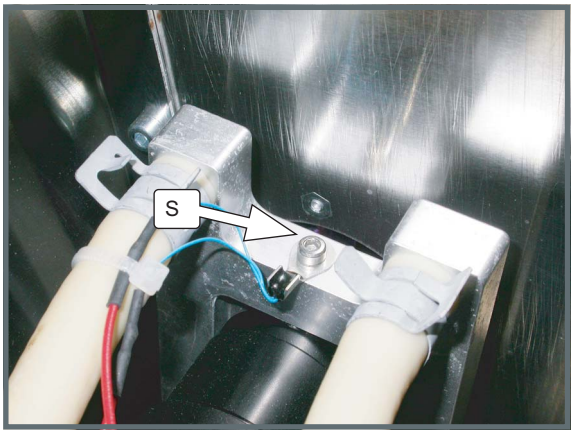
Code 5960: “light pipe - temperature too high” (Error)

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

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

Situation	Solution
Interruption of the liquid cooling circuit.	Check if the loop of the liquid cooling circuit is closed.

Situation	Solution
The liquid cooling circuit of the Light Processor Unit is mistakenly excluded from the main liquid cooling circuit.	Reconnect the cooling circuit of the Light Processor Unit with the pump and heat exchanger.
The pump of the water cooling is electrical disconnected.	Check if the wire unit of the pump is properly connected.
Blocked high density filter of the heat exchanger.	Replace the high density filter. See service manual chapter page 397.
No or insufficient liquid inside the cooling circuit. The pump is sucking air and sounds noisier then normal.	Fill the cooling circuit with liquid and expel all air. Pressurize the circuit.
Malfunction pump of the cooling circuit. You don't feel any vibrations when touching the pump after activating the "Refill mode" via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See service manual chapter "Cleaning the cooling pump", page 240.
Defect temperature sensor (Reference S image 4-30) on the water cooling block of the Light Pipe entrance.	Replace the temperature sensor on the Light Pipe entrance.
Malfunction Formatting Interface Board.	Replace the Formatting Interface Board (FFIB).
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 115. 2. Replace the lamp house with a new lamp house. See service manual chapter "Removal of the lamp house", page 100.
Misalignment of the cold mirror.	Readjust the cold mirror. See service manual chapter "Adjusting the cold mirror", page 137.



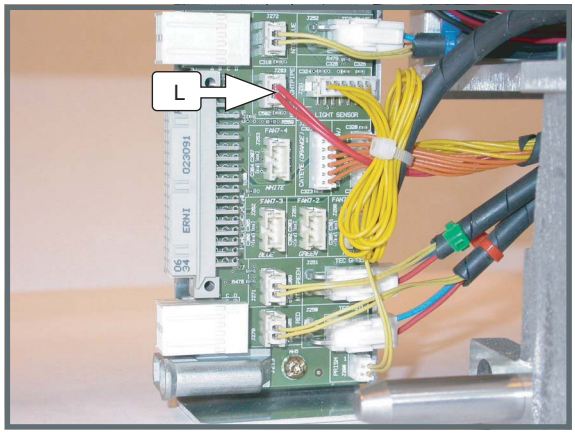


Image 4-30
S Temperature sensor on the cooling block at the light pipe entrance.
L Wire unit of the temperature sensor on the cooling block at the light pipe entrance.

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

Situation	Solution
Wire unit (reference L image 4-30) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug in the wire unit of the temperature sensor into its socket on the Formatting Interface Board.
Damaged wire unit of the temperature sensor (Reference S image 4-30) which measures the temperature of the water cooling block of the light pipe entrance.	1. Repair the wire unit. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor (Reference S image 4-30) on the water cooling block of the light pipe entrance.	Replace the temperature sensor.

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

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (reference S image 4-30) which measures the temperature of the water cooling block of the light pipe entrance. When disconnecting the wire unit (reference L image 4-30) of the temperature sensor from the Formatting Interface Board the error code is changed to “light pipe - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor on the water cooling block of the light pipe entrance. When disconnecting the wire unit (reference L image 4-30) of the temperature sensor from the Formatting Interface Board the error code is changed to “light pipe - temperature sensor open”.	Replace the temperature sensor.

Code 5970: “dmd red front - temperature too high” (Error)

This error code is probably preceded by the warning code 5971: “dmd red front - temperature high”. The same troubleshooting table can be applied.

Code 5971: “dmd red front - temperature high” (Warning)

Situation	Solution
The wire unit of the temperature sensor at the front of the DMD is mistakenly switched with one of the wire units of the other temperature sensors of the Light Processor Unit.	Check if all wire units of the temperature sensors are plugged into their respective sockets on the Formatting Interface Board. See image 4-31.
The wire units of the Peltier elements (TEC’s), mounted on the common cooling block of the heat pipes, are mistakenly switched.	Check if all wire units of the Peltier elements are plugged into their respective sockets on the Formatting Interface Board. See image 4-31.
No thermal contact between heat pipes and common cooling block due to loose screws.	Check if the four screws, which attach the heat pipes of the involved channel to the common cooling block, are fastened. See image 4-32.
Malfunction Peltier element (TEC) between heat pipes and common cooling block. Use the “diode test” of a multi-meter to check out the Peltier. Polarity does not matter. The Peltier is OK in case the measured value is higher then 0,01 volt.	Remove the light processor from its compartment and replace the malfunction Peltier. If problem persist, contact Barco for further instructions.

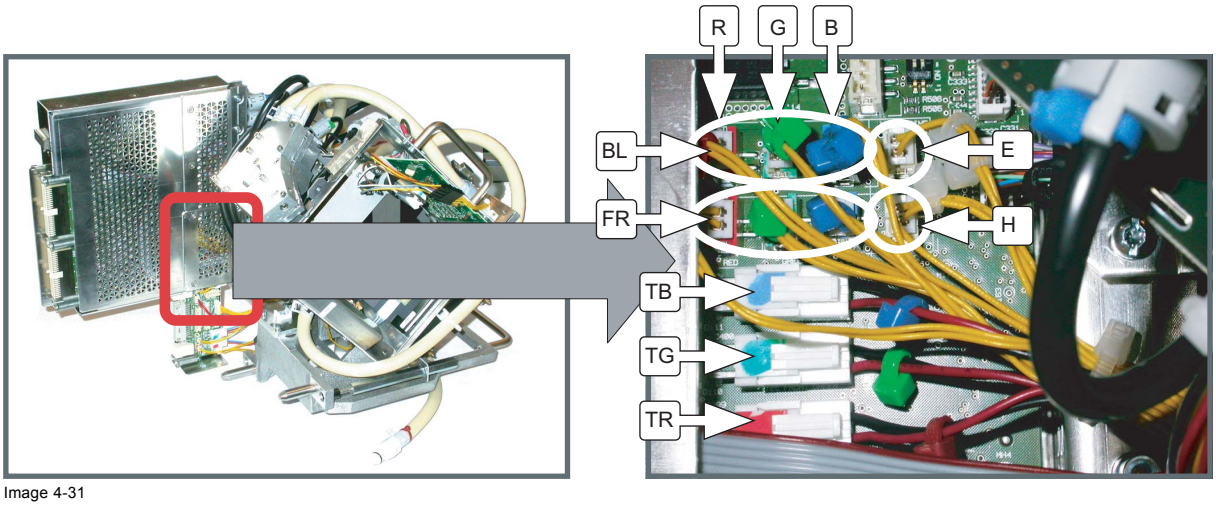


Image 4-31

R Temperature sense Red channel.
G Temperature sense Green channel.
B Temperature sense Blue channel.
BL Temperature sense DMD water cooling blocks.
FR Temperature sense DMD front.
E Temperature sense Light Processor air (Engine).
H Temperature sense Heat pipes cooling blocks (block front).
TB Power supply for TEC front Blue.
TG Power supply for TEC front Green.
TR Power supply for TEC front Red.

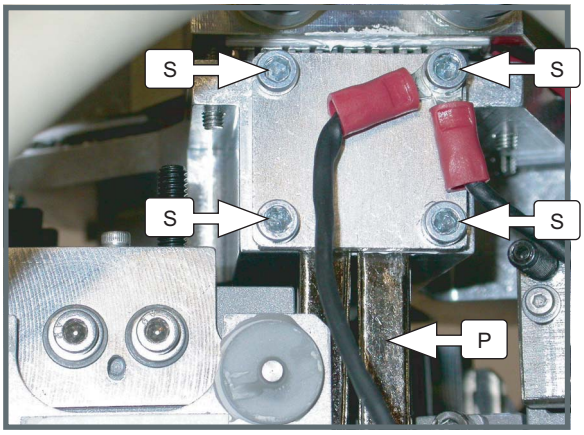


Image 4-32
S Screws.
P Heat pipe.

Code 5973: “dmd red front - temperature low” (Warning)

Situation	Solution
The temperature on the front side of the DMD of the red channel is low.	If this problem persist, contact Barco for further instructions.

Code 5974: “dmd red front - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference FR/R image 4-31) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug in the wire unit of the temperature sensor into its socket on the Formatting Interface Board.
Damaged wire unit of the temperature sensor which measures the temperature at the front side of the DMD of the red channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

Code 5975: “dmd red front - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (reference S3 image 4-33) which measures the temperature at the front side of the DMD of the red channel. When disconnecting the wire unit (reference FR/R image 4-31) of the temperature sensor from the Formatting Interface Board the error code is changed to “dmd red front - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the red channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

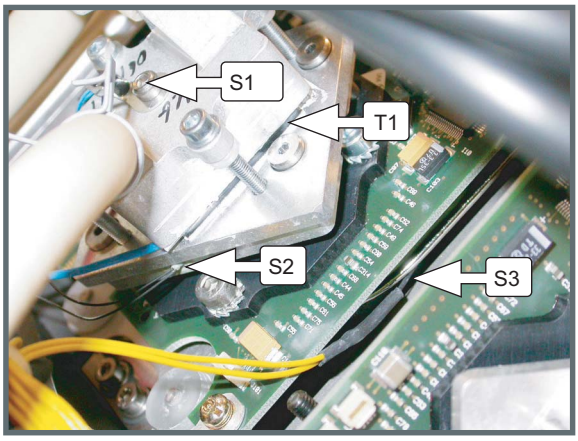


Image 4-33
Location temperature sensors and Peltier element per channel.

S1 Temperature sensor of the cooling block.
T1 Peltier element (TEC) between cooling block and DMD.
S2 Temperature sensor between Peltier element and DMD.
S3 Temperature sensor at the front side of the DMD.

Code 5980: “dmd green front - temperature too high” (Error)

This error code is probably preceded by the warning code 5981: “dmd green front - temperature high”. The same troubleshooting table can be applied.

Code 5981: “dmd green front - temperature high” (Warning)

Situation	Solution
The wire unit of the temperature sensor at the front of the DMD is mistakenly switched with one of the wire units of the other temperature sensors of the Light Processor Unit.	Check if all wire units of the temperature sensors are plugged into their respective sockets on the Formatting Interface Board. See image 4-31.
The wire units of the Peltier elements (TEC’s), mounted on the common cooling block of the heat pipes, are mistakenly switched.	Check if all wire units of the Peltier elements are plugged into their respective sockets on the Formatting Interface Board. See image 4-31.
No thermal contact between heat pipes and common cooling block due to loose screws.	Check if the four screws, which attach the heat pipes of the involved channel to the common cooling block, are fastened. See image 4-32.
Malfunction Peltier element (TEC) between heat pipes and common cooling block. Use the “diode test” of a multi-meter to check out the Peltier. Polarity does not matter. The Peltier is OK in case the measured value is higher then 0,01 volt.	Remove the light processor from its compartment and replace the malfunction Peltier. If problem persist, contact Barco for further instructions.

Code 5983: “dmd green front - temperature low” (Warning)

Situation	Solution
The temperature on the front side of the DMD of the green channel is low.	If this problem persist, contact Barco for further instructions.

Code 5984: “dmd green front - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference FR/G image 4-31) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug in the wire unit of the temperature sensor into its socket on the Formatting Interface Board.

Situation	Solution
Damaged wire unit of the temperature sensor which measures the temperature at the front side of the DMD of the green channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the green channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

Code 5985: “dmd green front - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (reference S3 image 4-33) which measures the temperature at the front side of the DMD of the green channel. When disconnecting the wire unit (reference FR/G image 4-31) of the temperature sensor from the Formatting Interface Board the error code is changed to “dmd green front - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the green channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

Code 5990: “dmd blue front - temperature too high” (Error)

This error code is probably preceded by the warning code 5991: “dmd blue front - temperature high”. The same troubleshooting table can be applied.

Code 5991: “dmd blue front - temperature high” (Warning)

Situation	Solution
The wire unit of the temperature sensor at the front of the DMD is mistakenly switched with one of the wire units of the other temperature sensors of the Light Processor Unit.	Check if all wire units of the temperature sensors are plugged into their respective sockets on the Formatting Interface Board. See image 4-31.
The wire units of the Peltier elements (TEC’s), mounted on the common cooling block of the heat pipes, are mistakenly switched.	Check if all wire units of the Peltier elements are plugged into their respective sockets on the Formatting Interface Board. See image 4-31.
No thermal contact between heat pipes and common cooling block due to loose screws.	Check if the four screws, which attach the heat pipes of the involved channel to the common cooling block, are fastened. See image 4-32.
Malfunction Peltier element (TEC) between heat pipes and common cooling block. Use the “diode test” of a multi-meter to check out the Peltier. Polarity does not matter. The Peltier is OK in case the measured value is higher then 0,01 volt.	Remove the light processor from its compartment and replace the malfunction Peltier. If problem persist, contact Barco for further instructions.

Code 5993: “dmd blue front - temperature low” (Warning)

Situation	Solution
The temperature on the front side of the DMD of the blue channel is low.	If this problem persist, contact Barco for further instructions.

Code 5994: “dmd blue front - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference FR/B image 4-31) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug in the wire unit of the temperature sensor into its socket on the Formatting Interface Board.
Damaged wire unit of the temperature sensor which measures the temperature at the front side of the DMD of the blue channel.	1. Repair the wire unit. 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the blue channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

Code 5995: “dmd blue front - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (reference S3 image 4-33) which measures the temperature at the front side of the DMD of the blue channel. When disconnecting the wire unit (reference FR/B image 4-31) of the temperature sensor from the Formatting Interface Board the error code is changed to “dmd blue front - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve 2. If not repairable, replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.
Defect temperature sensor which measures the temperature at the front side of the DMD of the blue channel.	Replace the whole Light Processor Unit. Contact Barco for further instructions to repair the malfunction light processor.

Code 6000: “block front - temperature too high” (Error)

This error code is probably preceded by the warning code 6001: “block front - temperature high”. The same troubleshooting table can be applied.

Code : “block front - temperature high” (Warning)

Situation	Solution
Interruption of the liquid cooling circuit.	Check if the loop of the liquid cooling circuit is closed.
The liquid cooling circuit of the Light Processor Unit is mistakenly excluded from the main liquid cooling circuit.	Reconnect the cooling circuit of the Light Processor Unit with the pump and heat exchanger.
The pump of the water cooling is electrical disconnected.	Check if the wire unit of the pump is properly connected.
Blocked high density filter of the heat exchanger.	Replace the high density filter. See service manual chapter page 397.
No or insufficient liquid inside the cooling circuit. The pump is sucking air and sounds noisier then normal.	Fill the cooling circuit with liquid and expel all air. Pressurize the circuit.
Malfunction pump of the cooling circuit. You don’t feel any vibrations when touching the pump after activating the “Refill mode” via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See service manual chapter "Cleaning the cooling pump", page 240.

Code 6004: “block front - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference H image 4-31) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug in the wire unit of the temperature sensor into its socket on the Formatting Interface Board.
Damaged wire unit of the temperature sensor (Reference H image 4-34) which measures the temperature of the common water cooling block of the heat pipes which drain the heat from the front of the DMD’s.	1. Repair the wire unit. 2. If not repairable, replace the Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor (Reference H image 4-34) which measures the temperature of the common water cooling block of the heat pipes which drain the heat from the front of the DMD’s.	Replace the Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

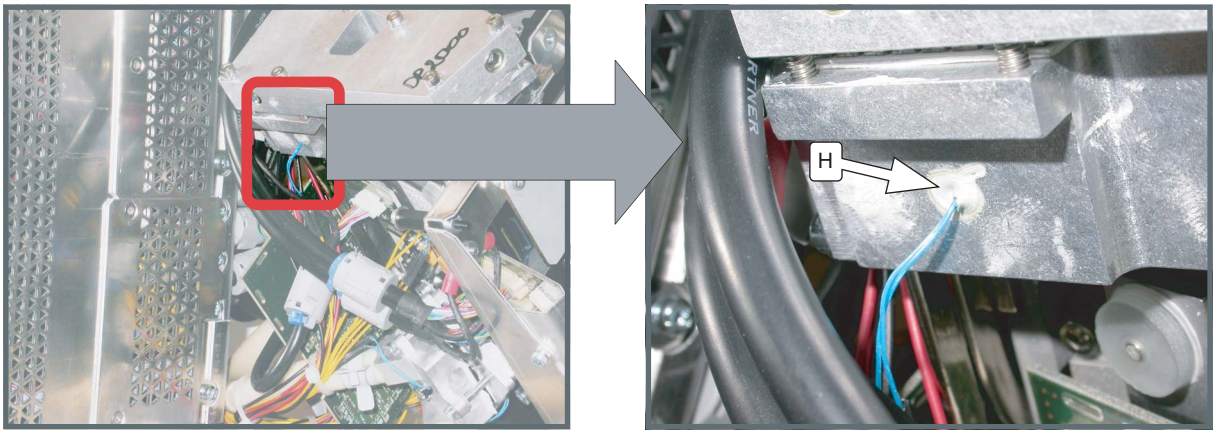


Image 4-34
H Temperature sense Heat pipes cooling blocks (block front).

Code 6005: “block front - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (Reference H image 4-34) which measures the temperature of the common water cooling block of the heat pipes which drain the heat from the front of the DMD’s. When disconnecting the wire the wire unit (reference H image 4-31) of the temperature sensor from the Formatting Interface Board the error coded is changed to “block front - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.
Defect temperature sensor (Reference H image 4-34) which measures the temperature of the common water cooling block of the heat pipes which drain the heat from the front of the DMD’s. When disconnecting the wire the wire unit (reference H image 4-31) of the temperature sensor from the Formatting Interface Board the error coded is changed to “block front - temperature sensor open”.	Replace the Light Processor Unit. Contact Barco for further instructions to repair the malfunction Light Processor Unit.

Code 6010: “block red - temperature too high” (Error)

This error code is probably preceded by the warning code 6011: “block red - temperature high”. The same troubleshooting table can be applied.

Code 6011: “block red - temperature high” (Warning)

Situation	Solution
Interruption of the liquid cooling circuit.	Check if the loop of the liquid cooling circuit is closed.
The liquid cooling circuit of the Light Processor Unit is mistakenly excluded from the main liquid cooling circuit.	Reconnect the cooling circuit of the Light Processor Unit with the pump and heat exchanger.
The pump of the water cooling is electrical disconnected.	Check if the wire unit of the pump is properly connected.
Blocked high density filter of the heat exchanger.	Replace the high density filter. See service manual chapter page 397.
No or insufficient liquid inside the cooling circuit. The pump is sucking air and sounds noisier then normal.	Fill the cooling circuit with liquid and expel all air. Pressurize the circuit.
Malfunction pump of the cooling circuit. You don’t feel any vibrations when touching the pump after activating the “Refill mode” via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See service manual chapter "Cleaning the cooling pump", page 240.

Code 6014: “block red - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference BL/R image 4-31) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug in the wire unit of the temperature sensor into its socket on the Formatting Interface Board.
Damaged wire unit of the temperature sensor (Reference BL/R image 4-35) which measures the temperature of the water cooling block of the red channel.	1. Repair the wire unit. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor (Reference BL/R image 4-35) on the water cooling block of the red channel.	Replace the temperature sensor.

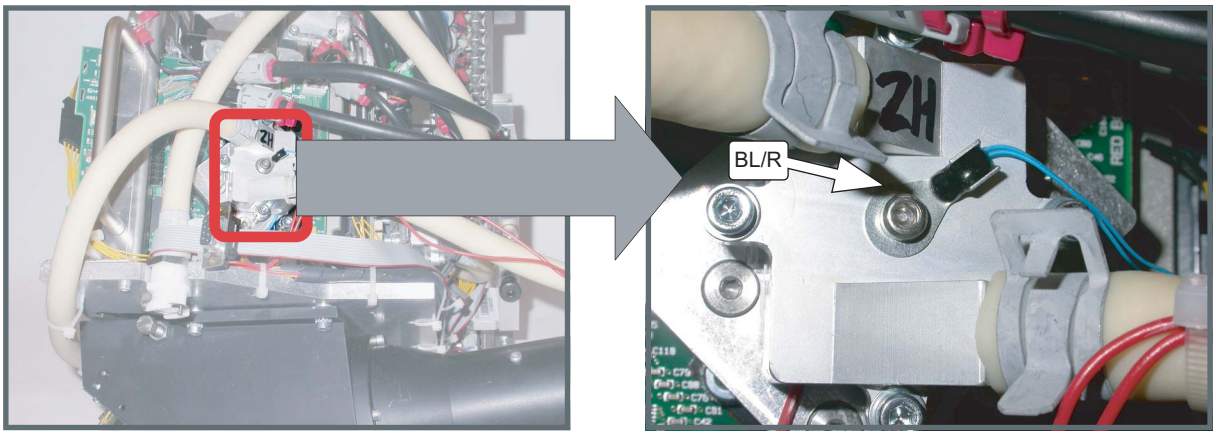


Image 4-35
B Temperature sensor DMD water cooling block of the red channel.

Code 6015: “block red- temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (reference R image 4-35) which measures the temperature of the water cooling block of the red channel. When disconnecting the wire unit (reference BL/R image 4-31) of the temperature sensor from the Formatting Interface Board the error code is changed to “block red - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor on the water cooling block of the red channel. When disconnecting the wire unit (reference BL/R image 4-31) of the temperature sensor from the Formatting Interface Board the error code is changed to “block red - temperature sensor open”.	Replace the temperature sensor.

Code 6020: “block green - temperature too high” (Error)

This error code is probably preceded by the warning code 6021: “block green - temperature high”. The same troubleshooting table can be applied.

Code 6021: “block green - temperature high” (Warning)

Situation	Solution
Interruption of the liquid cooling circuit.	Check if the loop of the liquid cooling circuit is closed.
The liquid cooling circuit of the Light Processor Unit is mistakenly excluded from the main liquid cooling circuit.	Reconnect the cooling circuit of the Light Processor Unit with the pump and heat exchanger.
The pump of the water cooling is electrical disconnected.	Check if the wire unit of the pump is properly connected.
Blocked high density filter of the heat exchanger.	Replace the high density filter. See service manual chapter page 397.
No or insufficient liquid inside the cooling circuit. The pump is sucking air and sounds noisier then normal.	Fill the cooling circuit with liquid and expel all air. Pressurize the circuit.
Malfunction pump of the cooling circuit. You don’t feel any vibrations when touching the pump after activating the “Refill mode” via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See service manual chapter "Cleaning the cooling pump", page 240.

Code 6024: “block green - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference BL/G image 4-31) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug in the wire unit of the temperature sensor into its socket on the Formatting Interface Board.
Damaged wire unit of the temperature sensor (Reference BL/G image 4-36) which measures the temperature of the water cooling block of the green channel.	1. Repair the wire unit. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor (Reference BL/G image 4-36) on the water cooling block of the green channel.	Replace the temperature sensor.

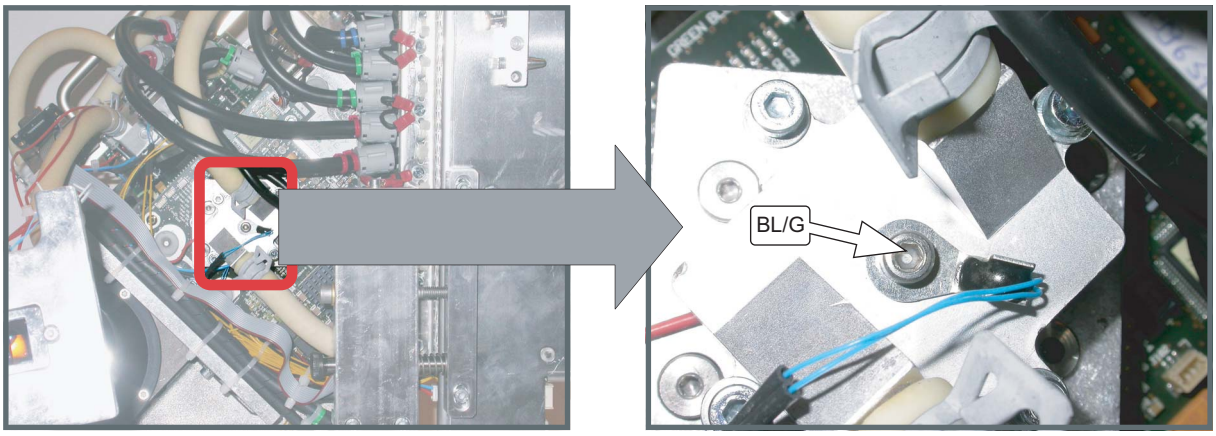


Image 4-36
B Temperature sensor DMD water cooling block of the green channel.

Code 6025: “block green - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (reference G image 4-36) which measures the temperature of the water cooling block of the green channel. When disconnecting the wire unit (reference BL/G image 4-31) of the temperature sensor from the Formatting Interface Board the error code is changed to “block green - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor on the water cooling block of the green channel. When disconnecting the wire unit (reference BL/G image 4-31) of the temperature sensor from the Formatting Interface Board the error code is changed to “block green - temperature sensor open”.	Replace the temperature sensor.

Code 6030: “block blue - temperature too high” (Error)

This error code is probably preceded by the warning code 6031: “block blue - temperature high”. The same troubleshooting table can be applied.

Code 6031: “block blue - temperature high” (Warning)

Situation	Solution
Interruption of the liquid cooling circuit.	Check if the loop of the liquid cooling circuit is closed.
The liquid cooling circuit of the Light Processor Unit is mistakenly excluded from the main liquid cooling circuit.	Reconnect the cooling circuit of the Light Processor Unit with the pump and heat exchanger.
The pump of the water cooling is electrical disconnected.	Check if the wire unit of the pump is properly connected.
Blocked high density filter of the heat exchanger.	Replace the high density filter. See service manual chapter page 397.
No or insufficient liquid inside the cooling circuit. The pump is sucking air and sounds noisier then normal.	Fill the cooling circuit with liquid and expel all air. Pressurize the circuit.
Malfunction pump of the cooling circuit. You don’t feel any vibrations when touching the pump after activating the “Refill mode” via the Communicator software.	1. Check the electrical resistance of the pump winding. Replace the pump if infinite. 2. Drain the liquid cooling circuit, open the pump and check if the pump rotor is not blocked. If so, remove the rotor and clean the bearings of the pump. See service manual chapter "Cleaning the cooling pump", page 240.

Code 6034: “block blue - temperature sensor open” (Error)

Situation	Solution
Wire unit (reference BL/B image 4-31) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug in the wire unit of the temperature sensor into its socket on the Formatting Interface Board.
Damaged wire unit of the temperature sensor (Reference BL/B image 4-37) which measures the temperature of the water cooling block of the blue channel.	1. Repair the wire unit. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor (Reference BL/B image 4-37) on the water cooling block of the blue channel.	Replace the temperature sensor.

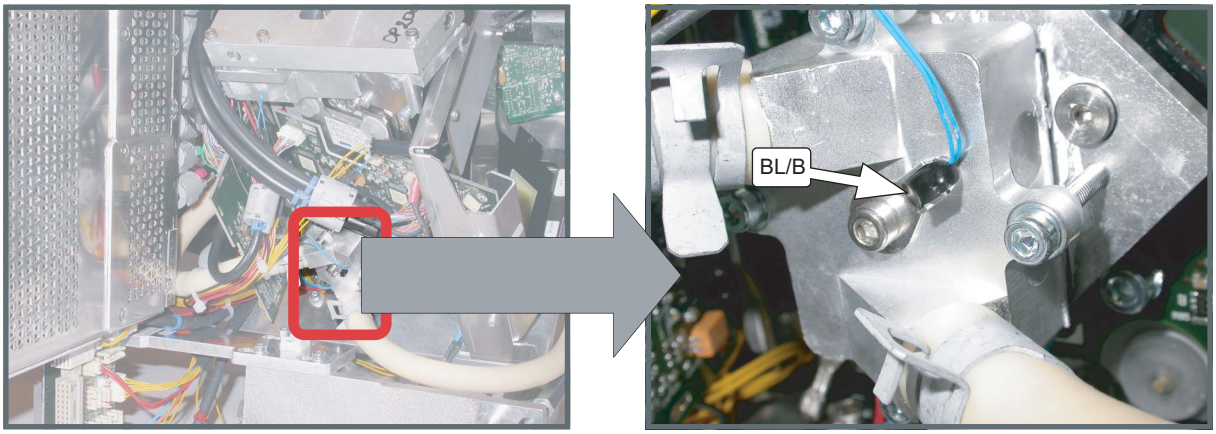


Image 4-37
BL/B Temperature sensor DMD water cooling block of the blue channel.

Code 6035: “block blue - temperature sensor short” (Error)

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (reference B image 4-37) which measures the temperature of the water cooling block of the blue channel. When disconnecting the wire unit (reference BL/B image 4-31) of the temperature sensor from the Formatting Interface Board the error code is changed to “block blue - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor on the water cooling block of the blue channel. When disconnecting the wire unit (reference BL/B image 4-31) of the temperature sensor from the Formatting Interface Board the error code is changed to “block blue - temperature sensor open”.	Replace the temperature sensor.

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 air inlets at the bottom of the projector.	Check if the air inlet at the bottom of the projector is free.

Situation	Solution
Blocked air inlets at the front of the projector.	Check if the air inlet at the front of the projector is free.
Filthy high density filter of the heat exchanger.	Clean or replace the high density filter underneath the heat exchanger at the bottom of the projector.
Filthy high density filter of the electronics.	Clean or replace the high density filter at the front side of the projector.
Malfunction air extraction system.	Check customer air extraction system for adequate extraction. The air extraction system must be capable of removing minimum 6,65 m³/min or 235 CFM per installed DP-2000/DP-1500 digital projector.
Malfunction ambient temperature sensor (reference E image 4-38) of the Light Processor unit.	Replace the temperature sensor.
Transport plate at the bottom of the projector is not removed.	Make sure that the plate (part of the packaging), on which the projector is mounted for transport, is removed.

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

Situation	Solution
Wire unit (reference E image 4-31) of the temperature sensor is disconnected from the Formatting Interface Board.	Plug the wire unit of the temperature sensor into its socket on the Formatting Interface Board.
Damaged wire unit of the temperature sensor (reference E image 4-38).	1. Repair the wire unit. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor (reference E image 4-38).	Replace the temperature sensor.

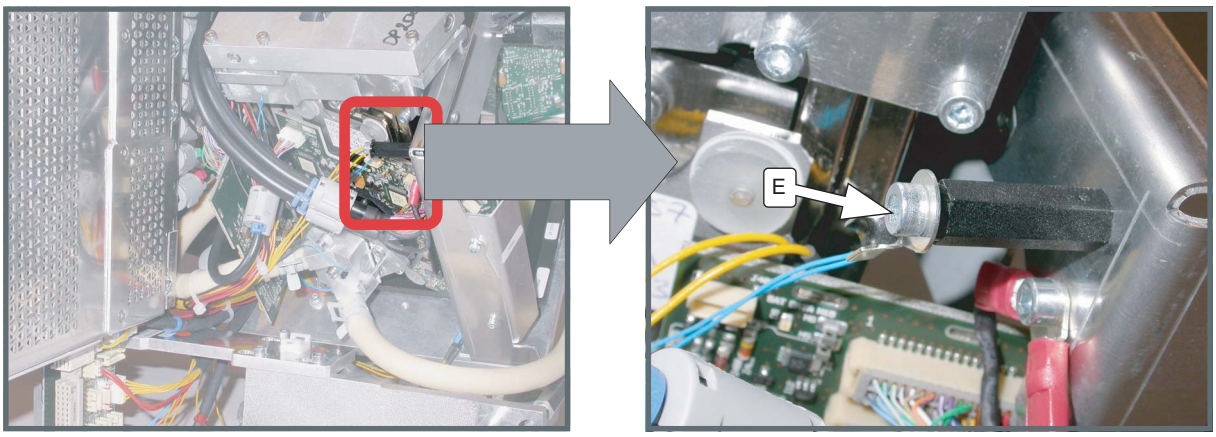


Image 4-38
E Temperature sensor compartment Light Processor Unit.

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

Situation	Solution
Damaged insulation of the wire unit of the temperature sensor (reference E image 4-38), which measures the temperature inside the compartment of the Light Processor Unit. When disconnecting the wire unit of the temperature sensor from the Formatting Interface Board (reference E image 4-31) the error code is changed to “engine air - temperature sensor open”.	1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and temperature sensor.
Defect temperature sensor (reference E image 4-38) of the Light Processor Unit. When disconnecting the wire unit of the temperature sensor from the Formatting Interface Board (reference E image 4-31) the error code is changed to “engine air - temperature sensor open”.	Replace the whole wire unit and temperature sensor.

Code 6884: “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 7473: “lamp cathode fan - voltage low” (Warning)

Situation	Solution
Malfunction SMPS module. All other fans also report voltage low error.	Replace the SMPS module.
Damaged insulation of the wire unit (reference C image 4-39) of the cathode fan (reference FC image 4-39).	Check the insulation of the wire unit of the cathode fan. The cathode fan is located between the lamp compartment and the Input & Communication Unit. 1. Repair the insulation of the wire unit using shrink sleeve. 2. If not repairable, replace the whole wire unit and/or fan.
Malfunction Fan & Motor Control board.	Replace the Fan & Motor Control board.
Malfunction Power Backplane (bad connection)	Replace the Power Backplane.

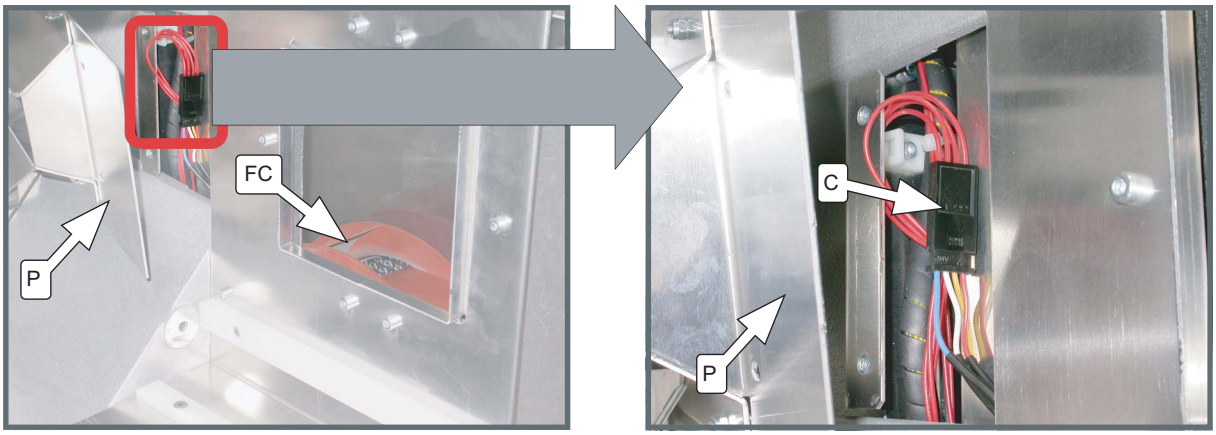


Image 4-39
P Cover plate.
FC Lamp cathode fan. Located between the lamp compartment and the Input & Communication Unit.
C Wire unit connection of the lamp cathode fan.

5. REMOVAL AND INSTALLATION OF PROJECTOR COVERS

About this chapter

Most maintenance and servicing 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 some covers may only be removed by qualified service personnel, see remarks above each procedure.

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 cover
- Removal of the input cover
- Removal of the front cover
- Removal of the side cover
- Removal of the rear cover
- Removal of the top cover
- Open the sealed compartment
- Close the sealed compartment
- Installation of the top cover
- Installation of the rear cover
- Installation of the side cover
- Installation of the front cover
- Installation of the input cover
- Installation of the lamp cover

5.1 Removal of the lamp cover

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

Necessary tools

7 mm flat screw driver.

How to remove the lamp cover of the projector?

1. Release the two captive screws at the top and bottom right side of the lamp cover, using a flat screw driver.

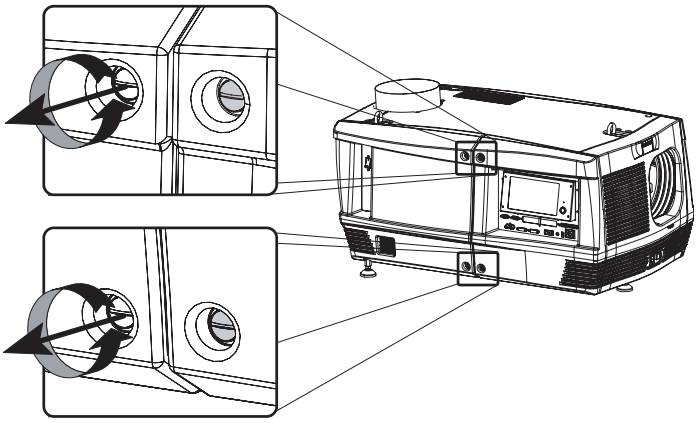


Image 5-1

2. Remove the lamp cover from the projector doing the following:
   a) gently pull out the left bottom corner (A) of the lamp cover,
   b) then gently pull out the left top corner (B) of the lamp cover,
   c) then move the lamp cover away from the projector (C).

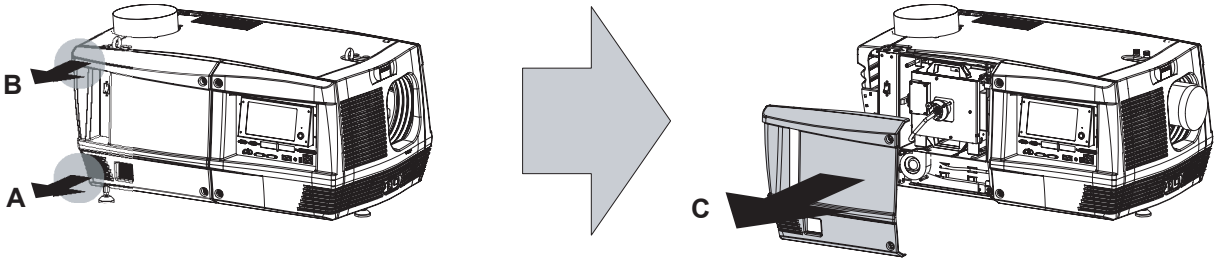


Image 5-2

5.2 Removal of the input cover

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

Necessary tools

7 mm flat screw driver.

How to remove the input cover of the projector?

1. Release the two captive screws at the top and bottom left side of the input cover, using a flat screw driver.

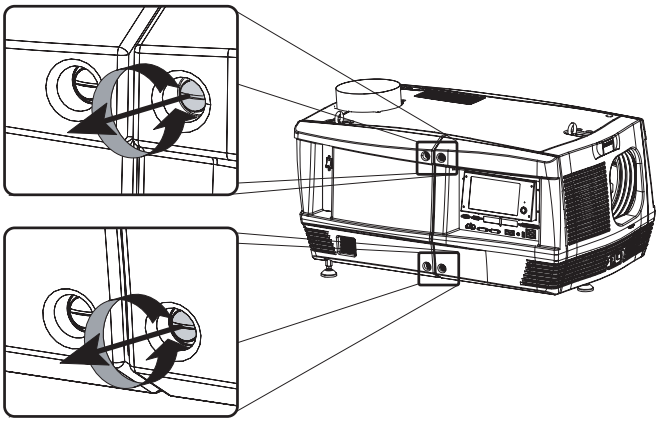


Image 5-3

2. Remove the input cover from the projector doing the following:
   a) gently pull out the right bottom corner (A) of the input cover,
   b) then gently pull out the right top corner (B) of the input cover,
   c) then move the input cover away from the projector (C).

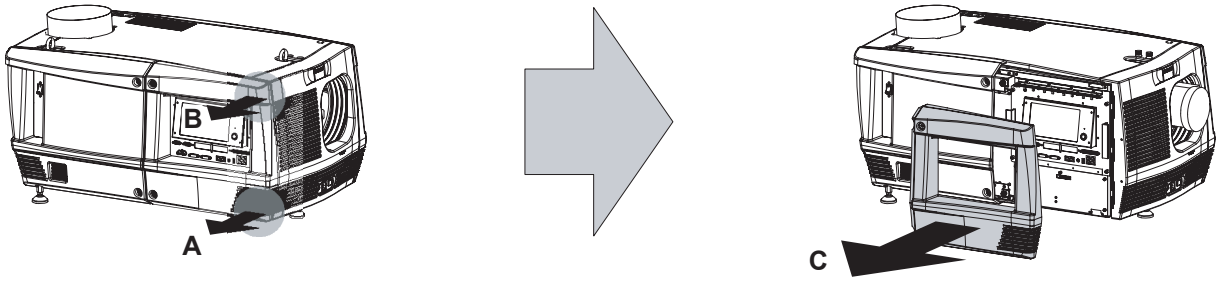


Image 5-4

5.3 Removal of the front cover

The input cover and the lens have to be removed before removing the front cover. See procedures "Removal of the input cover", page 83, and "Lens removal", page 254.

Necessary tools

7 mm flat screw driver.

How to remove the front cover of the projector?

1. Check if the input cover and the lens are removed.
2. Remove the rubber dust ring from the lens holder. See the detail at the right side of image 5-5.
3. Release the captive screw at the middle bottom of the front cover, using a flat screw driver.

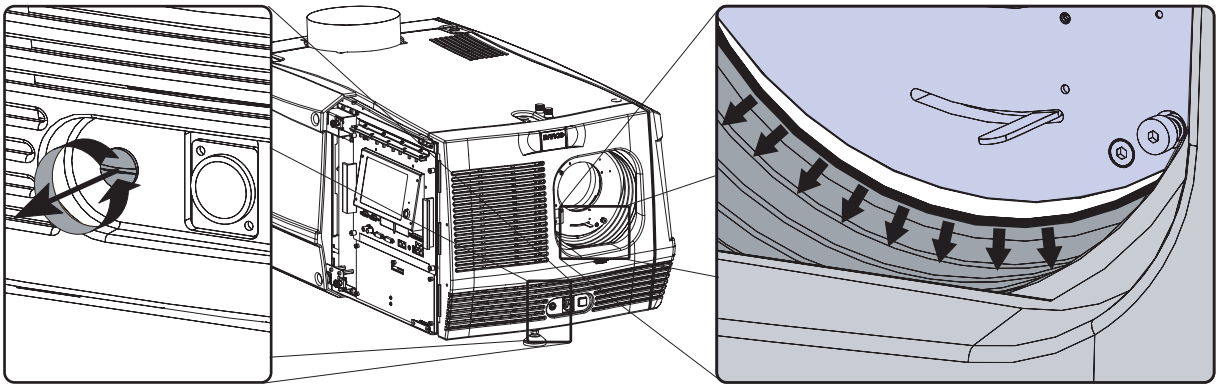


Image 5-5

4. Remove the front cover from the projector doing the following:
   a) standing in front of the projector, pull the upper right corner (A) of the front cover toward you until the latch releases,
   b) pull the lower right corner (B) of the front cover toward you until the latch releases,
   c) then move the front cover away from the projector.

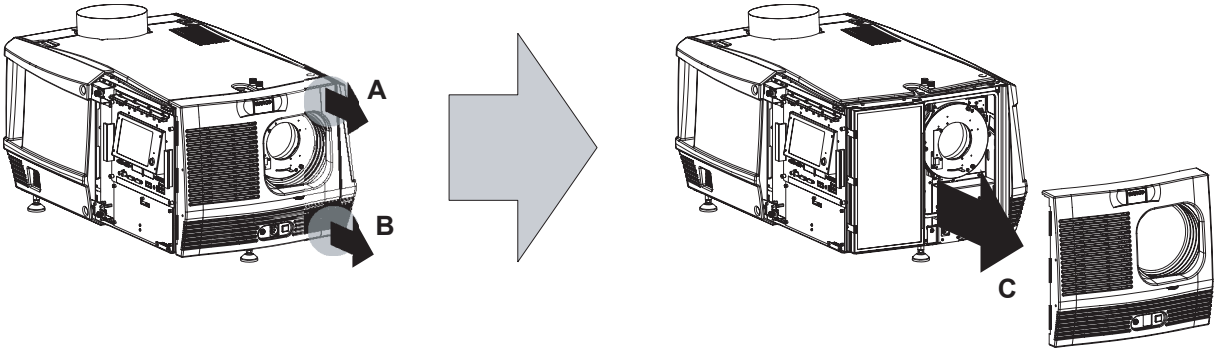


Image 5-6

5.4 Removal of the side cover

Necessary tools

Flat screw driver.

How to remove the side cover of the projector?

1. Release the captive screw at the middle bottom of the side cover, using a flat screw driver.

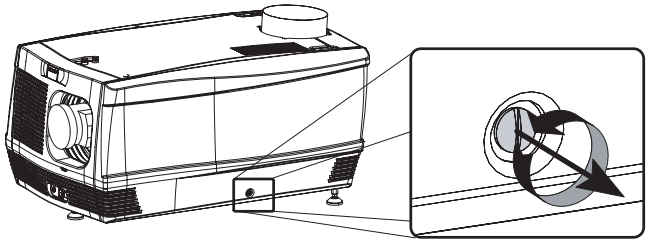


Image 5-7

2. Remove the side cover from the projector doing the following:
   a) gently pull out the bottom corners (A) of the side cover,
   b) then gently pull out the top corners (B) of the side cover,
   c) then move the side cover away from the projector (C).

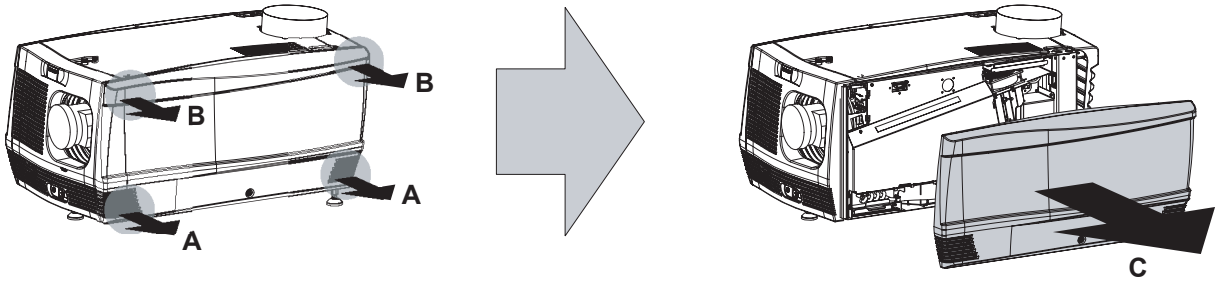


Image 5-8

5.5 Removal of the rear cover

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

Necessary tools

7 mm flat screwdriver.

How to remove the rear cover from the projector?

1. Release the two captive screws at the bottom corners of the rear cover, using a flat screw driver.

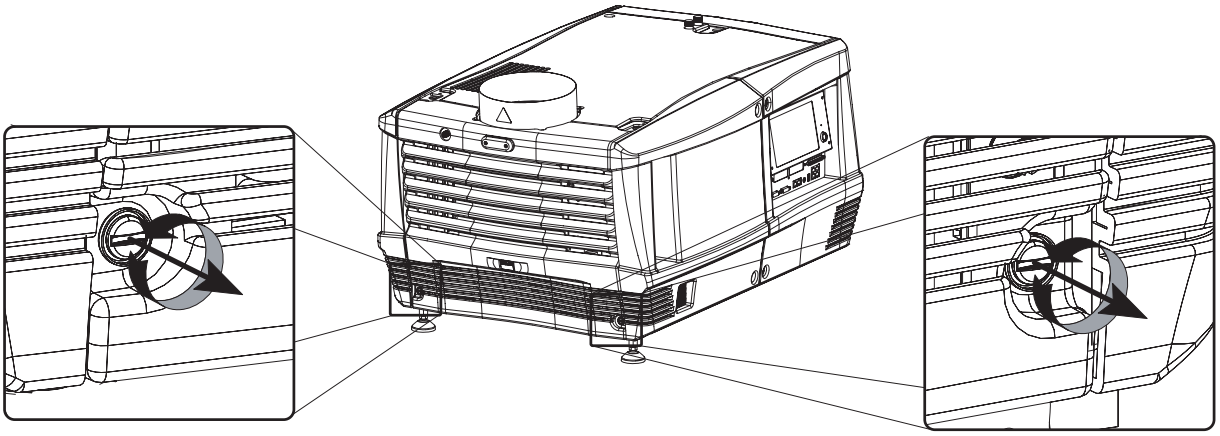


Image 5-9

2. Remove the rear cover of the projector doing the following:
   a) gently pull out the top corners of the rear cover,
   b) then move the rear cover away from the projector.

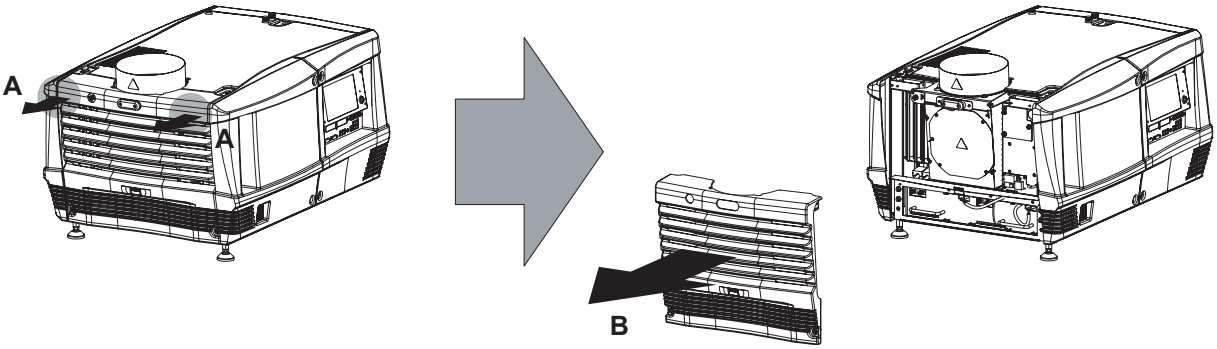


Image 5-10

5.6 Removal of the top cover

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

All side covers, front cover and back cover have to be removed before removing the top cover.

Necessary tools

Allen key 5 mm

How to remove the top cover of the projector?

1. After all side covers, front and back cover are removed, turn out both fixation screws.

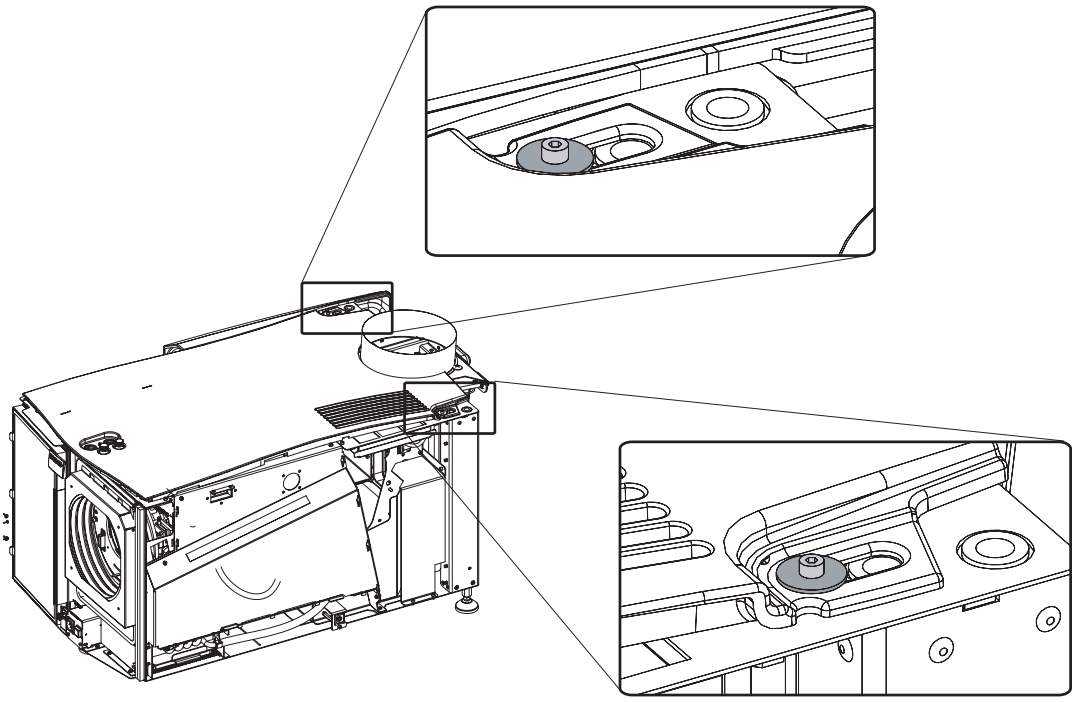


Image 5-11

2. Lift up the top cover and take it off.

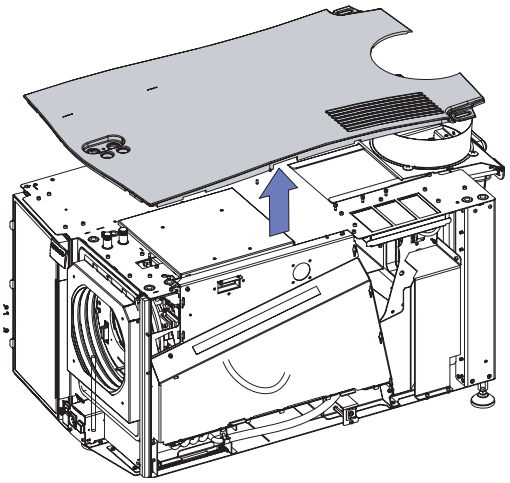


Image 5-12

5.7 Open the sealed compartment

This procedure assumes that the left side cover of the projector is already removed.

Necessary tools

3 mm Allen wrench.

How to open the sealed compartment of the Light Processor Unit?

1. Release the three hexagon head cap screws as illustrated. Use for that a 3 mm Allen wrench.
   Note: *A washer is mounted between the plate and the screw head.*

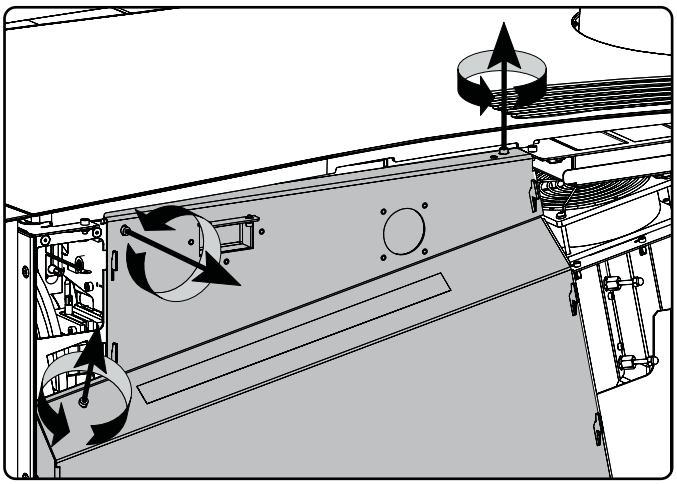


Image 5-13

2. Lift up the cover plate slightly, using the two lower lips provided, and then remove the cover plate away from the projector.

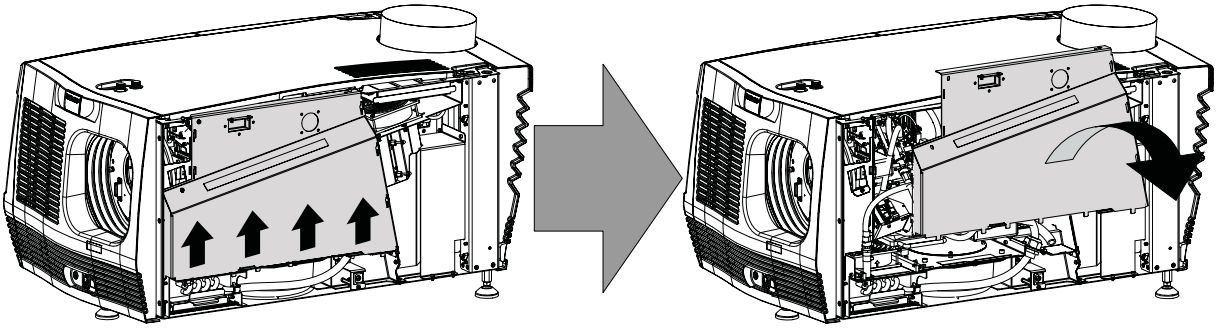


Image 5-14

5.8 Close the sealed compartment

Necessary tools

3 mm Allen wrench.

How to close the sealed compartment of the Light Processor Unit?

1. Place the cover plate in its place as illustrated.
   Caution: *Do not damage the micro switch at the top of the projector.*

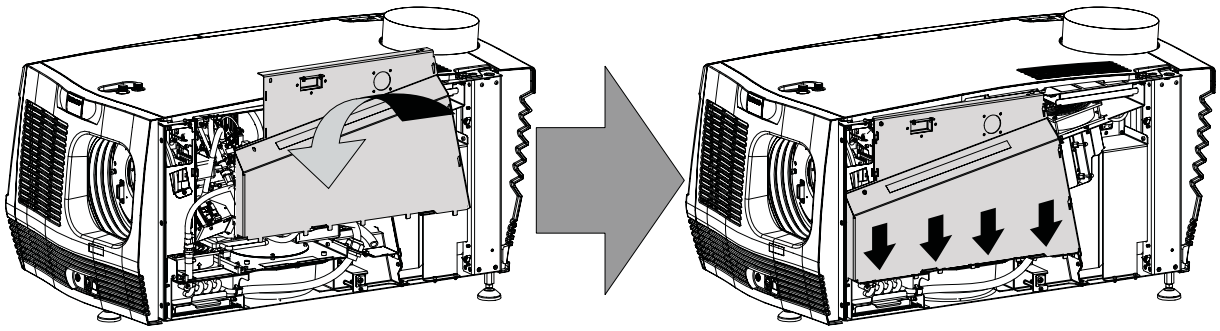


Image 5-15

2. Fasten the three hexagon head cap screws as illustrated. Use for that a 3 mm Allen wrench.
   Note: *Insert a washer between the each screw and the plate.*

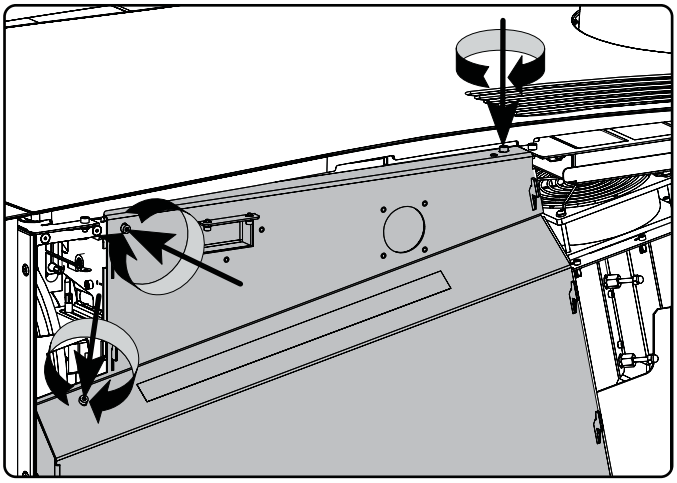


Image 5-16

5.9 Installation of the top cover

Necessary tools

Allen key 5 mm

How to install the top cover of the projector?

1. Place the top cover on the projector so that both holes matches the adjustment studs on top of the projector.

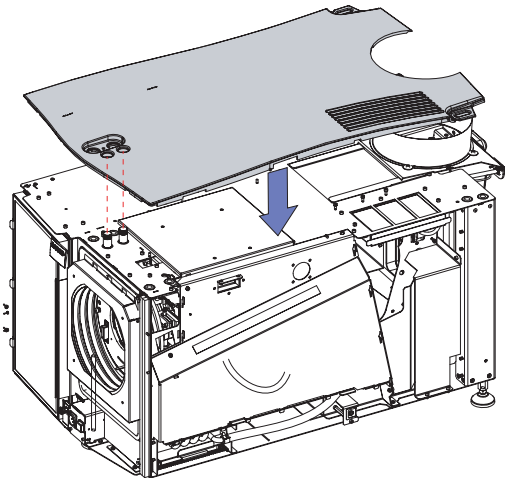


Image 5-17

2. Turn in both fixation screws. Insert the washer between the screw and the top cover.

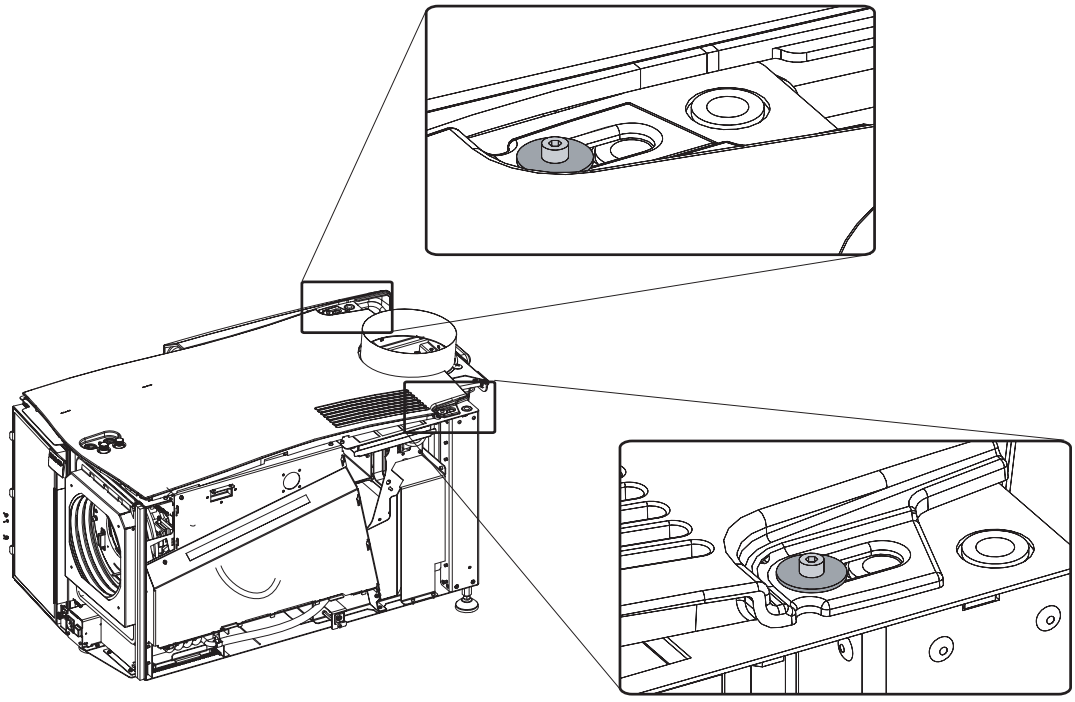


Image 5-18

5.10 Installation of the rear cover

Necessary tools

7 mm flat screwdriver.

How to install the rear cover of the projector?

1. Install the rear cover of the projector doing the following:
   a) Bring the rear cover towards it final position,
   b) then gently push the locking studs of the top corners into their receivers

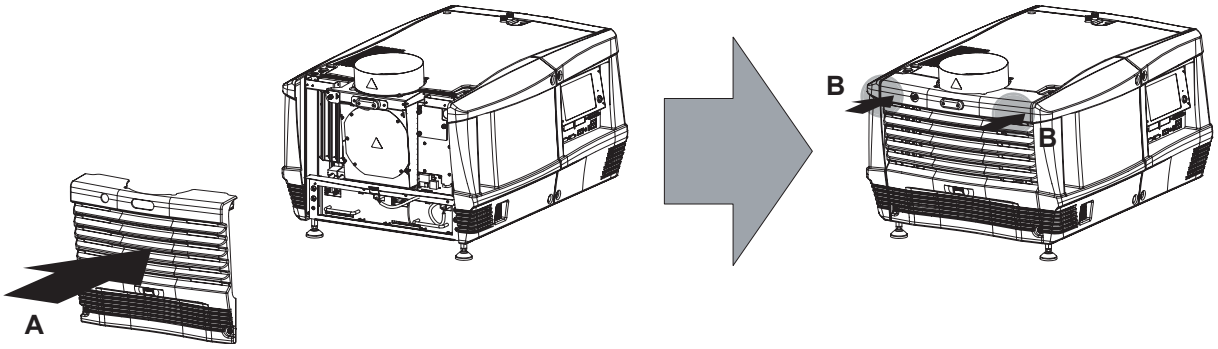


Image 5-19

2. Secure the rear cover by locking the captive screws at the bottom corners of the rear cover.

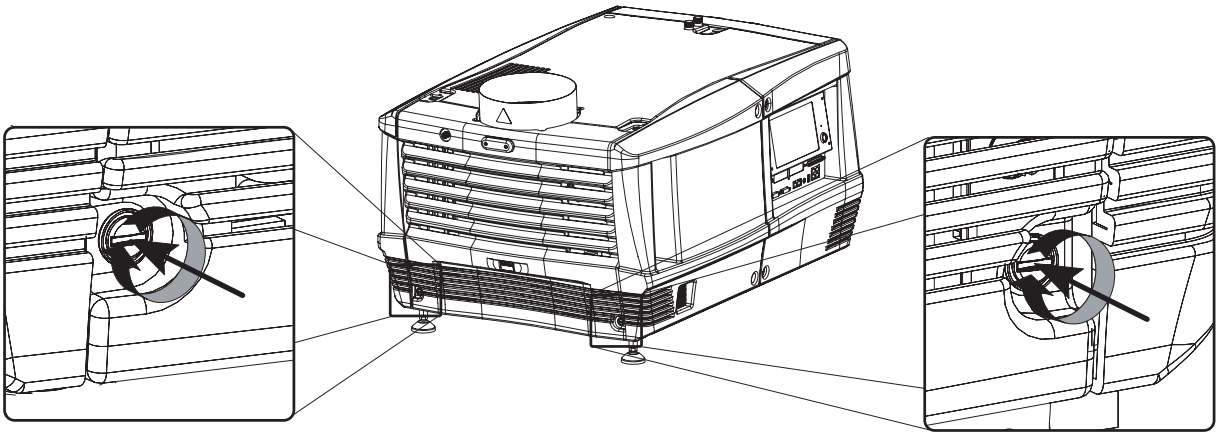


Image 5-20

5.11 Installation of the side cover

Necessary tools

7 mm flat screw driver.

How to install the side cover of the projector?

1. Check if the bottom and top filters are present.
2. Look through the small window, which is provided on the security cover of the light processor and check the pressure indicated on the internal manometer of the liquid cooling circuit. This pressure should be between 0,5 and 1 bar. If the pressure is out of range, inform the responsible and qualified technician, so he may take necessary corrective action.

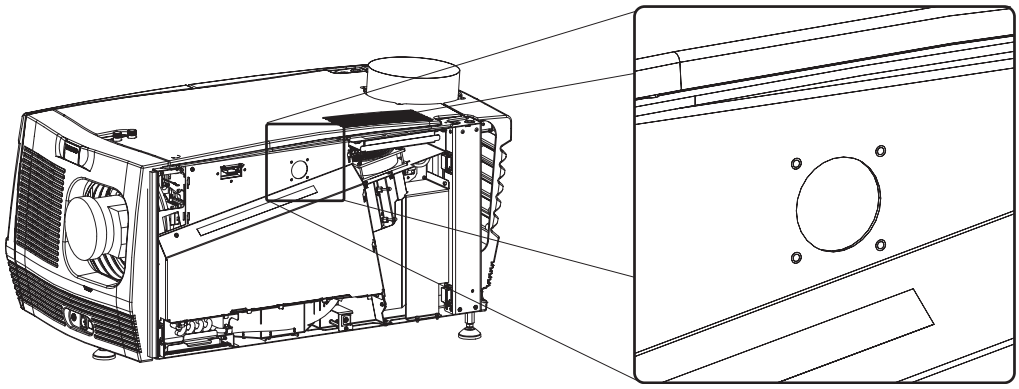


Image 5-21

3. Install the side cover of the projector doing the following:
   a) Bring the side cover towards its final position (A),
   b) then gently push the locking studs of the top corners (B) into their receivers,
   c) then gently push the locking studs of the bottom corners (C) into their receivers.

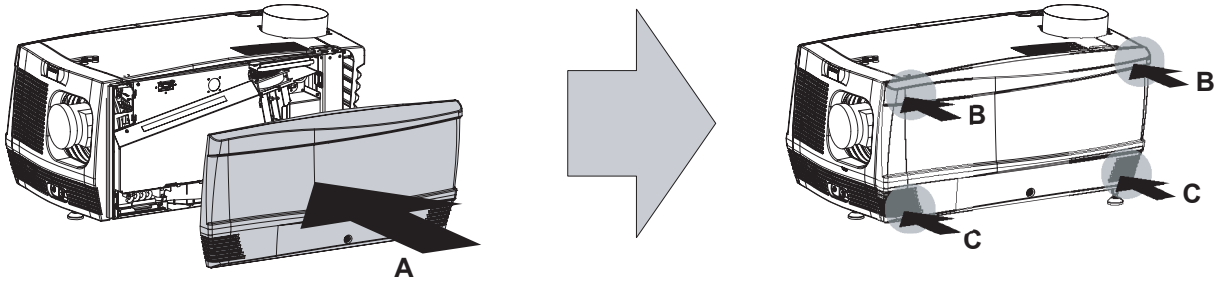


Image 5-22

4. Secure the side cover by locking the captive screw in the middle at the bottom of the side cover.

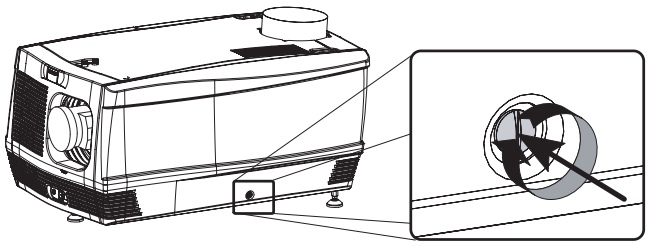


Image 5-23

5.12 Installation of the front cover

The input cover and the lens may not be installed yet.

Necessary tools

7 mm flat screw driver.

How to install the front cover of the projector?

1. Check if the front filter is present.
2. Ensure that no lens is mounted and that the input cover is not installed.
3. Install the front cover of the projector doing the following:
   a) first hook in the side of the front cover at the front filter,
   b) then gently push the other side of the front cover into position,
   c) ensure that the locking studs in the corners click into their receivers.

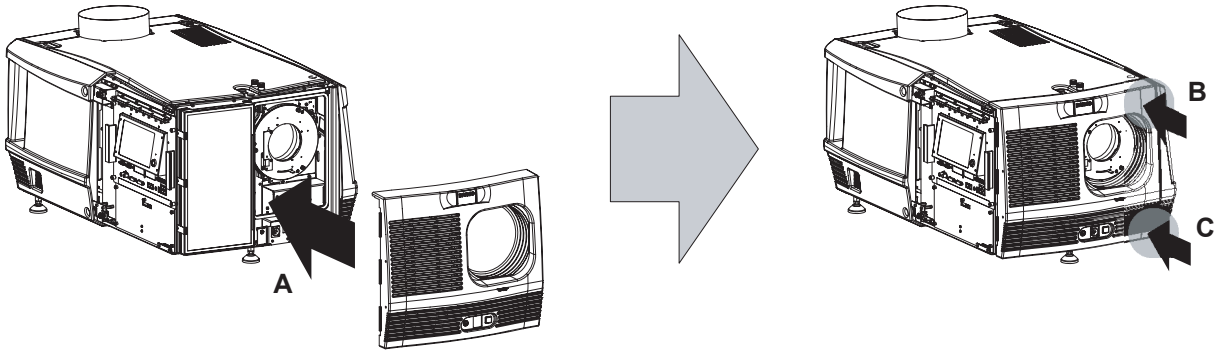


Image 5-24

4. Secure the front cover by locking the captive screw in the middle at the bottom of the front cover.

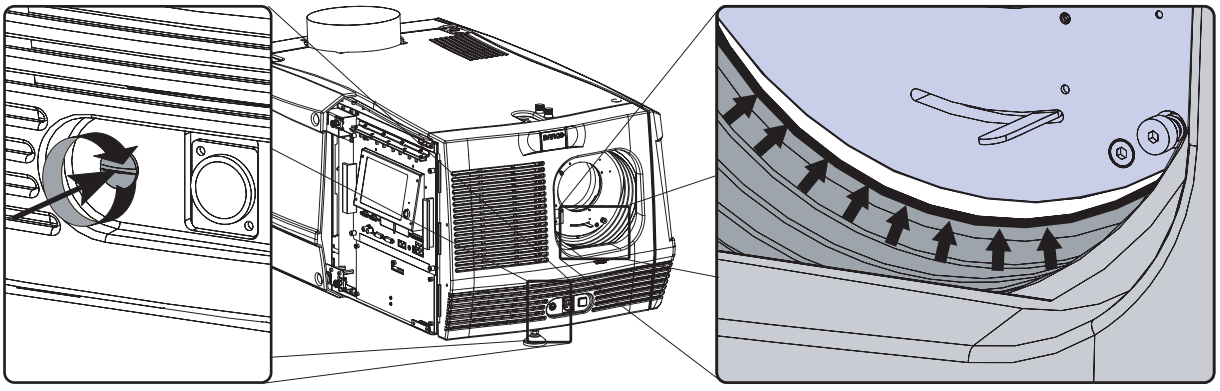


Image 5-25

5. Reinstall the rubber dust ring around the lens holder. See detail at the right of image 5-25.

5.13 Installation of the input cover

Necessary tools

7 mm flat screw driver.

How to install the input cover of the projector?

1. Install the input cover of the projector doing the following:
   a) Bring the input cover towards its final position (A),
   b) then gently push the locking stud at the right top corner (B) into its receiver,
   c) then gently push the locking stud at the right bottom corner (C) into its receiver.

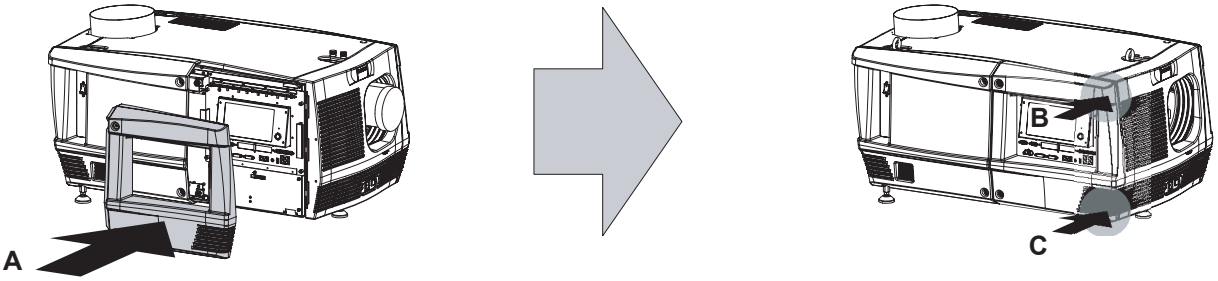


Image 5-26

2. Secure the input cover by locking the two captive screws at the left side of the input cover.

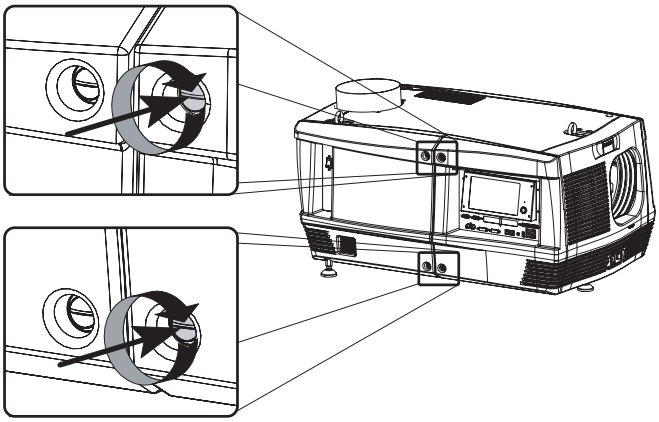


Image 5-27

5.14 Installation of the lamp cover

Necessary tools

7 mm flat screw driver.

How to install the lamp cover of the projector?

1. Install the lamp cover of the projector doing the following:
   a) Bring the lamp cover towards its final position (A),
   b) then gently push the locking stud at the left top corner (B) into its receiver,
   c) then gently push the locking stud at the left bottom corner (C) into its receiver.

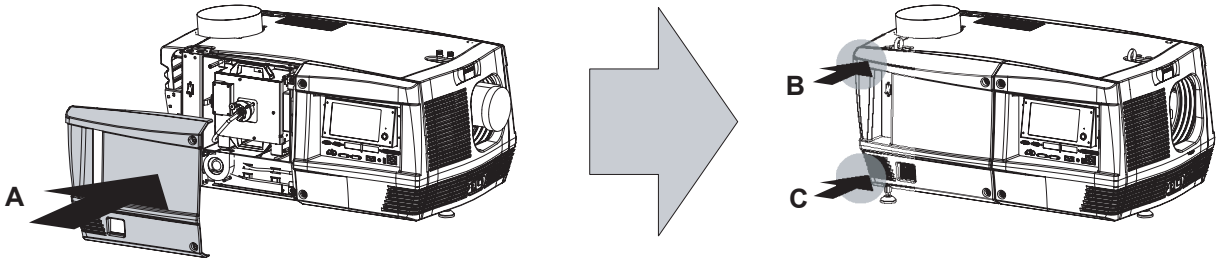


Image 5-28

2. Secure the lamp cover by locking the two captive screws at the right side of the lamp cover.

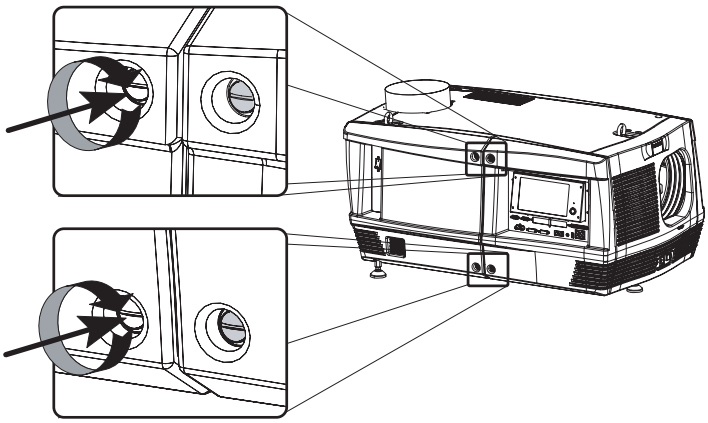


Image 5-29

6. LAMPS AND LAMP HOUSE

About this chapter

This chapter enumerates all the supported xenon lamps for the DP-2000/DP-1500 digital projector 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, lamp reflector and the Lamp Info unit.

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 with neck protector) 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
- Removal of the lamp house
- Removal of the xenon lamp
- Installation of the xenon lamp
- Installation of the lamp house
- Resetting the lamp parameters
- Realignment of the lamp in its reflector
- Replacement of the Lamp Info module
- Replacement of the UV blocker
- Replacement of the UV blocker
- Replacement of the lamp reflector
- Cleaning the Reflector of the Lamp House
- Cleaning the UV blocker of the Lamp House

6.1 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 a level between 25 and 35 volt. The DC current consumed by the lamp during normal operation can increase to 130 ampere. The maximum light produced by the xenon lamp inside the DP-2000/DP-1500 digital projector is roughly 180000 lumens.

The xenon lamp is safely sheltered inside the lamp house. The lamp house exist in a reflector, a UV blocker, an lamp anode socket, a lamp cathode socket, a lamp info module, and an XYZ-adjustment mechanism to align the lamp in the reflector. The lamp house can handle xenon lamps up to 4200 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 info module holds the lamp parameters and keeps track of the lamp history such as lamp power, number of strikes, total lamp run time, etc. For that it is important to reset the lamp parameters after each lamp replacement.

Parts identification xenon lamp

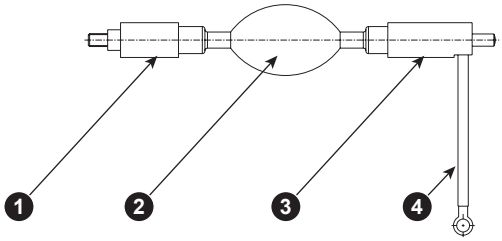


Image 6-1
1 Cathode of the xenon lamp.
2 Envelope of the xenon lamp.
3 Anode of the xenon lamp.
4 Anode wire of the xenon lamp.

Parts identification lamp house

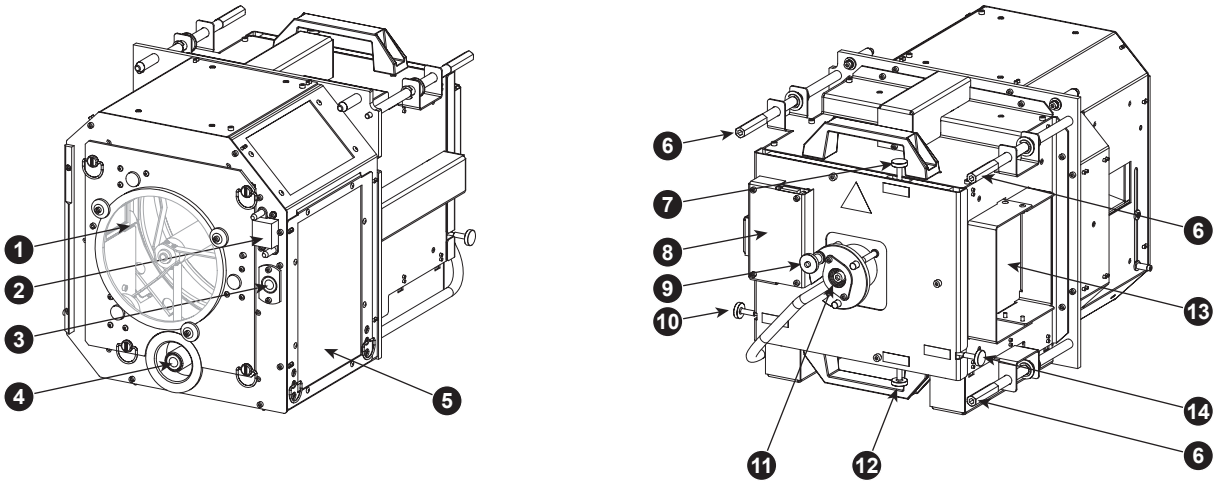


Image 6-2
1 UV blocker.
2 Connection Lamp Info Module.
3 Cathode connection with SPG.
4 Anode connection with SPG
5 Removable side panel.
6 Fixation screw lamp house.
7 Adjustment screw vertical lamp alignment.
8 Lamp Info Module.
9 Adjustment screw for lamp Z-alignment.
10 Lock screw horizontal lamp alignment.
11 Lamp cathode fixation screw.
12 Lock screw vertical lamp alignment.
13 Air inlet cathode cooling.
14 Adjustment screw horizontal lamp alignment.

6.2 Supported xenon lamps

Supported xenon lamps (without lamp house)

Lamp	Type	Order info
Osram xenon lamp of 4 kW	4kW DHP	**R9855937**
Osram xenon lamp of 3 kW	3kW DHP	**R9855938**
Osram xenon lamp of 2 kW	2kW DHP	**R9855956**
Osram xenon lamp of 1,2 kW	1,2kW DHP	**R9855959**
Ushio xenon lamp of 4 kW	DXL40BAF	**R9855939**
Ushio xenon lamp of 3 kW	DXL30BAF	**R9855940**
Ushio xenon lamp of 2 kW	DXL20BAF	**R9855955**
Ushio xenon lamp of 1,2 kW	DXL12BAF	**R9855961**

Protective packaging

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 chield, clean cotton glovers, welder's jacket).

Image 6-3

6.3 Removal of the lamp house

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

CAUTION: Lamp casing is very hot after operation. To avoid burns, let the projector cool down for at least 15 minutes before proceeding to the lamp unit replacement.

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

Necessary tools

7 mm flat screw driver.

How to remove the lamp house of the projector ?

1. Switch off the projector.
2. Remove the lamp cover.
3. Release the three spring lock screws of the lamp house as illustrated.

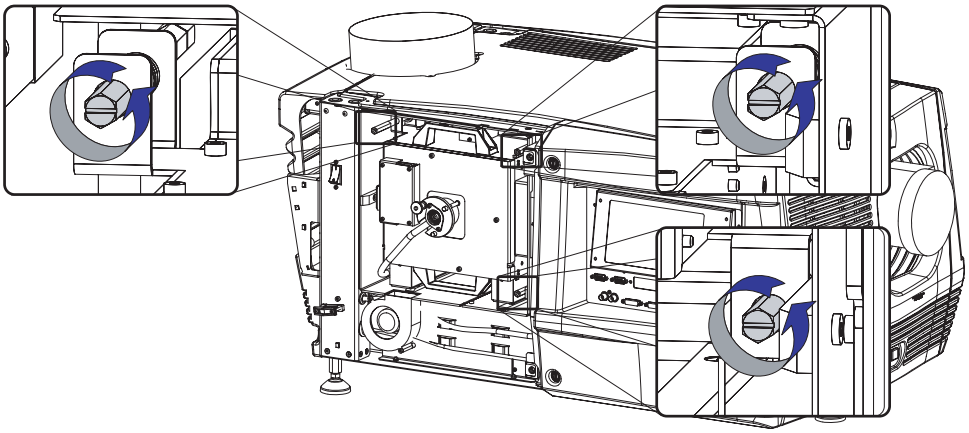


Image 6-4

4. Hold fast the lamp house by the handles and pull the lamp house out of the projector.
   Caution: *Beware of the weight of the lamp assembly. Take the necessary precautions to avoid personal injury.*

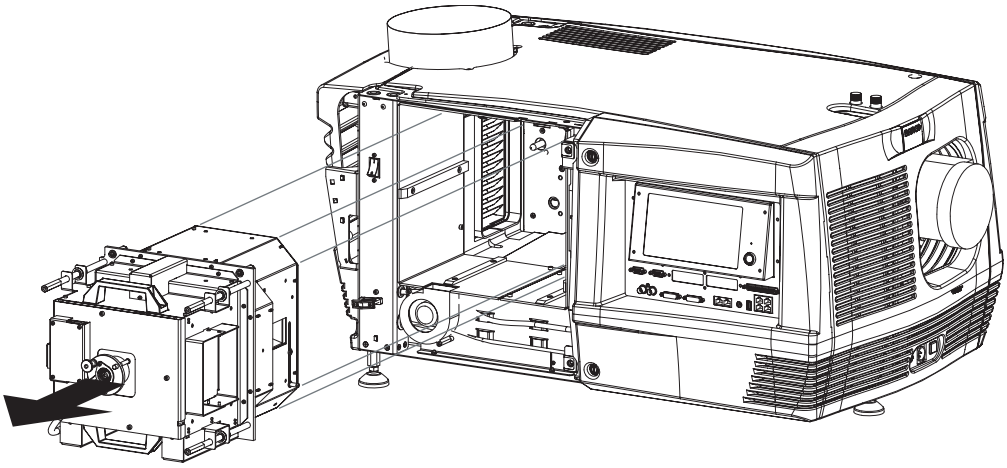


Image 6-5

5. Place the lamp house on a stable support.

While starting up the projector, the electronics detect if a lamp is installed. If no lamp is installed, it is not possible to start up the projector.

6.4 Removal of the xenon lamp

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.

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 with neck protector) 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

- Flat blade screw driver.
- 5 mm Allen wrench.
- 17 mm open-end wrench (2 pieces).
- Lamp protective container or protective cloth with two binders.

How to remove the xenon lamp from the lamp house?

1. Release the xenon lamp from its socket by removing the hexagon socket head cap screw and washer as illustrated. Use a 5 mm Allen wrench.

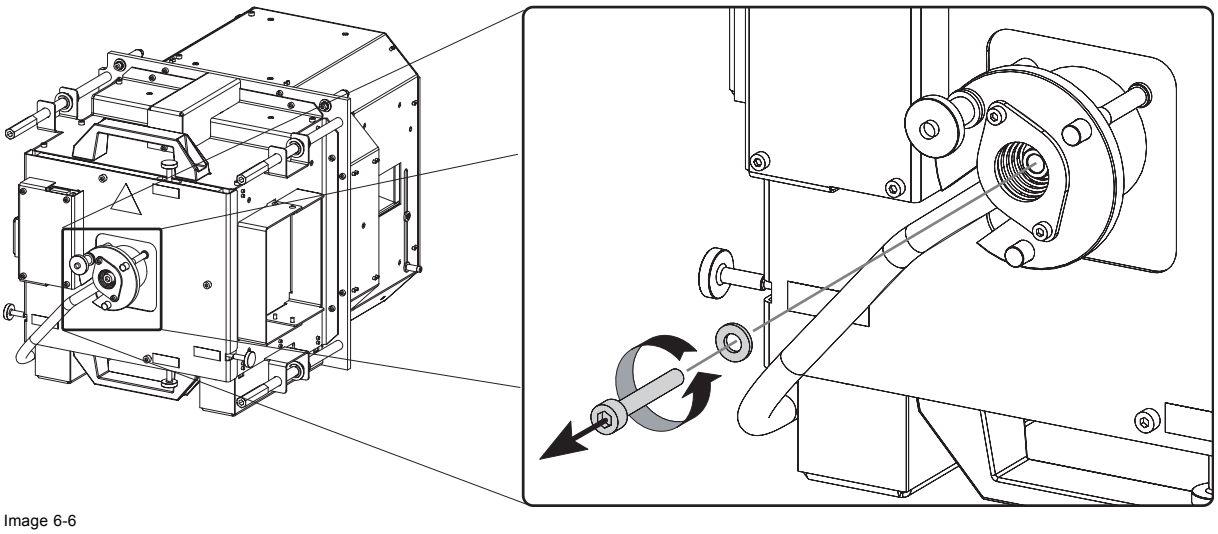


Image 6-6

2. Remove the Lamp House side cover by releasing the two retaining thumbscrews as illustrated.

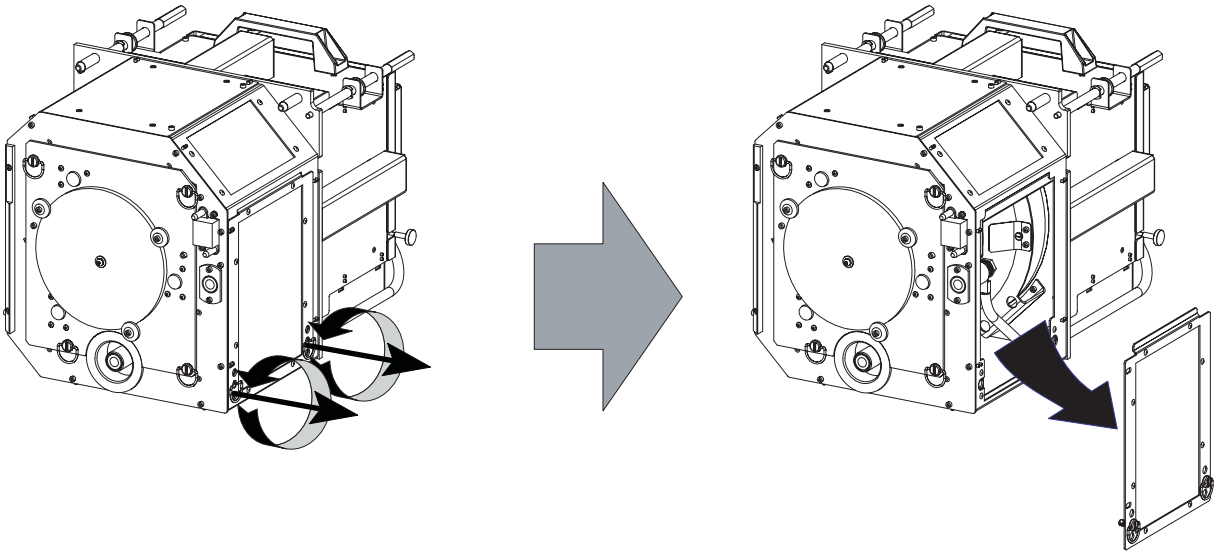


Image 6-7

3. Release the four retaining thumbscrews of the UV blocker assembly as illustrated. Make sure that the UV blocker assembly remains in its position while releasing the screws.

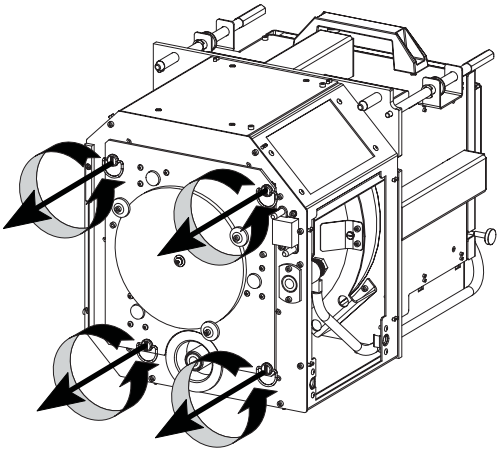


Image 6-8

4. Support the xenon lamp inside the Lamp House with one hand while removing the UV blocker assembly from the Lamp House. Note that some xenon lamps are installed with an anode adaptation bushing.
   Caution: *Ensure that you wear protective clothing, a full face shield and protective gloves.*

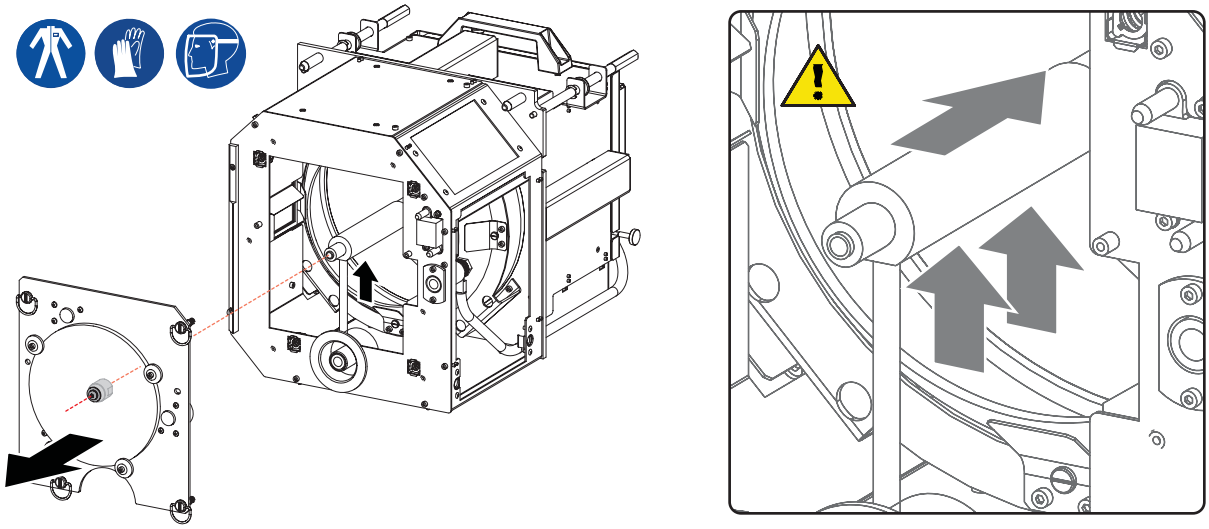


Image 6-9

5. Slide the white anode socket, which is connected via a thick wire with the xenon lamp, upwards away from its position and then remove the xenon lamp with anode socket from the Lamp House.

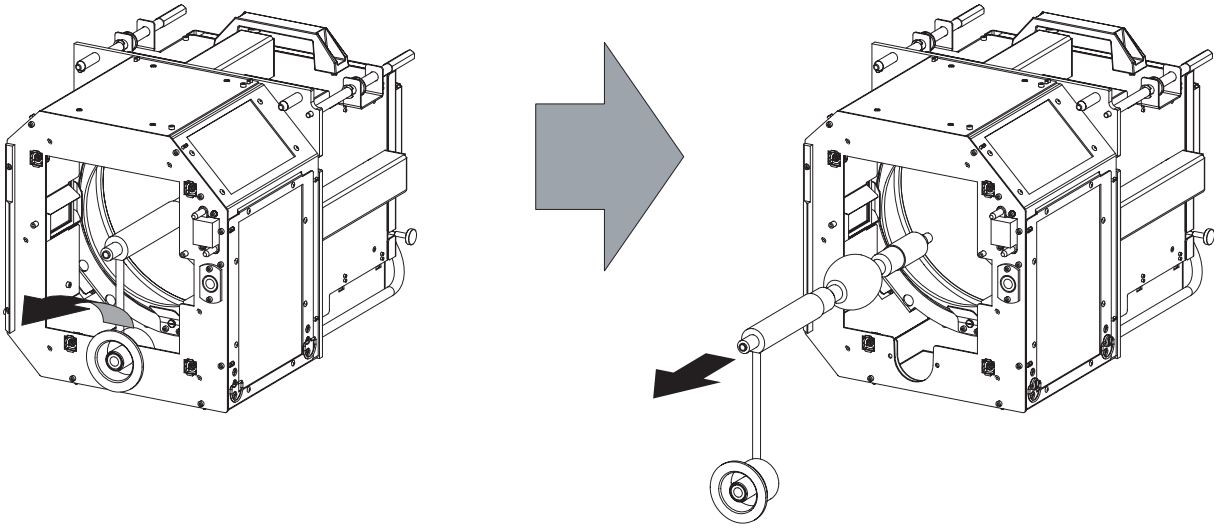


Image 6-10

6. Place the xenon lamp into a protective container or wrap a protective cloth around the xenon lamp prior to proceed with this procedure.
7. Remove the anode wire lug from the anode socket. Use for that two open end wrenches of 17 mm. Hold one nut (reference 7) with one wrench while releasing the other nut (reference 4) with the other wrench. Note that a plain washer (reference 5) is provided between the lock nut (reference 4) and the anode wire lug (reference 6).

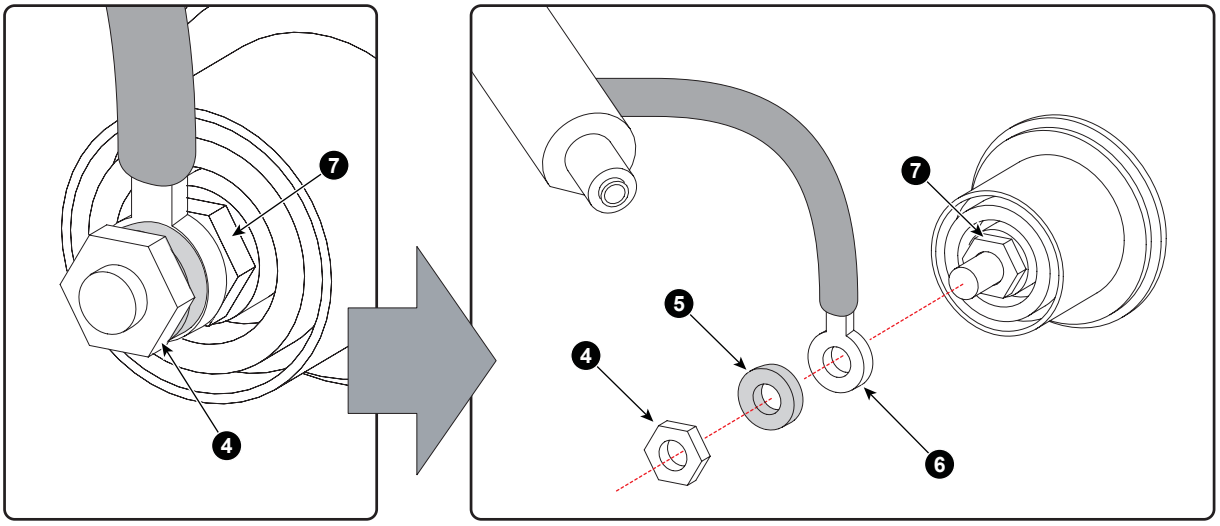


Image 6-11

Note: *The electrical connection pins of older Lamp Houses may contain two flat washers, one on each side of the wire lug. New Lamp Houses can contain only one flat washer due to the shorter thread clearance of the new improved connection pins.*

8. Remove the cathode lamp adaptor (reference 11) from the xenon lamp (reference 13) as illustrated. Use a 5 mm Allen wrench to release the adaptor fixation screw (reference 12) of the adaptor.

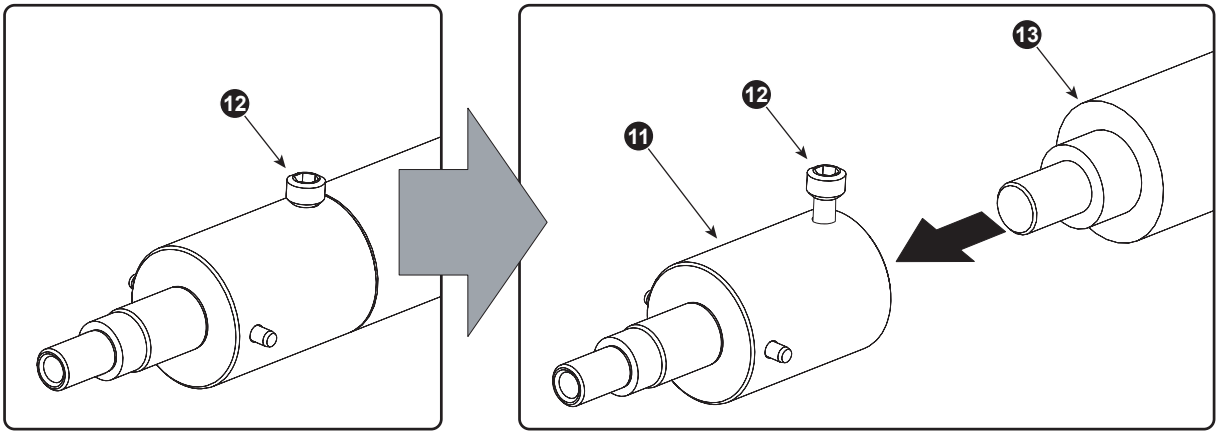


Image 6-12

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.

6.5 Installation of the xenon lamp

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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 with neck protector) 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 is applicable upon a Lamp House equipped with an UV blocker with an integrated anode support instead of a three leg anode support. It is recommended to upgrade the Lamp House with an integrated anode support before installing a new xenon lamp.

Necessary tools

- 17 mm open ended wrench.
- Torque wrench with 17 mm hexagon socket
- Torque wrench with 5 mm Allen socket.

Necessary parts

- Lamp cathode adapter.
- Hexagon socket head screw M6 x 40.
- Flat washer.

How to install the xenon lamp into the Lamp House?

1. Remove the UV blocker and side cover of the lamp house by releasing the retaining thumbscrews as illustrated.
   Note: *In case of a lamp replacement, the UV blocker will be already removed.*

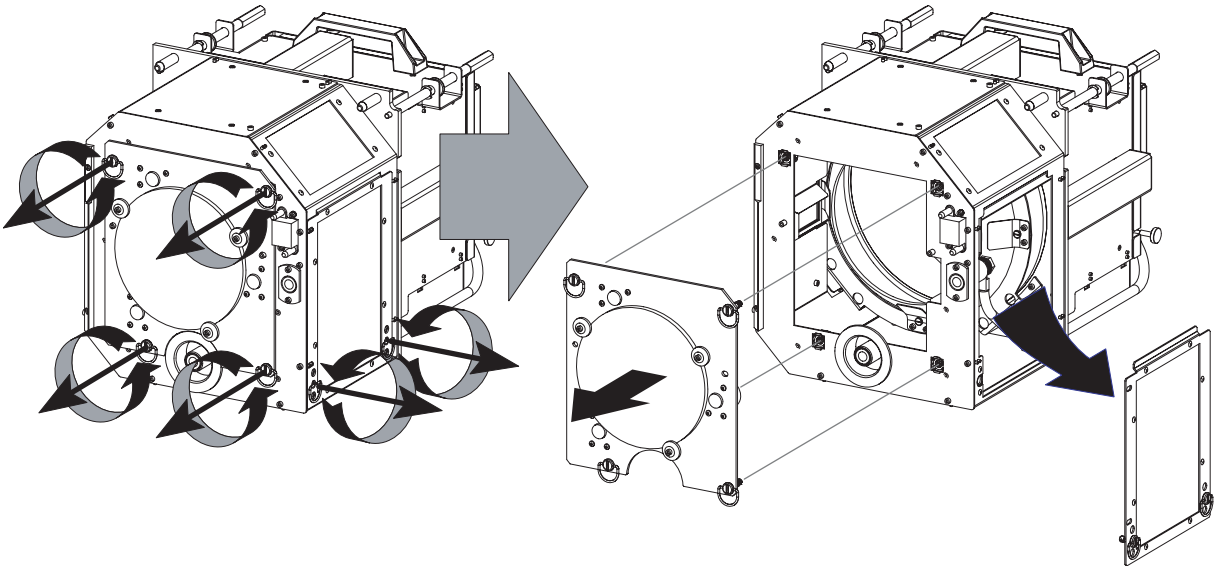


Image 6-13

2. Install the lamp cathode adaptor (reference 1) upon the xenon lamp (reference 3) as illustrated. Tighten the adapter fixation screw (reference 2) with a torque of **2,5 Nm** (6,64 lbf*ft). Use for that a torque wrench with a 5 mm Allen socket. Make sure that there is full contact between the cathode adapter and the lamp base.

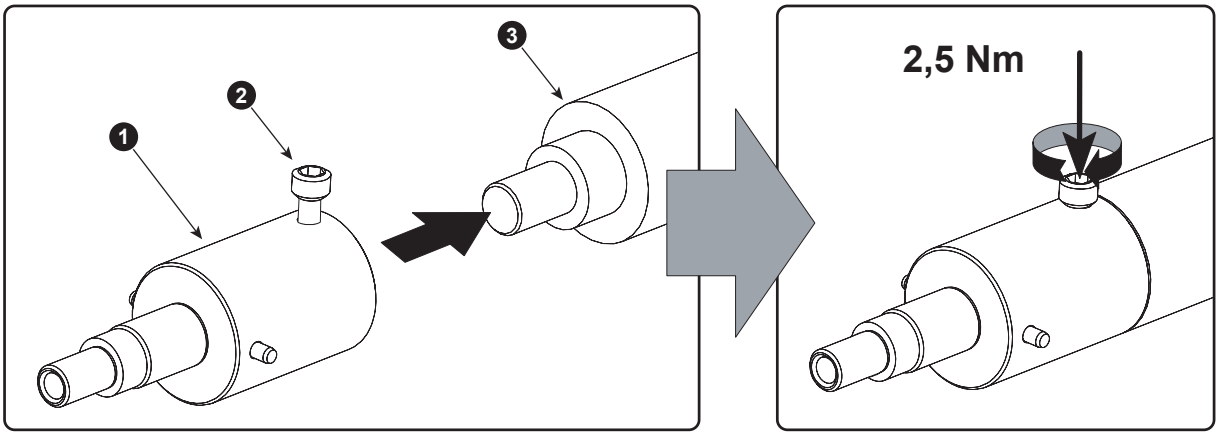


Image 6-14

3. Install the anode wire lug (reference 6) upon the anode socket. Use an 17 mm open-end wrench to hold the first nut (reference 7) while fastening the lock nut (reference 4) on the rod with a torque of **9 Nm** (6,64 lbf*ft) using a torque wrench with 17 mm hexagon socket. Ensure that there is a flat washer (reference 5) between the lock nut and the wire lug.
   Caution: *Do not tighten the first nut (reference 1) against the connector housing. There must be some play (1 mm maximum). This is important to insert the Lamp House smoothly into the projector.*

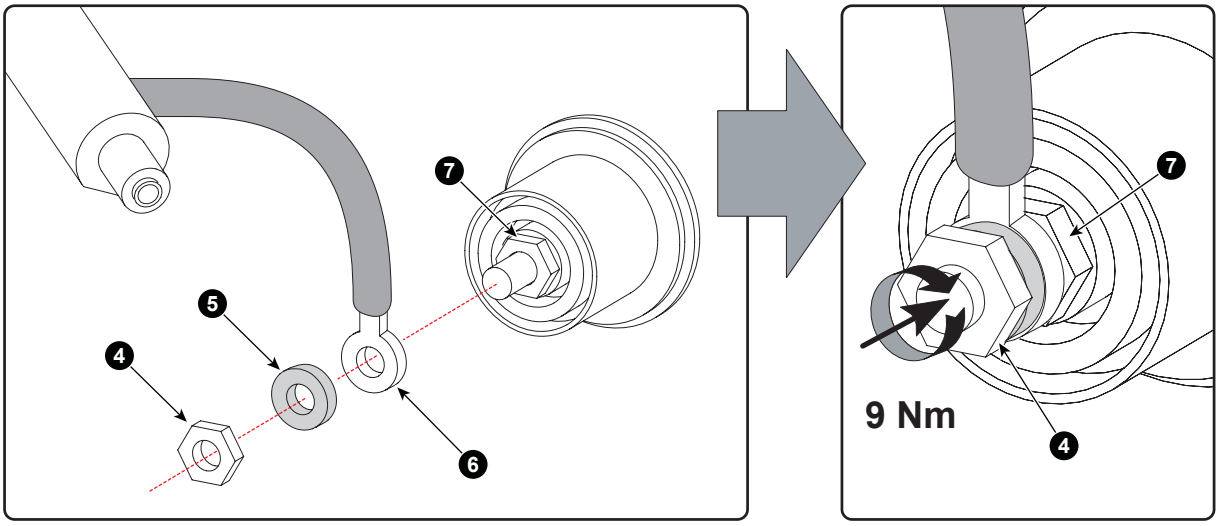


Image 6-15

Note: *The electrical connection pins of older Lamp Houses may contain two flat washers, one on each side of the wire lug. New Lamp Houses can contain only one flat washer due to the shorter thread clearance of the new improved connection pins.*

4. Remove the protective container or unwrap the protective cloth from the xenon lamp.
   Warning: *Ensure that you wear protective clothing, a full face shield and protective gloves.*

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

5. Gently guide the xenon lamp into position inside the Lamp House as illustrated. Anode socket hanging vertical down. While inserting the lamp, rotate it slightly, engaging the pins of the cathode adapter in the foreseen slots. This is to ensure the lamp cathode is completely inserted.

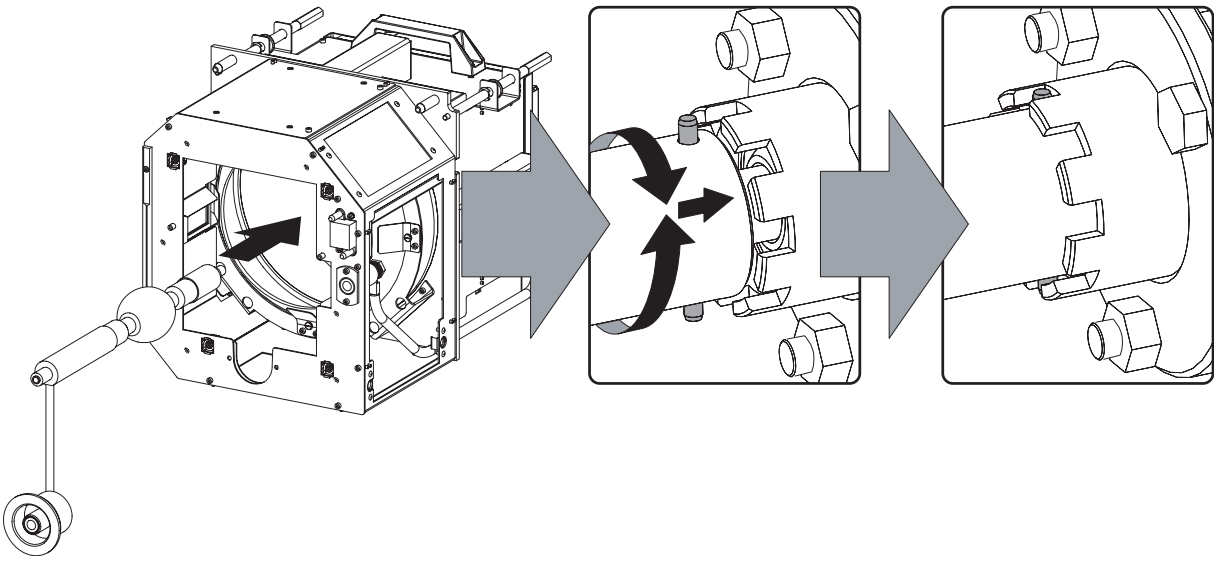


Image 6-16

Warning: *Make sure that the both pins of the cathode adapter are engaged in the foreseen slots.*

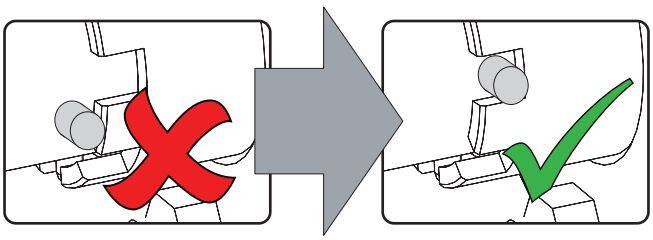


Image 6-17

6. Insert the anode socket into position as illustrated.
   Caution: *Avoid any tension on the anode wire, so there is no mechanical stress on the lamp.*

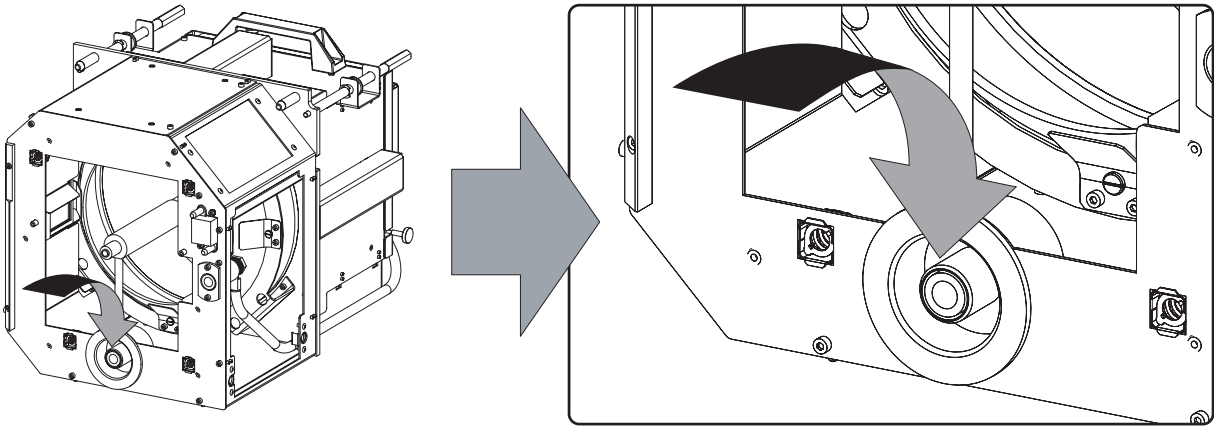


Image 6-18

7. Reinstall the UV blocker assembly as illustrated. Make sure that the xenon lamp is properly supported by the lamp supporting mechanism in the centre of the UV blocker. Use the opening at the side of the Lamp House to guide the supporting pin of the xenon lamp into the anode supporting mechanism.

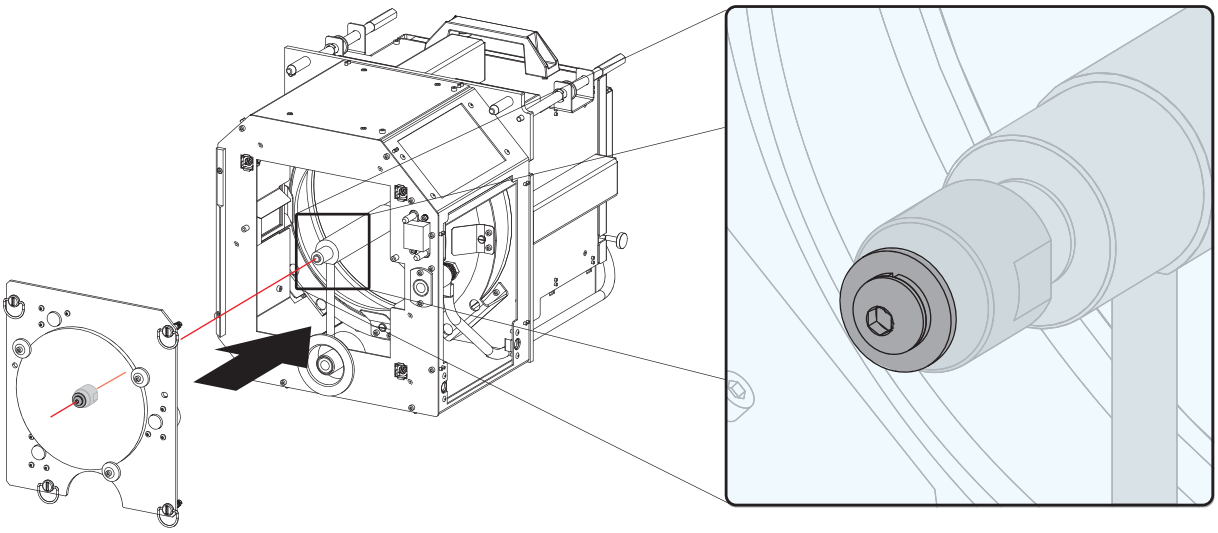


Image 6-19

8. Secure the UV blocker by fastening the four retaining thumbscrews as illustrated.
   Note: *Please ensure that the thumb screws turning wires are flush with the cover or interference will occur while inserting the lamp house into the projector.*

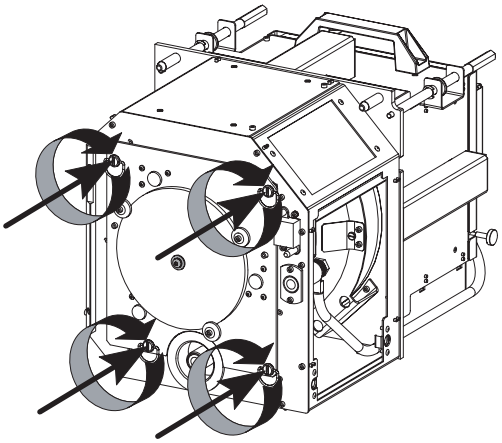


Image 6-20

9. Fasten the cathode side of the xenon lamp using a hexagon socket head screw M6 x 40 and a plane washer as illustrated. Use a torque of **2,5 Nm** (1,84 lbf*ft) to fasten the hexagon socket head screw. Use for that a torque wrench with a 5 mm Allen socket.
   Caution: *Make sure that the both pins (reference 10 of image 6-21) of the cathode adapter remain engaged in the foreseen slots. Therefor, use one hand to keep the xenon lamp into position while inserting the hexagon socket head screw.*

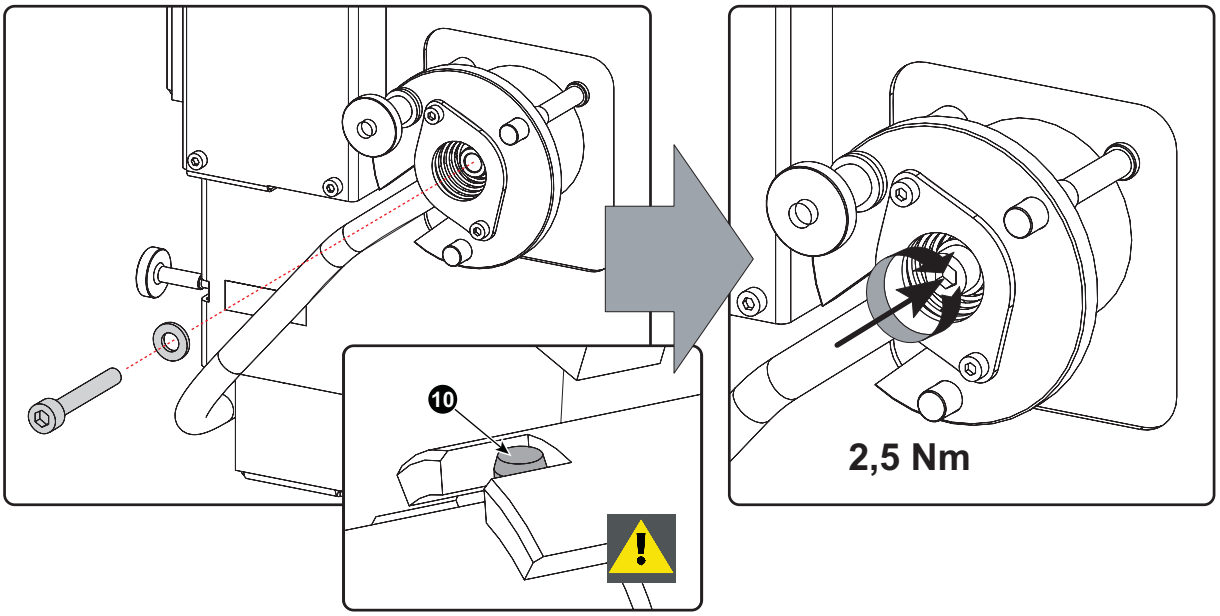


Image 6-21

10. Check the cathode connection inside the Lamp House. Use an 17 mm open-end wrench to hold the first nut while fastening the second nut on the rod with a torque of **9 Nm** (6,64 lbf*ft) using a torque wrench with 17 mm hexagon socket. Ensure that there is a flat washer (reference 3) between the lock nut and the wire lug.

Caution: *This cathode connection must be checked with every lamp change!*

Caution: *Do not tighten the first nut (reference 1) against the connector housing. There must be some play (1 mm maximum). This is important to insert the Lamp House smoothly into the projector.*

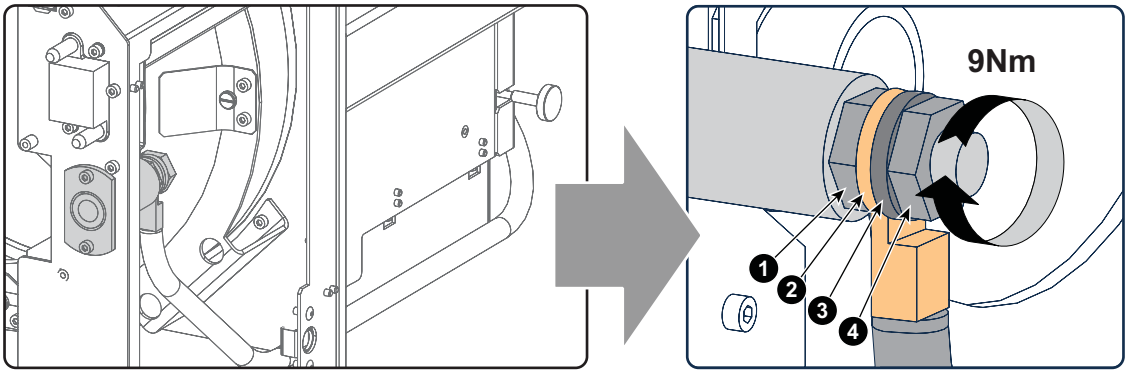


Image 6-22

Note: *The electrical connection pins of older Lamp Houses may contain two flat washers, one on each side of the wire lug. New Lamp Houses can contain only one flat washer due to the shorter thread clearance of the new improved connection pins.*

11. Reinstall the side cover of the Lamp House as illustrated.

Note: *Please ensure that the thumb screws turning wires are flash with the cover or interference will occur while inserting the Lamp House into the projector.*

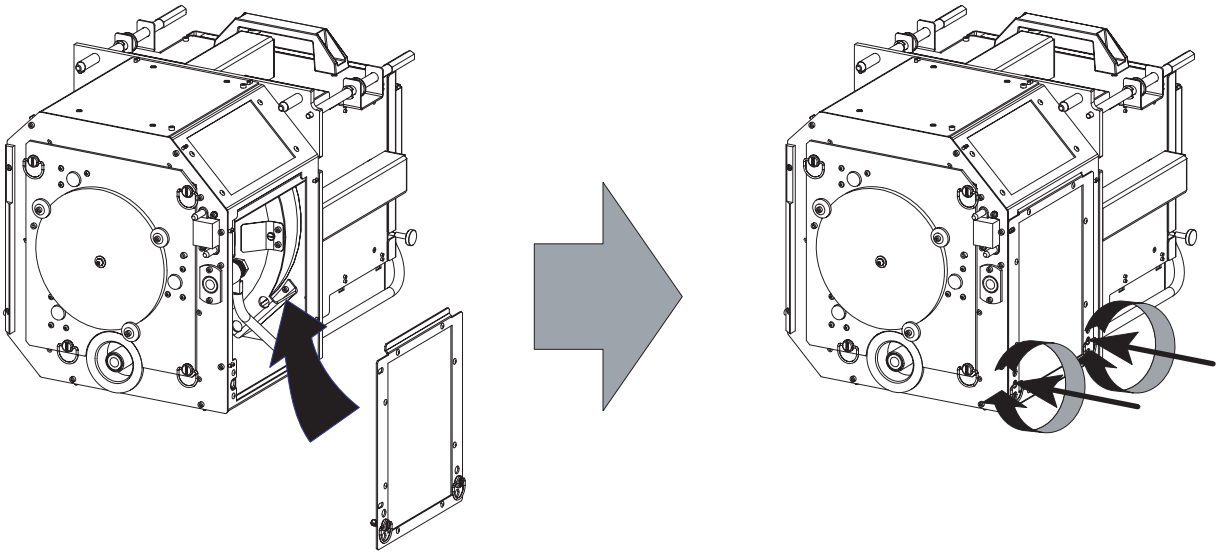


Image 6-23

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. See procedure “Resetting the lamp parameters”.

A realignment of the xenon lamp in its reflector is required after the installation of the xenon lamp in the lamp house. See procedure "Realignment of the lamp in its reflector", page 115.

6.6 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

7 mm flat screw driver.

How to install the lamp house of the projector ?

1. Ensure the projector is switched off.
2. Remove the lamp cover.
3. Hold fast the lamp house by its handles and gently slide the lamp house into its socket. Note that the compartment is provided with guides (G) to position the lamp house correctly.

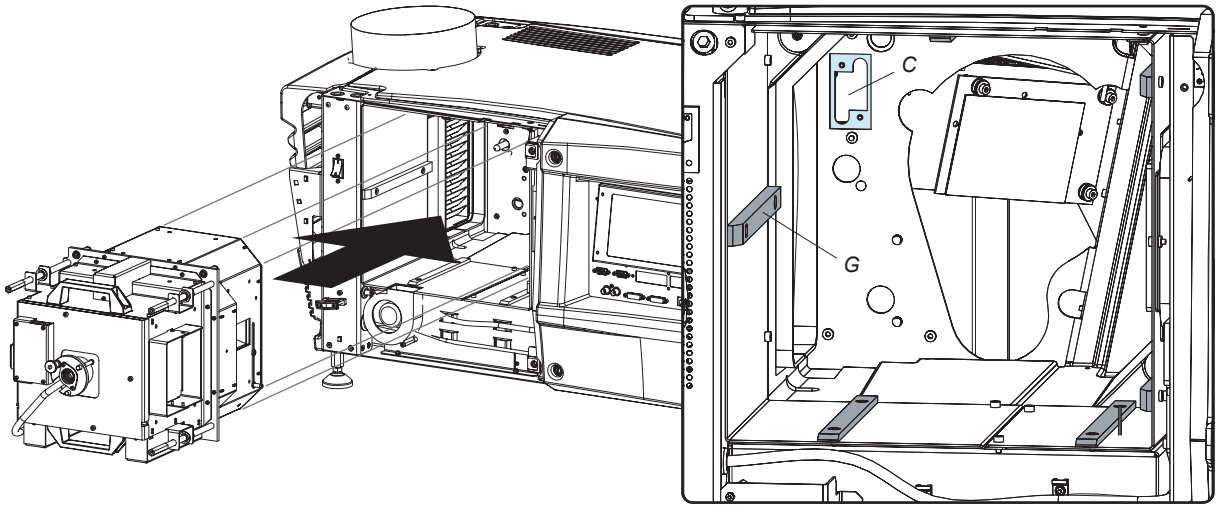


Image 6-24

4. Push the lamp house forward until it slides fully into the projector.
5. Secure the correct position of the lamp house by tightening all three spring lock screws as illustrated.

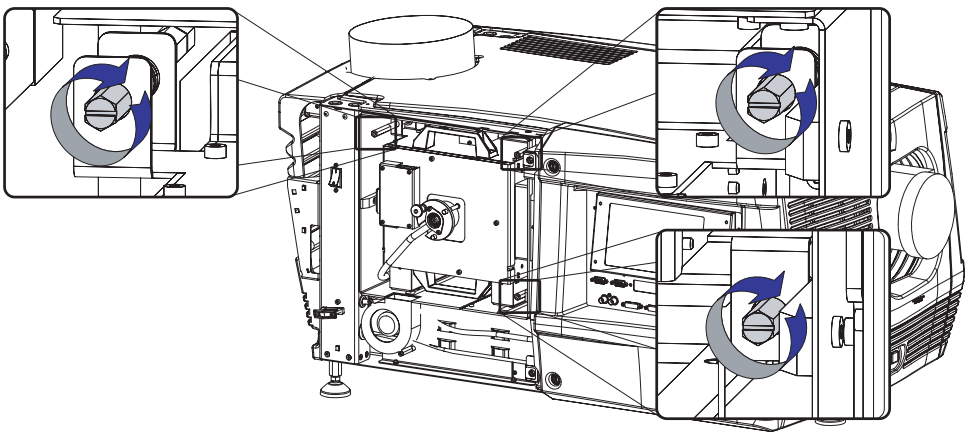


Image 6-25

6. Reinstall the lamp cover of the projector.

While starting up the projector, the electronics detect if a lamp is installed. If no lamp is installed, it is not possible to start up the projector.

6.7 Resetting the lamp parameters

CAUTION: The "LAMP INFO" parameters 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.

How to reset the lamp parameters?

1. Start up the projector but do not ignite the lamp.
2. Go via the **Communicator** touch panel to the menu "**Installation**" > "**Lamp**" > "**Lamp information**".
3. While the *Lamp information* window is displayed, tap on **Reset** (1).

   A reset message is displayed (2).
4. Tap on **Select** (3) to display a list of possible article numbers (4). Select a article number (5) and tap **OK** (6).

   The software will validate the selected article number (7).
5. Fill out the serial number of the lamp (8).
6. Click **Reset** (9).

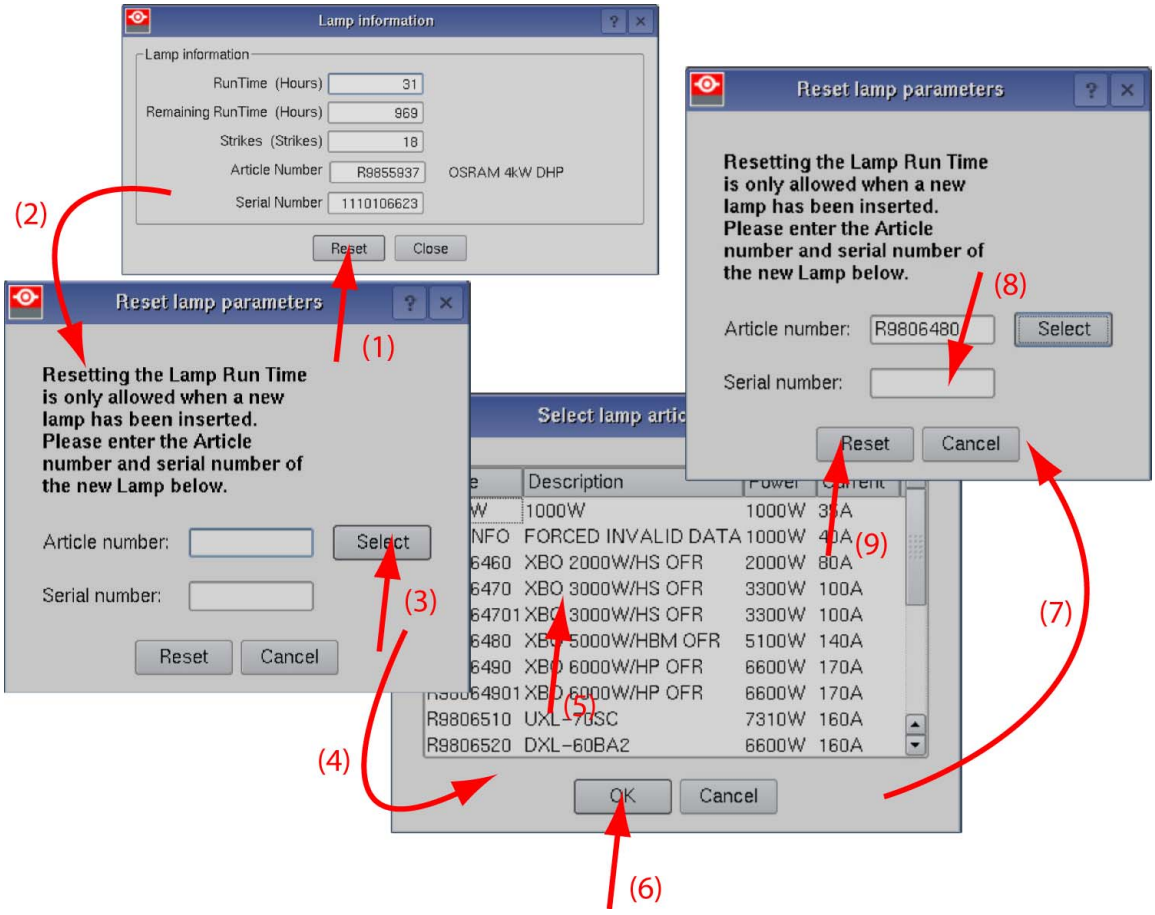


Image 6-26
Reset lamp info

CAUTION: For more information about using the Communicator Touch Panel consult the user's guide of the Communicator Touch Panel.

6.8 Realignment of the lamp in its reflector

Each xenon lamp installation requires a realignment of the lamp in its reflector for optimal performance of the xenon lamp in the DP-2000/DP-1500 projector. 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.

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. Go via the Communicator touch panel to the menu **"Installation"** > **"Lamp"** > **"Light output"**.
4. Set the "**Light output mode**" in **normal mode** and the "**Lamp Dimming**" on maximum (**255**).
   Note: *This window on the Communicator touch panel shows in the upper left corner the measured value of the built-in light sensor of the projector.*

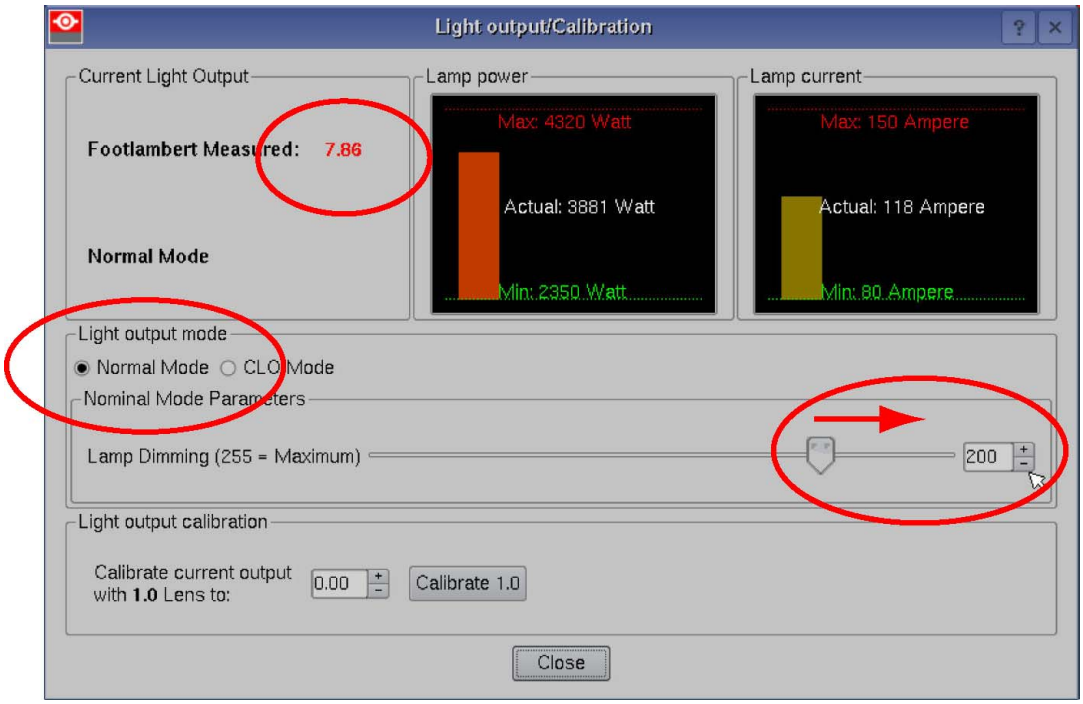


Image 6-27

5. Release the X-axis lock thumb screw (ref LX image 6-28) and Y-axis lock thumb screw (ref LY image 6-28).
6. Adjust the X-axis (ref X image 6-28), the Y-axis (ref Y image 6-28) and the Z-axis (ref Z image 6-28) 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 minimum repeat this adjustment cycle twice.

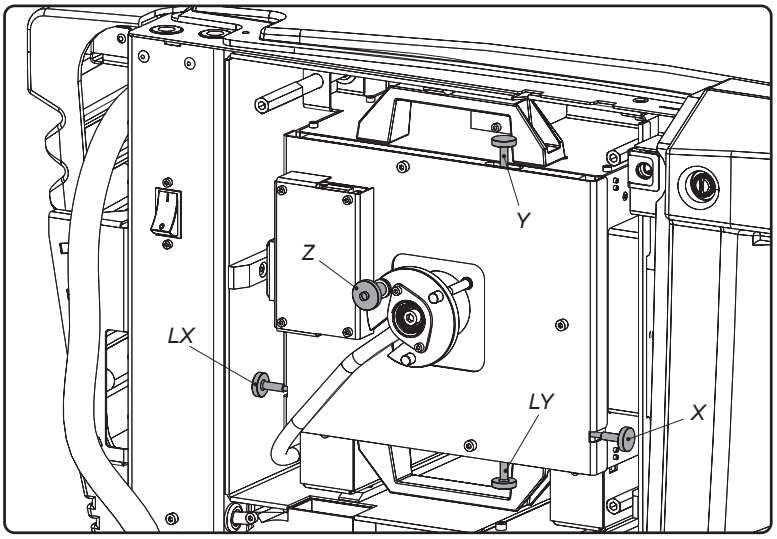


Image 6-28

7. Fasten the X-axis lock thumb screw (ref LX image 6-28) and Y-axis lock thumb screw (ref LY image 6-28).
8. Switch off the projector.
9. Reinstall the cover of the lamp compartment.

6.9 Replacement of the Lamp Info module

This procedure requires that the lamp house is removed from the projector. See procedure "Removal of the lamp house", page 100.

Necessary tools

- 2,5 mm Allen wrench.
- 5 mm nut driver.

How to replace the Lamp Info module?

1. Remove the cover of the Lamp Info module by releasing the hexagon socket head cap screws (reference 1) as illustrated. Use a 2,5 mm Allen wrench.

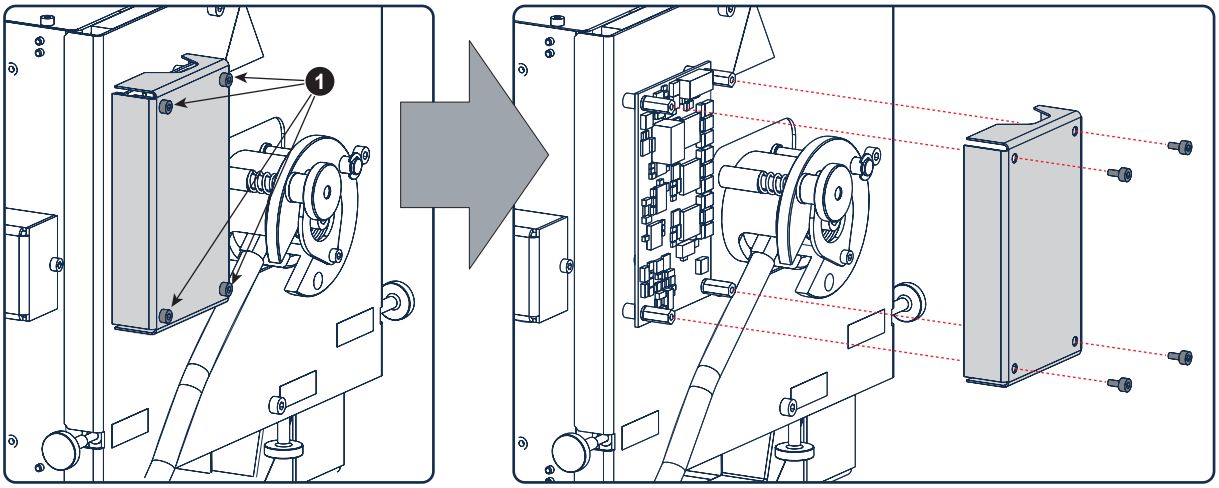


Image 6-29

2. Disconnect the wire unit (reference C) from the Lamp Info module as illustrated.

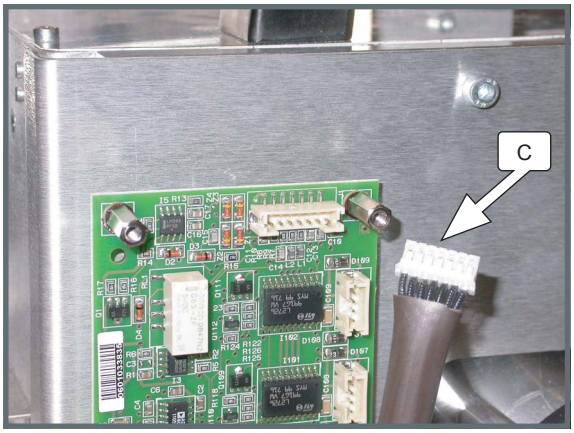


Image 6-30

3. Remove the Lamp Info module from the lamp house by releasing the four spacers (reference 2) as illustrated. Use a 5 mm nut driver. Do not loose the isolating rings (reference 3).

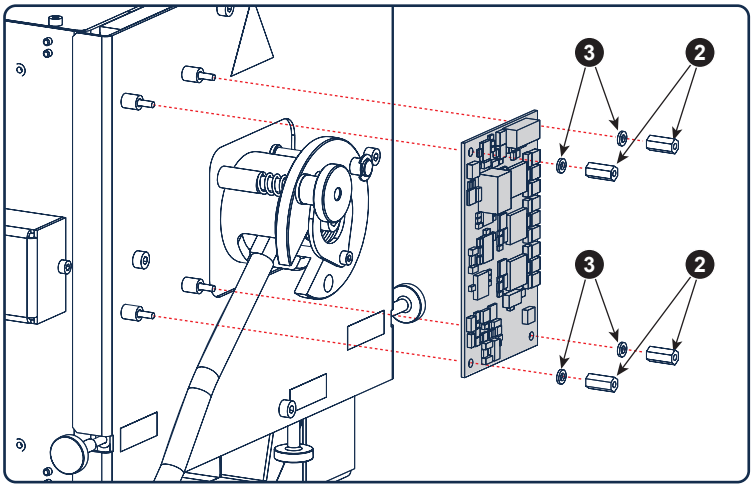


Image 6-31

4. Reinstall a new Lamp Info module and fasten with four spacers (reference 2 image 6-31). Make sure to place a isolating ring (reference 3 image 6-31) between the module and the spacer. Use a 5mm nut driver.
5. Reconnect the wire unit (reference C) as illustrated.

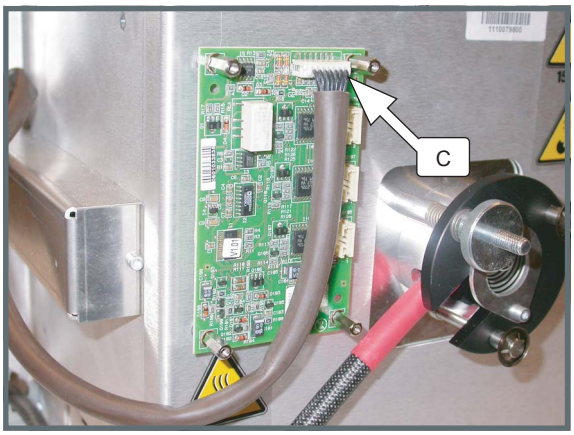


Image 6-32

6. Reinstall the cover of the Lamp Info module. Fasten with four hexagon socket head cap screws (reference 1 image 6-29). Use a 2,5 mm Allen wrench

6.10 Replacement of the UV blocker

This procedure is only valid when replacing an UV blocker without integrated anode support.

This procedure requires that the lamp house is removed from the projector. See procedure "Removal of the lamp house", page 100.

CAUTION: The person that performs this procedure MUST be wearing a full face shield with neck protector, a welder's jacket and clean leather gloves with wrist protectors. This is required to safely dismantle or assemble the lamp house, which contains a xenon lamp.

Necessary tools

2,5 mm Allen wrench.

How to replace the UV blocker of the lamp house?

1. Remove the uppermost washer of the three washers which securing the UV blocker. Use a 2,5 mm Allen wrench.

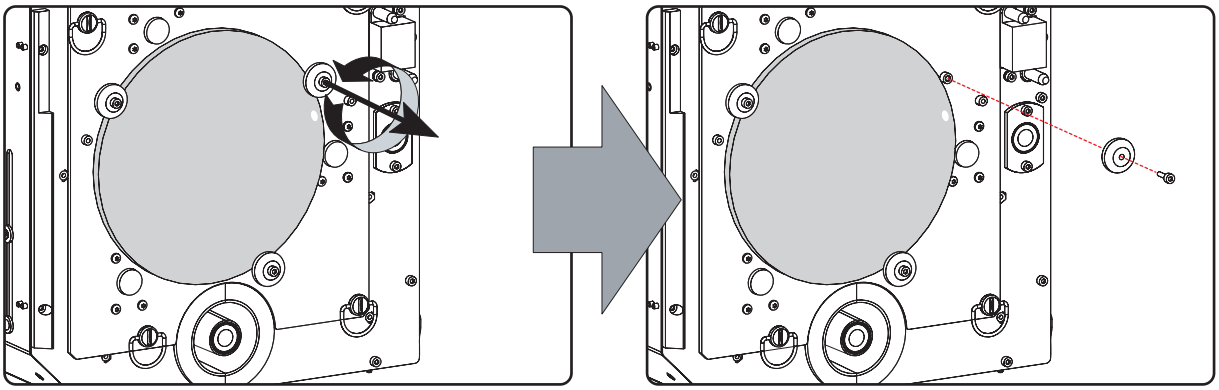


Image 6-33

2. Release the screws a bit (2 turns) of the other two washers and remove the UV blocker.
   Caution: *Take care that the UV blocker doesn't drop.*

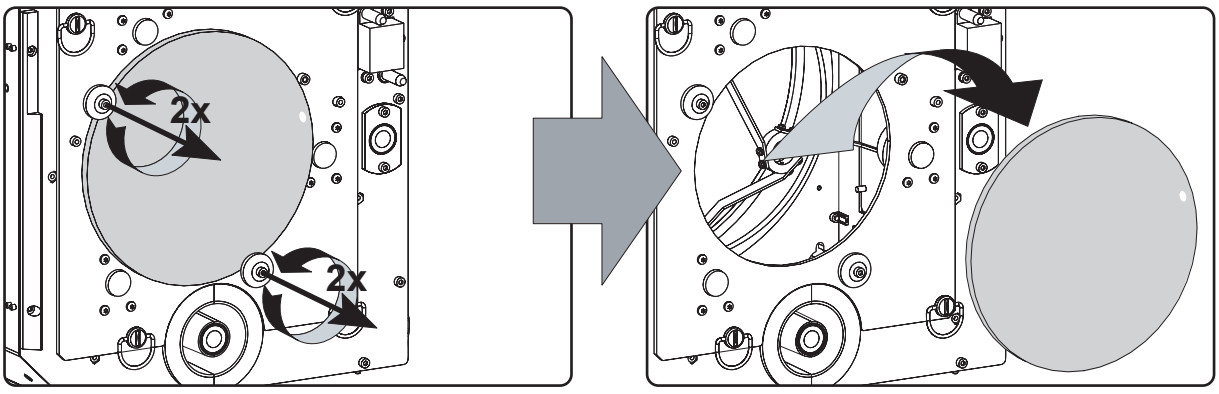


Image 6-34

3. Place a new UV blocker into position.
   Tip: *Check if the UV blocker is clean. If not, see procedure "Cleaning the UV blocker of the Lamp House", page 128, before installing the UV blocker.*

   Caution: *Make sure that the side of the UV blocker, which is marked with a white dot (reference 3) on the border, is facing the outside of the lamp house.*

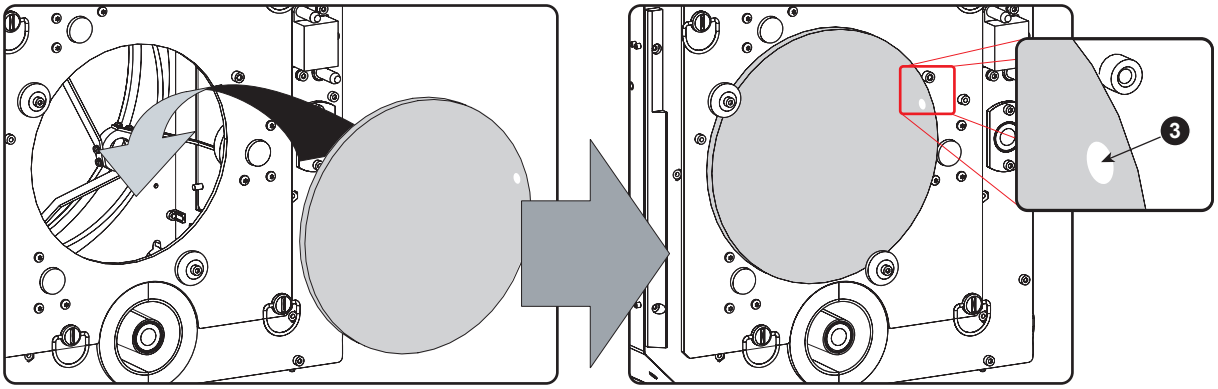


Image 6-35

4. Reinstall the upper most washer (reference 1) and secure the UV blocker by fastening the screws of all three washers. Use 2,5 mm Allen wrench.

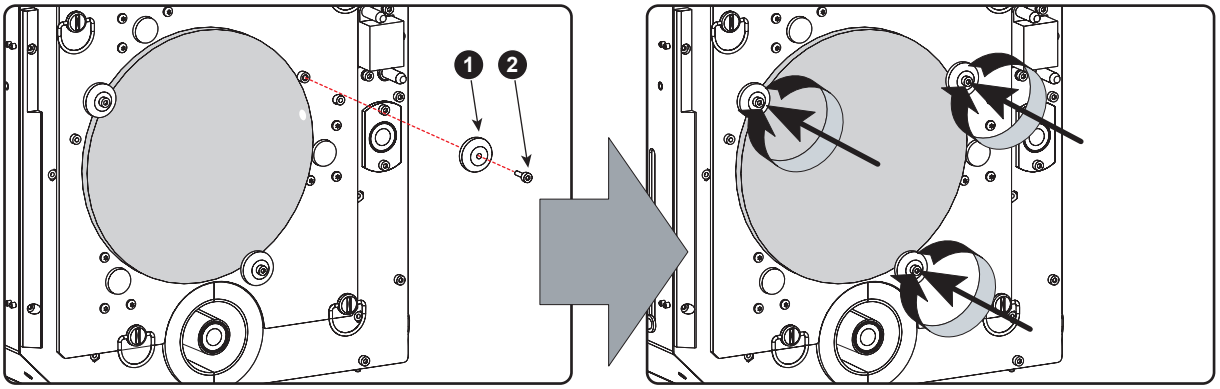


Image 6-36

6.11 Replacement of the UV blocker

This procedure is only valid when replacing an UV blocker with an glued or screwed anode support.

This procedure requires that the lamp house is removed from the projector. See procedure "Removal of the lamp house", page 100.

CAUTION: The person that performs this procedure MUST be wearing a full face shield with neck protector, a welder's jacket and clean leather gloves with wrist protectors. This is required to safely dismantle or assemble the lamp house, which contains a xenon lamp.

Necessary tools

2,5 mm Allen wrench.

How to replace the UV blocker with glued anode support?

1. Ensure that you wear protective clothing, a full face shield and protective gloves.
2. Remove first the lamps house side cover and then the lamp house UV blocker assembly by releasing the retaining thumbscrews as illustrated. Support the xenon lamp while removing the UV blocker assembly.

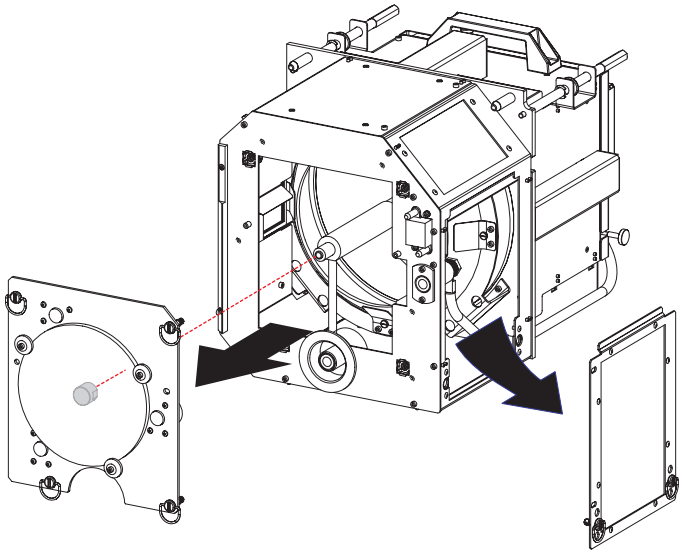


Image 6-37

3. Replace the UV blocker with integrated anode support as illustrated. Use a 2,5 mm Allen wrench to loosen/fasten the three hexagon socket head cap screws (reference 3). Make sure that the anode support is on the inner side of the assembly.
   Caution: *Do not touch the new UV blocker with bare fingers. You should wear clean leather gloves to protect your hands against the danger of explosion of the high pressurized xenon lamp and to avoid that the UV blocker gets contaminated with grease or dirt. You may wear latex or cotton gloves in case there is no danger of a highly pressurized xenon lamp.*

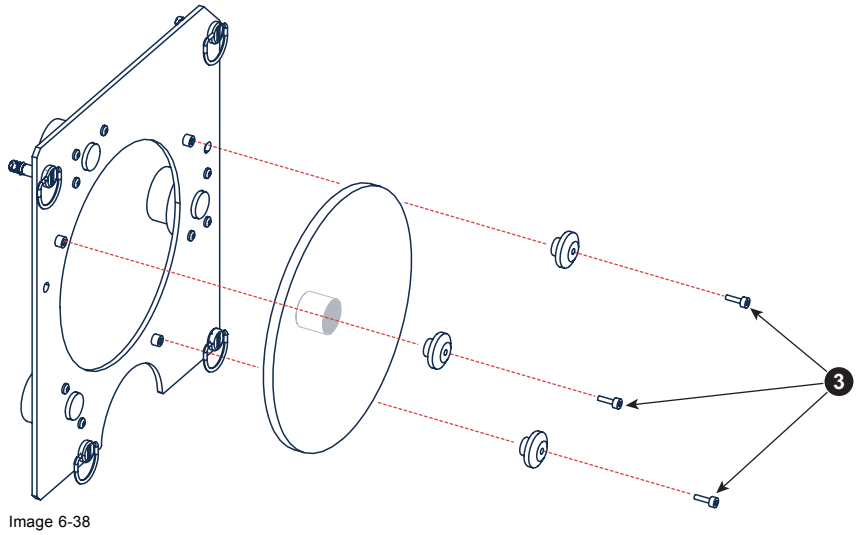


Image 6-38

4. Reinstall the UV blocker assembly as illustrated. Make sure that the xenon lamp is properly supported by the lamp supporting mechanism in the centre of the UV blocker. Use the opening at the side of the lamp house to guide the supporting pin of the xenon lamp into the anode supporting mechanism.

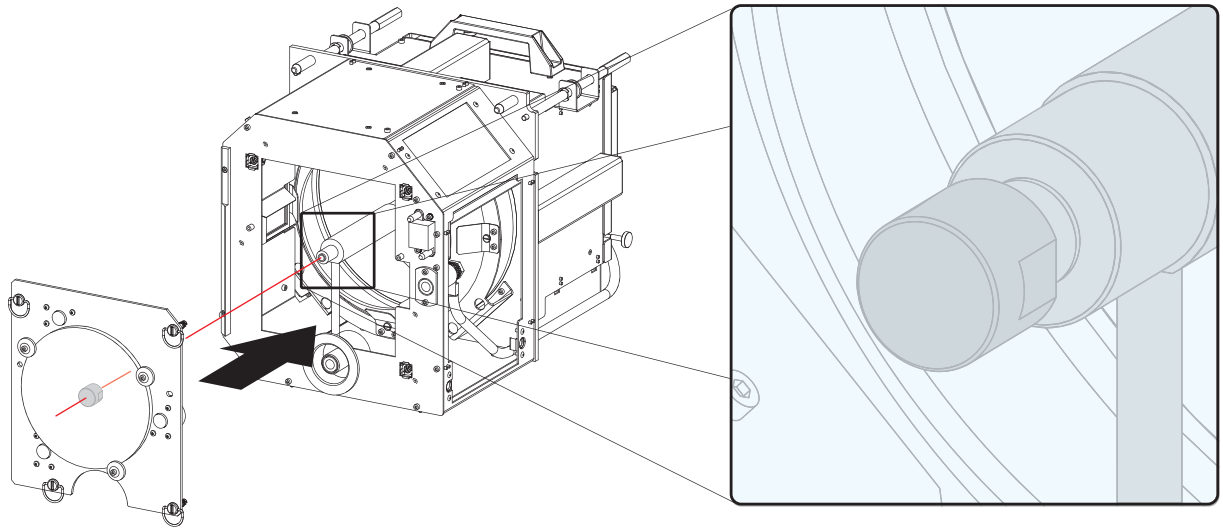


Image 6-39

5. Secure the UV blocker by fastening the four retaining thumbscrews as illustrated.
   Note: *Please ensure that the retaining thumb screws turning wires are flash with the cover or interference will occur while inserting the lamp house into the projector.*

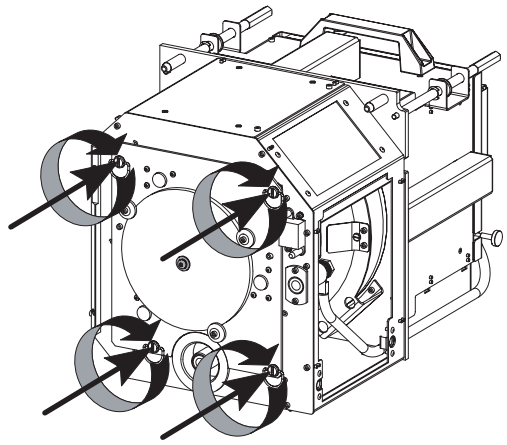


Image 6-40

6. Reinstall the side cover of the lamp house as illustrated.
   Note: *Please ensure that the retaining thumb screws turning wires are flash with the cover or interference will occur while inserting the lamp house into the projector.*

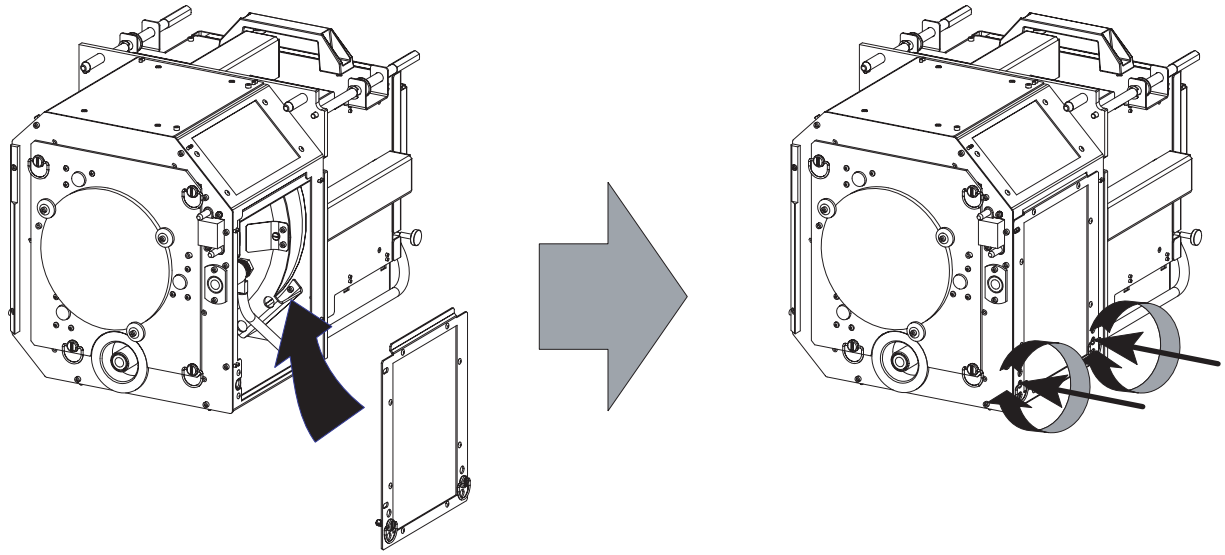


Image 6-41

6.12 Replacement of the lamp reflector

Lamp reflector assembly

The reflector of the lamp has three major parts. One mounting plate, one spheric glass mirror and one elliptic glass mirror. Both mirrors are glued on the mounting plate and are perfectly aligned with each other. The mounting plate serves also as a reference plate between the reflector and the projector optics. The mounting plate has two positioning pins which ensure a correct alignment of the reflector assembly with respect to the projector once the lamp house is inserted in the projector.

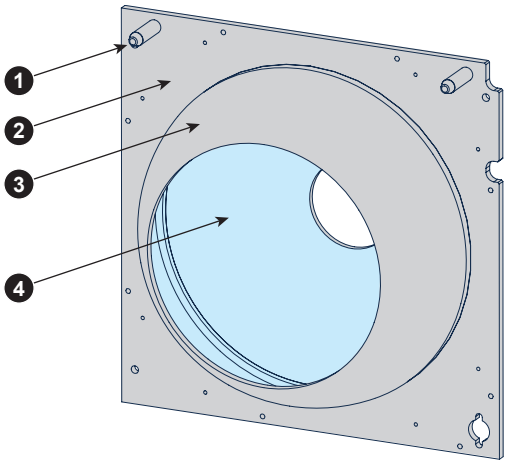


Image 6-42
1 Positioning pin.
2 Mounting plate.
3 Spheric glass mirror.
4 Elliptic glass mirror.

This procedure assumes that there is no lamp installed inside the lamp house. If so, see procedure "Removal of the xenon lamp", page 102.

CAUTION: Do not touch the glass of the reflector assembly while unpacking and installing. Hold fast the reflector assembly by its metal mounting plate.

Necessary tools

- Two 17 mm open-end wrenches.
- Torque wrench with 17 mm hexagon socket.
- 2,5 mm Allen wrench.

How to replace the reflector of the lamp house?

1. Remove the side cover of the lamp house by releasing the two retaining thumbscrews as illustrated.

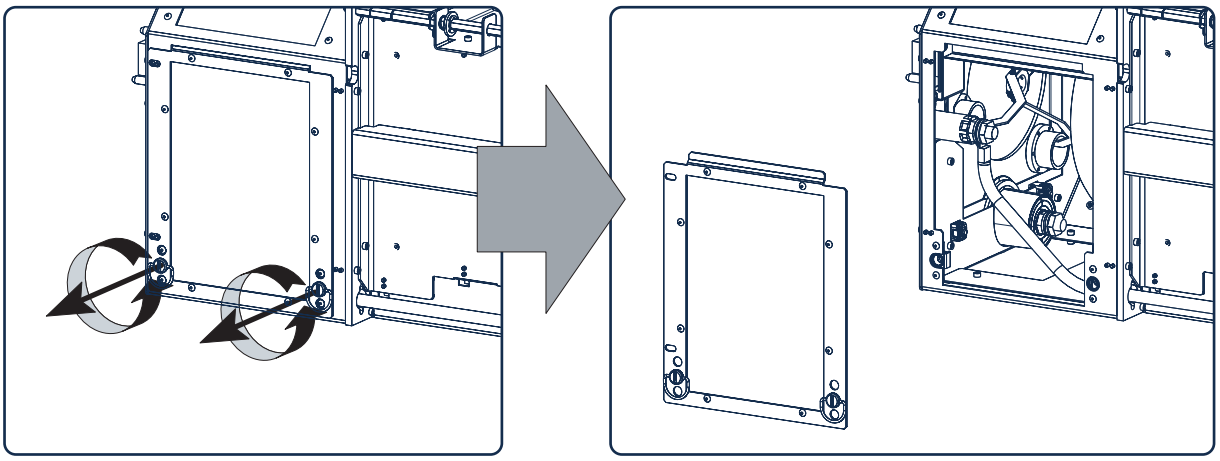


Image 6-43

2. Disconnect one end of the cathode wire from the lamp house as illustrated. Use two open-end wrenches to release the nuts.
   Tip: *Place the washers and nuts back on the socket.*

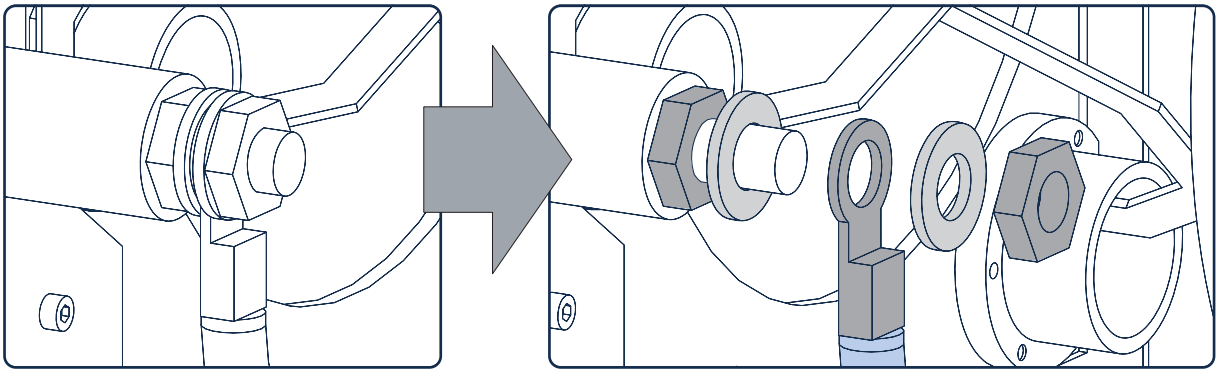


Image 6-44

3. Guide the cathode wire through the hole out of the lamp house.

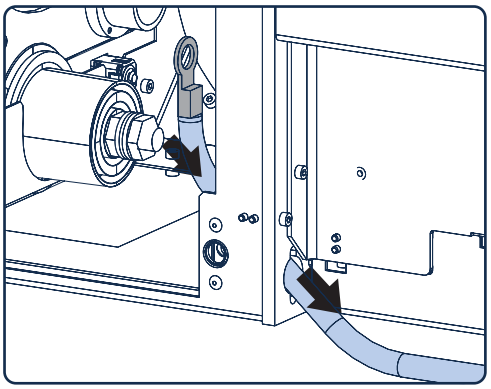


Image 6-45

4. Place the lamp house upon the anode side as illustrated and remove the bottom profiles. Use a 2,5 mm Allen wrench to release the hexagon socket head cap screws of the bottom profiles.
   Caution: *Do not damage the UV blocker or the blue electrical socket of the lamp house.*

   Tip: *Let the three spacers of the UV blocker rest upon a clean flat surface (e.g. a thick book).*

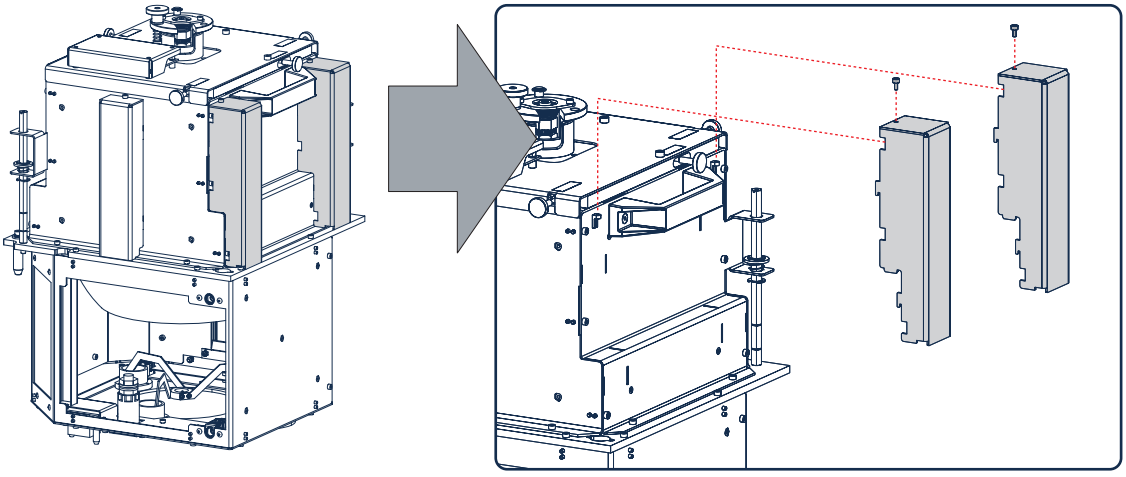


Image 6-46

5. Remove the cathode side of the lamp house by releasing 8 hexagon socket head cap screws (reference 6, two screws per side) as illustrated in image 6-47. Use a 2,5 mm Allen wrench.
6. Remove the reflector assembly of the lamp house by releasing 8 hexagon socket head cap screws (reference 7, two screws per side) as illustrated. Use a 2,5 mm Allen wrench. Note that these screws are longer than those screws which you removed in the previous step.

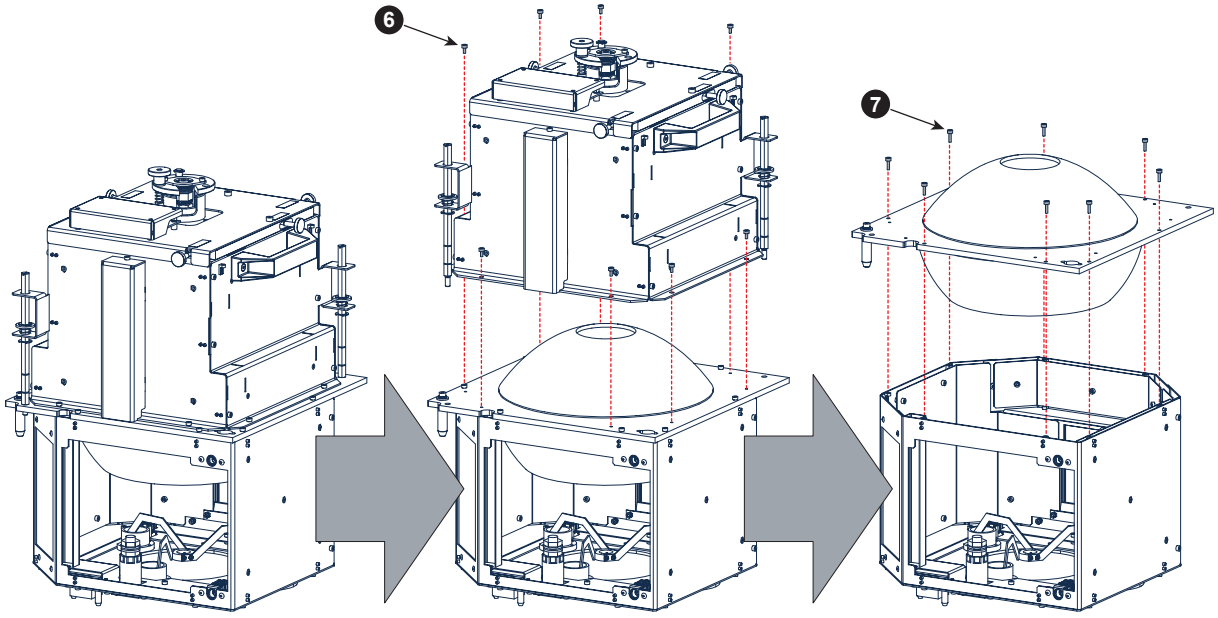


Image 6-47

7. Place a new reflector assembly upon the anode side of the lamp house and fasten with 8 hexagon head cap screws (reference 7 image 6-47). Use a 2,5 mm Allen wrench. These screws must have a length of 10 mm. Make sure to position the reflector assembly correctly.
   Caution: *Do not touch the glass of the reflector assembly. Hold fast the reflector assembly by its metal mounting plate.*
8. Reinstall the cathode side of the lamp house (see middle drawing of image 6-47). Fasten with 8 hexagon head cap screws (reference 6 image 6-47). Use a 2,5 mm Allen wrench.
9. Reinstall the bottom profiles. See image 6-46. Use a 2,5 mm Allen wrench.
10. Guide the cathode wire inside the lamp house as illustrated.

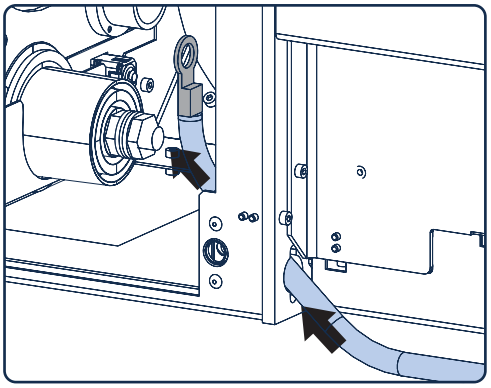


Image 6-48

11. Reconnect the cathode wire with the lamp house. Make sure to place a washer (reference 2 and 4) between the nuts and the eye of the cathode wire (reference 3). Use a torque of 9 Nm to fasten the nuts (reference 1 and 5). Block the first nut (reference 1) with a 17 mm open-end wrench while applying a torque of 9 Nm on the second nut (reference 5) with a torque wrench.

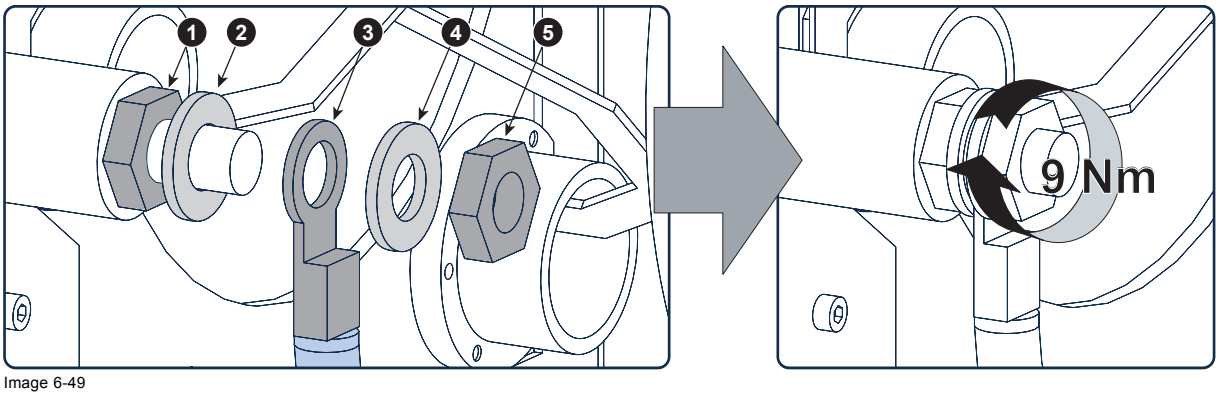


Image 6-49

12. Reinstall the side cover of the lamp house.

6.13 Cleaning the Reflector of the Lamp House

When cleaning the Reflector?

Only clean the Reflector of the Lamp House in case it is really necessary. This means in case dust is clearly visible upon the surface of the Reflector.

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

WARNING: ISOPROPANOL ALCOHOL (200–661–7).

Hazardous product. Irritating to eyes and skin. Always use in a well ventilated area. Vapors may cause drowsiness and dizziness. Avoid contact with skin and eyes. In case of contact with the eyes, rinse immediately with plenty of water and seek medical advise.

CAUTION: ISOPROPANOL ALCOHOL (200–661–7).

Hazardous product. Lightly flammable. Always use in a well ventilated area. Keep away from sources of ignitions. Do not smoke while working with isopropanol. Exclusive keep in original container tightly closed at a cool, well ventilated and fireproof storage space.

Necessary tools

- Compressed air.
- Clean Torayse cloth.
- Clean cotton cloth.
- Demineralized water.
- Isopropanol alcohol.

How to clean the Reflector of the Lamp House?

1. Try to blow away the dust with compressed air.
2. Is all dust removed from the Reflector?
   If yes, stop this cleaning procedure.
   If no, wipe off the dust of the Reflector. Use for that a clean Torayse cloth.
   Tip: *Limit the number of wipe movements. This to protect the optical coating. It is better to wipe of the dust with one good wipe movement then with 10 soft wipe movements.*
3. Is all dust removed from the Reflector?
   If yes, stop this cleaning procedure.
   If no, wipe off the dust of the Reflector first with a clean cotton cloth and demineralized water and than with a clean Torayse cloth.
   Tip: *Use isopropanol alcohol instead of demineralized water to remove fingerprints.*

CAUTION: Never use a Lamp House which Reflector is cracked or has a damaged coating. Neglecting this will result in irreversible damage of the projector.

6.14 Cleaning the UV blocker of the Lamp House

When cleaning the UV blocker?

Only clean the UV blocker of the Lamp House in case it is really necessary. This means in case dust is clearly visible upon the surface of the UV blocker.

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

WARNING: ISOPROPANOL ALCOHOL (200–661–7).

Hazardous product. Irritating to eyes and skin. Always use in a well ventilated area. Vapors may cause drowsiness and dizziness. Avoid contact with skin and eyes. In case of contact with the eyes, rinse immediately with plenty of water and seek medical advise.

CAUTION: ISOPROPANOL ALCOHOL (200–661–7).

Hazardous product. Lightly flammable. Always use in a well ventilated area. Keep away from sources of ignitions. Do not smoke while working with isopropanol. Exclusive keep in original container tightly closed at a cool, well ventilated and fireproof storage space.

Necessary tools

- Clean Torayse cloth.
- Clean cotton cloth.
- Demineralized water.
- Isopropanol alcohol.

How to clean the UV blocker of the Lamp House?

1. Wipe off the dust of both sides of the UV blocker. Use for that a clean Torayse cloth.
   Tip: *Limit the number of wipe movements. This to protect the optical coating. It is better to wipe of the dust with one good wipe movement than with 10 soft wipe movements.*
2. Is all dust removed from the UV blocker?
   If yes, stop this cleaning procedure.
   If no, wipe off the dust of the UV blocker with a clean cotton cloth and demineralized water.
   Tip: *Use isopropanol alcohol instead of demineralized water to remove fingerprints.*

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.

7. COLD MIRROR ASSEMBLY

About this chapter

This chapter describes how to replace the cold mirror and top fan as complete assembly. It also describes the necessary adjustments for the cold mirror.

CAUTION: Normally the Cold Mirror should never be readjusted in the field except when the Cold Mirror or Lamp Reflector has 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
- Removal of the cold mirror assembly
- Replace the Cold Mirror
- Installation of the cold mirror assembly
- Adjusting the cold mirror
- Cleaning the Cold Mirror

7.1 Introduction

Functionality of the cold mirror

The location of the cold mirror in the light path is between the light source (xenon lamp) and the light pipe. The cold mirror reflects the visible light and absorbs the infra red light. 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 above the heat sink blows cold air upon the heat sink and cold. The hot air is transported to the outside of the projector. The cold mirror has three adjustment screws to modify the position of the cold mirror so that the centre of the light spot is precisely reflected in the centre of the integration rod entrance for optimal performance.

Parts identification of the cold mirror assembly

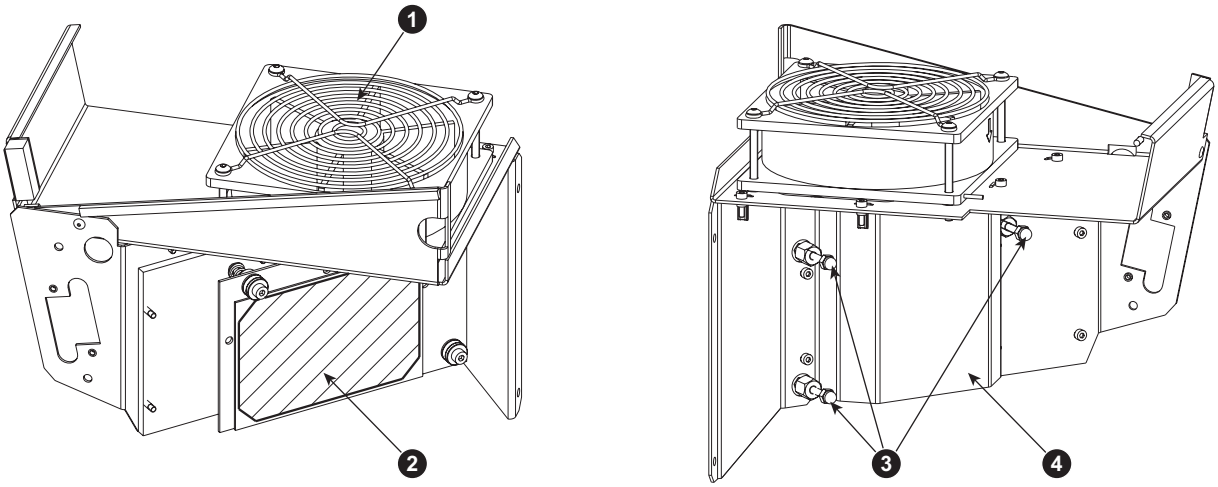


Image 7-1
1 Cold mirror fan.
2 Cold mirror.
3 Cold mirror adjustment screws.
4 Cover plate cold mirror heat sink.

Diagnostic

The easiest way to check the condition of the cold mirror is by removing the lamp unit. When the lamp unit 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 case 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.

7.2 Removal of the cold mirror assembly

The cold mirror can not be replaced separately. Always replace the whole assembly (mirror + heat sink + fan).

Necessary tools

- 3 mm Allen wrench.
- 2,5 mm Allen wrench.

How to remove the cold mirror assembly?

1. Remove the lamp door and lamp house from the projector.
2. Remove the left side cover of the projector.
3. Remove the cover plate of the sealed compartment. See procedure page 88.
   Note: *This cover plate has to be removed because it overlaps the cover plate of the Start Pulse Generator.*
4. Remove the cover of the Start Pulse Generator as illustrated. This cover is secured with 5 hexagon socket head cap screws. Use a 3 mm Allen wrench.

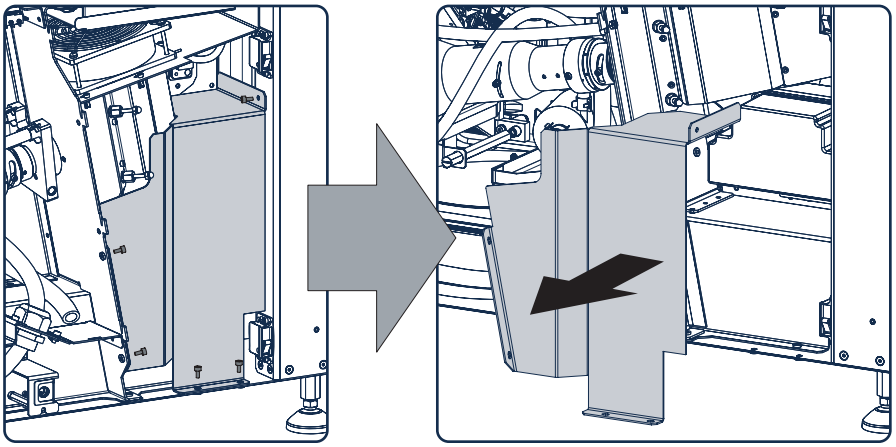


Image 7-2

5. Disconnect the fan wire unit (reference 1).
   Tip: *Pull out the top high density filter for easy access to the fan wire unit.*

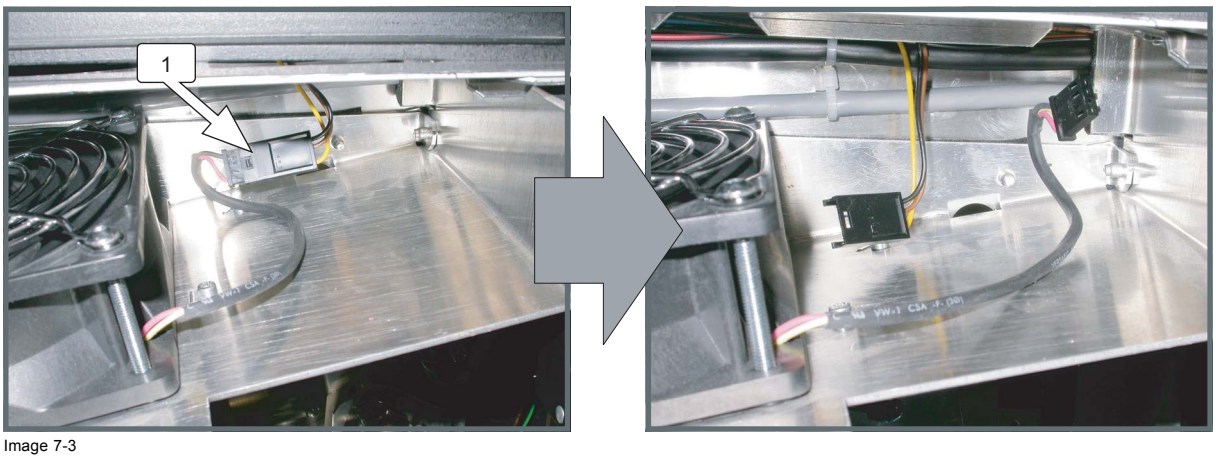


Image 7-3

6. Release the Lamp Info connector by turning out the screws (reference 2) as illustrated. Use a 2,5 mm Allen wrench.

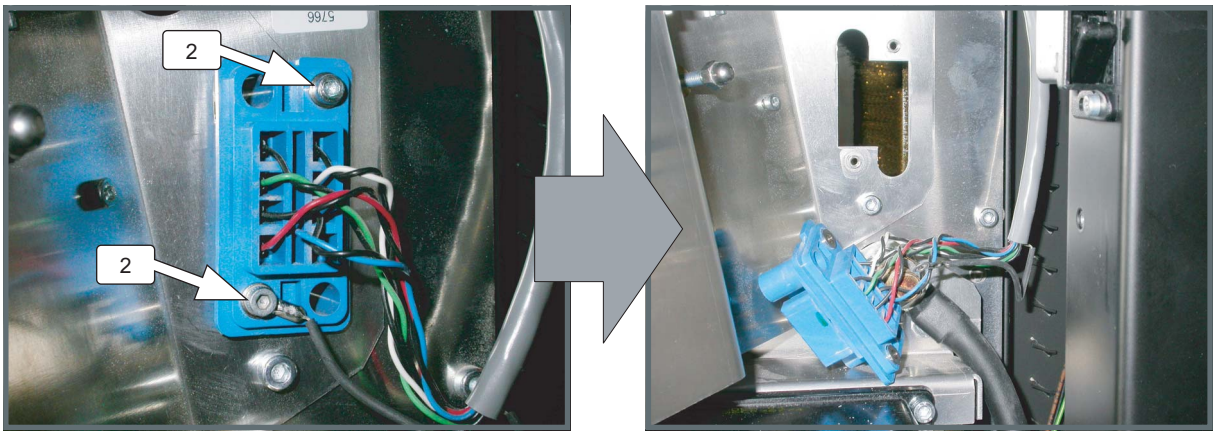


Image 7-4

7. Turn out the two hexagon socket head cap screws (reference 3) at the left side of the assembly. Use a 3 mm Allen wrench.

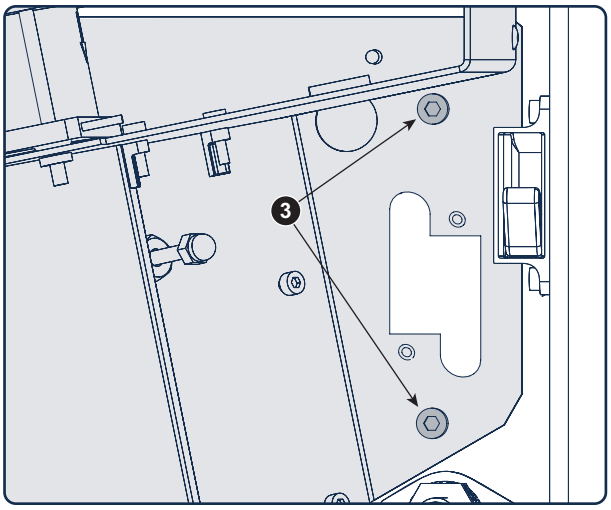


Image 7-5

8. Remove the cold mirror assembly from the projector by turning out the two hexagon socket head cap screws at the left side of the assembly. Use a 3 mm Allen wrench.

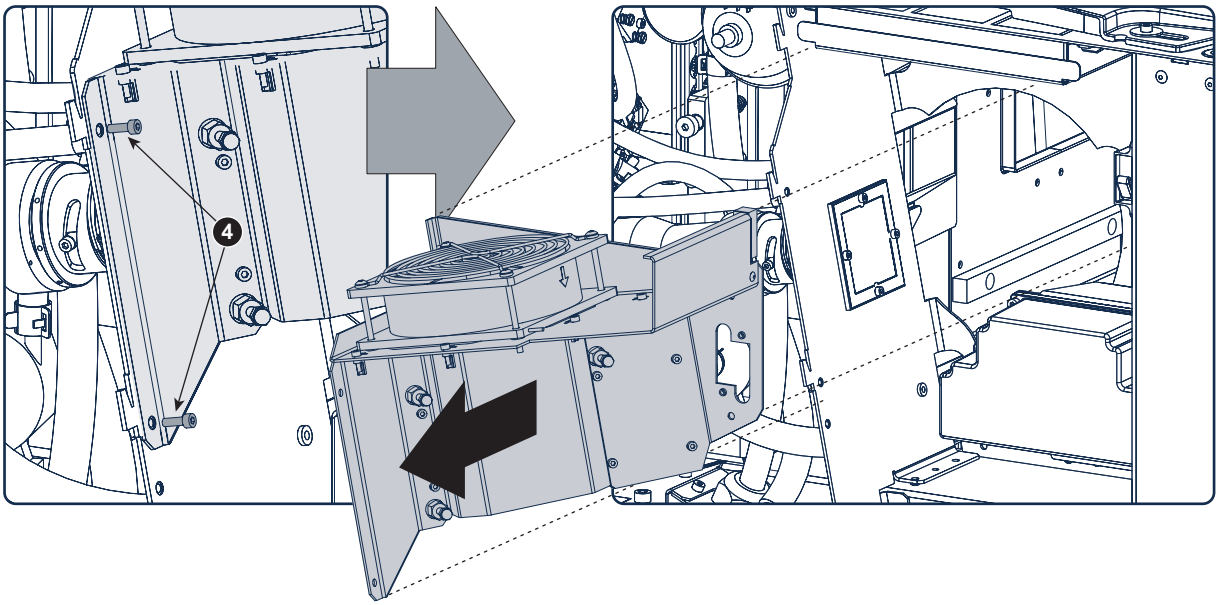


Image 7-6

7.3 Replace the Cold Mirror

Necessary tools

- 7mm nut driver.
- 7mm open-end wrench.
- 3mm Allen wrench.
- Latex or cotton gloves.
- Slide caliper.

How to replace the Cold Mirror?

1. Loosen the three nuts (reference 11) at the rear side of the Cold Mirror. Use a 7mm open-end wrench.
2. Loosen the three lock nuts (reference 10) at the rear side of the Cold Mirror. Use a 7mm open-end wrench.
3. Loosen the three long screws (reference 1) at the front side of the Cold Mirror. Use a 3 mm Allen wrench.
4. Remove the small components (reference 5, 6, 7, 8 & 9) from the long screws (reference 1) and take of the Cold Mirror.
5. Install the new Cold Mirror. Ensure that all mounting parts (reference 1 to 9) upon the three long screws are placed in that order as illustrated.
   Caution: *Do not touch the surface of the Cold Mirror. Use cotton gloves to handle the Cold Mirror.*

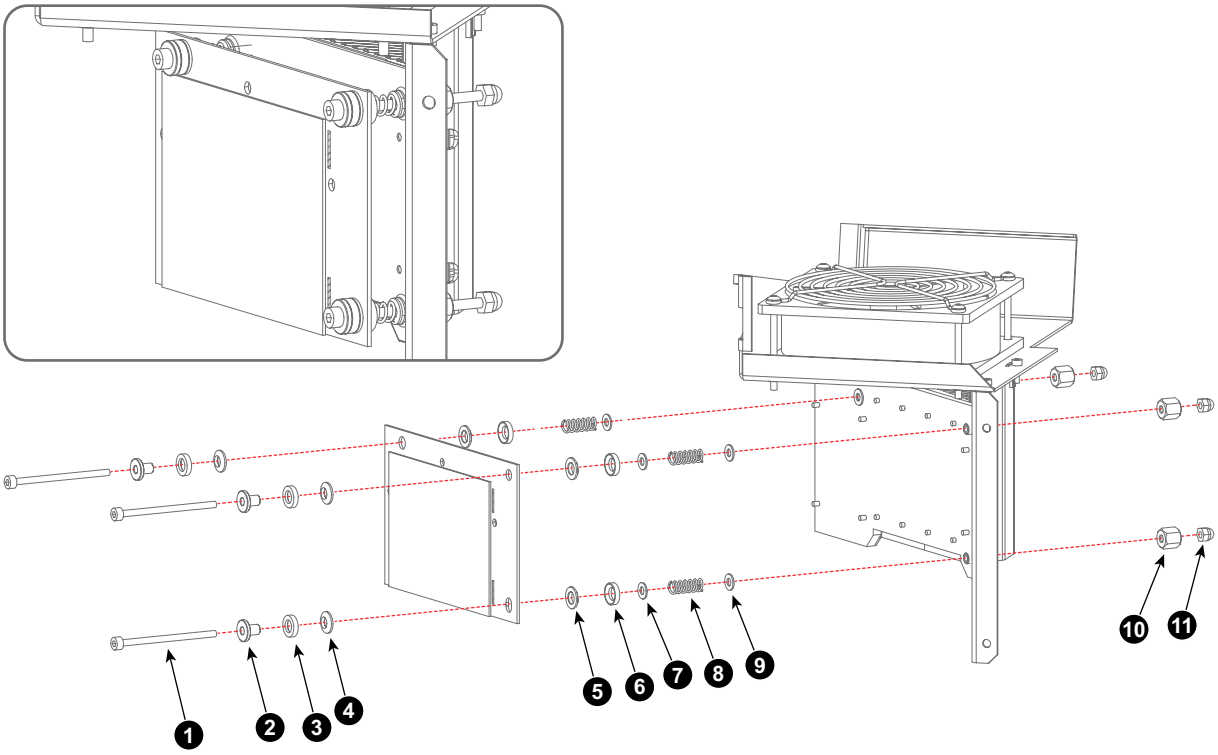


Image 7-7

6. Tighten the three long screws until the distance between the Cold Mirror and frame is 17.4mm. Tighten the lower lock nut until the distance between the Cold Mirror and the frame is 17.4mm.

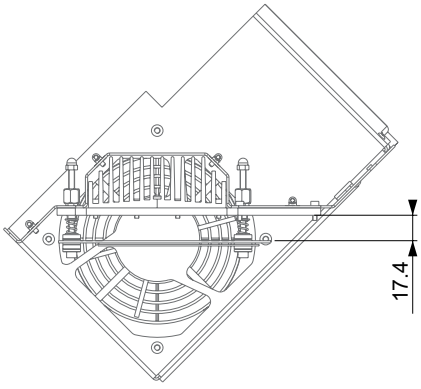


Image 7-8

7. Place a lock nut (reference 10) and a cap nut (reference 11) at the end of each long screw (reference 1).
   Note: *While tightening the lock nuts ensure that the distance between the Cold Mirror and frame remains 17.4mm. This position of the screws correspond with nearly an optimal position of the mirror.*

7.4 Installation of the cold mirror assembly

The cold mirror can not be replaced separately. Always replace the whole assembly (mirror + heat sink + fan).

Necessary tools

- 3 mm Allen wrench.
- 2,5 mm Allen wrench.

How to install the cold mirror assembly?

1. Hold the cold mirror assembly in its place and secure with two hexagon socket head cap screws (reference 4) as illustrated. Use a 3 mm Allen wrench.
   Caution: *Make sure that the wire unit of the fan does not get jammed between the assembly and the projector chassis.*

   Caution: *Do not touch the surface of the cold mirror.*

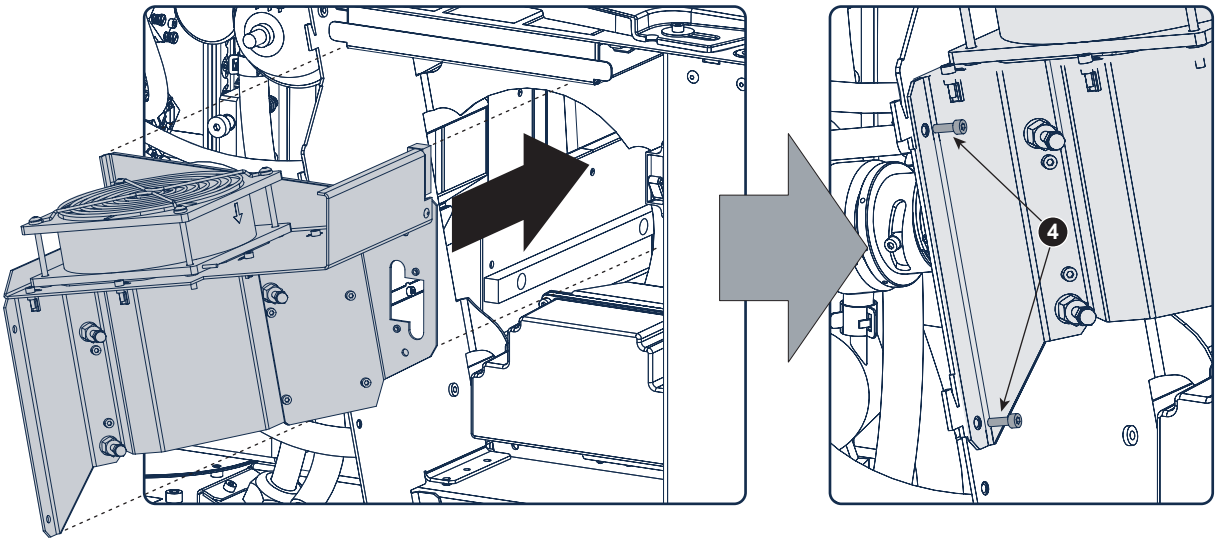


Image 7-9

2. Fasten the right side of the cold mirror assembly using two hexagon socket head cap screws (reference 3) as illustrated. Use a 3 mm Allen wrench.

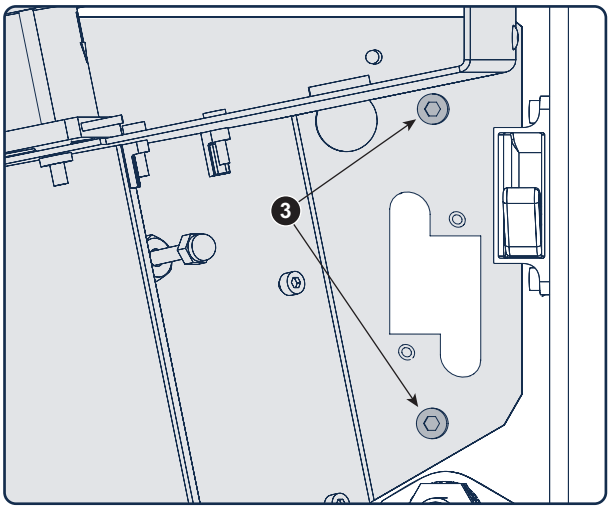


Image 7-10

3. Fasten the Lamp Info connector with two hexagon socket head cap screws (reference 2) as illustrated. Use a 2,5 mm Allen wrench.
   Caution: *Make sure that the ground wire (reference 5) is capture by one of the screws.*

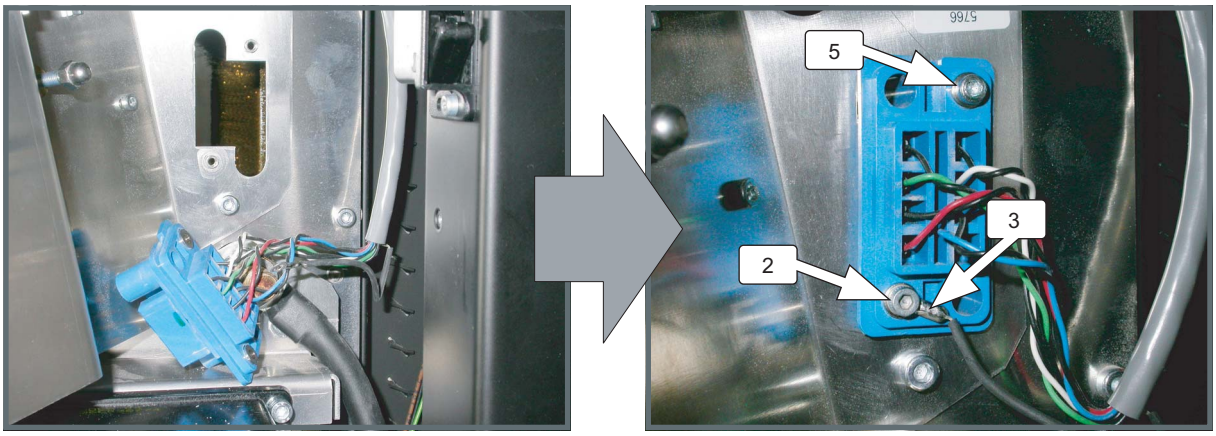


Image 7-11

4. Reconnect the wire unit (reference 1) of the fan.

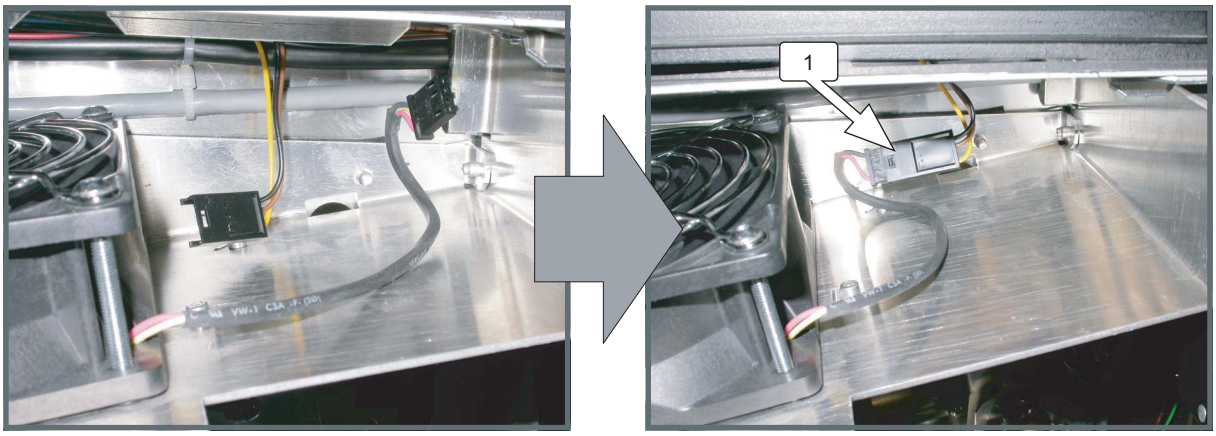


Image 7-12

5. Fasten the cover of the Start Pulse Generator with 5 hexagon socket head cap screws as illustrated. Use a 3 mm Allen wrench.

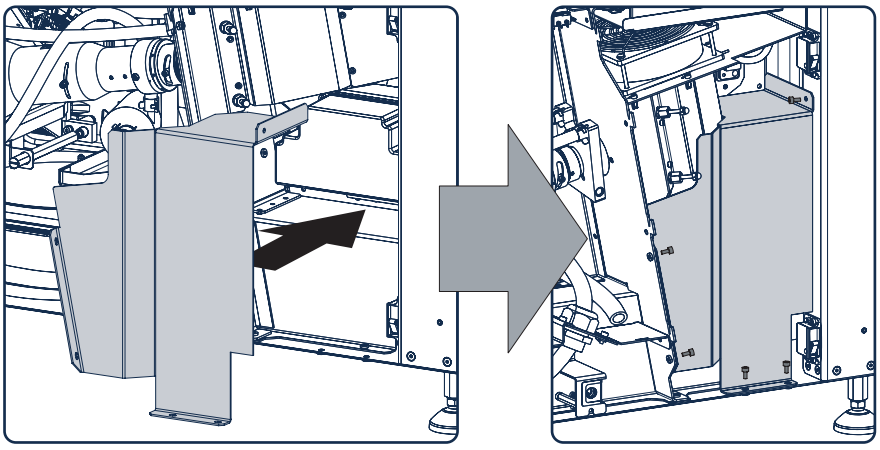


Image 7-13

6. Close the sealed compartment. See procedure page 89.

7. Readjust the Cold Mirror. See "Adjusting the cold mirror", page 137.

The cold mirror has to be readjusted after installation.

7.5 Adjusting the cold mirror

The position of the xenon bulb 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 bulb in its reflector for maximum light output. Once the cold mirror and xenon bulb are optimally adjusted, the cold mirror should never be adjusted again. A xenon bulb replacement only requires realignment of the lamp in its reflector. Only when a cold mirror is replaced, should it be readjusted.

Necessary tools

- 10 mm open-end wrench.
- 7 mm nut driver.
- Light meter.
- Slide caliper.

How to setup the projector for adjusting the cold mirror?

1. Remove the left cover and lamp cover of the projector.
2. Loosen the three lock nuts (reference 4 image 7-14) of the cold mirror adjustment screws. Use for that a 10 mm open-end wrench.

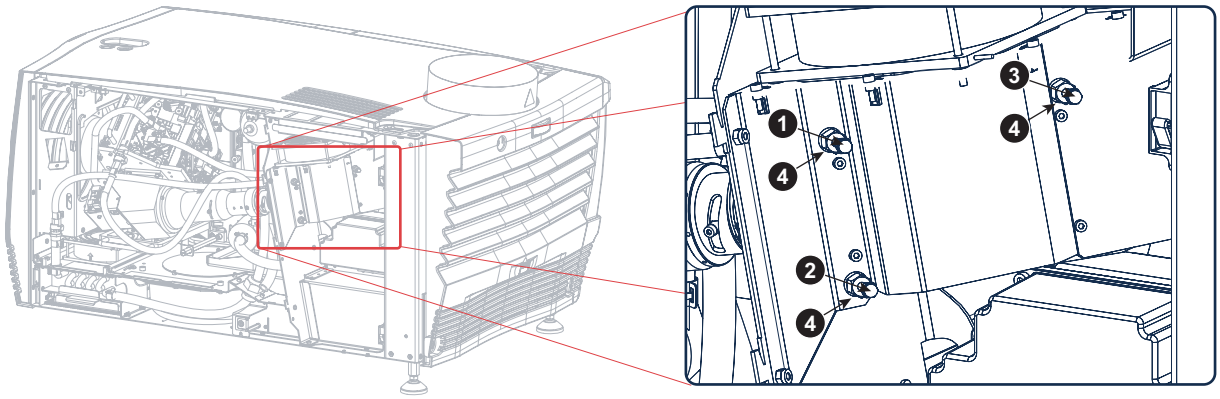


Image 7-14

3. Release the X and Y axis lock thumb screws (reference LX & LY image 7-15) of the Lamp House.

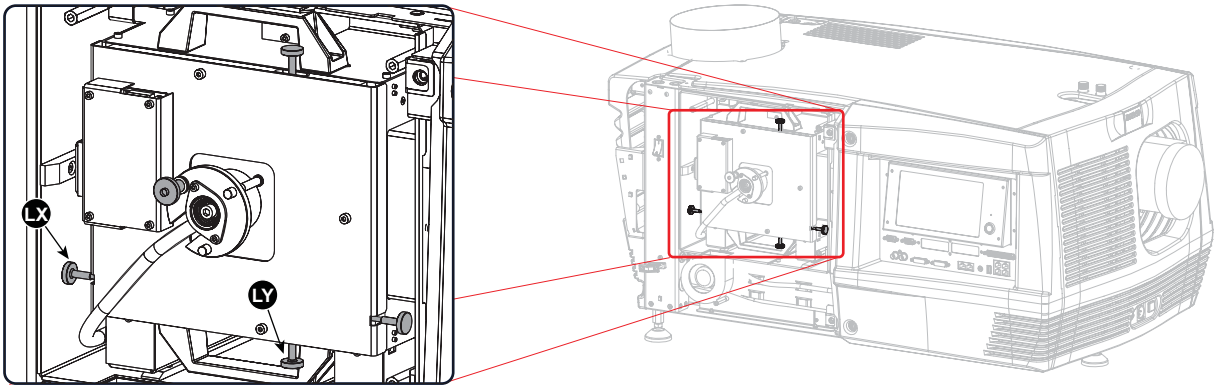


Image 7-15

4. Check the nominal position of the cold mirror and if required adjust. The distance between the head of the each adjustment screw (reference 1, 2 & 3 image 7-14) and the assembly plate should be 32,5 mm for nominal position. This distance corresponds with 17,4 mm between the cold mirror and its mounting surface. This nominal position is the best position to start the adjustment procedure. Normally the cold mirror spare part is delivered with the cold mirror in its nominal position.

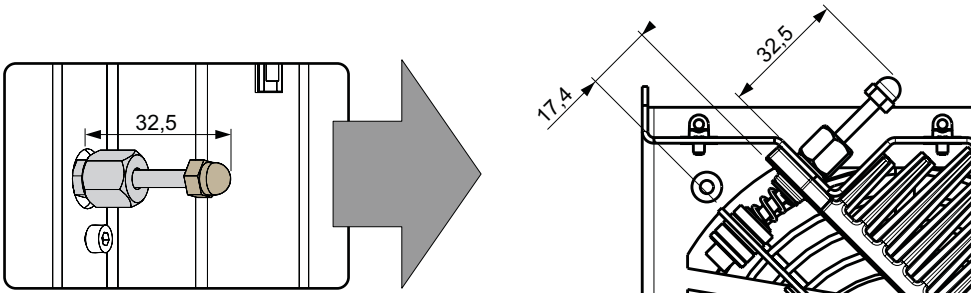


Image 7-16

5. Project a white test pattern.
6. Place the light meter in the center of the projected image.

How to adjust the cold mirror?

1. Turn the adjustment screw 2 (reference 2 image 7-17) in or out until the maximum light output is measured. Use for that a 7 mm nut driver.

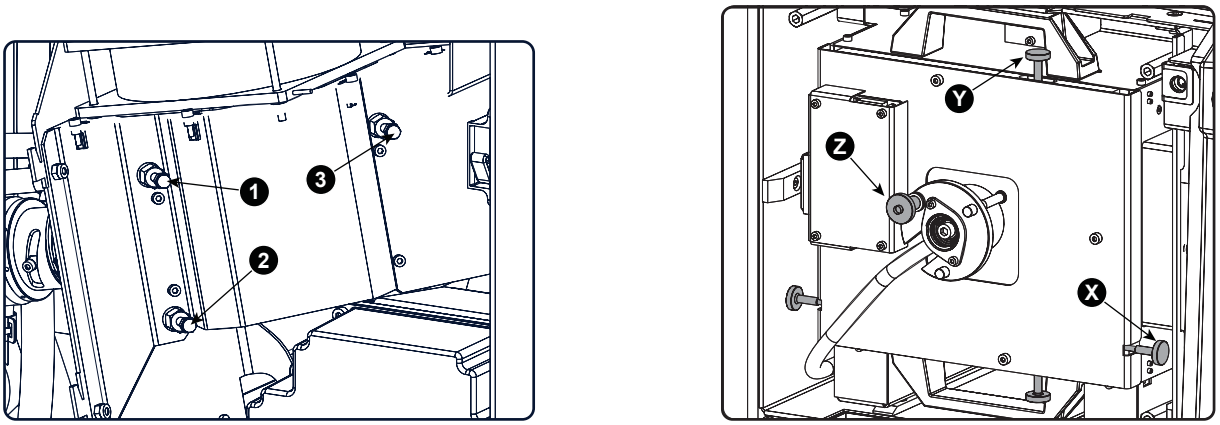


Image 7-17

2. Turn the adjustment screw 3 (reference 3 image 7-17) 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 7-17) 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.
5. Turn the adjustment screw 1, 2 and 3 (reference 1, 2 & 3 image 7-17) 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 2 and 3 (reference 2 & 3 image 7-17) until a uniform brightness is obtained.
   - Screw 2 (reference 2 image 7-17) will correct the difference between the left and the right side of the projected image.
   - Screw 3 (reference 3 image 7-17) 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 7-14) against the plate (hold on the screws while securing the nuts).
9. Secure the position of the xenon lamp in its reflector by turning the X and Y axis lock thumb screws (reference LX & LY image 7-15) of the Lamp House.

7.6 Cleaning the Cold Mirror

When cleaning the Cold Mirror?

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

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

WARNING: ISOPROPANOL ALCOHOL (200–661–7).

Hazardous product. Irritating to eyes and skin. Always use in a well ventilated area. Vapors may cause drowsiness and dizziness. Avoid contact with skin and eyes. In case of contact with the eyes, rinse immediately with plenty of water and seek medical advise.

CAUTION: ISOPROPANOL ALCOHOL (200–661–7).

Hazardous product. Lightly flammable. Always use in a well ventilated area. Keep away from sources of ignitions. Do not smoke while working with isopropanol. Exclusive keep in original container tightly closed at a cool, well ventilated and fireproof storage space.

Necessary tools

- Clean Torayse cloth.
- Clean cotton cloth.
- Demineralized water.
- Isopropanol alcohol.

How to clean the Cold Mirror?

1. Wipe off the dust of the Cold Mirror. Use for that a clean Torayse cloth.
   Tip: *Limit the number of wipe movements. This to protect the optical coating. It is better to wipe of the dust with one good wipe movement than with 10 soft wipe movements.*
2. Is all dust removed from the Cold Mirror?
   If yes, stop this cleaning procedure.
   If no, wipe off the dust of the Cold Mirror with a clean cotton cloth and demineralized water.
   Tip: *Use isopropanol alcohol instead of demineralized water to remove fingerprints.*

8. SMALL UV/IR BLOCKER

About this chapter

This chapter gives an brief description of the UV/IR blocker and how to diagnose an to replace it.

Overview

- Introduction
- Replacement of the small UV/IR blocker
- Cleaning the small UV/IR blocker

8.1 Introduction

Small UV/IR blocker

The small UV/IR blocker is located in the light path between the cold mirror and the integration rod. Next to reflecting the remaining ultra violet and infra red radiation from the light source the small UV/IR blocker also separates the light source compartment from the light processor compartment.

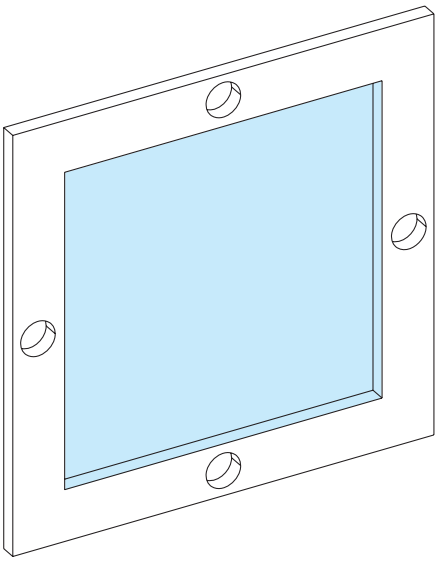


Image 8-1

Location

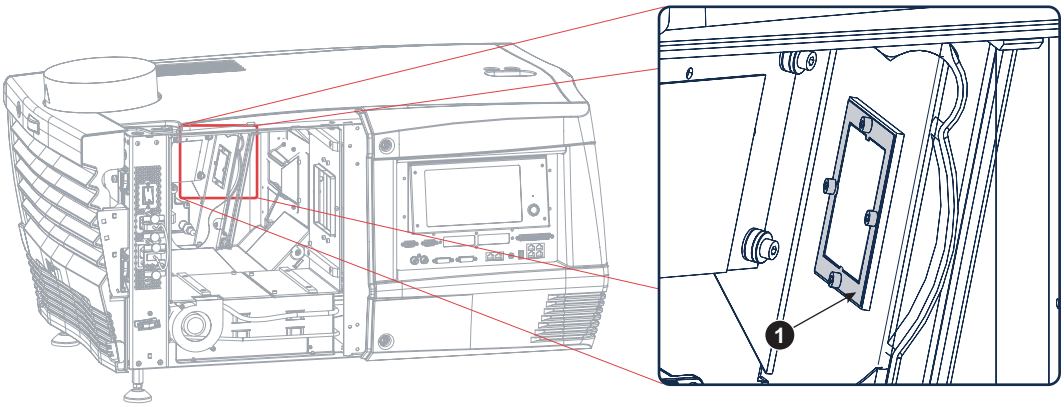


Image 8-2
1 Small UV/IR blocker.

Diagnostic

The easiest way to check the condition of the small UV/IR blocker is by removing the lamp unit. When the lamp unit is removed, the small UV/IR blocker becomes visible at the end of the lamp compartment. In case the small UV/IR blocker is not damaged but dirt is clearly visible upon the surface of the UV/IR blocker it is recommended to clean the UV/IR blocker. Always replace the small UV/IR blocker with a new one in case the small UV/IR blocker is damaged. Possible damages are:

- Small UV/IR blocker is broken.
- Coating peels off.
- Small UV/IR blocker is cracked.

The light output on the screen will be lower than the normal light output in case of a damaged or dirty small UV/IR blocker.

CAUTION: While replacing or cleaning the small UV/IR blocker do not touch the cold mirror.

8.2 Replacement of the small UV/IR blocker

This procedure assumes that the lamp house is already removed from the projector.

Necessary tools

2,5 mm Allen wrench.

How to replace the small UV/IR blocker?

1. Remove the metal frame of the small UV/IR blocker by turning out the four screws (reference 1) as illustrated.
   Caution: *Do not touch the surface of the cold mirror.*

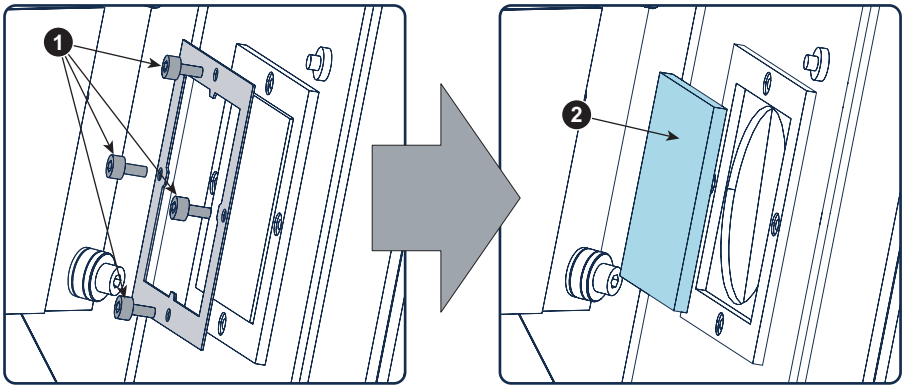


Image 8-3

2. Remove out the UV/IR blocker (reference 2 of image 8-3) from its holder.
3. Place a new UV/IR blocker in the holder with the black mark at one of the borders towards the cold mirror.
   Caution: *Do not touch the UV/IR blocker nor the surface of the cold mirror with your fingers.*
4. Put the frame back and fasten the screws. Do not fasten to hard, because the glass might break.
5. Reinsert the lamp house, see page 112.

8.3 Cleaning the small UV/IR blocker

When cleaning the small UV/IR blocker?

Only clean the small UV/IR blocker in case it is really necessary. This means in case dust is clearly visible upon the surface of the small UV/IR blocker.

This procedure requires that the lamp house is removed from the projector.

WARNING: ISOPROPANOL ALCOHOL (200–661–7).

Hazardous product. Irritating to eyes and skin. Always use in a well ventilated area. Vapors may cause drowsiness and dizziness. Avoid contact with skin and eyes. In case of contact with the eyes, rinse immediately with plenty of water and seek medical advise.

CAUTION: ISOPROPANOL ALCOHOL (200–661–7).

Hazardous product. Lightly flammable. Always use in a well ventilated area. Keep away from sources of ignitions. Do not smoke while working with isopropanol. Exclusive keep in original container tightly closed at a cool, well ventilated and fireproof storage space.

Necessary tools

- Clean Torayse cloth.
- Clean cotton cloth.
- Demineralized water.
- Isopropanol alcohol.

How to clean the small UV/IR blocker?

1. Wipe off the dust of the small UV/IR blocker. Use for that a clean Torayse cloth.
   Tip: *Limit the number of wipe movements. This to protect the optical coating. It is better to wipe of the dust with one good wipe movement than with 10 soft wipe movements.*
2. Is all dust removed from the small UV/IR blocker?
   If yes, stop this cleaning procedure.
   If no, wipe off the dust of the small UV/IR blocker with a clean cotton cloth and demineralized water.
   Tip: *Use isopropanol alcohol instead of demineralized water to remove fingerprints.*

9. DOLBY® 3D COLOR WHEEL

About this chapter

This chapter contains information about the optional Dolby® 3D color wheel.

Overview

- Introduction
- Change valved fittings
- Installation of the Dolby® 3D color wheel assembly in a DP-series projector
- Replacement of the Dolby® 3D color wheel control board

9.1 Introduction

Introduction of the Dolby® 3D color wheel

The Barco digital projectors mentioned in the “where to use” list can be upgraded for 3D digital cinema by installing the Dolby® 3D color wheel. This Dolby® 3D color wheel upgrade kit is designed by Barco and fits precisely upon the light pipe entrance of the 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 lenses 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 new 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 Dolby® 3D color wheel assembly, are equipped with respectively a short and a long tube with a valved fitting for DP2K projectors. Extra valved fittings for the DP-xx00 series are delivered separately and can be used to replace the current mounted fittings. Note that this cooling circuit is not used on the DP-1200 series.

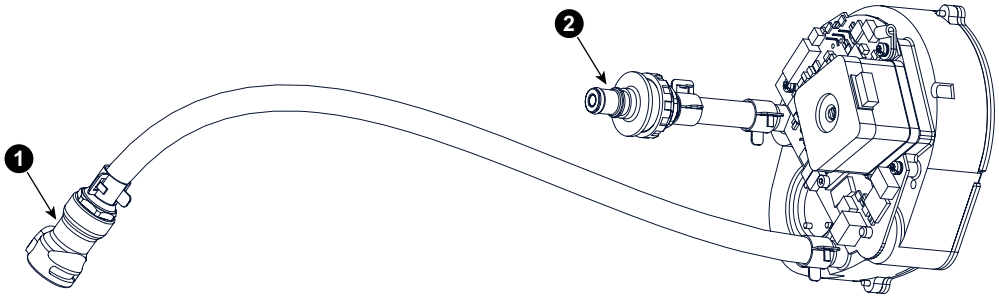


Image 9-1
1 Female valved fitting on the tube of the liquid cooling circuit exit side.
2 Male valved fitting on the tube of the liquid cooling circuit entrance side.

Parts location of the Dolby® 3D color wheel assembly

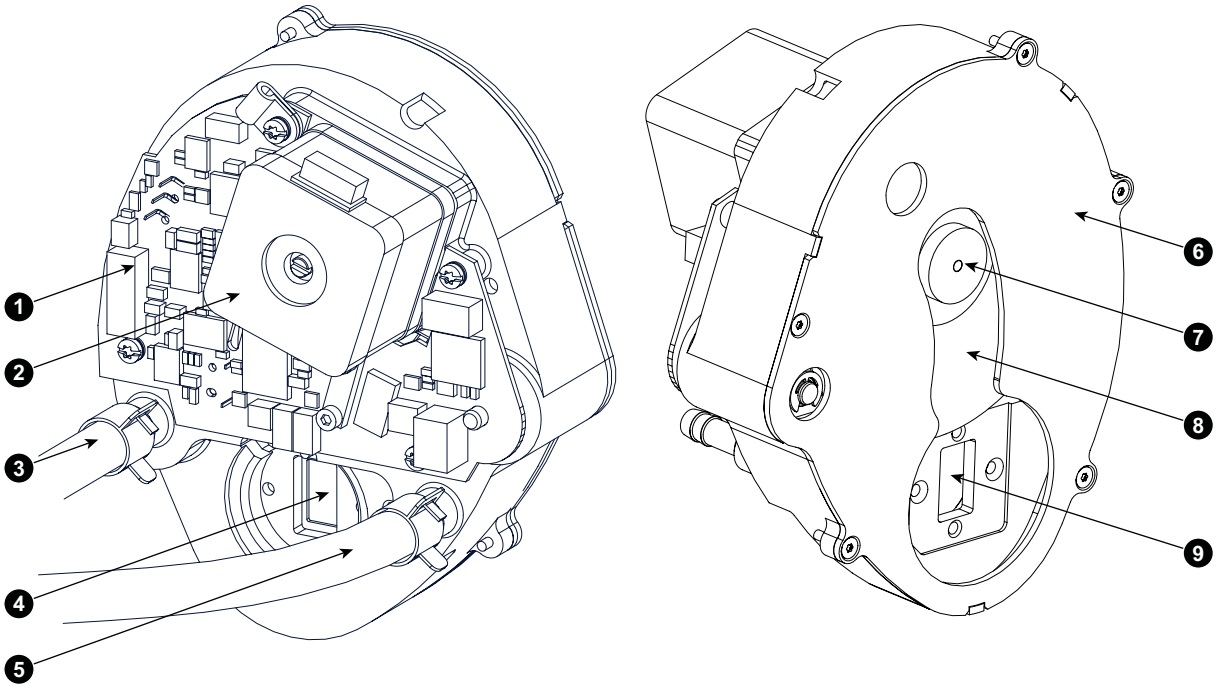


Image 9-2
1 Socket for connection with the Formatter Interface Board (FIB).
2 Color wheel retraction motor.
3 Liquid cooling circuit entrance.
4 Light path exit.
5 Liquid cooling circuit exit.
6 Cover plate 3D color wheel.
7 Spinning motor 3D color wheel.
8 3D color wheel.
9 Light path entrance.

9.2 Change valved fittings

About the assembly

New valved fittings for DP2K series are mounted on the assembly.

When using the assembly in a DP-1500 or DP-2000, these valved fittings must be replaced with the separate delivered valved fittings.

The female and male fittings are swapped for a DP-1500 or DP-2000. That means that the current mounted male fitting has to be replaced with a female fitting and the current female fitting with a male fitting.

Necessary tools

Set of pliers

Necessary parts

One male and one female valved fitting for DP-series projectors.

How to change

1. On the short tube, open the fastening clamp (reference 1) and pull off the current mounted male valved fitting (reference 2).

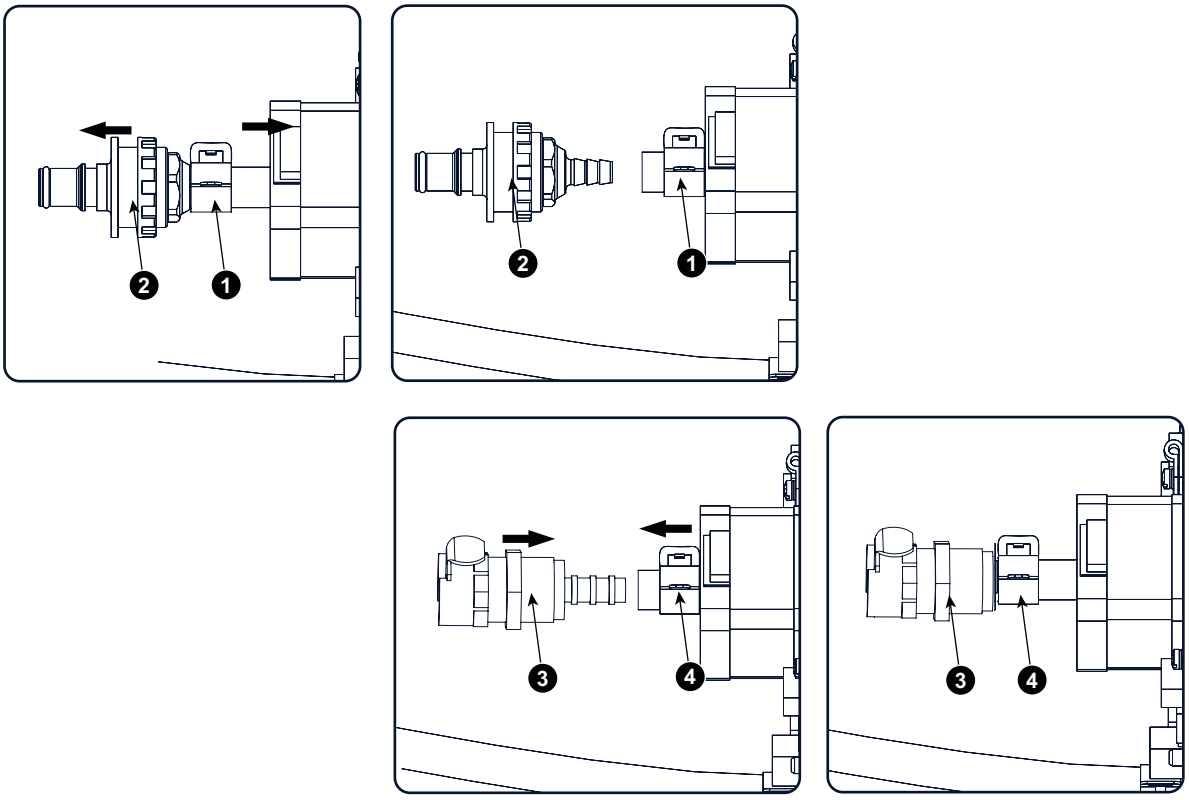


Image 9-3

2. Shorten the tube from 8 cm to 5 cm.
3. Take the separate delivered female valved fitting and push it in the tube (reference 3).
4. Slide the fastening clamp fully towards the valved fitting and close the clamp (reference 4).
5. Repeat this procedure to replace the current mounted female valved fitting on the long tube with the delivered male valved fitting.
6. Return to the installation process overview to continue with the installation.

9.3 Installation of the Dolby® 3D color wheel assembly in a DP-series projector

This procedure assumes that the cooling circuit of the Light Processor unit is drained and that the cooling block of the rod entrance is removed.

For the DP-1200 series all steps around the cooling circuit can be skipped because the DP-1200 does not have a liquid cooling circuit. Connect the IN and OUT of the cooling circuit of the Dolby® 3D color wheel assembly with each other if installed in a DP-1200..

Necessary tools

- Set of pliers.
- 2.5 mm Allen wrench.
- T10 Torx screw driver.
- Clean optical cloth.
- Side cutter

Necessary parts

- Male valved fitting (reuse from original rod entrance cooling block).
- Four M3 x 10 Phillips countersunk head screws (included in the kit).
- Thread fastener, Permabond type A130.
- One M3 x 4 hexagon socket head cap screw (reuse).
- One mask (included in the kit)
- Power/Date wire for the Dolby® 3D color wheel assembly.
- Cable ties.

How to install the Dolby® 3D color wheel assembly

1. Shorten the tube from the Light processor by **8 centimeters**.

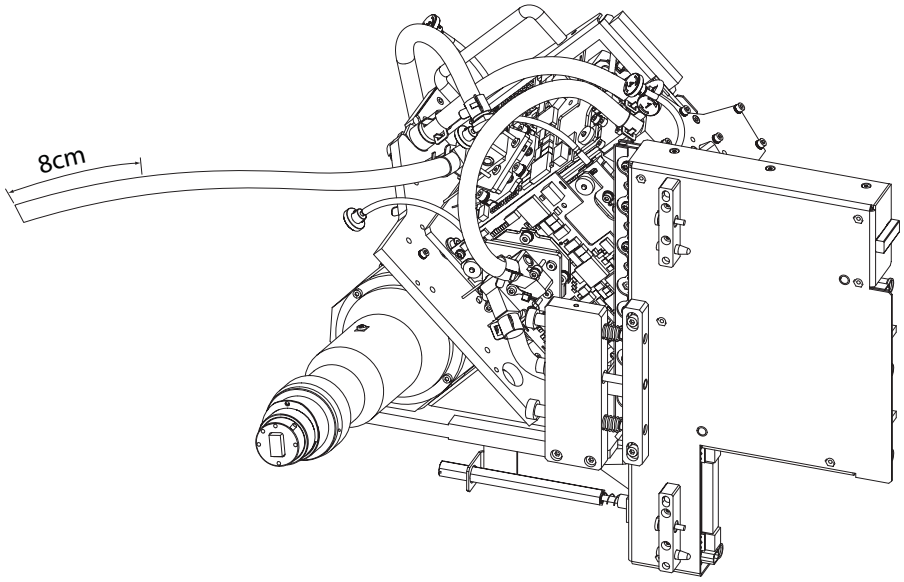


Image 9-4

2. Remove the male valved fitting (reference 3) and its fastening clamp (reference 2) from the tube of the rod entrance cooling block, which was removed from the light pipe.

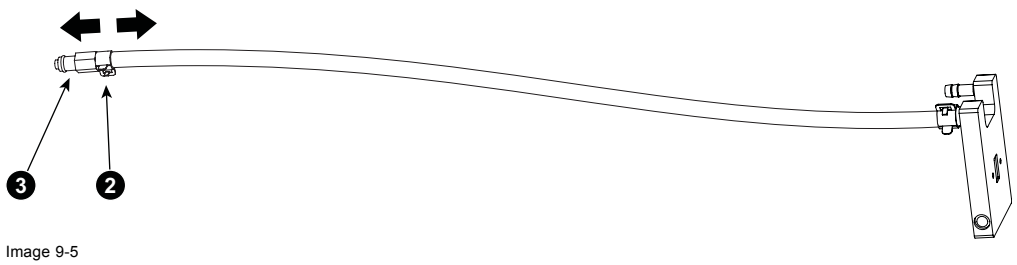


Image 9-5

3. Mount the male valved fitting (reference 3) on the tube (reference 1) of the light processor unit as illustrated. Make sure that the tube is provided with a fastening clamp (reference 2). Use a set of pliers to position the fastening clamps.

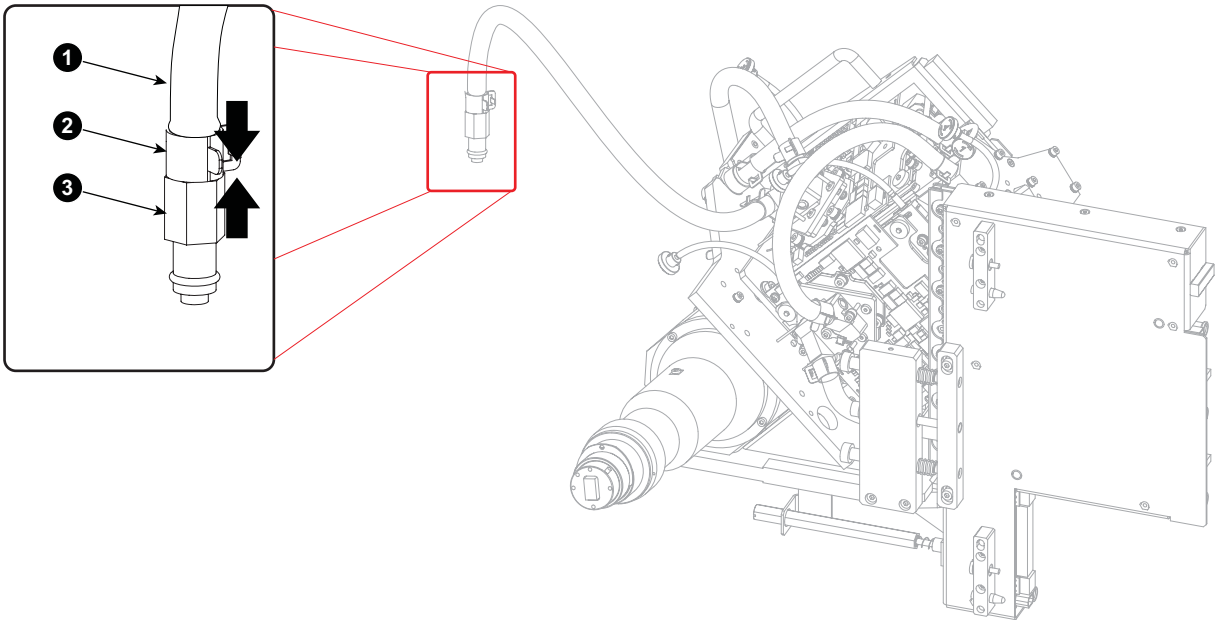


Image 9-6

4. Makes sure that the color wheel is retracted (non acting position) so you can freely look through the light path opening.

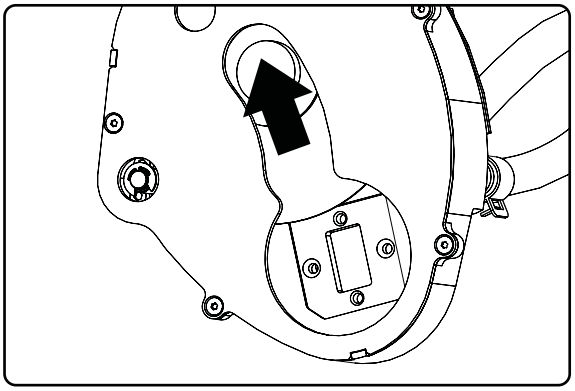


Image 9-7

5. Carefully bring the Dolby® 3D color wheel up towards the light pipe. It is very important to **look straight into the light pipe** (reference 4) via the light path opening (reference 3) of the Dolby® 3D color wheel when doing this.
Caution: *Any contact with the integration rod may cause damage.*

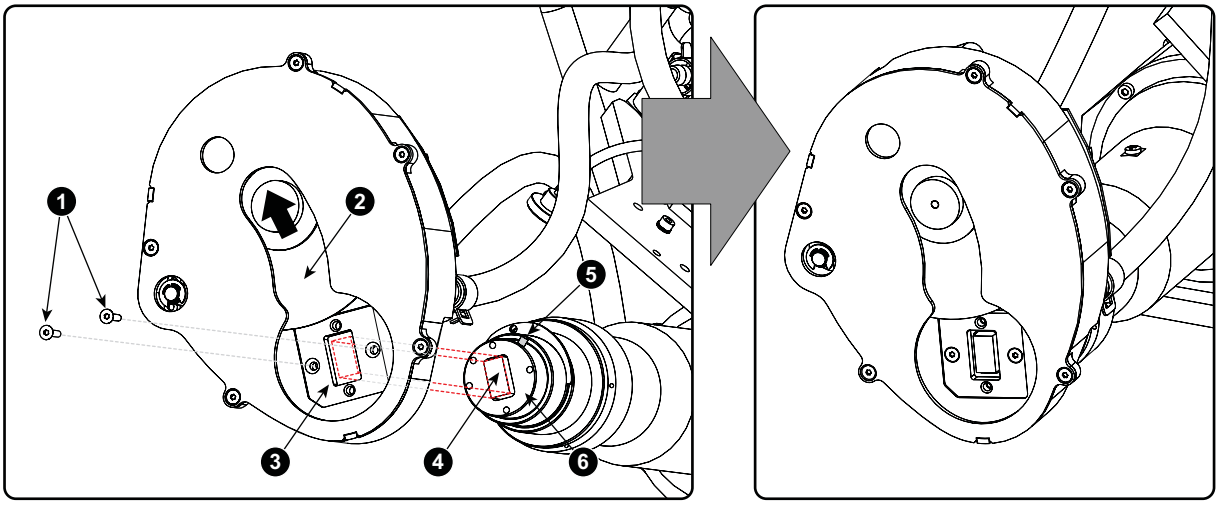


Image 9-8

6. Secure the Dolby® 3D color wheel with two Torx **countersunk** head screws (reference 1 image 9-8) in combination with thread fastener, Permabond type A130. Use a Torx T10 screw driver.
   Caution: *Before fixing the Dolby® 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. See reference 6 on image 9-8. This will ensure the module is correctly positioned while allowing secure fixing. Failure to do this could result in wheel breakage.*

7. Install the mask (reference 2) into its socket as illustrated. Use the mask plate with engraved number R858504..
   Fasten with two Torx **countersunk** head screws (reference 3). Use a Torx T10 screw 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.*

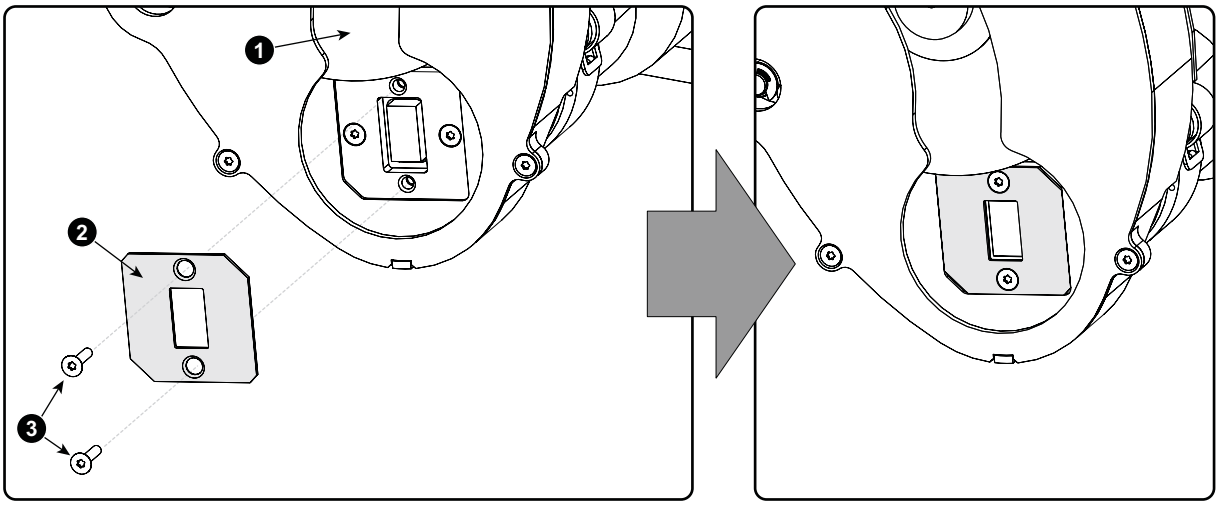


Image 9-9

8. Fasten the temperature sensor (reference 2) with a hexagon socket head screw (reference 1) onto the Dolby® 3D color wheel assembly as illustrated. Use a 2.5 mm Allen wrench.

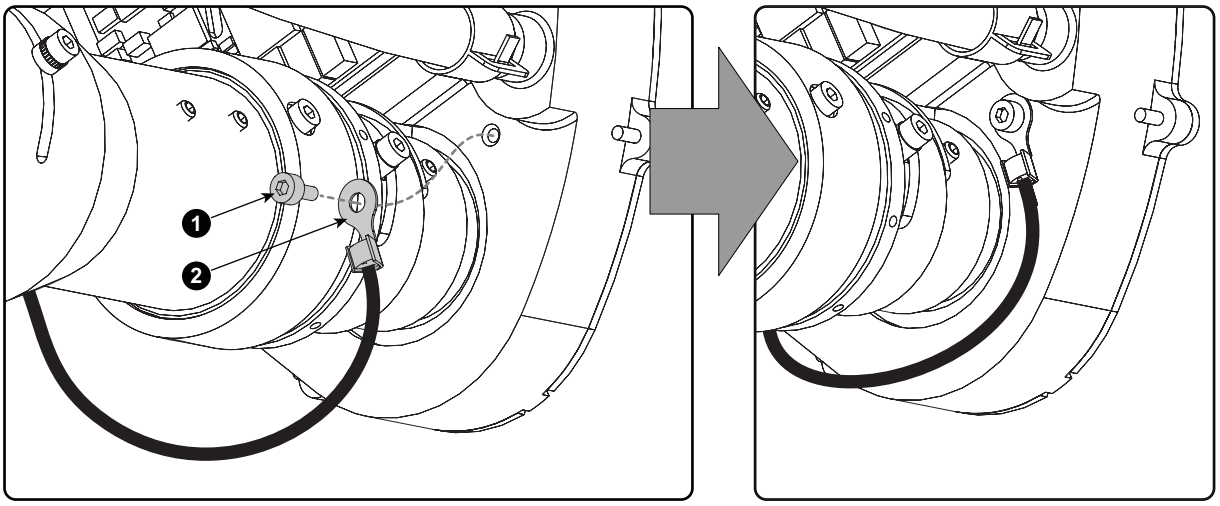


Image 9-10

9. Couple the cooling circuit of the Light Processor together with the cooling circuit (short tube) of the Dolby® 3D color wheel assembly.

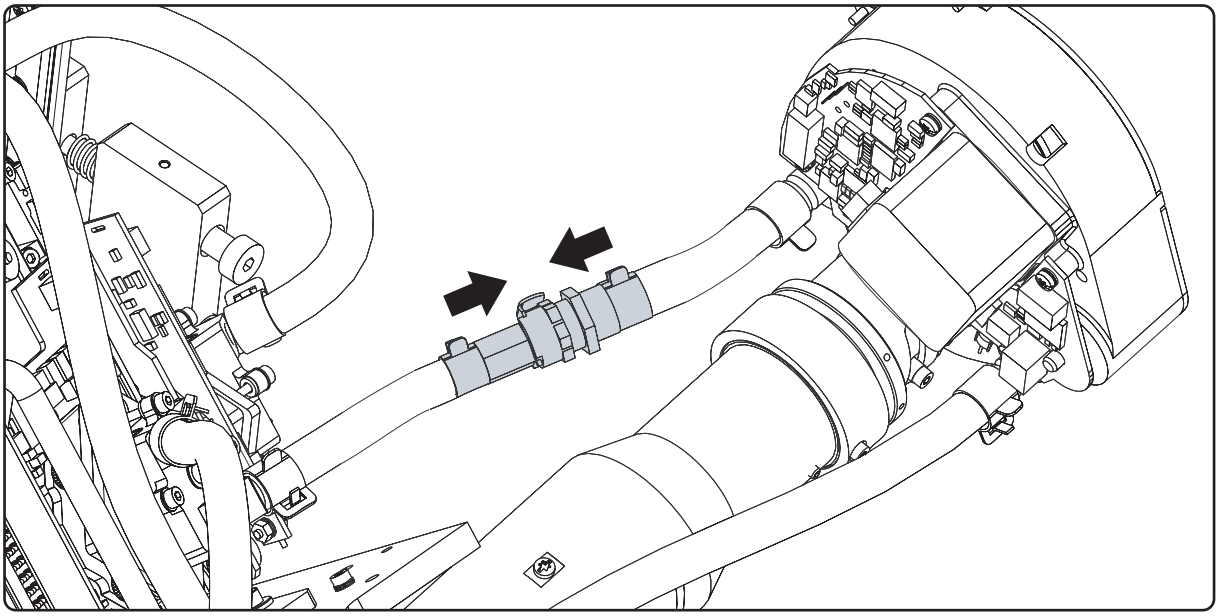


Image 9-11

10. Connect the data/power wire (reference 1) with the control board of the Dolby® 3D color wheel assembly. Secure the data/power wire unit (1) and the temperature sensor wire unit (reference 3) with cable ties (reference 2) as illustrated.
Caution: *Make sure the temperature sensor is properly fixed and makes good contact with the module.*

Caution: *Make sure when strapping the data/power wire unit to the cooling tube, there is no stress on the cable.*

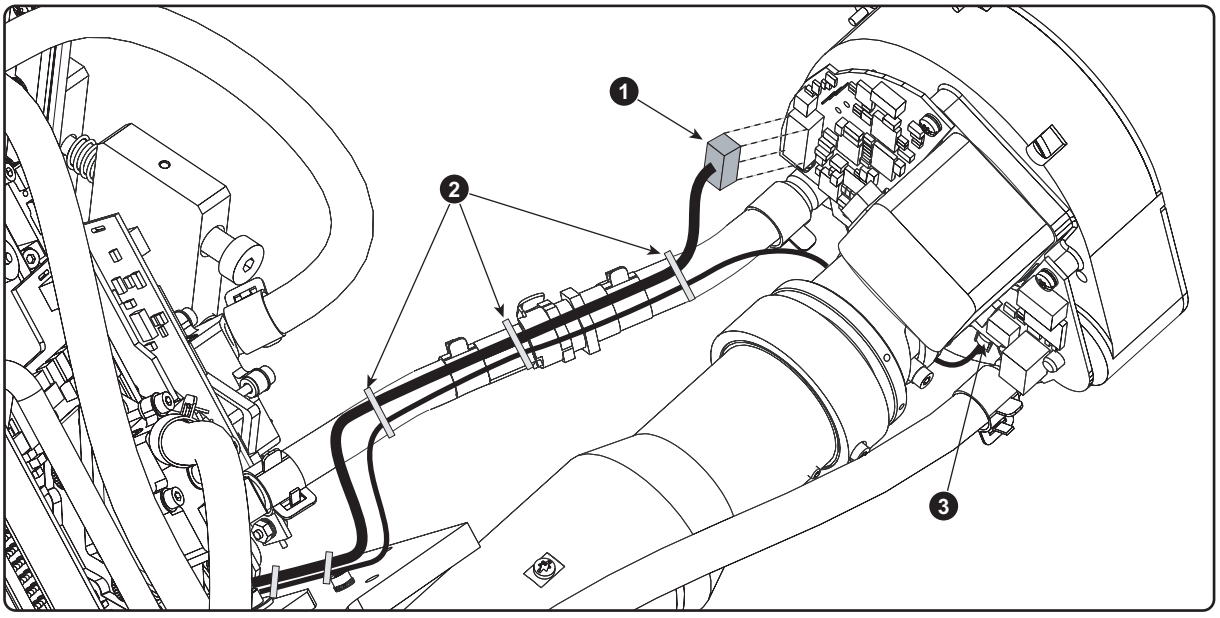


Image 9-12

11. Connect the other end of the data/power wire unit (reference 3) with the Formatting Interface Board (FIB). Remove the small cover of the FIB to access the socket on the printed circuit board of the FIB. Use a T10 Torx screw driver to release the two Torx countersunk head screws (reference 1) and the Torx head screw (reference 2). Make sure to reinstall the small cover.
Warning: *Make sure projector is not powered when connecting/disconnecting the Dolby® 3D color wheel module.*

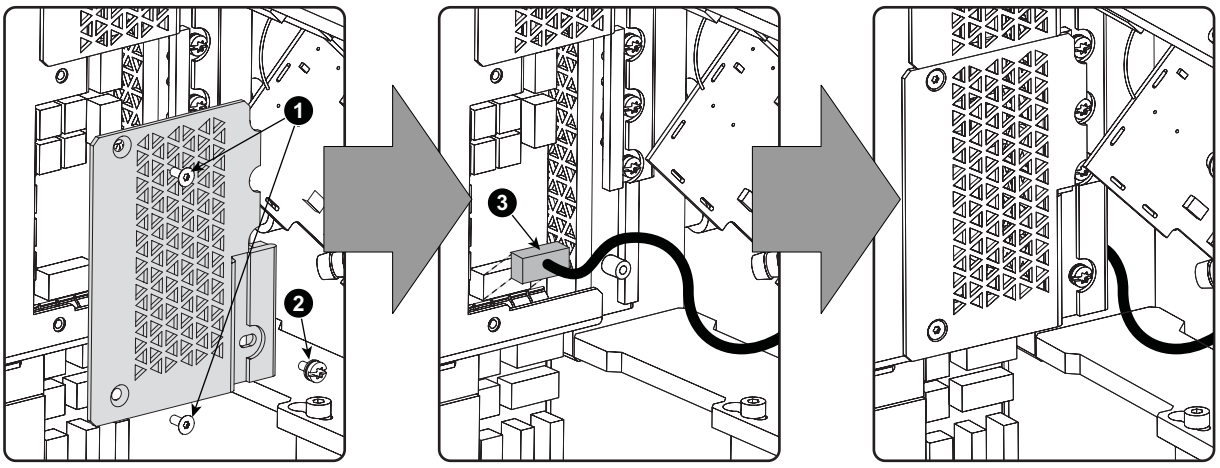


Image 9-13

After installation of the Dolby® 3D color wheel assembly proceed with installing the Light Processor unit. Then fill, expel air and pressurize the cooling circuit.

After installation, the Dolby® 3D color wheel assembly still needs to be calibrated. Use the 3D calibration kit (Order No. R9856230) which includes the software and manual with instructions on how to calibrate your Dolby® 3D color wheel.

9.4 Replacement of the Dolby® 3D color wheel control board

This procedure assumes that the Light Processor unit with the Dolby® 3D color wheel assembly is already removed from the projector.

Necessary tools

- T10 Torx driver.
- 2,5 mm Allen wrench.

How to replace the Dolby® 3D color wheel control board?

1. Make sure that the Light Processor unit with Dolby® 3D color wheel is placed upon a stable table.
2. Remove the lock from the flat cable of the spinning motor by loosen the two hexagon socket head cap screws (reference 1) as illustrated. Use a 2,5 mm Allen wrench.

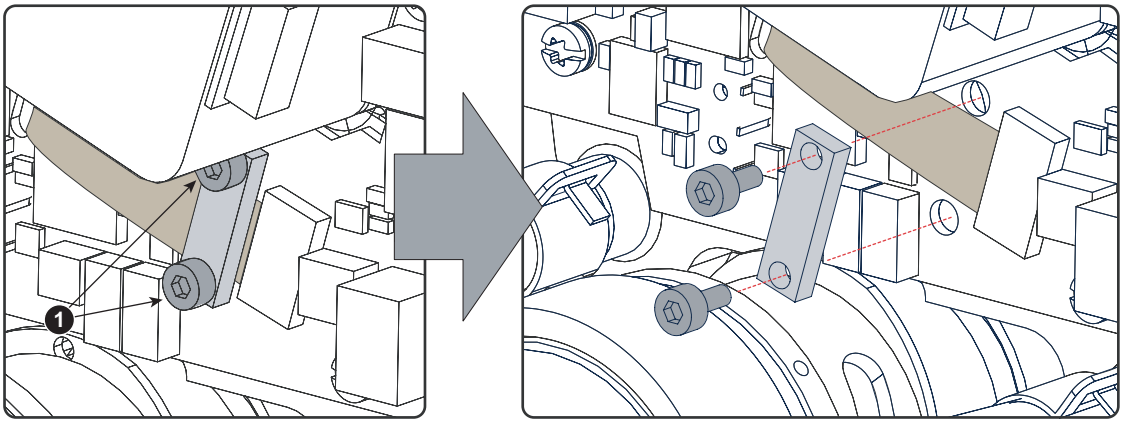


Image 9-14

3. Disconnect the four wire units from the control board:
   a) Wire unit of the spinning motor feedback circuit.
   b) Connection with Formatting Interface Board.
   c) Wire unit between retraction motor and electronic board.
   d) Wire unit (flat cable) between spinning motor and electronic board.

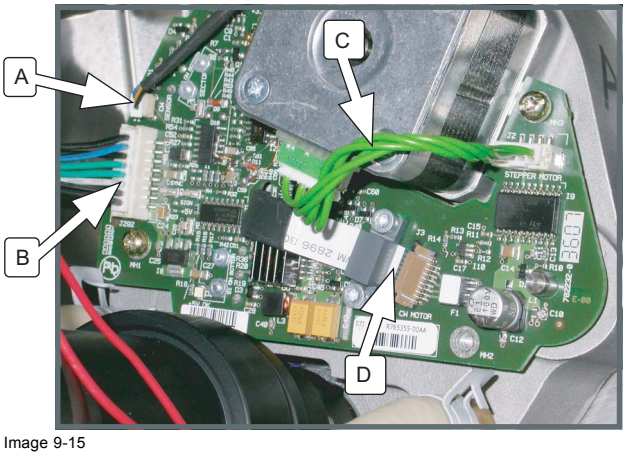


Image 9-15

4. Remove the control board by loosen the four Torx screws (reference 2) as illustrated. Use a T10 Torx driver.

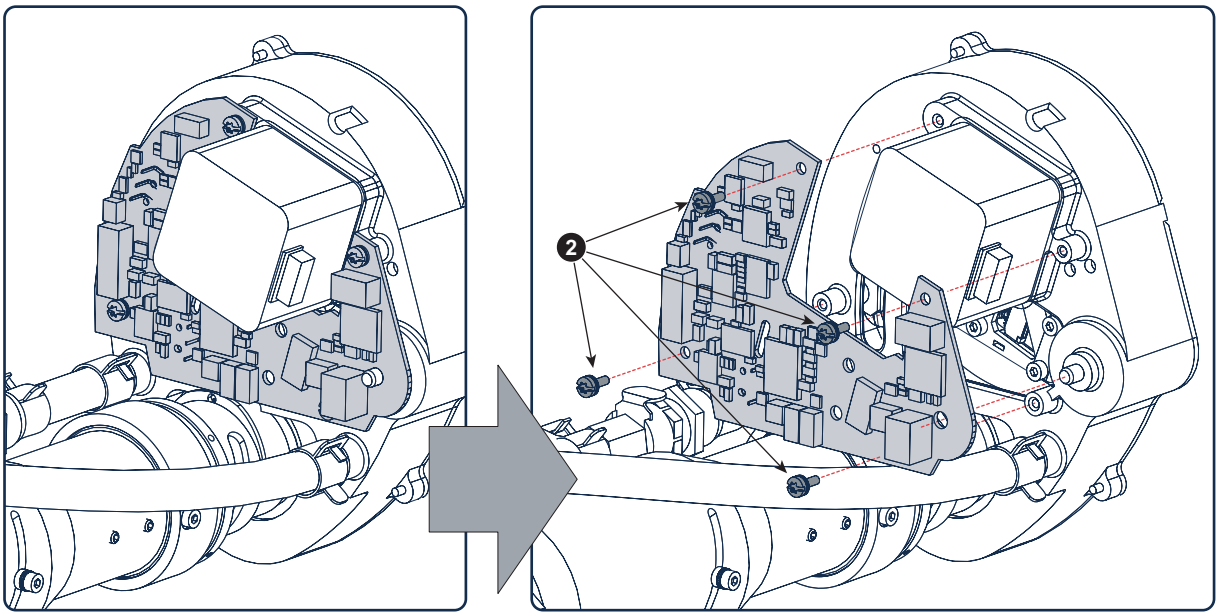


Image 9-16

5. Install a new control board as illustrated. Make sure that you guide the flat cable (reference 3) through the slot opening in the board. Use a T10 Torx driver to fasten the four screws (reference 2).

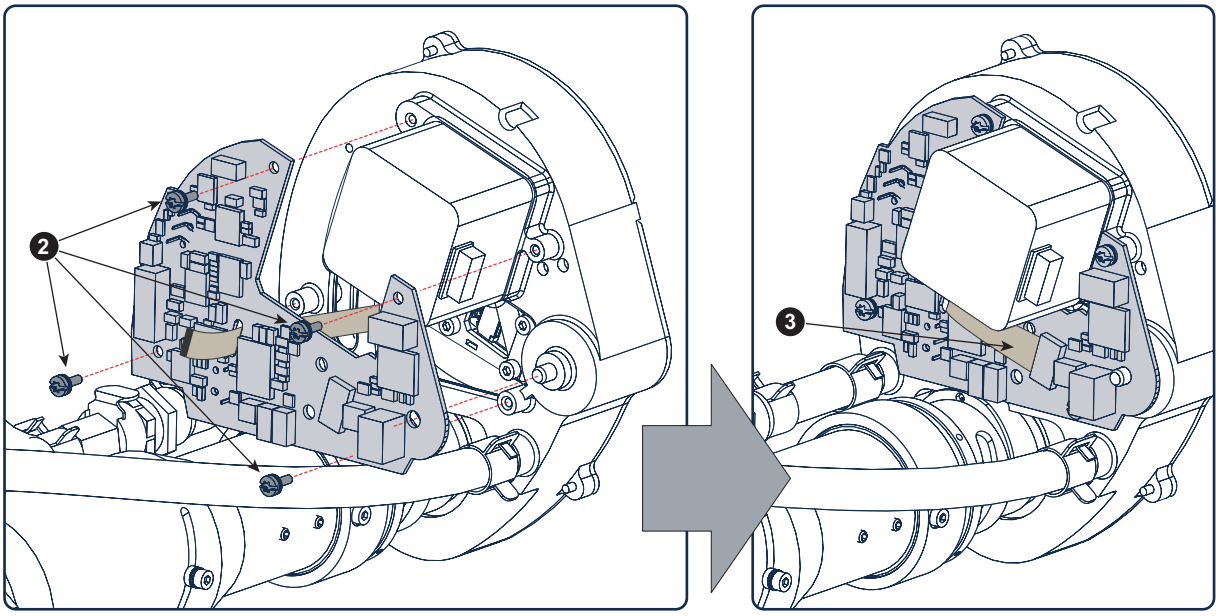


Image 9-17

6. Reconnect the four wire units with the new control board. See image 9-15.
7. Secure the flat cable of the spinning motor with a small fixation plate and two screws (reference 1) as illustrated. Use a 2,5 mm Allen wrench.

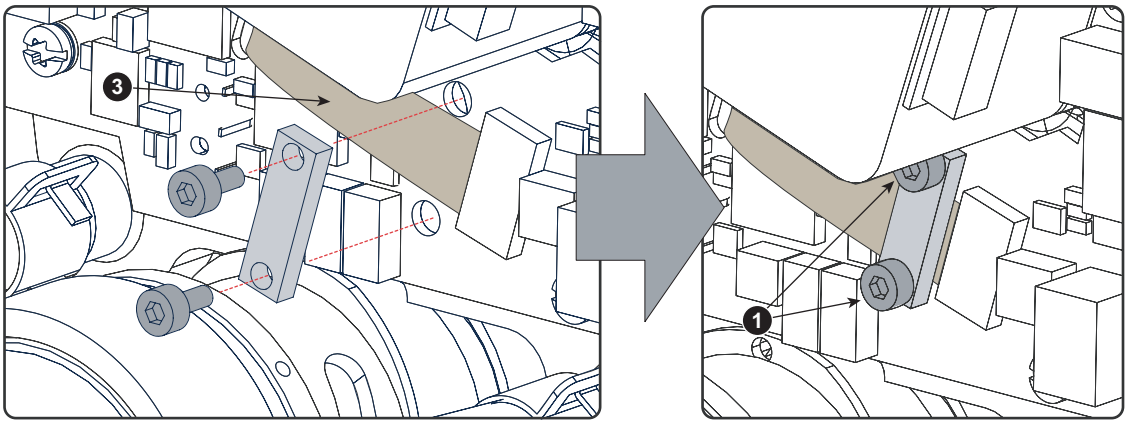


Image 9-18

10. INTEGRATION ROD

About this chapter

This chapter describes briefly the functionality of the integration rod, how to diagnose the integration rod, how to replace this rod and how to adjust it.

Overview

- Introduction
- Rod diagnostic
- Removal of the integration rod assembly
- Installing a new integration rod assembly
- Adjusting the integration rod

10.1 Introduction

Functionality of the integration rod

The integration rod is made of fused silica and is approximately 13 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. Futhermore, the integration rod ensures that the light beam is focused on the DMD's, which results in an optimally focused light beam on the screen.

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.

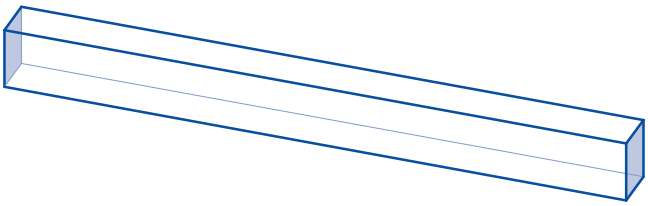


Image 10-1

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 inside an aluminium tube, which requires replacing together with the rod. This aluminum tube also contains an adjustment mechanism to position the rod inside the light pipe. The integration rod, the aluminium tube and the adjustment mechanism together form the "integration rod assembly".

Parts

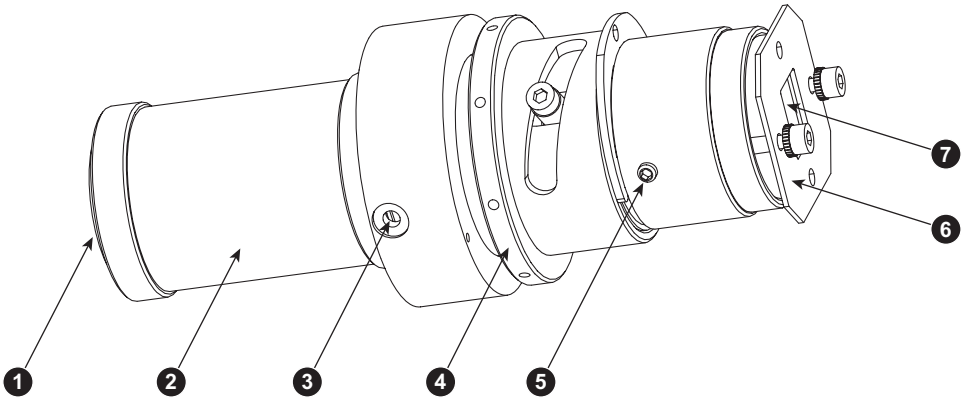


Image 10-2
1 Rod exit.
2 Aluminium tube.
3 Fixation screw rod assembly.
4 Rod adjustment ring.
5 Set screw for rod focus adjustment.
6 Rod entrance.
7 Rod entrance mask.

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.

10.2 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

- 7 mm flat screw driver.
- 2 mm Allen wrench.

How to diagnose the integration rod of the projector?

1. Remove the side cover of the projector.
   Caution: *Remove the side cover 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.*
2. Switch on the projector and project a white test pattern. See users manual of the projector to do so. Make sure that the projected white test pattern is focused.
3. Release the two set screws (A) as illustrated. Use a 2 mm Allen wrench. It's not necessary to remove the set screws.

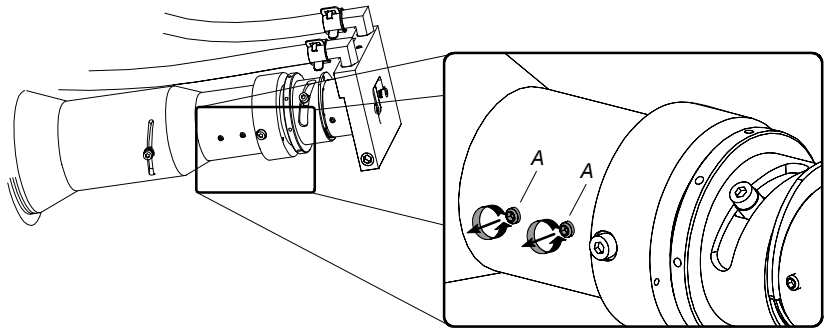


Image 10-3

4. Gently rotate the adjustment ring (D) of the integration rod assembly back and forward while watching the projected image.

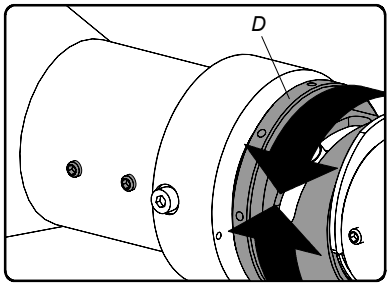


Image 10-4

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

10.3 Removal of the integration rod assembly

To remove the integration rod assembly from the light pipe the light processor unit has to be removed from the projector first.

CAUTION: All servicing to the Light Processor unit has to be done in a dust free area. Use compressed air to blow away all dust on the outside of the Light Processor unit before entering the unit into the dust free area.

Necessary tools

- Compressed air.
- 2 mm Allen wrench.
- 2,5 mm Allen wrench.

How to remove the integration rod from the light pipe?

1. Remove the cooling block at the light pipe entrance by releasing the two socket head screws as illustrated. Use a 2,5 mm Allen wrench.
   Note: *Note that the screws, which fasten the cooling block, also fasten the mask between the cooling block and integration rod.*

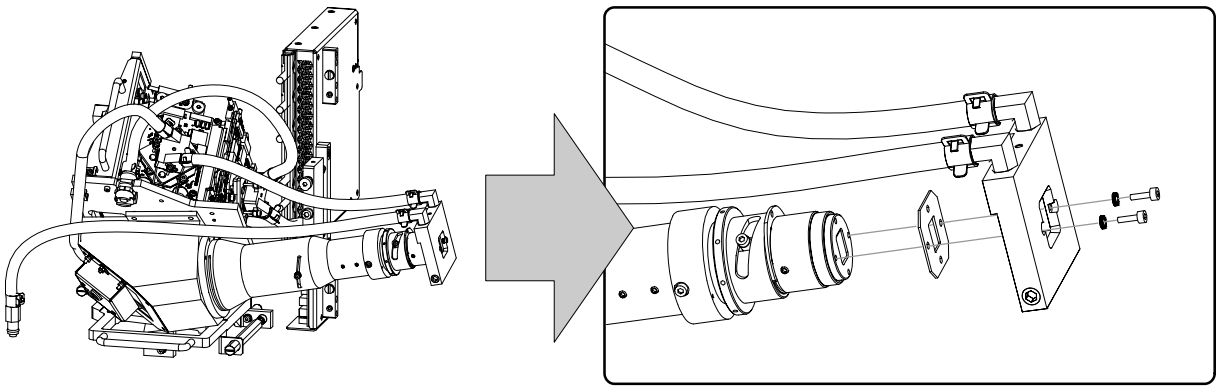


Image 10-5

2. Release the two set screws (A) as illustrated. Use a 2 mm Allen key. It's not necessary to remove the set screws.
3. Remove the socket head screw (B) as illustrated. Use a 2,5 mm Allen wrench.

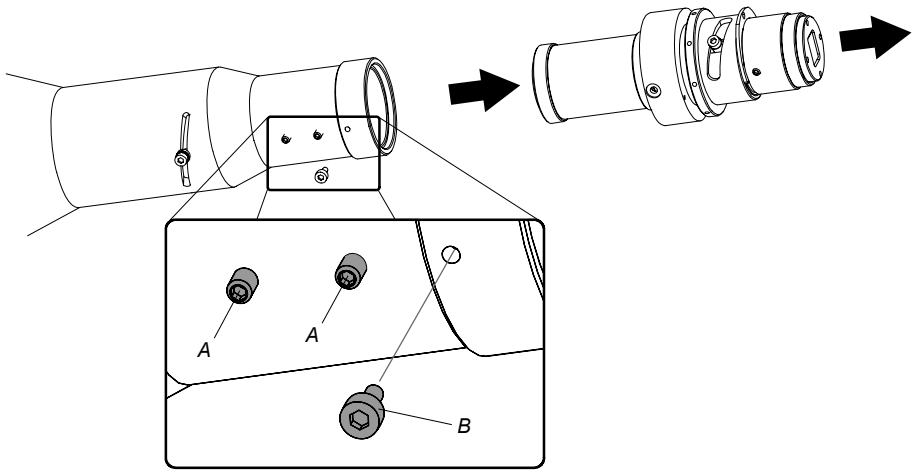


Image 10-6

4. Pull the integration rod assembly out of the light pipe.

Do not keep the Light Pipe entrance open (no Integration Rod installed) for a long period. This to prevent dust intrusion.

10.4 Installing a new integration rod assembly

Necessary tools

- Compressed air.
- 2 mm Allen wrench.
- 2,5 mm Allen wrench.

Necessary parts

Integration rod assembly.

How to install a new the integration rod assembly?

1. Removing the mask (M) from the integration rod by releasing the socket screws (S). Use a 2,5 mm Allen wrench.
   Caution: *Never touch the entrance or exit side of the integration rod assembly.*

   Note: *The mask (M), the washers (W) and the socket screws (S) have to be reinstalled later in this procedure.*

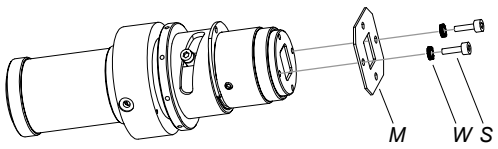


Image 10-7

2. Check if there are no dust particles present on the exit side of the integration rod assembly. If necessary remove the dust with compressed air.
   Note: *The exit side of the rod is much more critical than the entrance side of the rod.*
3. Check if the inner side of the light pipe entrance is dust free. If necessary remove the dust with compressed air.
4. Gently slide the integration rod into the light pipe as illustrated.

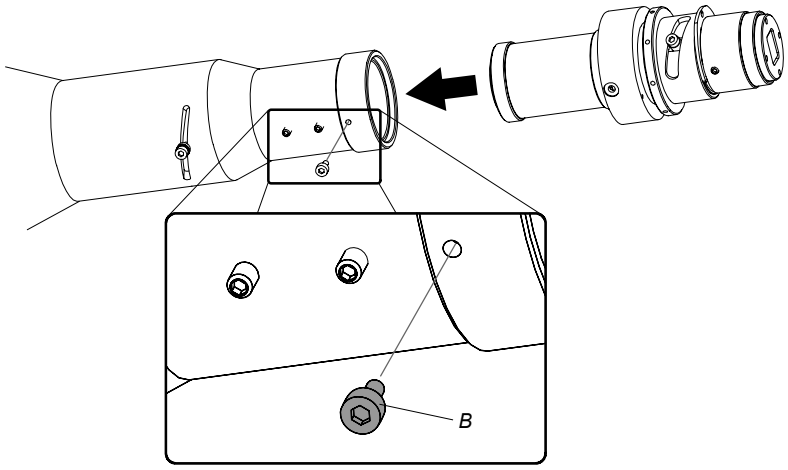


Image 10-8

5. Secure the integration rod with a hexagon socket head screw (B). Use a 2,5 mm Allen wrench.
6. Rotate the integration rod until the set screws (A) of the light pipe are aligned with the set screw (B) of the integration rod assembly as illustrated.

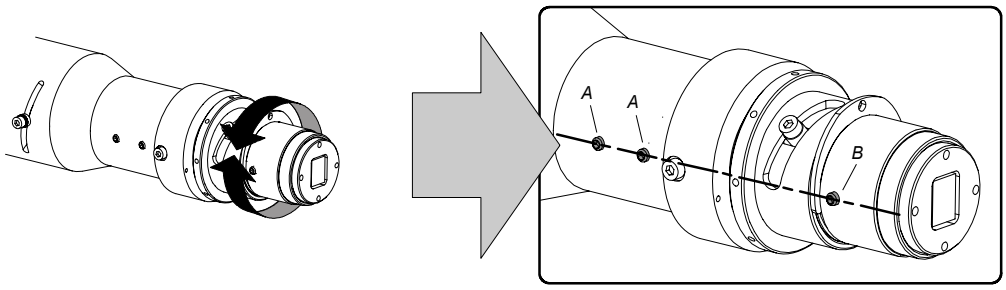


Image 10-9

7. Fasten the set screws (A). Use a 2 mm Allen wrench.

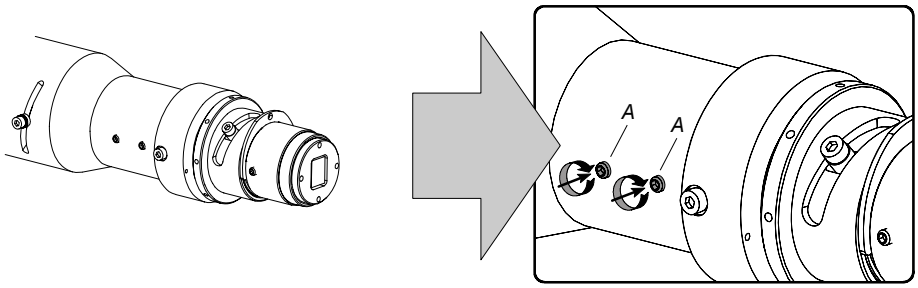


Image 10-10

8. Install the mask (M) and cooling block as illustrated. Use for that two washers (W) and two hexagon screws (S) which you removed in step one. Use a 2,5 mm Allen wrench.
   Caution: *Ensure that the mask (M) is placed in portrait like the entrance of the integration rod.*

   Ensure that the shining side of the mask (M) is facing the lamp.

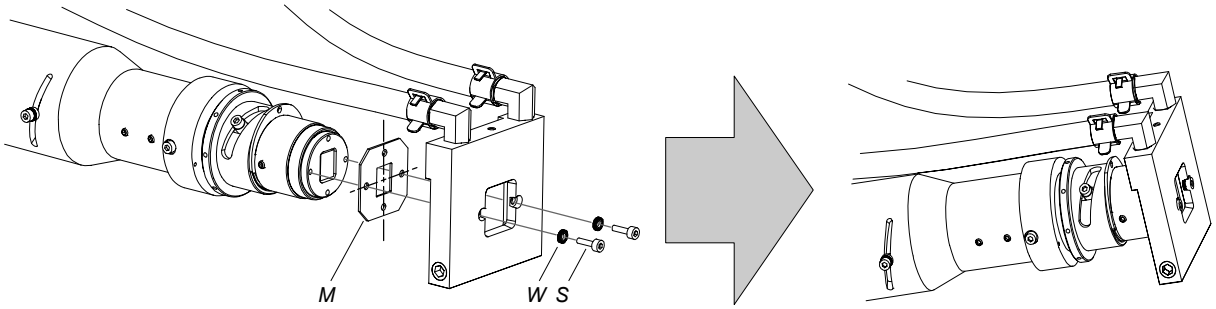


Image 10-11

The integration rod must be adjusted after installation.

10.5 Adjusting the integration rod

To adjust the integration rod you have to remove the side cover (light processor side) first.

Necessary tools

2 mm Allen wrench.

How to adjust the integration rod of the projector?

1. Check if the set screws A and B are aligned. If not see procedure "Installing a new integration rod assembly", page 161, to align the set screws.

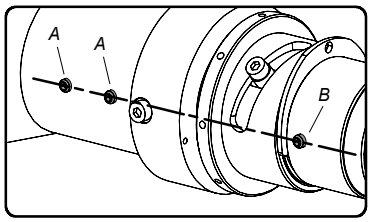


Image 10-12

2. Loosen the set screw B as illustrated. Use a 2 mm Allen wrench.

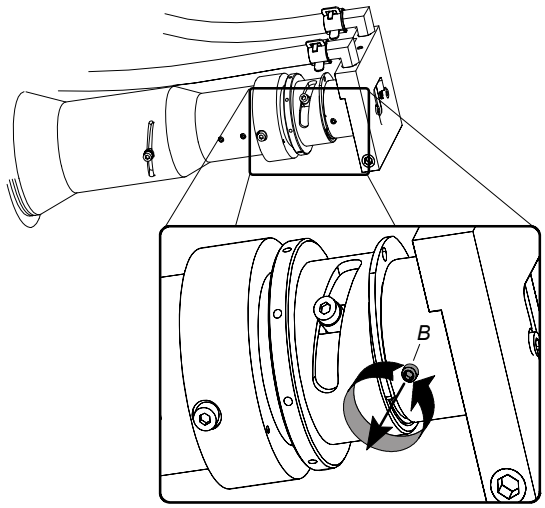


Image 10-13

3. Start up the projector but do not activate the lamp yet.
4. Set up the projector using the Communicator software to display a white internal pattern with a maximum contrast and a maximum dimming. Do not activate the lamp yet.
   a) Switch on the projector. Do not activate the lamp yet.
   b) Log on to the Communicator as “Service technician” and select: `Installation > Lamp > Light output`, and adjust lamp dimming slider to 0.
   c) Select : `Control > Test patterns > Full white`
   d) Make sure that you have a 2 mm Allen wrench within reach for the next steps.

   Caution: *Maximum five (5) seconds are allowed of minimum light output on an non-adjusted Integration Rod. Otherwise, the sealing between the DMD’s and the prism will be damaged.*
5. 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.*
6. Gently rotate the adjustment ring D back or forward to a position which projects the sharpest possible edges on the screen.
   Tip: *Place a 2 mm Allen wrench in one of the holes on the outer side of the adjustment ring (D). The Allen wrench function as an extension bar of the adjustment ring. This allows a more precise adjustment.*

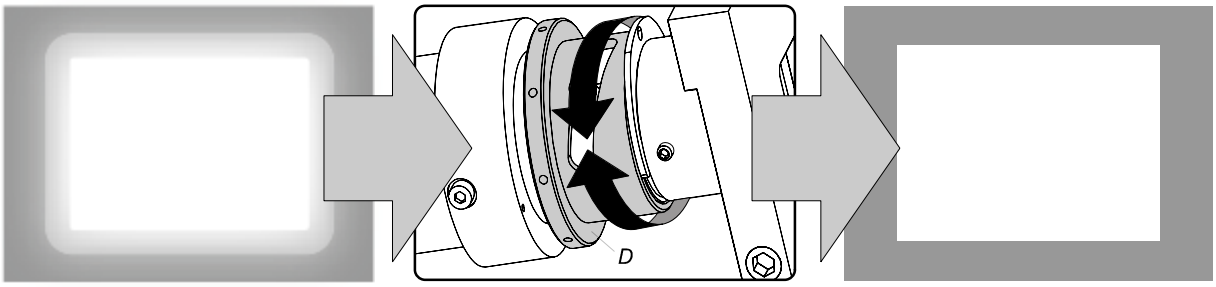


Image 10-14

7. Fasten the set screw B which you released in step 3.
8. Loosen the two set screws A as illustrated. Use a 2 mm Allen wrench.

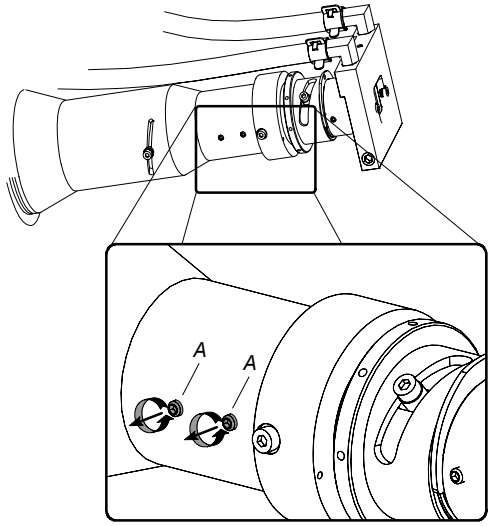


Image 10-15

9. Gently rotate the adjustment ring D until the projected light beam matches the projected outline of the DMD's.
   Note: *No spots in the projected image may move along with the movements of the rod. Spots which move with the movements of the rod indicates that the exit side of the integration rod is contaminated with dust. If this is the case, remove the integration rod and try to blow away the dust. If this doesn't help replace the integration rod.*

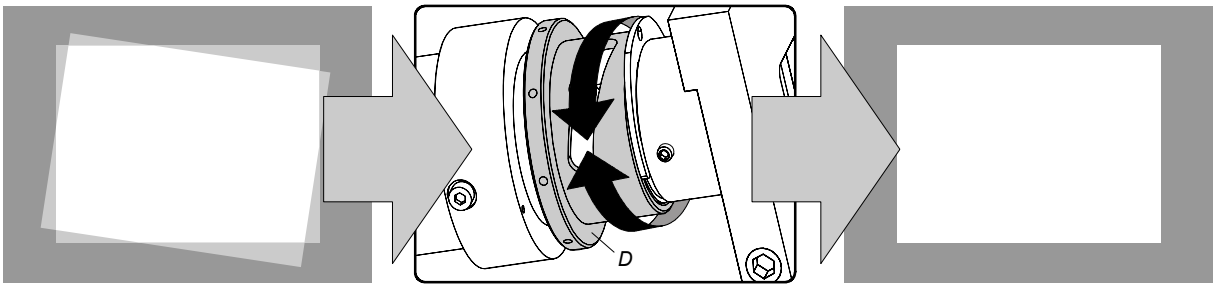


Image 10-16

10. Fasten the two set screws A which you released in step 8 and reinstall the projector side cover.

When you are familiar with this adjustment procedure you can optimize the focus position of the Integration Rod 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 the Integration Rod has to be done quickly. Otherwise, the sealing between the DMD's and the prism will be damaged.

11. LIGHT PROCESSOR ASSEMBLY

About this chapter

This chapter gives a brief introduction of the Light Processor assembly. Futhermore, this chapter includes the replacement procedure of the whole Light Processor or sub assemblies e.g. Shutter and Light Sensor module. Note that the service information about convergence adjustment and the integration rod is grouped in a separate chapter in this manual (page 157 and page 197).

Overview

- Introduction
- Light Processor diagnostic
- Removal of the Light Processor Unit
- Installation of the Light Processor Unit
- Replacement of the dowser (shutter)
- Replacement of the Light Sensor Module
- Adjusting the Fold Mirror
- Adjusting the light pipe zoom lens
- Adjusting the notch filter
- Cleaning the Prism exit side
- Replacement of the Peltier element from the DMD
- Replacement of a Peltier from the heat pipe cooling block
- Removal of the Formatting Interface Board
- Installation of the Formatting Interface Board

11.1 Introduction

Light Processor assembly

The light processor assembly has three major sub assemblies, namely: the Formatting Interface Board (reference 1), the Light Processor Unit (reference 2) with dowser (reference 3) and the Light Pipe assembly (reference 4).

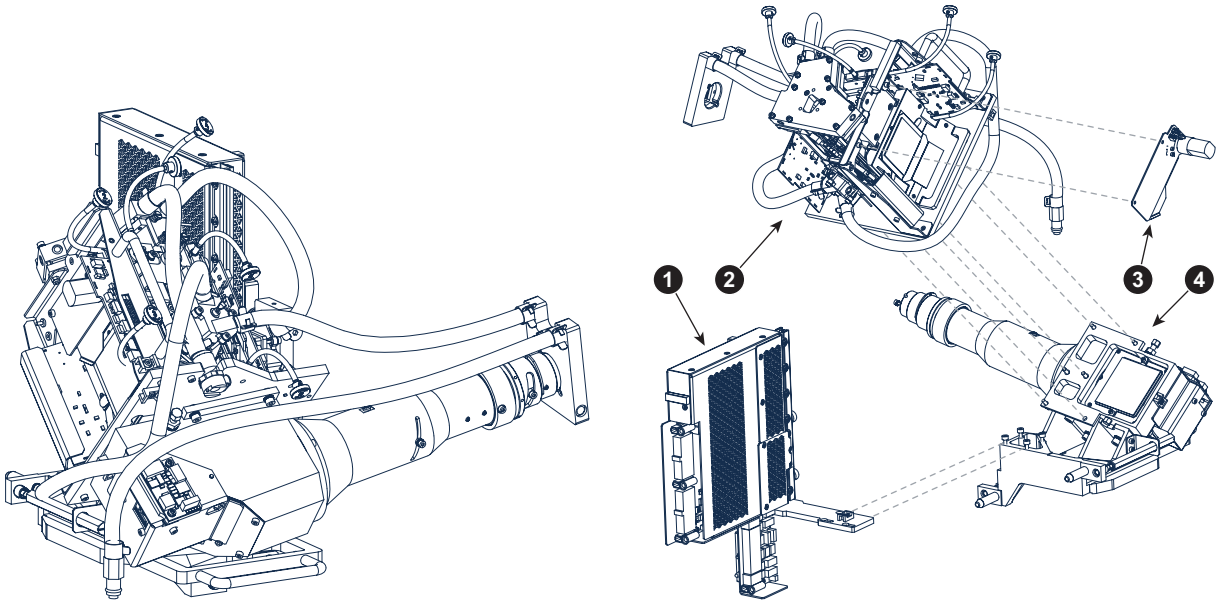


Image 11-1
1 Formatting Interface Board (FIB).
2 Light Processor Unit.
3 Dowser (Shutter).
4 Light Pipe.

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 contains the Integration Rod at the Light Pipe entrance (see page 157), the Light Pipe zoom lens which matches the size of the light beam with the size of the DMD's, the Folding Mirror which folding up the light path of the projector to make the projector more compact, and the Light Sensor Module which ensures a Constant Light Output (CLO) of the projector. Furthermore, the Light Pipe has a Notch filter on the exit which applies some small color corrections on the light coming out of the Light Pipe.

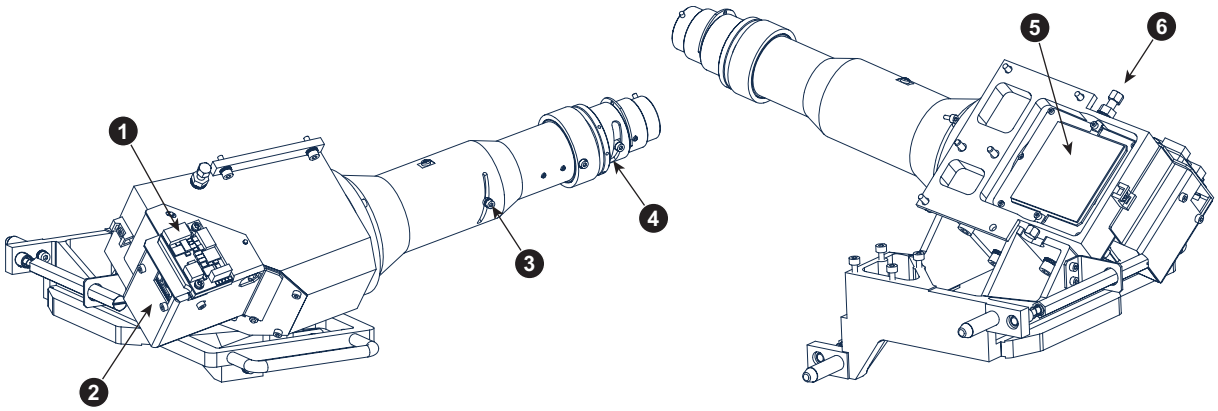


Image 11-2
1 Light Sensor Module.
2 Cover of Folding Mirror.
3 Adjustment handle of the Light Pipe Zoom Lens.
4 Integration Rod assembly.
5 Notch filter.
6 Adjustment screw of the Notch filter.

Light Processor

The Light Processor is the heart of the projector. The prism of the Light Processor splits up the homogeneous white light coming from the Light Pipe into red, green and blue light. The video information on the three DMD's is integrated with 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 which drives the micro mirrors to integrate the video signal into the light beam. A lot of heat is produced during the integration of the video information. To protect the DMD's for overheating the Light Processor is equipped with a

liquid cooling circuit. Each channel has its own cooling block. To improve the heat extraction a Peltier element is mounted between the rear side of the DMD and its cooling block. Heat pipes are used to drain the heat from the front of the DMD's to a common cooling block. To improve the heat extraction from the front of the DMD's three extra Peltier elements are mounted between these heat pipes and common cooling block. Note that the cooling circuit of the Light Processor includes a cooling block for the Light Pipe entrance.

The Light Processor is equipped with 12 temperature sensors. Each channel has one temperature sensor at the front of the DMD, one at the rear of the DMD and one on its cooling block. The common cooling block (front cooling via heat pipes) has also one temperature sensor and the cooling block for the Light Pipe entrance has also one temperature sensor. One temperature sensor is used the measure the ambient temperature of the compartment of the Light Processor assembly. These temperature sensors helps to drive the six Peltier elements and to protect the Light Processor for overheating.

The red and green channel are equipped with three extended adjustment knobs to convergence the DMD with the DMD of the blue channel which is the reference channel for convergence alignment.

The air gab between the prism and DMD is sealed to protect the DMD's for dust. It is important to know that a misaligned light path which reflects upon the sealing will damage the sealing very rapidly. At the bottom of the prism exit a "touch" sensor is mounted to protect the prism against accidental lens movements. Note that the Light Processor Unit is equipped with a motorized shutter (dowser) in front of the prism exit.

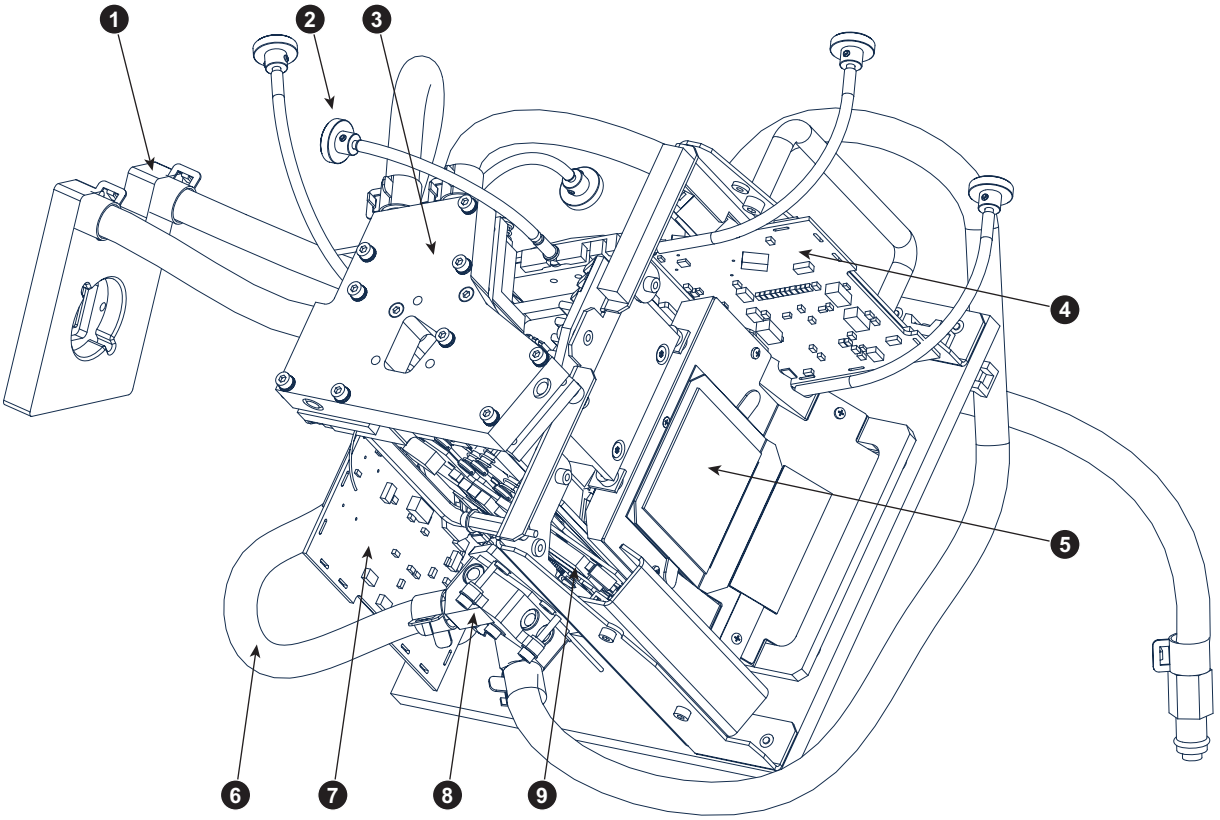
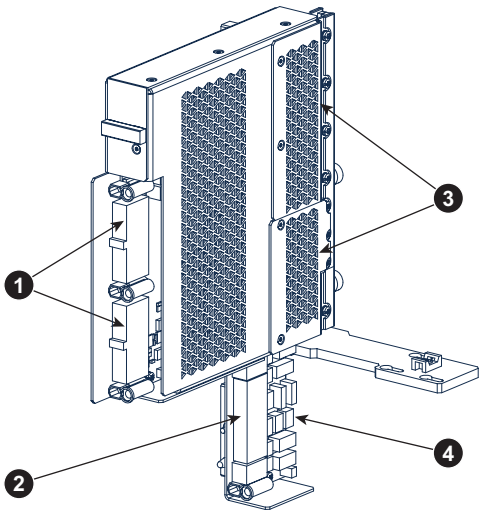


Image 11-3
1 Cooling block for Light Pipe entrance.
2 Convergence adjustment knob.
3 Common cooling block for DMD front cooling via heat pipes.
4 Formatting board of the red channel.
5 Prism exit.
6 Liquid cooling circuit.
7 Formatting board of the green channel.
8 Cooling block of the blue channel.
9 Formatting board of the blue channel.

Formatting Interface Board

The Formatting Interface Board is the interface between the TI boards and the Formatting boards of the DMD's. Futhermore, the Formatting Interface Board contains all electrical connections of components mounted upon the Light Processor and Light Pipe, such as temperature sensors, Peltier elements, dowser, Light Sensor Module, etc.



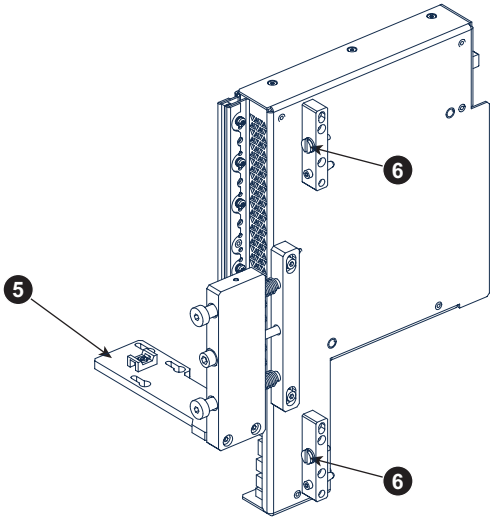


Image 11-4
1 Board to board connection with TI interface board.
2 Board to board connection with Power Backplane.
3 Removable cover.
4 Connections with temperature sensors, Peltiers, Dowser, etc.
5 Mounting bracket.
6 Fixation screw.

11.2 Light Processor diagnostic

Troubleshooting of the Light Processor assembly

There are several reasons why a removal or a replacement of the Light Processor is 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 FIB or Formatter boards.
- A crack in the prism, which can result in convergence problems and may disables you to focus the projected image.
- Defect Peltier element, which causes a too high DMD temperature.
- Damaged integration rod, which causes permanent spots in the projected image.
- Unacceptable amount of dark, bright or flat state pixels on one or more DMDs.
- Blocked dowser (shutter). Dowser does not respond when pressing the “DOWSER” button.
- Leakage in liquid cooling circuit.

Check the projector log files for errors or warnings and look for a solution in the chapter "Trouble shooting checklist", page 29.

11.3 Removal of the Light Processor Unit

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

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

Necessary tools

- Flat screw driver 6 x 150.
- Clean cloth.

How to remove the Light Processor Unit from the projector?

1. Remove the lens.
2. Release the two captive screws (reference 1 & 2) at the base of the Light Processor Unit as illustrated. Use a 6 mm flat screw driver.

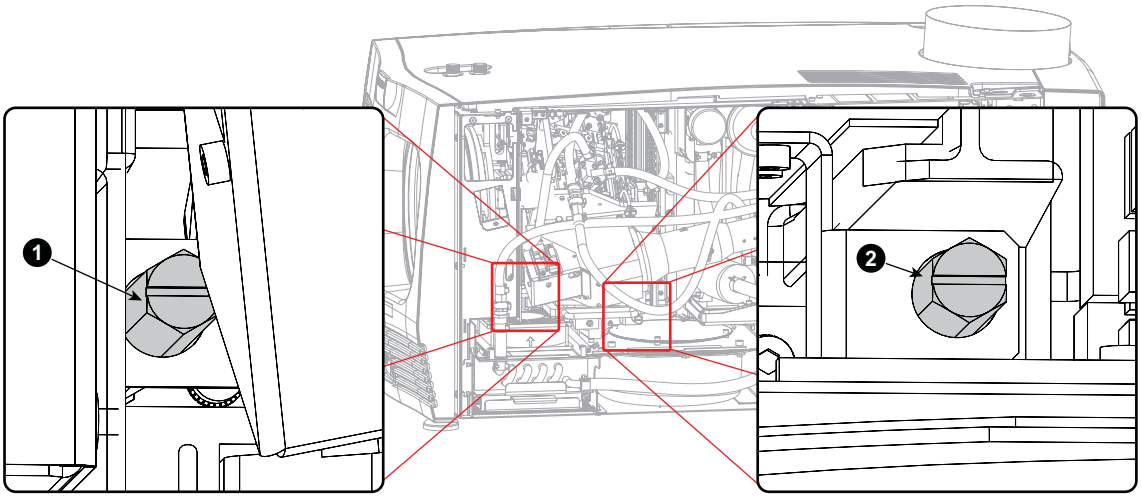


Image 11-5

3. Release the two captive screws (reference 3 & 4) at the right side of the Light Processor Unit. Use a 6 mm flat screw driver.
   Note: *The Formatting Interface Board (FIB) is attached to the Light Processor Unit and has to be removed from the projector together with the Light Processor Unit.*

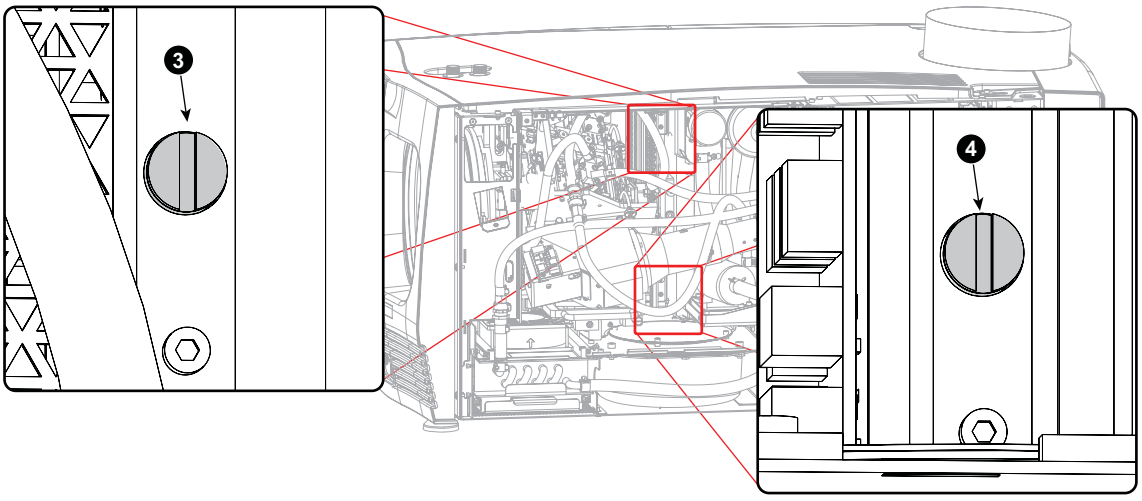


Image 11-6

4. Uncouple the cooling circuit from the Light Processor Unit by unplugging the two valved fittings as illustrated. One valved fitting is located in the tube coming from the pump and leading to the Light Processor Unit and the other valved fitting is located in the tube coming from the light pipe entrance and leading to the heat exchanger.
   Note: *Sometimes a little cooling liquid is spilled. Wrap a small clean cloth around the valved fitting while uncoupling to absorb the spilled cooling liquid.*

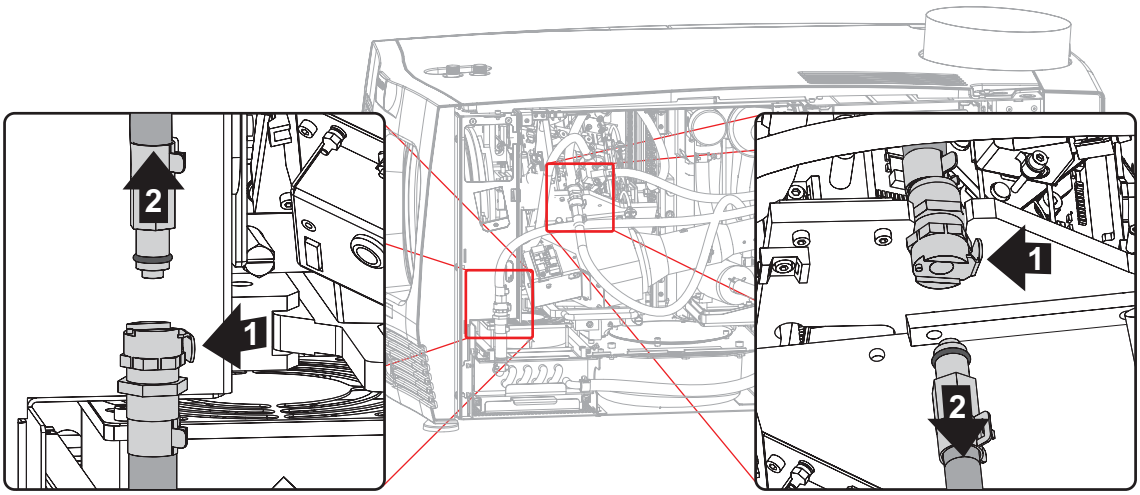


Image 11-7

5. Hold the Light Processor Unit by its handles and gently pull the Light Processor Unit out of its compartment.

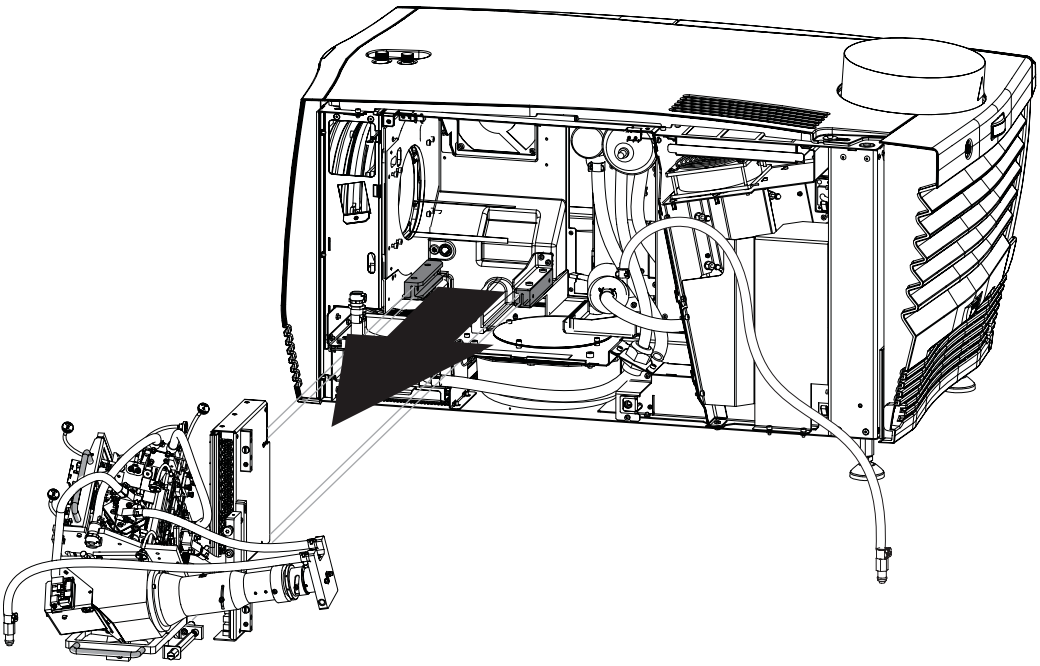


Image 11-8

6. Place the Light Processor Unit, which includes the Formatting Interface Board (FIB), on a stable table.

11.4 Installation of the Light Processor Unit

Necessary tools

- Flat screw driver 6 x 150.
- Clean cloth.

How to install the Light Processor Unit in the projector?

1. Make sure that there is no lens mounted.
2. Hold the Light Processor Unit by the handles and gently slide the Light Processor Unit into the compartment of the projector.
   Note: *The bottom of the Light Processor Unit is equipped with guides (reference 2) and positioning pins (reference 1).*

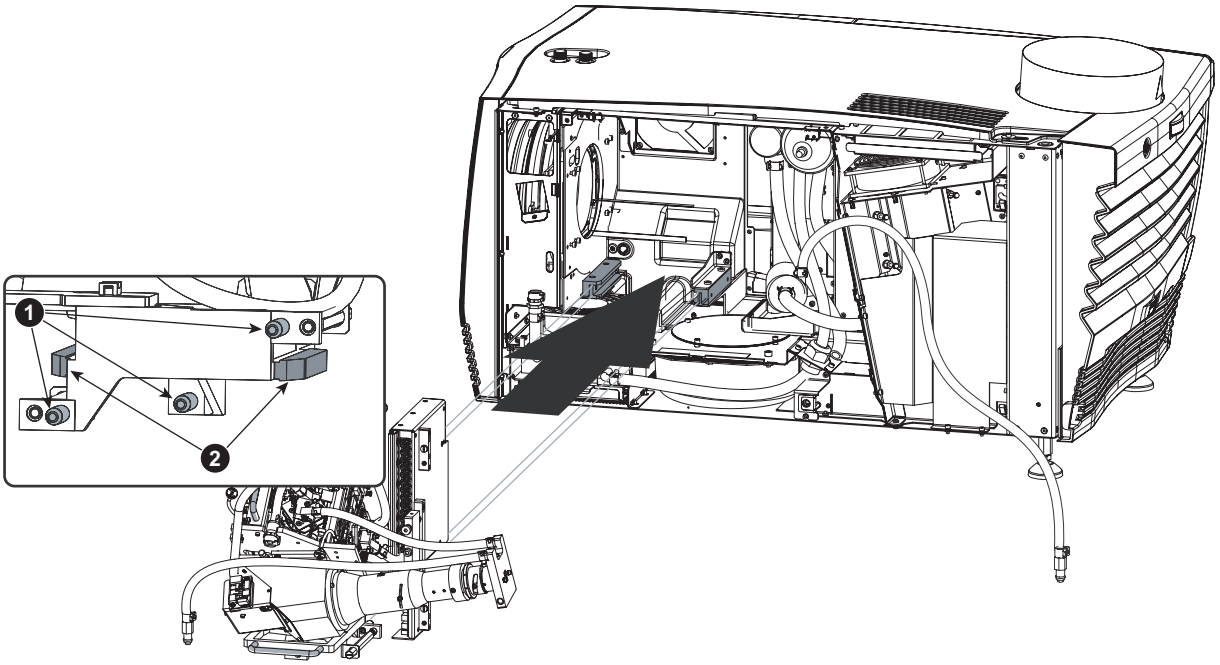


Image 11-9

3. Fasten the two captive screws (reference 1 & 2) at the base of the Light Processor Unit as illustrated. Use for that a flat screw driver 6 x 150.

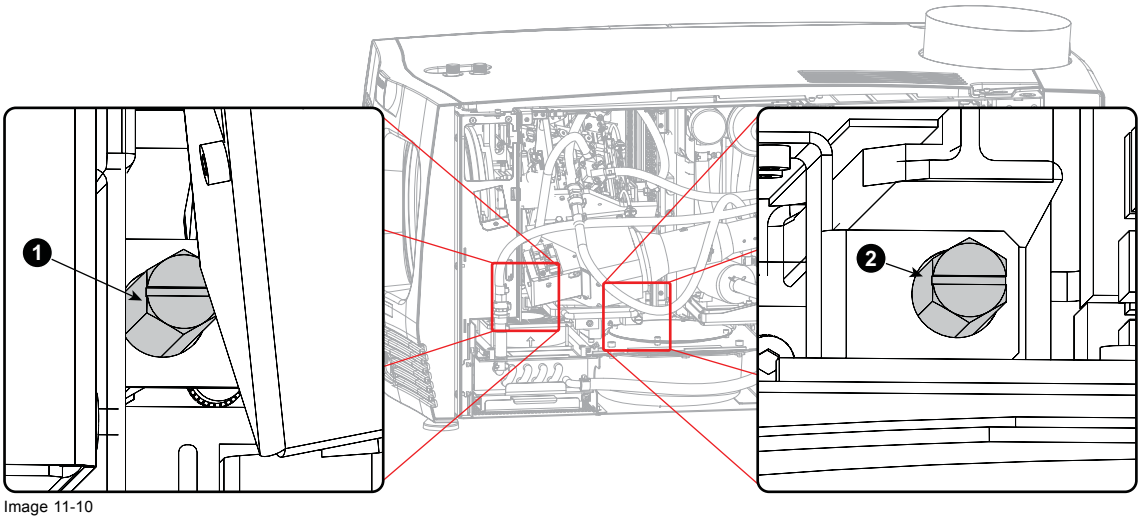


Image 11-10

4. Fasten the two captive screws (reference 3 & 4) at the right side of the Light Processor Unit as illustrated. Use for that a flat screw driver 6 x 150.
   Caution: *Prior to screwing ensure the reference blocks are pushed well up against there respective reference surfaces. Use your screw driver to tap gently on each block.*

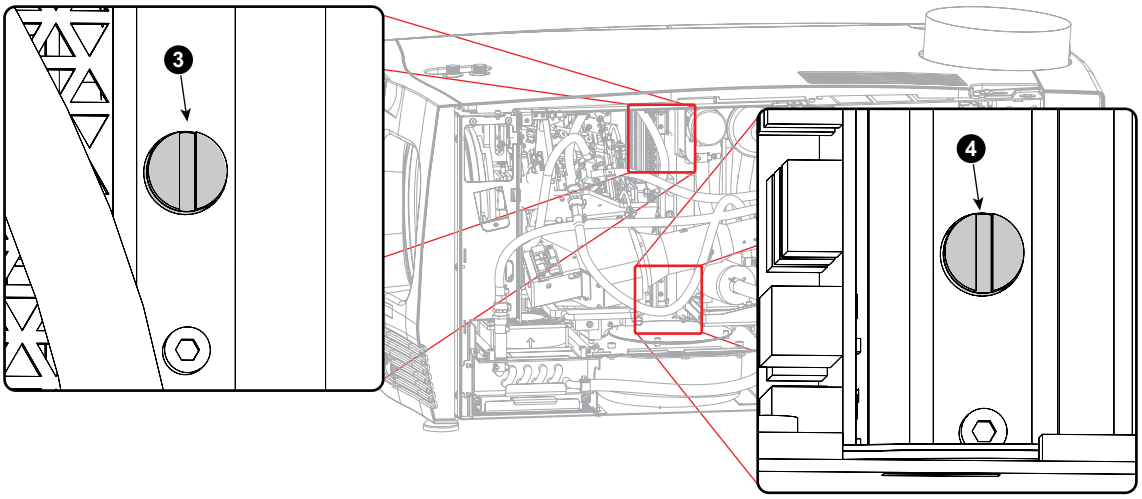
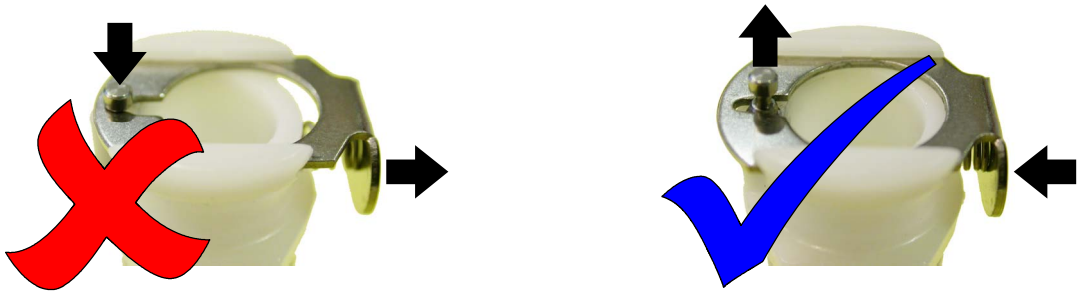


Image 11-11

5. Couple up the cooling circuit from the Light Processor Unit with the cooling circuit of the projector.
   Caution: *To avoid damage to the connector seal, always depress the connector tab of the female valved fitting prior to inserting the male valved fitting.*



Caution: *Make sure that the tube coming from the pump is leading to the cooling circuit of the DMDs and that the tube coming from the light pipe entrance is leading to the heat exchanger.*

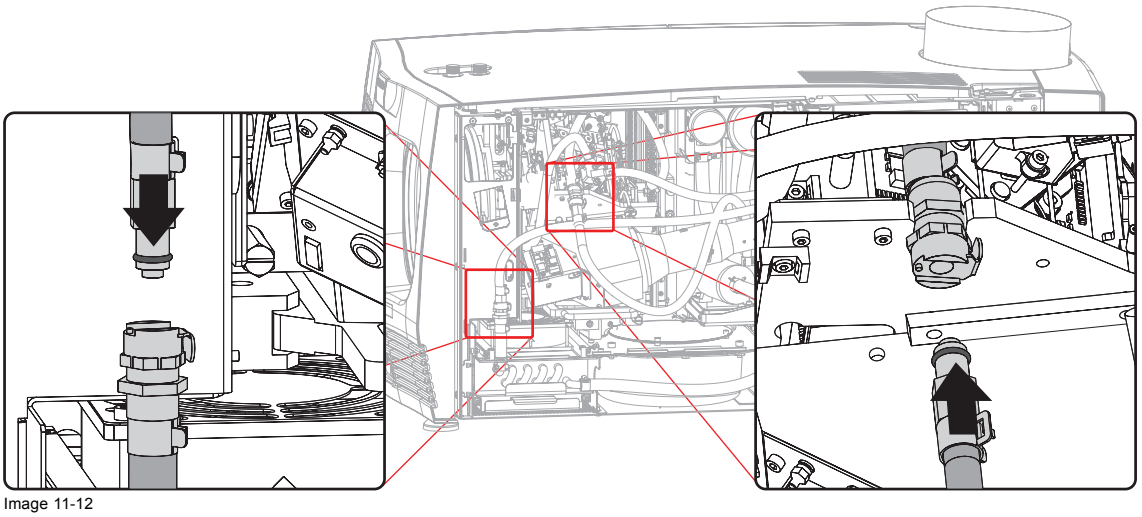


Image 11-12

6. Check the pressure indicated on the internal manometer of the liquid cooling circuit. This pressure should be between 0,5 and 1 bar. Take corrective actions if needed. See chapter "Liquid cooling circuit", page 215.

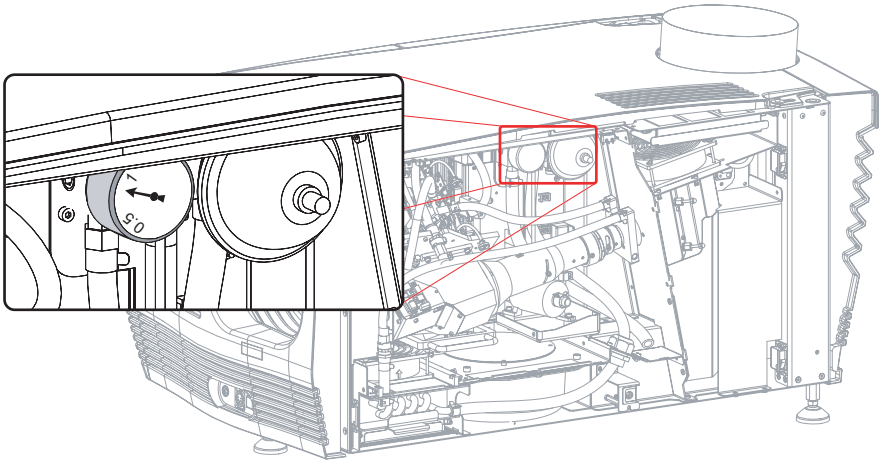


Image 11-13

7. Close the sealed compartment and reinstall all the projector covers.

11.5 Replacement of the dowser (shutter)

Dowser assembly

The dowser or shutter (“dowser” is more common in the cinema market and “shutter” in the events market) of the projector is mounted upon the Light Processor just above the light output path of the prism. The dowser assembly has an “open” and a “close” state. In the “close” state the dowser blade shuts off the light beam between the Light Processor (DMD’s) and lens. In the “open” state, the dowser is retracted from the light beam. Note that the local keypad has a dedicated button “DOWSER” to operate the dowser.

The Light Processor has to be removed from the projector before replacing the dowser. This procedure assumes that the Light Processor is already removed from the projector.

Necessary tools

2,5 mm Allen wrench.

How to replace the dowser of the Light Processor

1. Disconnect the wire unit of the dowser.

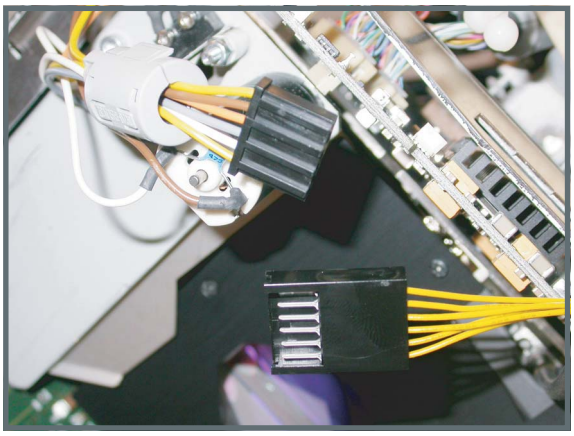


Image 11-14

2. Remove the dowser assembly from the Light Processor be releasing both hexagon socket head cap screws (reference 1) as illustrated. Use a 2,5 mm Allen wrench.

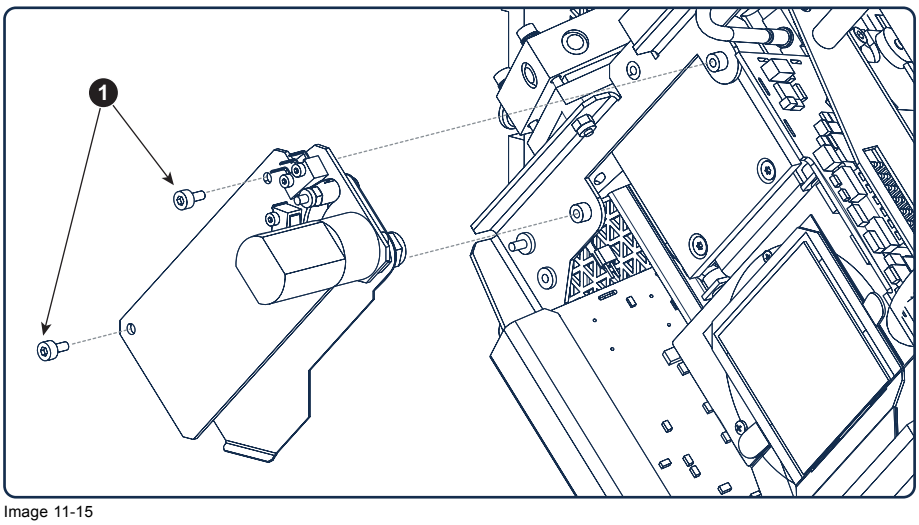


Image 11-15

3. Place a new dowser assembly in position and fasten with two hexagon socket head cap screws (reference 1). Use a 2,5 mm Allen wrench.

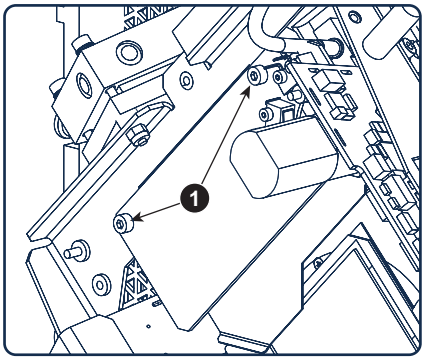


Image 11-16

4. Reconnect the wire unit of the dowser.

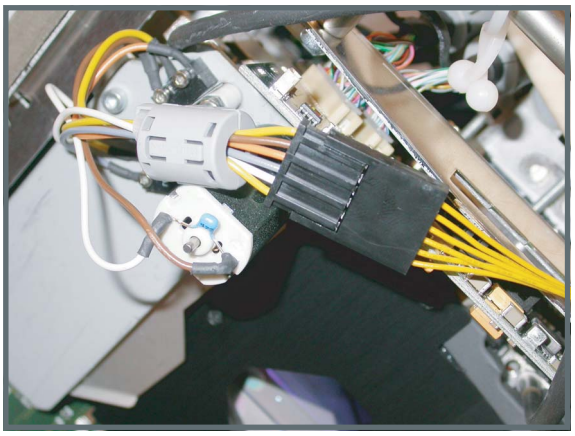


Image 11-17

11.6 Replacement of the Light Sensor Module

Purpose of the Light Sensor in the Light Pipe

To obtain a Constant Light Output (CLO) from the projector a light sensor is mounted just behind the fold mirror. On a regular base the controller of the projector read the measured values of this light sensor and, if required, sends corrective information to the Lamp Power Supply (LPS).

The left cover has to be removed from the projector to replace the Light Sensor Module. This procedure assumes that the left cover is already removed from the projector.

Necessary tools

- TX10 Torx screw driver.
- Light meter.

How to replace the Light Sensor Module of the Light Processor?

1. Disconnect the wire unit from the Light Sensor Module.

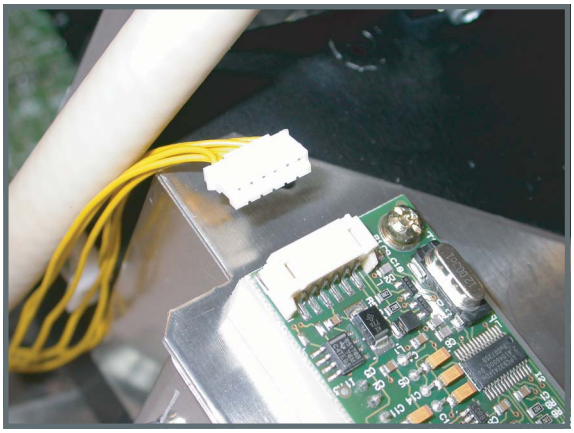


Image 11-18

2. Remove the Light Sensor Module by releasing the two Torx screws (reference 1). Use a TX10 Torx screw driver.
   Note: *The plastic spacer (reference 2) underneath the Light Sensor Module comes loose with the module.*

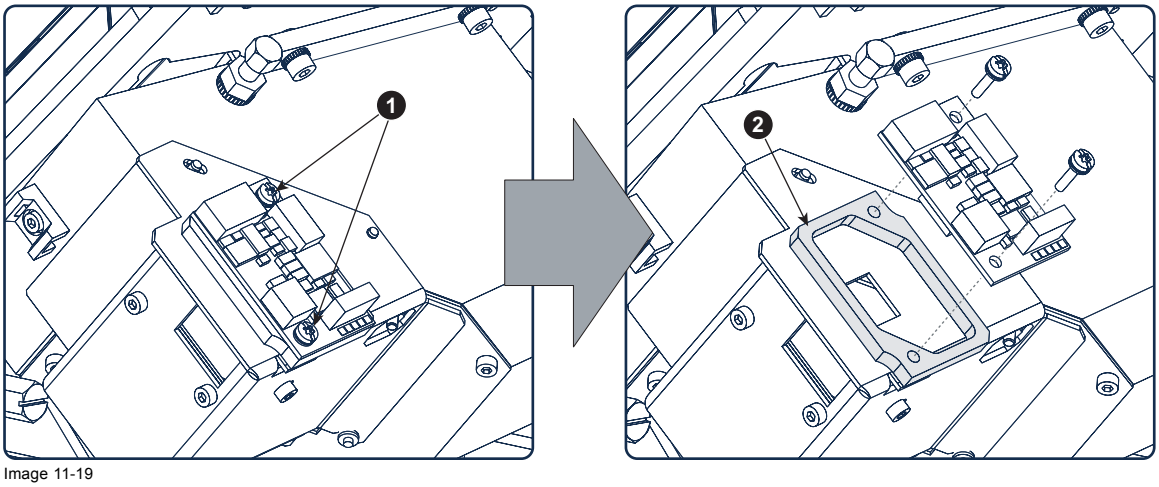


Image 11-19

3. Install a new Light Sensor Module. Make sure to reuse the plastic spacer (reference 2). Use a TX20 Torx screw driver to fasten both screws (reference 1).
4. Reconnect the wire unit with Light Info Module.

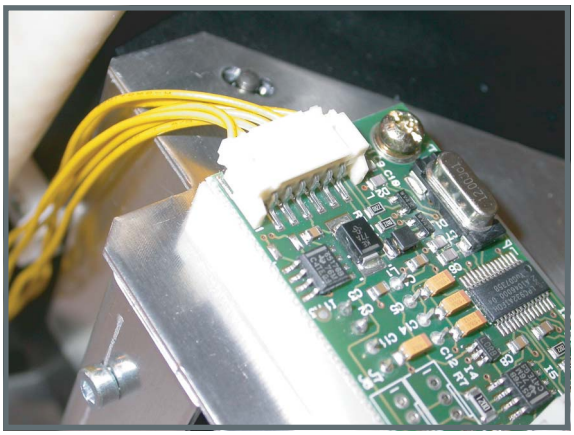


Image 11-20

5. Place a light meter in the center of the screen and calibrate the Light Sensor Module. For detailed instructions see user guide of the Communicator software.

11.7 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!

To access all three adjustment screws of the Fold Mirror the left side cover has to be removed from the projector and the Fold Mirror cover plate has be removed from the Light Pipe. This procedure assumes that the left side cover is already removed from the projector.

In most cases the Fold Mirror can be correctly aligned by turning the upper two adjustment screws of the Fold Mirror. These upper two screws can be accessed with a nut driver through the holes of the Fold Mirror cover. So, the removal of the Fold Mirror cover is unnecessary.

Necessary tools

- TX 10 Torx driver.
- 5,5 mm nut driver.

How to adjust the Fold Mirror?

1. Disconnect the wire unit from the Light Sensor Module.
2. Remove the Fold Mirror cover and the Light Sensor Module as a whole from the Light Pipe as illustrated. Do this by removing the upper Torx screw (reference 1) which fasten the Light Sensor Module and releasing the lower left nut (reference 2) which fasten the cover.

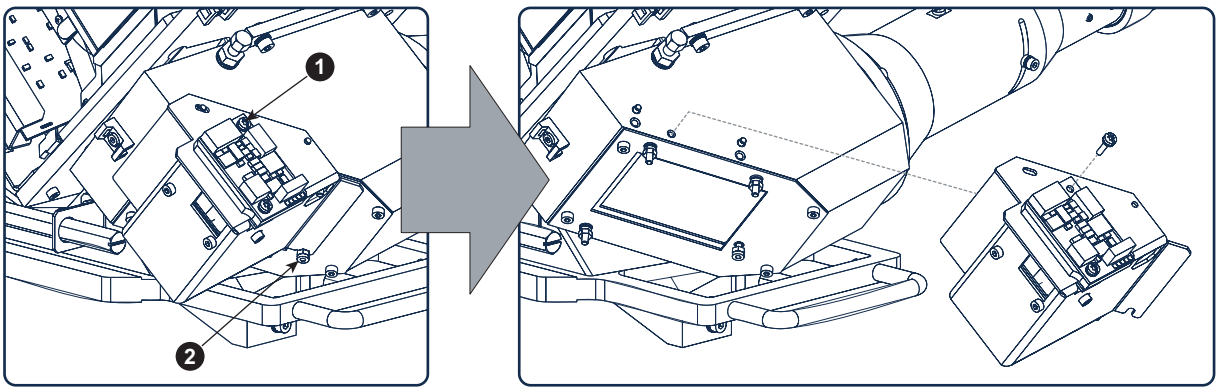


Image 11-21

3. Start up de projector and display a white test pattern with maximum dimming.
   Caution: *Projecting a misaligned light spot for more then 10 seconds may cause irreversible damage to the Light Processor. Therefore, it is important to maximum dim the light output and adjust the light spot as quickly as possible.*
4. 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 for that a 5,5 mm open end wrench. The illustration below shows the movements of the light spot (5) upon the screen (6) for each adjustment screw.

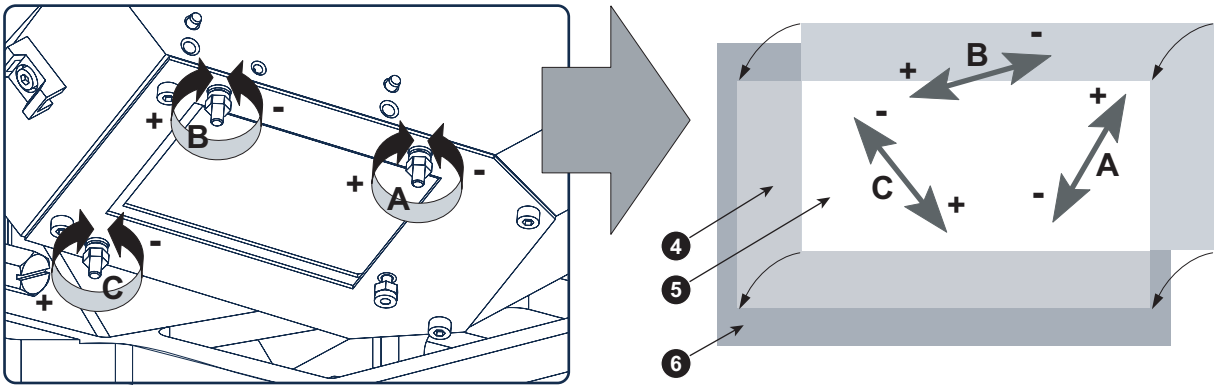


Image 11-22

5. Reinstall the cover of the Fold Mirror.
6. Reconnect the Light Sensor Module.
7. Place a light meter in the center of the screen and calibrate the Light Sensor Module. For detailed instructions see user guide of the Communicator software.

11.8 Adjusting the light pipe 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.

The left cover has to be removed from the projector to adjust the light pipe zoom lens. This procedure assumes that the left cover is already removed from the projector.

Necessary tools

2,5 mm Allen wrench.

How to adjust the light pipe zoom lens?

1. Release the hexagon socket head cap screw (reference 1 of image 11-23). Use a 2,5 mm Allen wrench.
2. Start up de projector and display a white test pattern with maximum dimming.
   Caution: *Projecting a light spot which is larger then the DMD outline for more then 10 seconds may cause irreversible damage to the Sealed Light Processor. Therefor, it is important to maximum dim the light output and adjust the light spot as quickly as possible.*
3. Adjust the position of the light pipe zoom lens by moving the hexagon socket head cap screw (reference 1) as illustrated until the size of the light spot (reference 2) matches the projected outline (reference 3) of the DMDs upon the screen (reference 4).

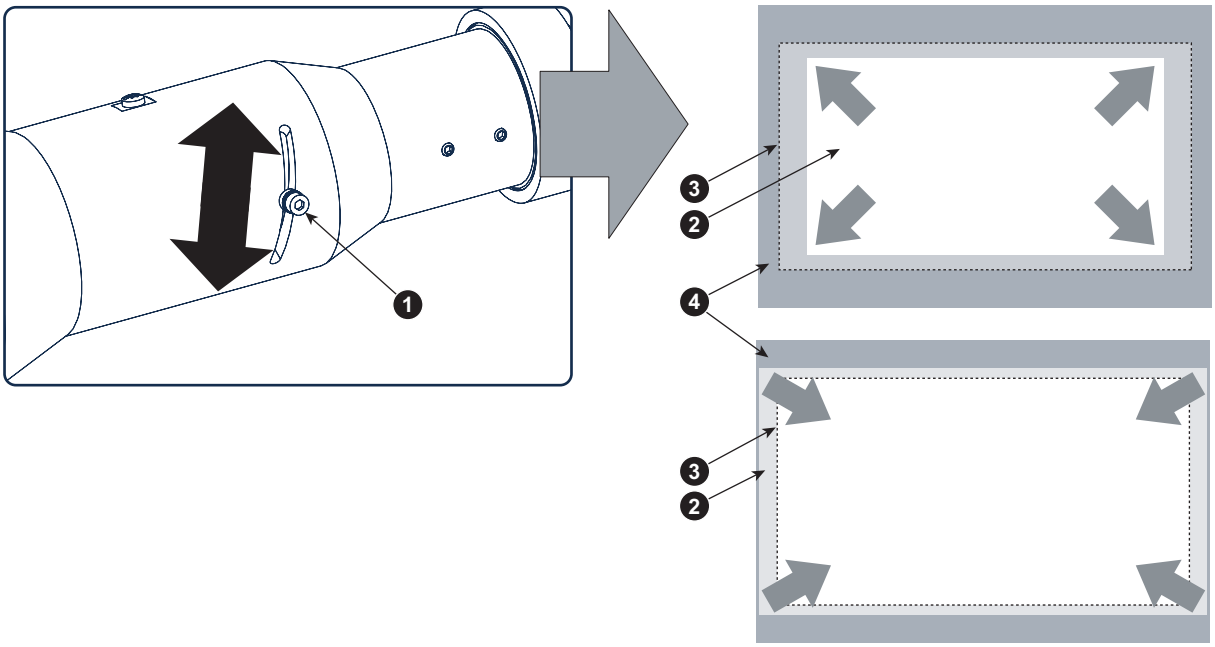


Image 11-23

4. Fasten the hexagon socket head cap screw. User a 2,5 mm Allen wrench.

11.9 Adjusting the notch filter

Purpose of the notch filter

The notch filter is a coated glass plate located at the end 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.

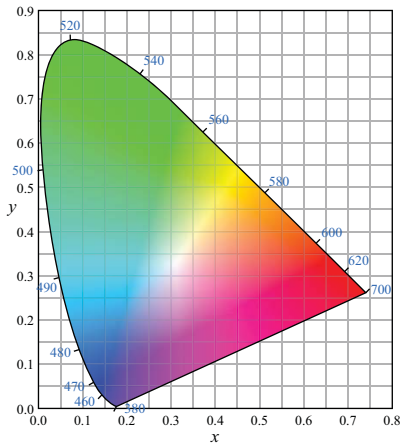


Image 11-24
Color triangle.

To access the notch filter the left side cover has to be removed from the projector. This procedure assumes that the left side cover is already removed from the projector.

Necessary tools

- 10 mm open-end wrench.
- 8 mm open-end 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 lock nut (reference 1) of the notch filter. Use for that a 10 mm open-end wrench.

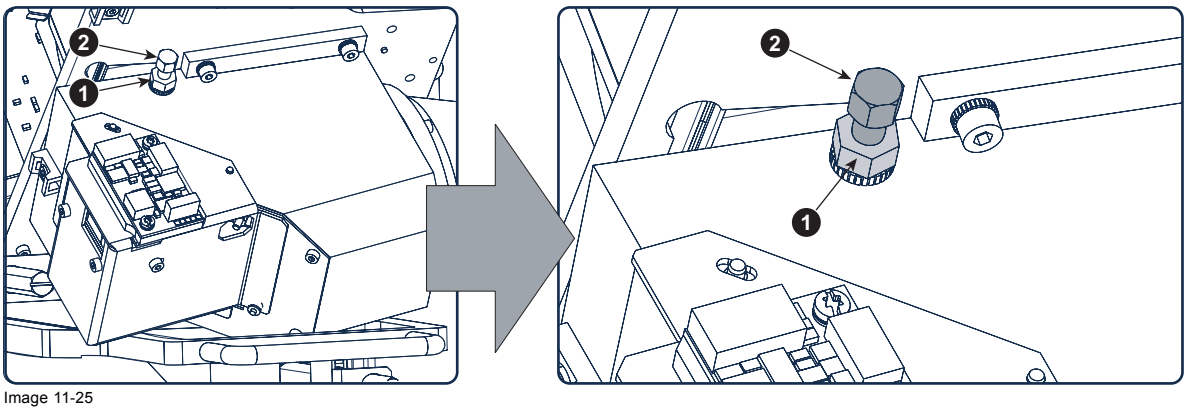


Image 11-25

2. Start up the projector and display an uncorrected red test pattern.
   Tip: *See user guide of the Communicator software for detail instructions about color calibration*
3. 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.
4. Slightly rotate the adjustment screw (reference 2 of image 11-25) of the notch filter until the measured X and Y values are within the required specs. Use for that a 8 mm open-end wrench.
   Note: *The adjustment range of the notch filter is limited. For most projectors the mid position of the thumbscrew gives also the most optimal result.*
5. Fasten the lock nut, reference 1 of image 11-25, to secure the position of the notch filter. Use for that a 10 mm open-end wrench. Make sure that the position of the notch filter remains unchanged while fastening the lock nut.

11.10 Cleaning the Prism exit side

When cleaning the Prism exit side?

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

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

WARNING: ISOPROPANOL ALCOHOL (200–661–7).

Hazardous product. Irritating to eyes and skin. Always use in a well ventilated area. Vapors may cause drowsiness and dizziness. Avoid contact with skin and eyes. In case of contact with the eyes, rinse immediately with plenty of water and seek medical advise.

CAUTION: ISOPROPANOL ALCOHOL (200–661–7).

Hazardous product. Lightly flammable. Always use in a well ventilated area. Keep away from sources of ignitions. Do not smoke while working with isopropanol. Exclusive keep in original container tightly closed at a cool, well ventilated and fireproof storage space.

Necessary tools

- Clean Torayse cloth.
- Clean cotton cloth.
- Demineralized water.
- Isopropanol alcohol.

How to clean the clean the Prism exit side?

1. Wipe off the dust of the Prism exit. Use for that a clean Torayse cloth.
   Tip: *Limit the number of wipe movements. This to protect the optical coating. It is better to wipe of 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 cotton cloth and demineralized water.
   Tip: *Use isopropanol alcohol instead of demineralized water to remove fingerprints.*

11.11 Replacement of the Peltier element from the DMD

To replace the Peltier from the DMD the Light Processor must be removed from the projector. This procedure assumes that the Light Processor is already removed.

The illustration in this procedure are from the red channel. Nevertheless the same procedure is applicable for the green and blue channel as well.

Necessary tools

- Torque wrench with a 2,5 mm Allen socket.
- Set of pliers.
- Clean cloth.

Necessary parts

- Peltier element.
- Tube with thermal paste.
- Cable ties.

How to replace the Peltier element from the DMD?

1. Disconnect the wire unit of the Peltier element, which you want to replace, from the Formatting Interface Board.

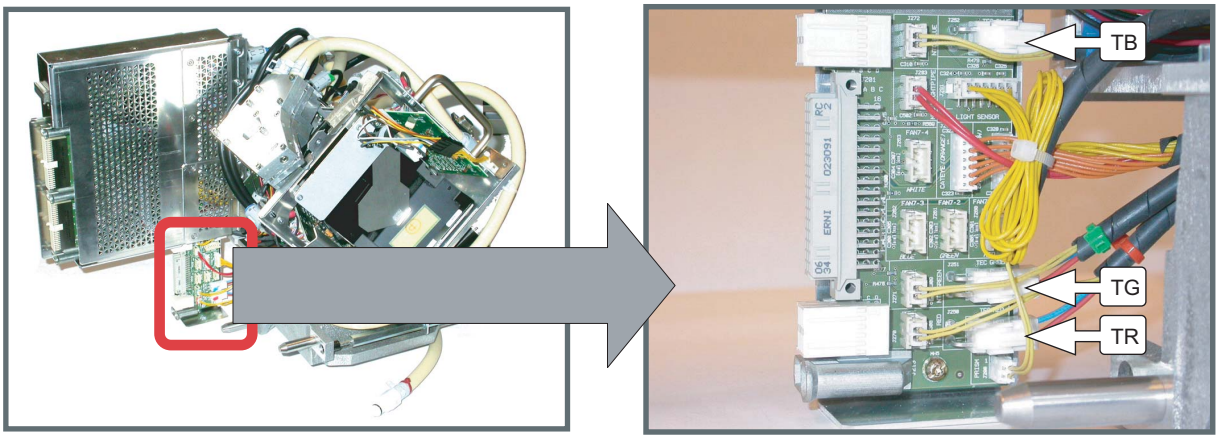


Image 11-26
TR Wire unit of the Peltier element (TEC) of the Red channel.
TG Wire unit of the Peltier element (TEC) of the Green channel.
TB Wire unit of the Peltier element (TEC) of the Blue channel.

2. Cut the connector of the Peltier element and pull the wires out of the cable tree.
   Or,
   remove the spiral around cable tree and take out the wires of the Peltier element.
3. Remove the cooling block by releasing the four hexagon socket head cap screws (reference 1) as illustrated. Note that the screws are captured with a plastic ring.

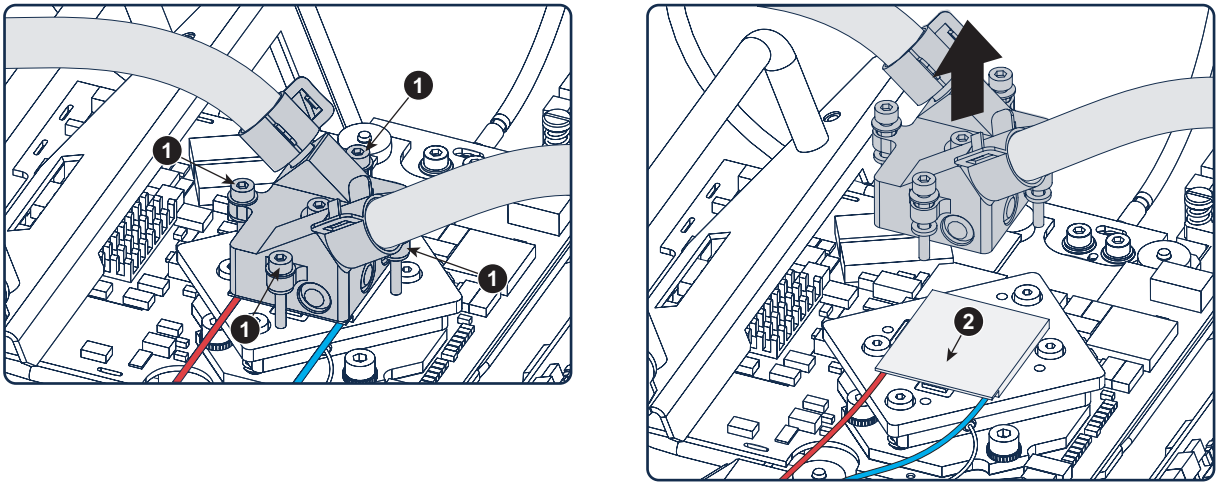


Image 11-27

4. Remove the Peltier element (reference 2 of image 11-27) and remove all old thermal paste from the Peltier socket and bottom side of the cooling block. Use a clean cloth the remove the old thermal paste.
5. Rub some thermal paste on both sides of the new Peltier element .
6. Place the new Peltier element in its socket, slide a little bit up and down to ensure a good contact and finally slide it against the upright sides of both studs (reference 3).
   Caution: *Make sure that the cold side (reference 4) of the Peltier element is facing the socket and make sure that the Peltier element is not laying on the studs.*

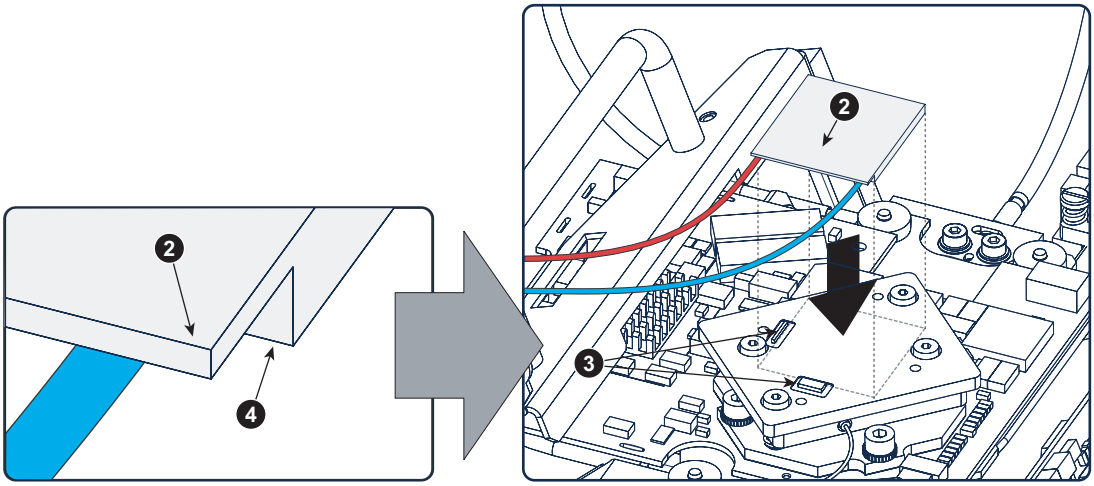


Image 11-28

7. Reinstall the cooling block upon the new Peltier element. Use a torque wrench with a 2,5 mm Allen socket to fasten the four screws (reference 1 of image 11-27) crosswise with a torque of 0,6 Nm.
8. Connect the wire unit of the Peltier element with its socket on the Formatting Interface Board. See image 11-26.
9. Reinstall the spiral around the cable tree.
   Or,
   use cable ties to secure the wires.

11.12 Replacement of a Peltier from the heat pipe cooling block

To replace the Peltier from the heat pipe cooling block the Light Processor must be removed from the projector. This procedure assumes that the Light Processor is already removed.

The illustration in this procedure shows a replacement of the Peltier of the red channel. Nevertheless the same procedure is applicable for the green and blue channel.

Necessary tools

- Torque wrench with a 2,5 mm Allen socket.
- Set of pliers.
- Clean cloth.

Necessary parts

- Peltier element.
- Tube with thermal paste.
- Cable ties.

How to replace one of the Peltier from the heat pipe cooling block?

1. Remove the small cover plate from the Formatting Interface Board. Use a 2,5 mm Allen wrench and a TX10 Torx screw driver to release the two hexagon socket countersunk head screws (reference 1) and the Torx head screw (reference 2).

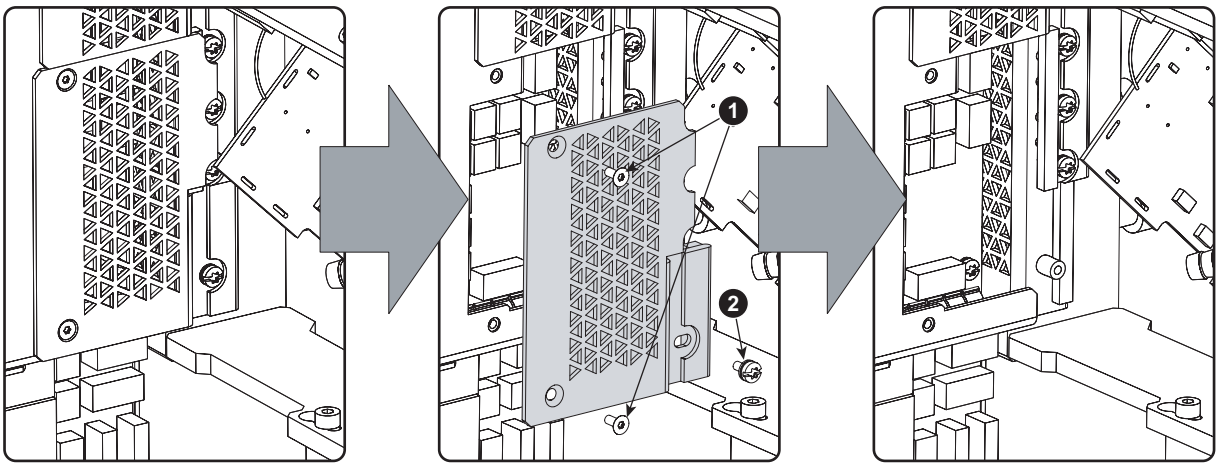


Image 11-29

2. Disconnect the wire unit of the Peltier element which you want to replace.

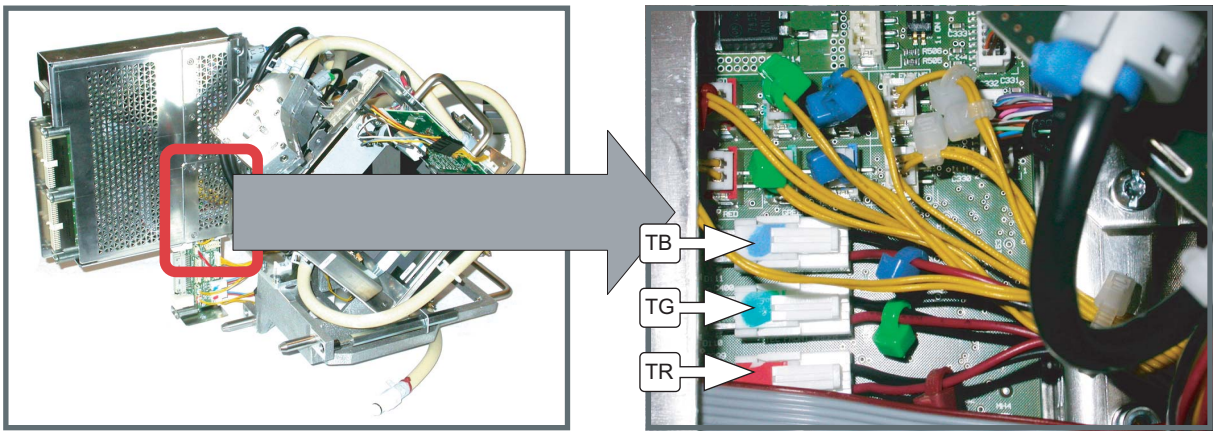


Image 11-30
TR Wire unit of the Peltier element (TEC) of the Red channel.
TG Wire unit of the Peltier element (TEC) of the Green channel.
TB Wire unit of the Peltier element (TEC) of the Blue channel.

3. Cut the connector of the Peltier element and pull the wires out of the cable tree.

Or,
remove the spiral around cable tree and take out the wires of the Peltier element.

4. Remove the common cooling block by releasing the eleven hexagon socket head cap screws (reference 1, 3 & 5) as illustrated. Note that two screws (reference 3) are sunken and one screw (reference 5) has an additional washer (reference 7) and nut (reference 8).

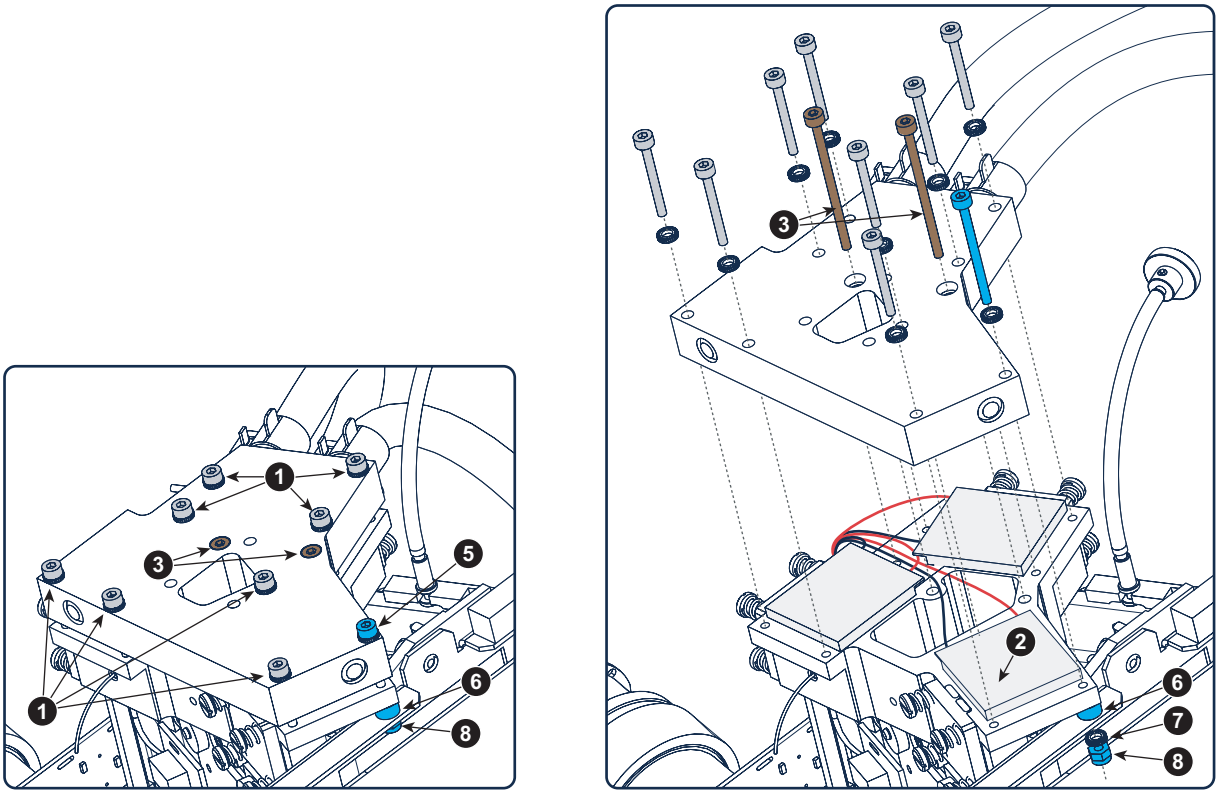


Image 11-31

5. Remove the Peltier element (reference 2 of image 11-31) and remove all old thermal paste from the Peltier socket and bottom side of the common cooling block. Use a clean cloth the remove the old thermal paste.
6. Rub some thermal paste on both sides of the new Peltier element .
7. Place the new Peltier element in its place as illustrated. Slide a little bit up and down to ensure a good contact.
   Caution: *Make sure that the cold side (reference 4) of the Peltier element is facing downwards.*

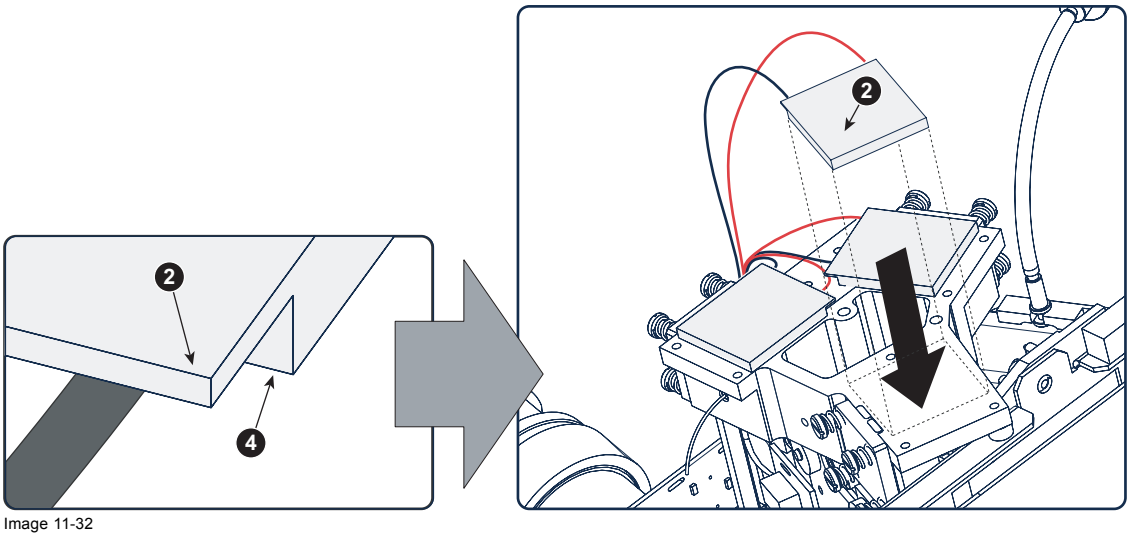


Image 11-32

8. Reinstall the common cooling block upon the new Peltier element. Use a torque wrench with a 2,5 mm Allen socket to fasten the eleven screws (reference 1, 3 & 5 of image 11-31) crosswise with a torque of 0,6 Nm. Note that two screws, which are longer (reference 3), are sunken and one screw (reference 5) has an additional washer (reference 7) and nut (reference 8).
9. Connect the wire unit of the Peltier element with its socket on the Formatting Interface Board and reinstall the small cover. See image 11-29and image 11-30.

10. Reinstall the spiral around the cable tree.
    Or,
    use cable ties to secure the wires.

11.13 Removal of the Formatting Interface Board

To remove the Formatting Interface Board you have to remove the Light Processor Unit out of its compartment first.

Necessary tools

- 3 mm Allen wrench.
- TX10 Torx screwdriver.

How to remove the Formatting Interface Board?

1. Disconnect the two ground wires from the base plate of the Formatting Interface Assembly. Use a 2,5 mm Allen wrench to release the hexagon socket head cap screw.

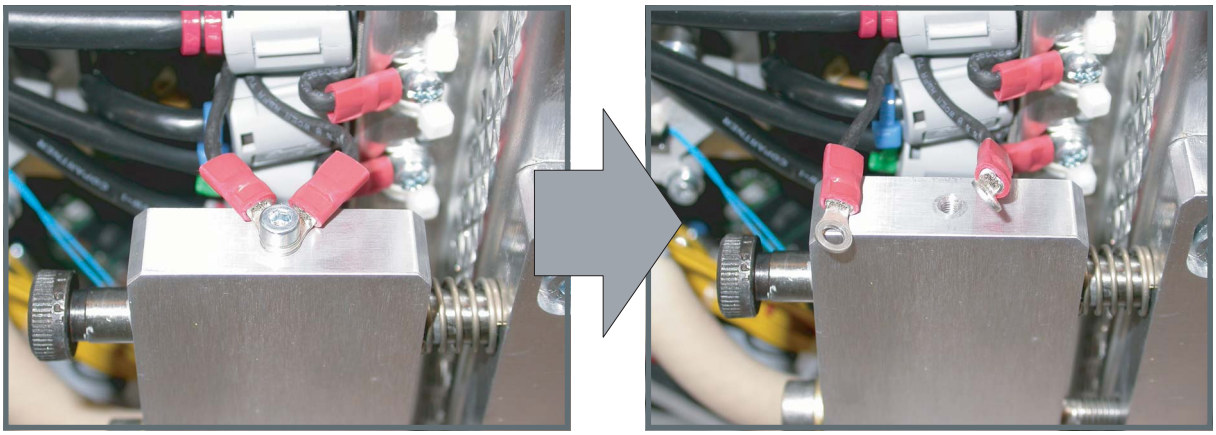


Image 11-33

2. Remove the two hexagon socket head cap screws (reference 1) from the base of the Light Processor Unit as illustrated. Use a 3 mm Allen wrench. Note that the Formatting Interface Assembly will come loose from the Light Processor but the cables remain connected. This way the Formatting Interface Assembly can be slightly turned away from the Light Processor which results in an easier access to the screws of the Formatting Interface Assembly.

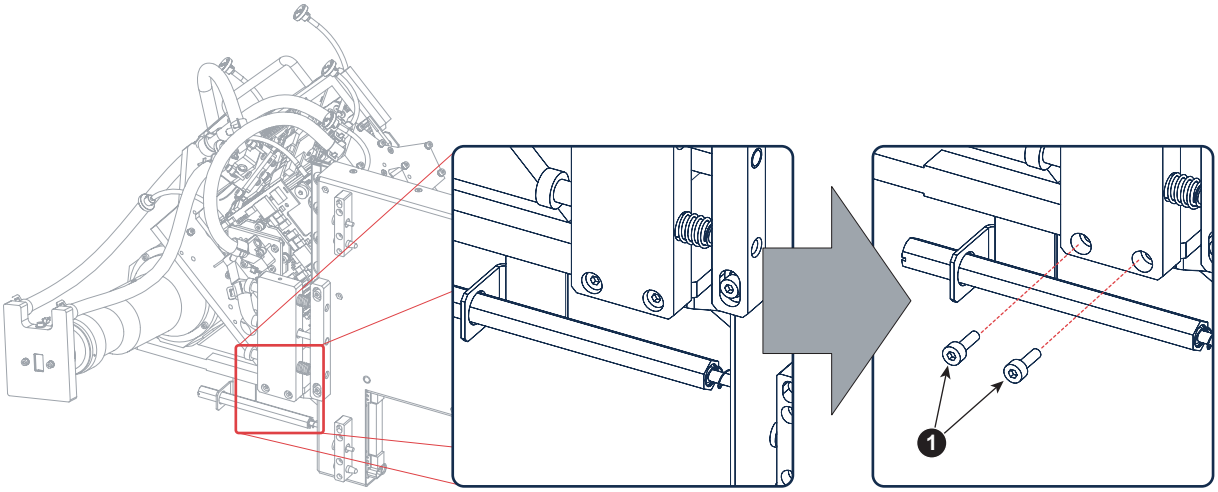


Image 11-34

3. Remove the small cover plate by releasing the two Torx countersunk head crews (reference 3) and the Torx head screw (reference 4). Use a TX10 Torx screwdriver.

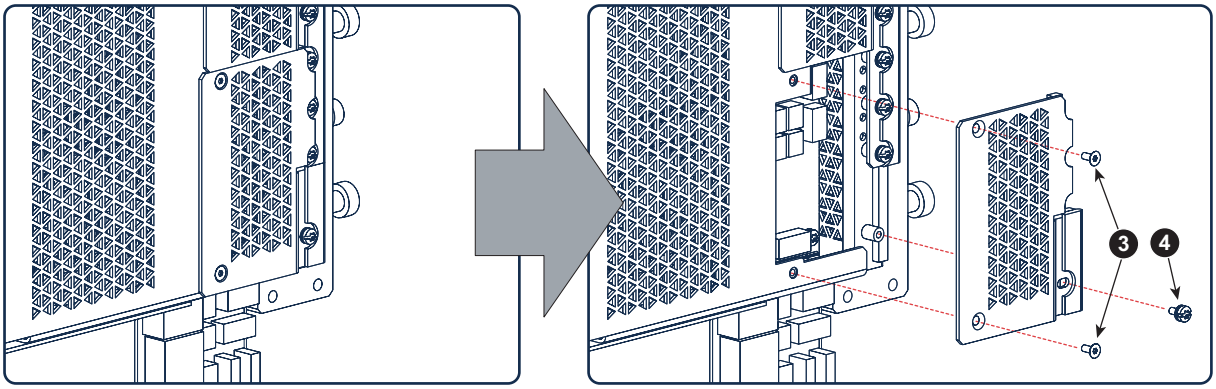


Image 11-35

4. Remove the upper cover plate by releasing the two Torx countersunk head crews (reference 5) and the seven Torx head screws (reference 6). Use a TX10 Torx screwdriver.

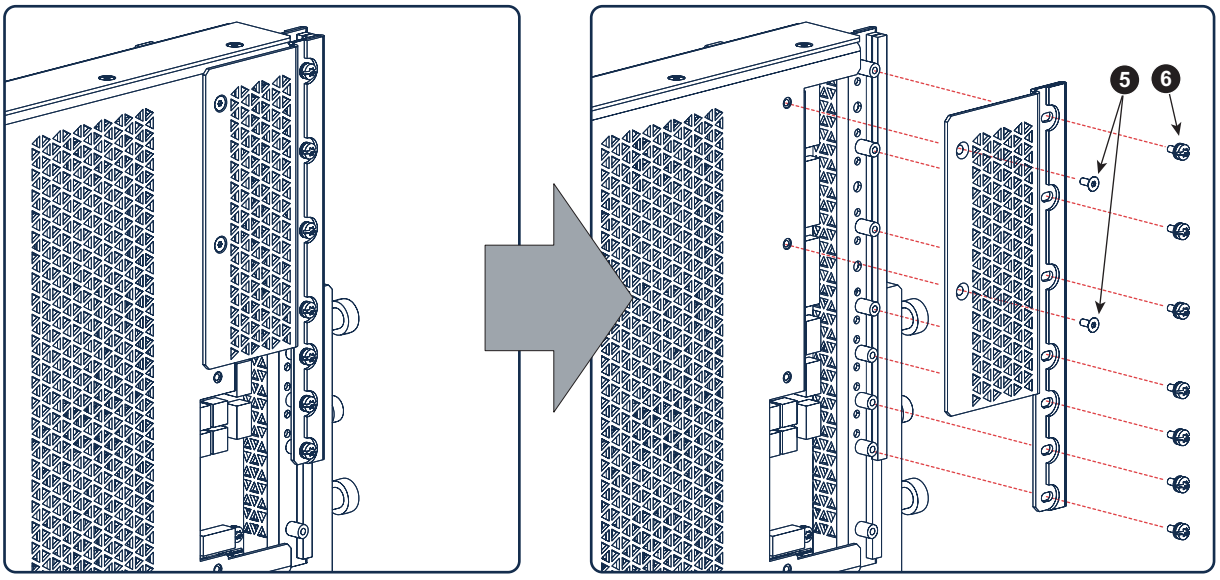


Image 11-36

5. Remove the big cover plate by releasing the six indicated Torx countersunk head screws (reference 7). Use a TX10 Torx screwdriver.

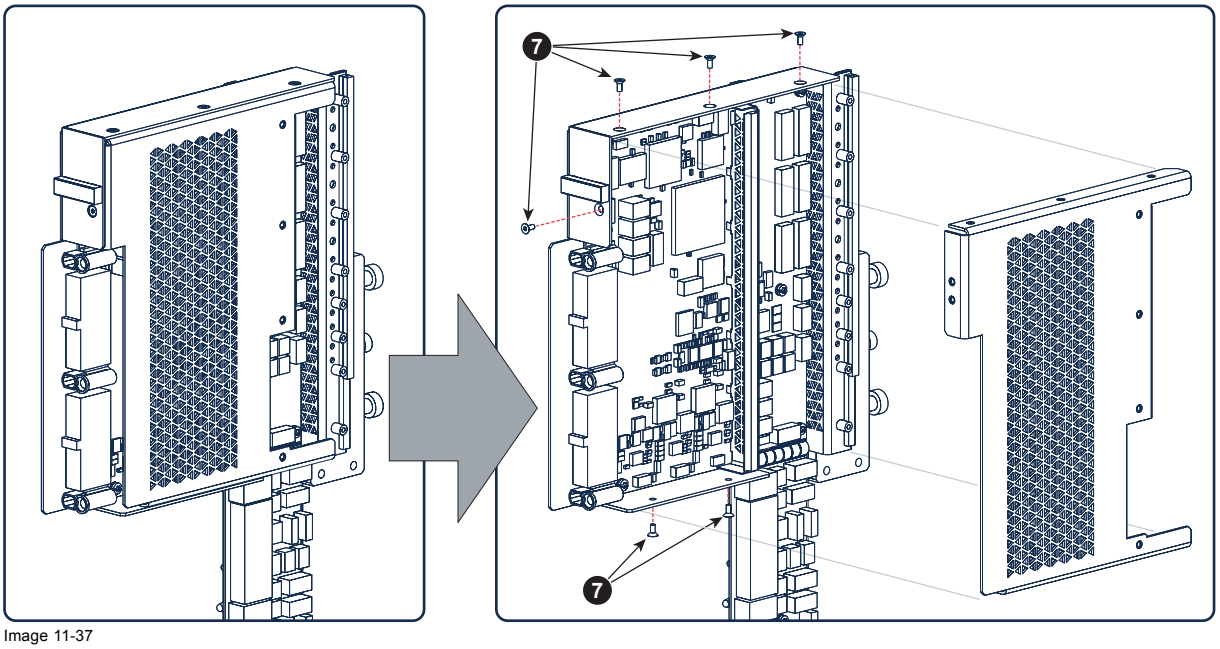


Image 11-37

6. Disconnect the six signal cables and the three power cables from the Formatting Interface Board.
   Caution: *Be careful not to damage the wires and connectors.*

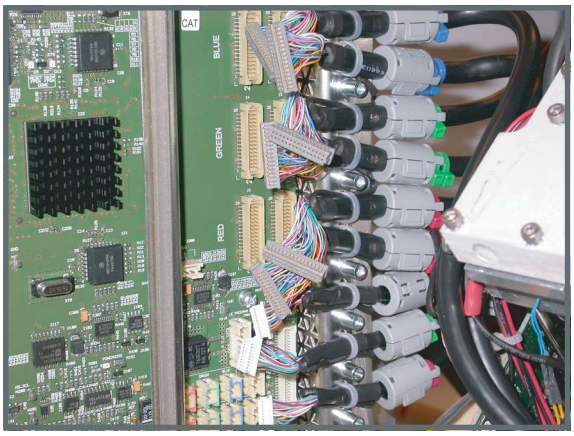
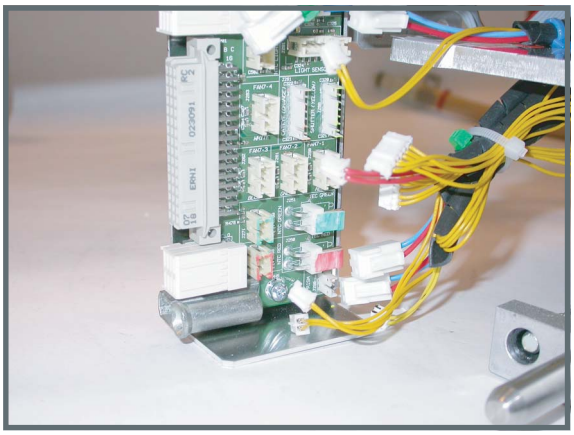


Image 11-38

7. Disconnect all wire units and the flat cable from the Formatting Interface Board.



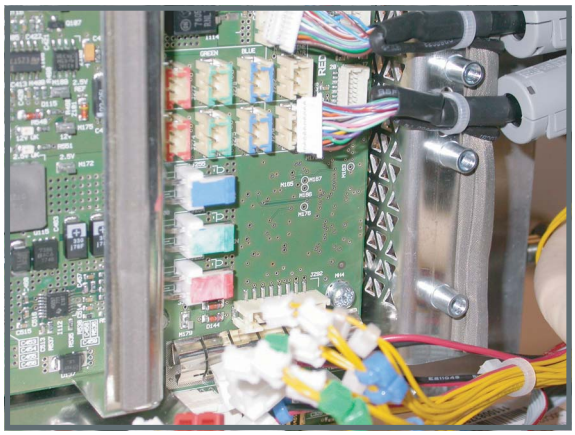


Image 11-39

8. Remove the Formatting Interface Board by releasing the seven indicated Torx screws (reference 8). Use a TX10 Torx screwdriver.

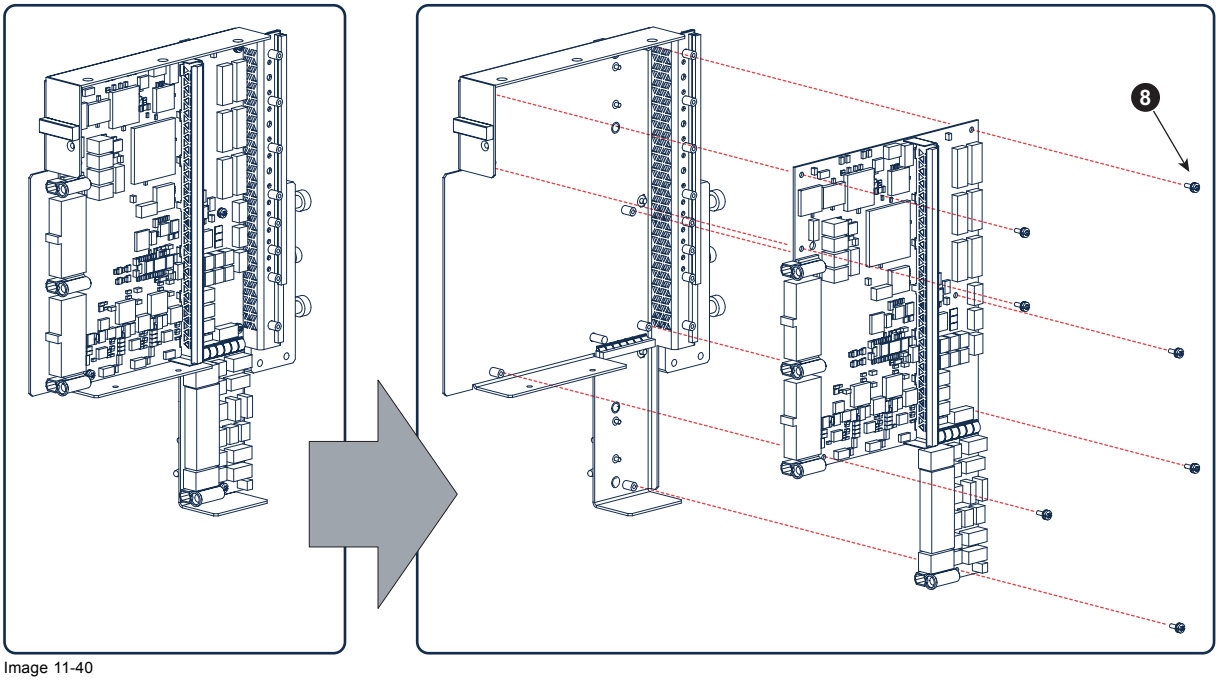


Image 11-40

11.14 Installation of the Formatting Interface Board

Necessary tools

- 3 mm Allen wrench.
- TX10 Torx screwdriver.

How to install the Formatting Interface Board?

1. Position the Formatting Interface Board in the box and turn in the seven fixation screws (reference 8). Use a TX10 Torx screwdriver.

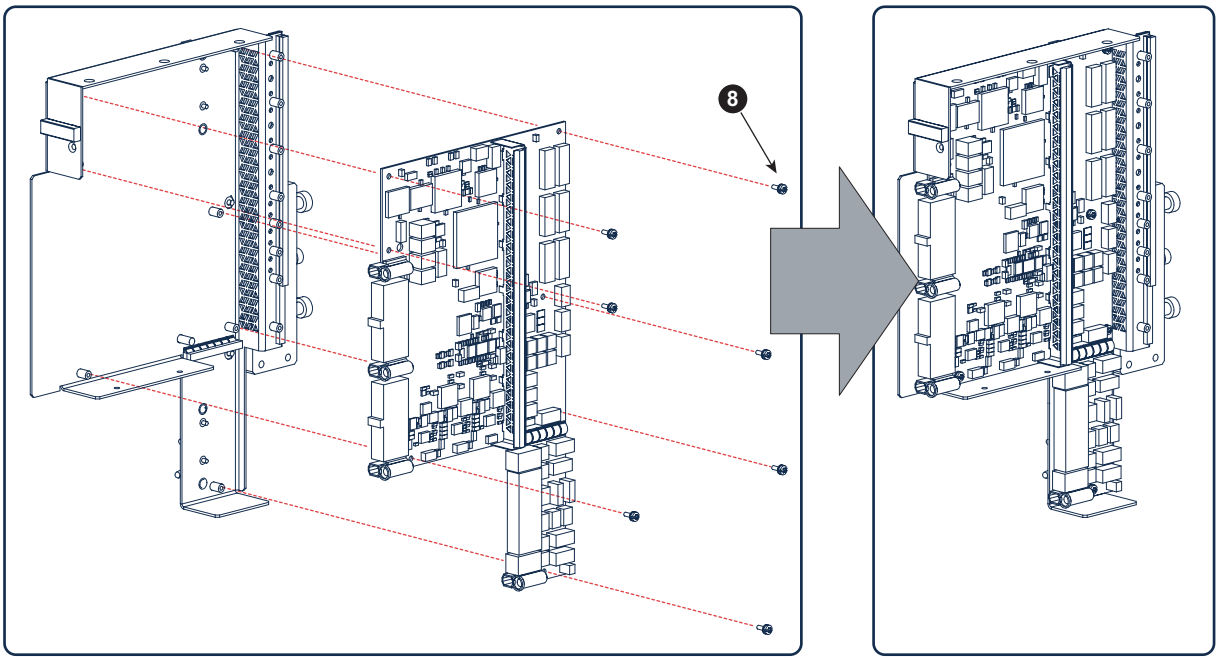


Image 11-41

2. Connect the six thick black signal cables and the three black data cables with the Formatting Interface Board as illustrated. Note the cables are marked with one or two colored rings.
   Caution: *Be careful not to damage the wires and connectors.*

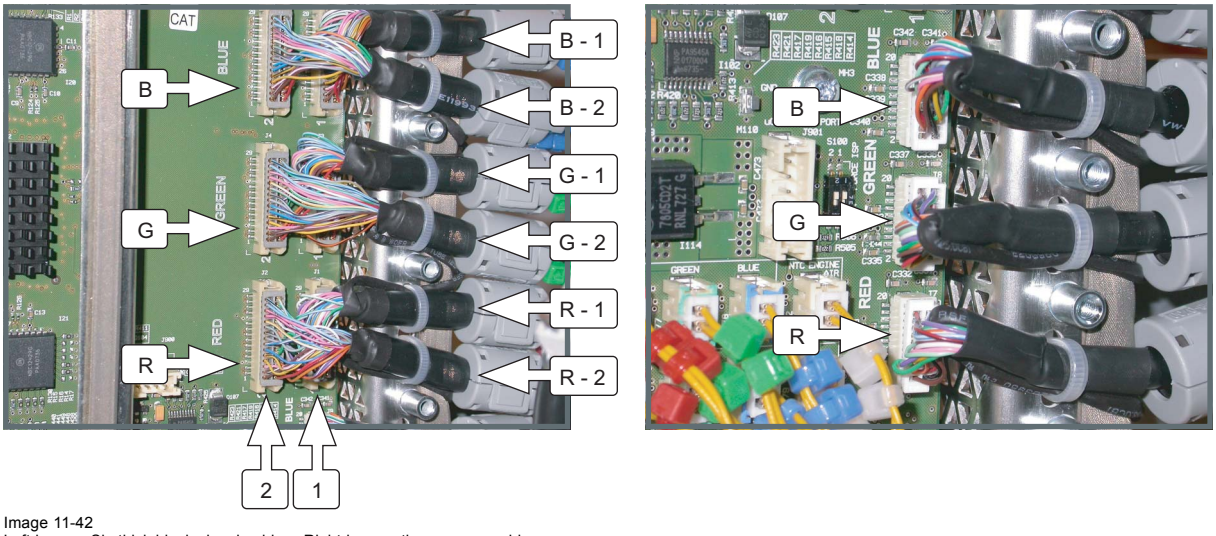


Image 11-42
Left image: Six thick black signal cables. Right image: three power cables.

3. Connect all wire units with the Formatting Interface Board as illustrated.
   Legend:

- SB: Wire unit of temperature sensor at the rear of the DMD of the blue channel.
- SG: Wire unit of temperature sensor at the rear of the DMD of the green channel.
- SR: Wire unit of temperature sensor at the rear of the DMD of the red channel.
- TB-R: Wire unit of Peltier element at the rear of the DMD of the blue channel.
- TG-R: Wire unit of Peltier element at the rear of the DMD of the green channel.
- TR-R: Wire unit of Peltier element at the rear of the DMD of the red channel.
- L: Wire unit of the temperature sensor on the cooling block at the light pipe entrance.
- SH: Wire unit of the shutter.
- LS: Wire unit of the light sensor inside the light pipe (behind the fold mirror).
- PR: Wire unit of prism sensor.
- R: Temperature sensors Red channel.
- G: Temperature sensors Green channel.
- B: Temperature sensors Blue channel.
- BL: Temperature sensors DMD water cooling blocks.
- FR: Temperature sensors DMD front.
- E: Temperature sense Light Processor air (Engine).
- H: Temperature sense Heat pipes cooling block (block front).
- TB-FR: Power supply for TEC front Blue.
- TG-FR: Power supply for TEC front Green.
- TR-FR: Power supply for TEC front Red.

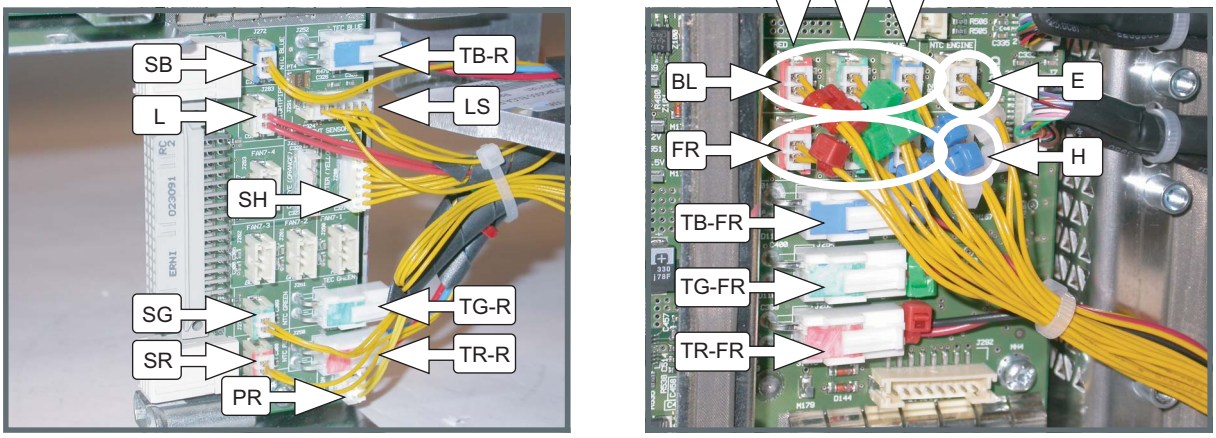


Image 11-43

4. Connect the flat cable with the Formatting Interface Board.

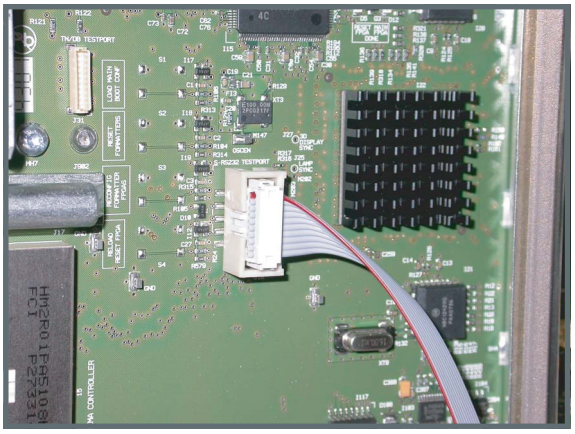


Image 11-44

5. Position the cover plate on the box and secure with six Torx countersunk head screws (reference 7). Use a TX10 Torx screwdriver.

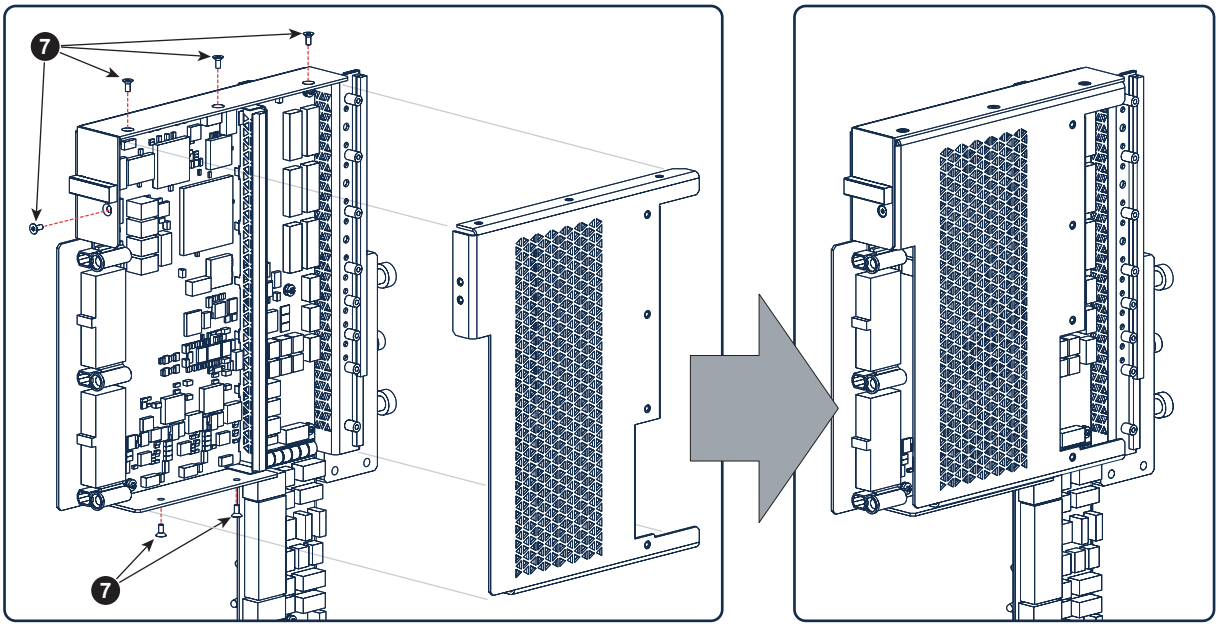


Image 11-45

6. Install the upper cover plate above the sockets of the data and power cables. Use a TX10 Torx driver to fasten the two Torx countersunk head screws (reference 5) and the 7 Torx screws (reference 6).

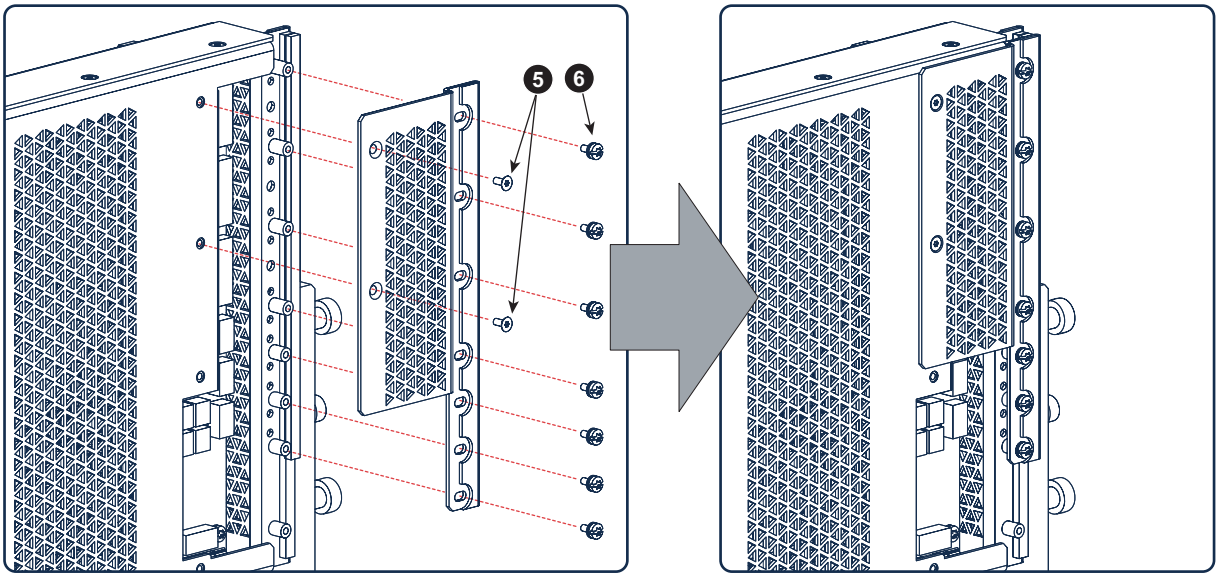


Image 11-46

7. Install the small cover plate. Use a TX10 Torx driver to fasten the two Torx countersunk head screws (reference 3) and the Torx screw (reference 4).

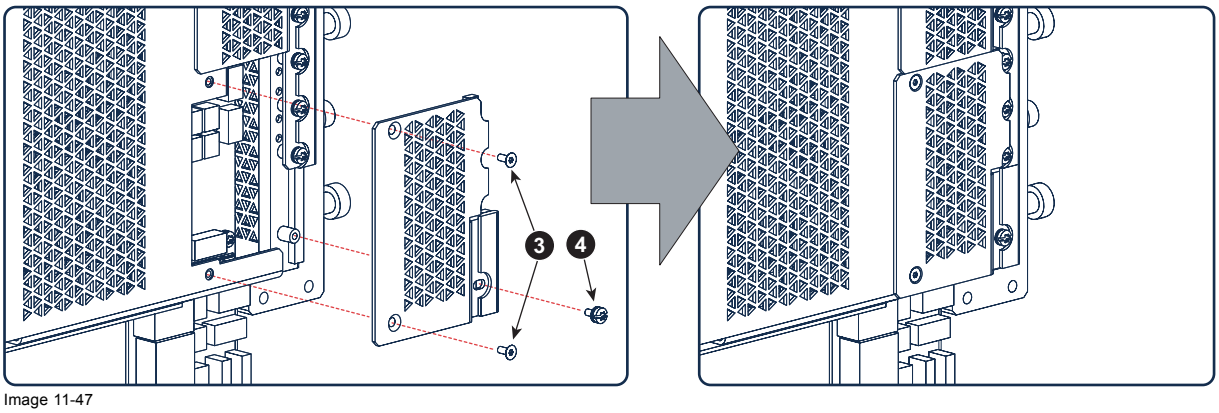


Image 11-47

8. Secure the Formatting Interface Assembly with two hexagon socket head cap screws (reference 1). Use a 3 mm Allen wrench.

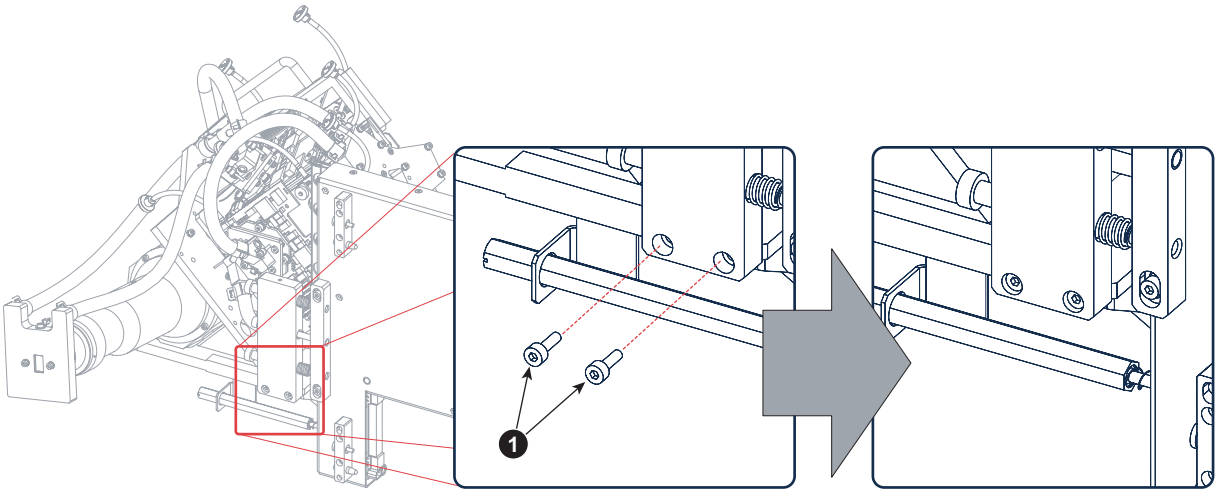


Image 11-48

9. Connect the two ground wires with the base plate of the Formatting Interface Assembly as illustrated. Use a 2,5 mm Allen wrench the fasten the hexagon socket head cap screw.

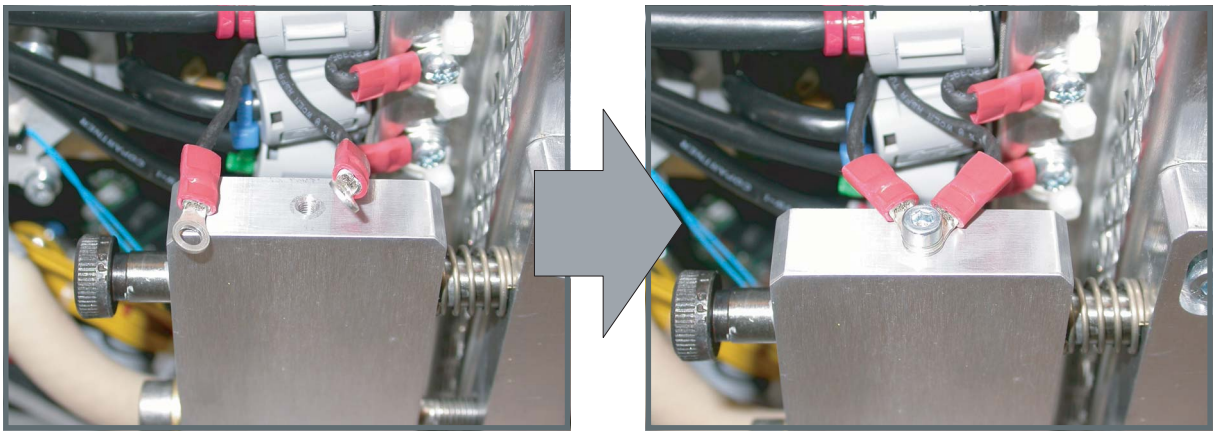


Image 11-49

Check if no wire units or cables did come loose from the Formatting Boards on the Light Processor Unit.

12. CONVERGENCE (WITH EXTENDERS)

About this chapter

This chapter describes how to prepare the projector for convergence adjustment and how to adjust the convergence in case the convergence mechanism is equipped with extenders.

The adjustment procedures described in this chapter are only valid for these Light Processors which are equipped with extended control knobs for convergence adjustment.

Overview

- Convergence controls
- Preparing for convergence adjustment
- Converging the red pattern onto the blue pattern
- Converging the green pattern onto the blue pattern

12.1 Convergence controls

Extended control knobs

As the DMD of the blue channel is not accessible in the projector, the image of this DMD will be taken as reference. Red and green will be aligned on blue when a small convergence drift is recognized. So, the DMD of the blue channel is fixed and can not be adjusted. The red and green channel are equipped with three extended control knobs for convergence adjustment. The adjustment knobs are numbered from 1 to 6 and have the same color as the channel which they effect.

All illustrations in this chapter are based upon the DP-2000 digital cinema projector which is equipped with a liquid cooling system. Nevertheless, the same principles remains valid for the DP-1200 digital cinema projector.

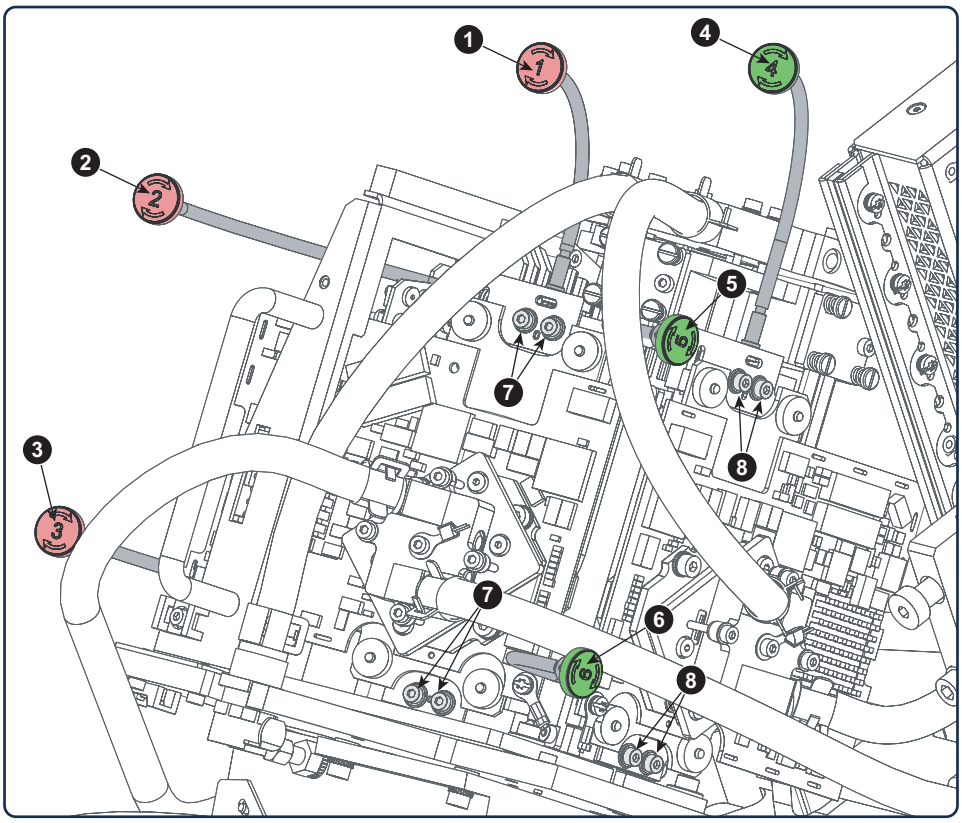


Image 12-1
1 Red channel, knob number 1.
2 Red channel, knob number 2.
3 Red channel, knob number 3.
4 Green channel, knob number 4.
5 Green channel, knob number 5.
6 Green channel, knob number 6.
7 Convergence lock screws of the red channel.
8 Convergence lock screws of the green channel.

To avoid convergence drift the position of the DMD is fixed with 4 screws per channel. These screws have to be released to enable the convergence mechanism.

CAUTION: Do not turn the convergence control knobs prior to releasing the four convergence lock screws. Neglecting may result in permanent damage of the convergence adjustment mechanism.

Convergence test pattern

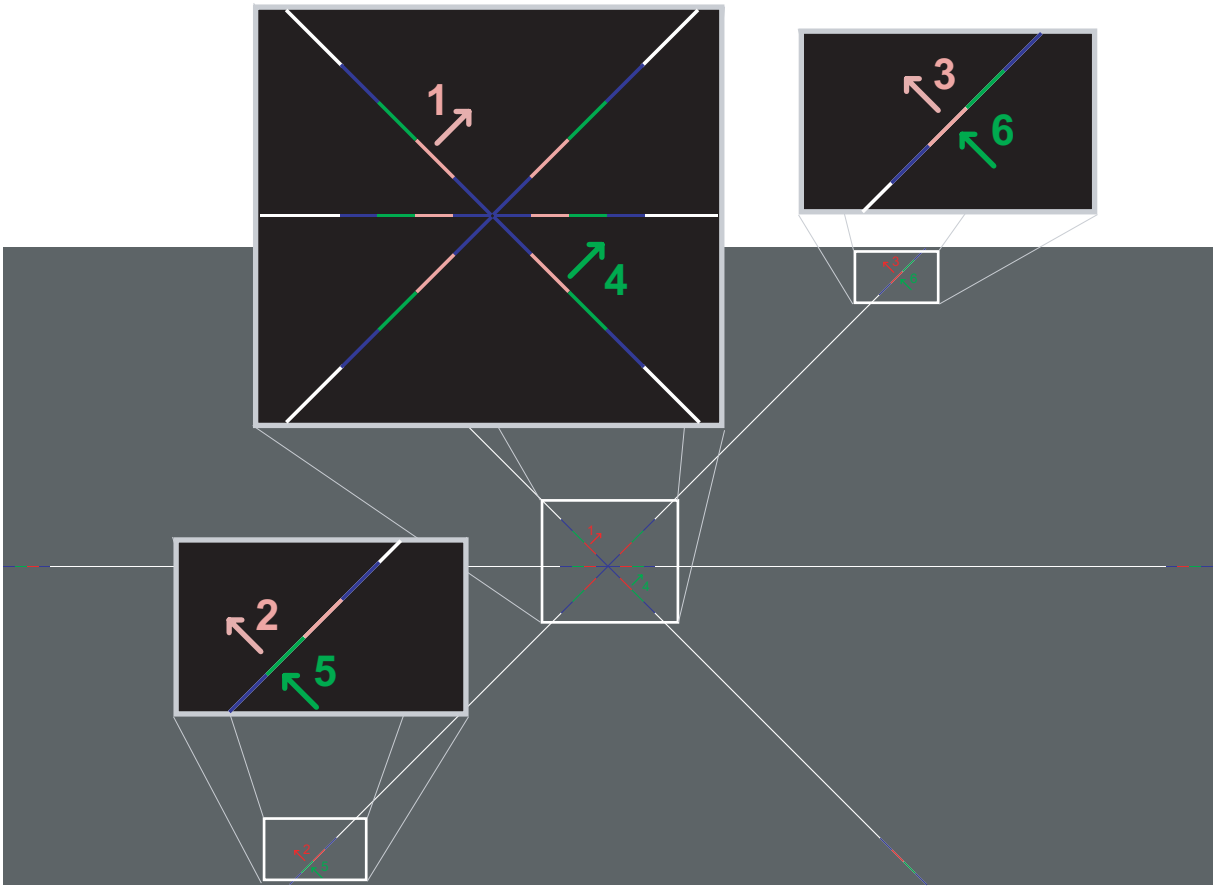


Image 12-2

The test pattern illustrated above is specially designed for convergence purposes. The test pattern has three red arrows numbered from 1 to 3 and three green arrows numbered from 4 to 6. These numbers and colors correspond with the numbers and colors of the extended control knobs (image 12-1). The direction of the arrow shows the movement of the channel color (red or green) when turning the corresponding knob in the direction indicated by the arrow marked on the knob.

The three convergence control knobs of one channel stand in relation with each other. So, a change to one of them will also effect the adjustment results of the two others. Therefore, all three control knobs have to be alternately and repeatedly adjusted until the projected color is perfectly converged with the blue reference color of the test pattern.

Adjustment range

- The adjustment range is limited to approximately 30 pixels in both directions.
- One turn (360°) of a control knob relates to an approximately 30 pixel displacement on the screen.
- When changing the adjustment direction there will be some play of approximately one turn (360°).

12.2 Preparing for convergence adjustment

Necessary tools

Flat blade screwdriver 7x150.

How to set up the projector for convergence adjustment?

1. Remove all side covers and top cover of the projector.
2. Open the sealed compartment of the Light Processor. See page 88.
3. Remove the convergence cover plate in the top plate as follow:
   a) loosen both captive screws (reference 1).
   b) slide the cover plate forward until it becomes free from the top plate.
   c) take off the cover plate.

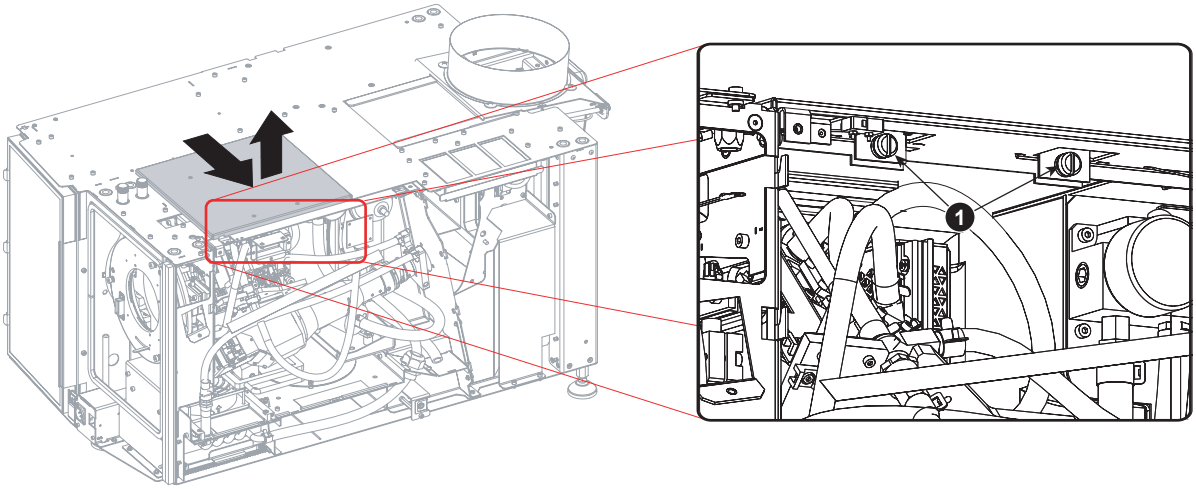


Image 12-3

4. Reinstall the lens and start up the projector.
5. Use the Communicator software to activate the convergence test pattern.

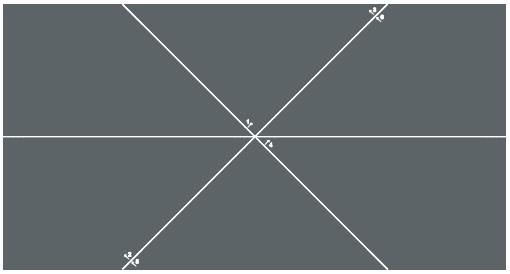


Image 12-4

12.3 Converging the red pattern onto the blue pattern

This adjustment procedure assumes that the projector is prepared for convergence adjustment. See page 200.

Necessary tools

2,5 mm Allen wrench.

How to converge the red pattern onto the blue pattern?

1. Release the four convergence lock screws (reference 7) of the red channel. Use a 2,5 mm Allen wrench

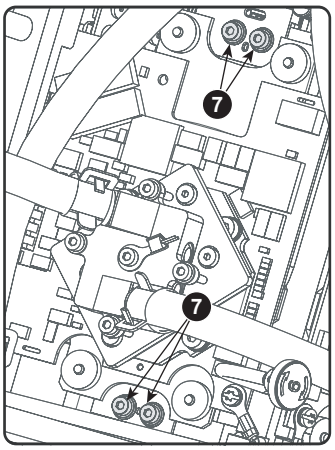


Image 12-5

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

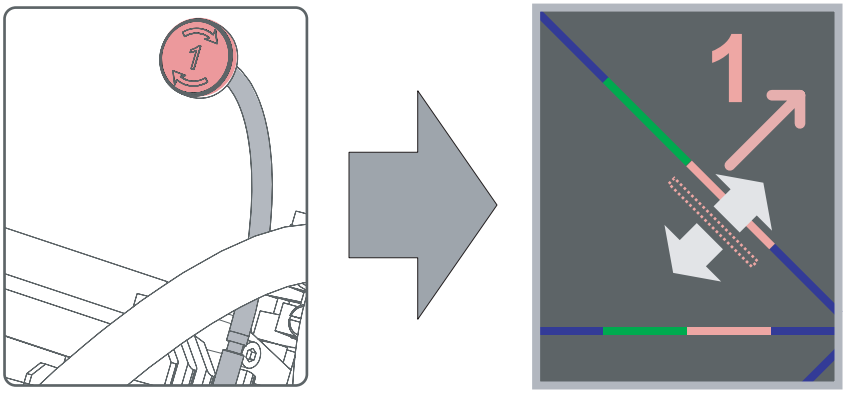


Image 12-6

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

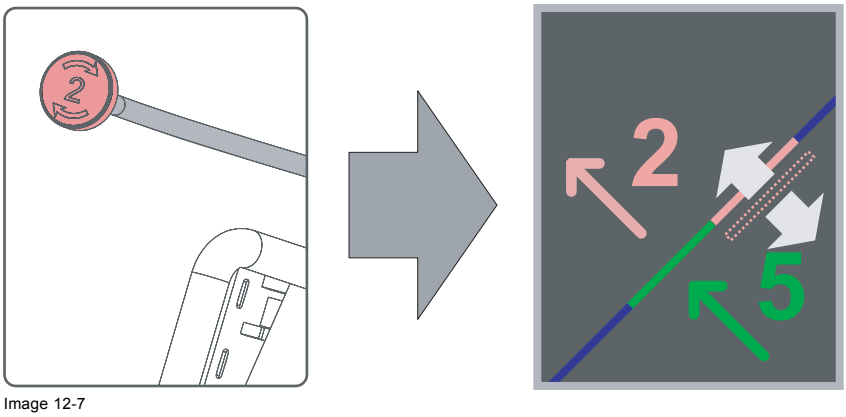


Image 12-7

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

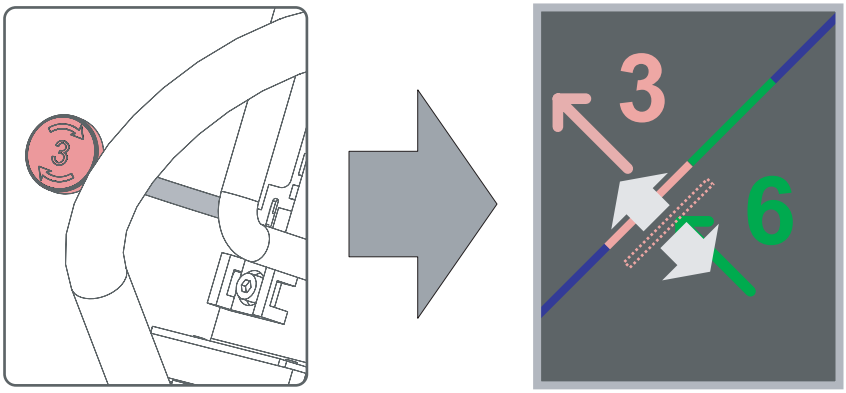


Image 12-8

5. Repeat step 3 and 4 until coincidence is obtained of the red pattern in the lower left and upper right of the projected image.
6. Repeat from step 2 until full coincidence is obtained of the red pattern in the center, lower left and upper right of the projected image.
7. Carefully secure the position of the DMD assembly by tightening the four convergence lock screws (reference 7 of image 12-5) of the red channel. Fasten the screws crosswise with small adjustments to each screw. Use a 2,5 mm Allen wrench.

12.4 Converging the green pattern onto the blue pattern

This adjustment procedure assumes that the projector is prepared for convergence adjustment. See page 200.

Necessary tools

2,5 mm Allen wrench.

How to converge the green pattern onto the blue pattern?

1. Release the four convergence lock screws (reference 8) of the green channel. Use a 2,5 mm Allen wrench

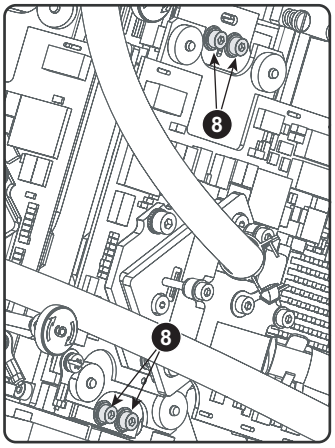


Image 12-9

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

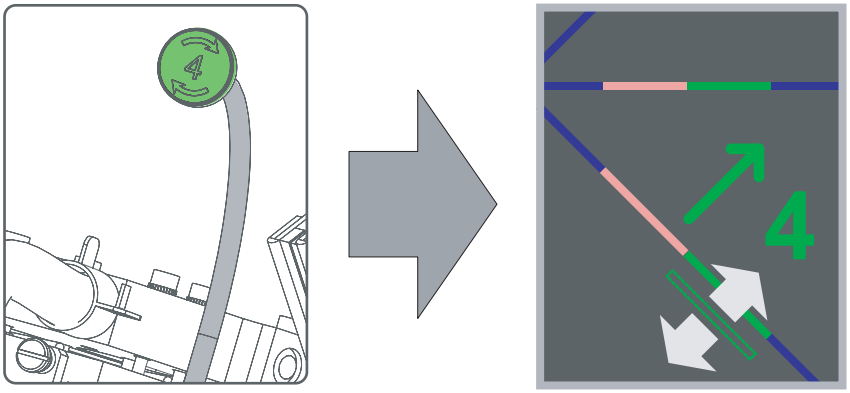


Image 12-10

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

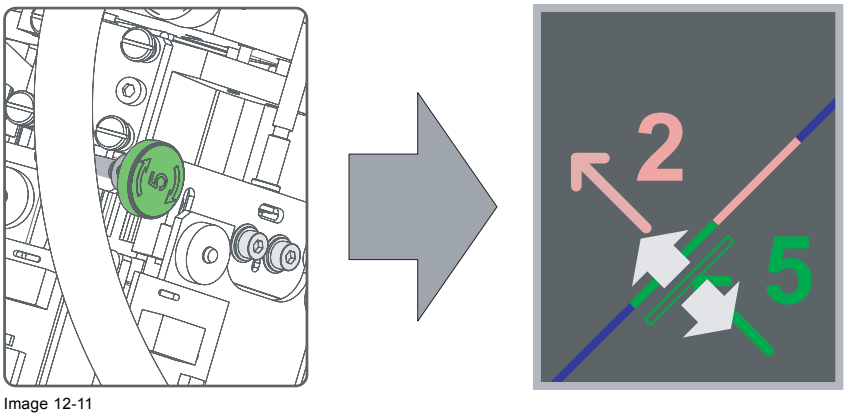


Image 12-11

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

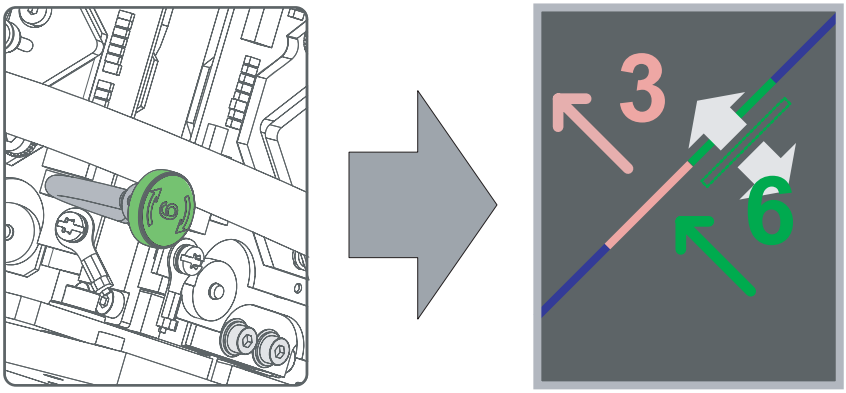


Image 12-12

5. Repeat step 3 and 4 until coincidence is obtained of the green pattern in the lower left and upper right of the projected image.
6. Repeat from step 2 until full coincidence is obtained of the green pattern in the center, lower left and upper right of the projected image.
7. Carefully secure the position of the DMD assembly by tightening the four convergence lock screws (reference 8 of image 12-9) of the green channel. Fasten the screws crosswise with small adjustments to each screw. Use a 2,5 mm Allen wrench.
8. Close the sealed compartment and reinstall all covers of the projector.

13. CONVERGENCE (OLD SYSTEM)

About this chapter

This chapter describes how to prepare the projector for convergence adjustment and how to adjust the convergence in case the convergence mechanism is NOT equipped with extenders.

Overview

- Action of the convergence controls
- Re-converging Green on Blue
- Readjustment of the plungers
- Re-converging Red on Blue

13.1 Action of the convergence controls

Influence of the controls on the convergences

The DMD assemblies are provided with 3 adjustable screws. The assembly itself is kept in place by a plunger near the adjustable screw. These plungers may not be re-adjusted (indicated in the drawing with the prohibited sign).

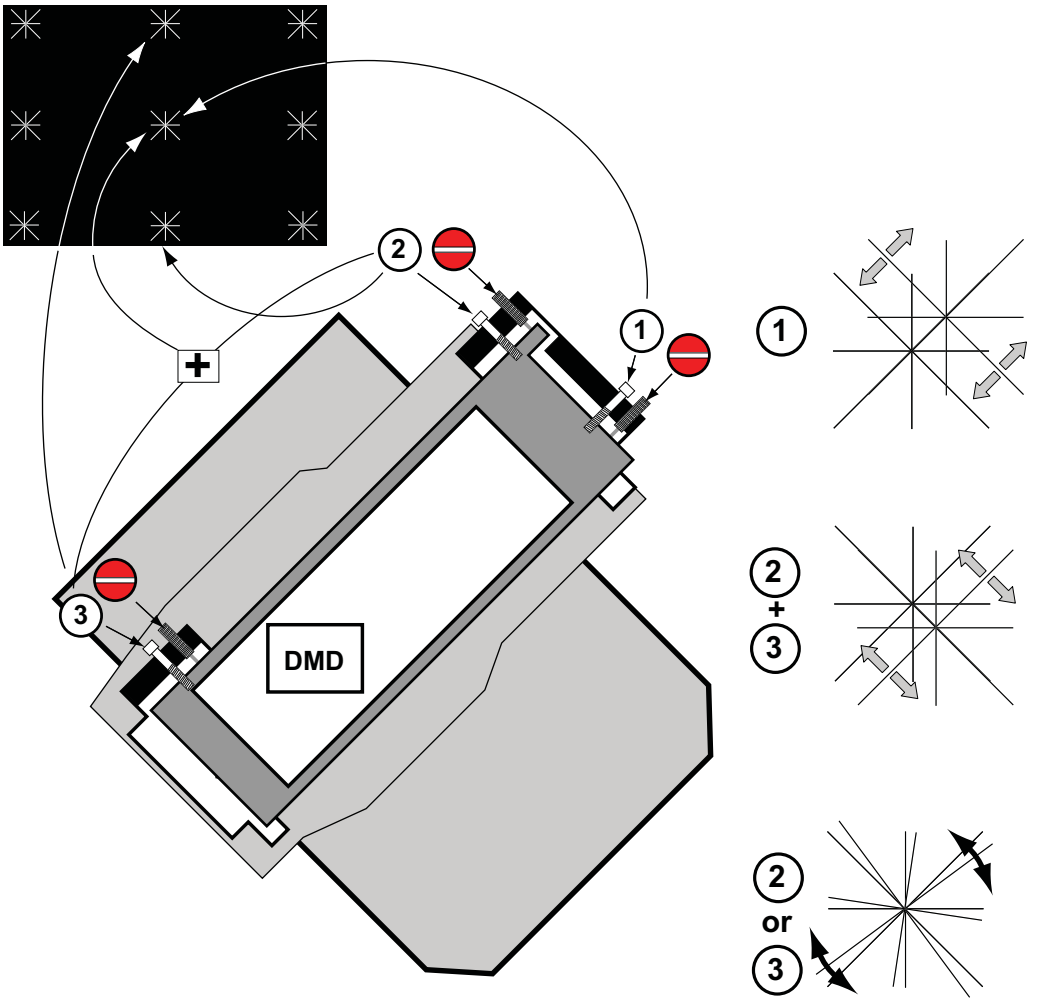


Image 13-1
Influence of the controls on the convergence

Adjusting the control(s):

- (1): Move the respective convergence pattern up or downwards 45° diagonally (Top-Left/Bottom-Right).
- (2) & (3) simultaneously: Move the respective convergence pattern up or downwards -45° diagonally (Top-Right/Bottom-Left).
- (2) or (3) separately: rotate the convergence pattern respectively +X° or -X°.

13.2 Re-converging Green on Blue

CAUTION: Be cautious when adjusting the convergence controls, because a small turn causes a large degree of shift.

Before starting the re-convergence, remove both side covers, front cover and top cover.

Location of the lock-down screws

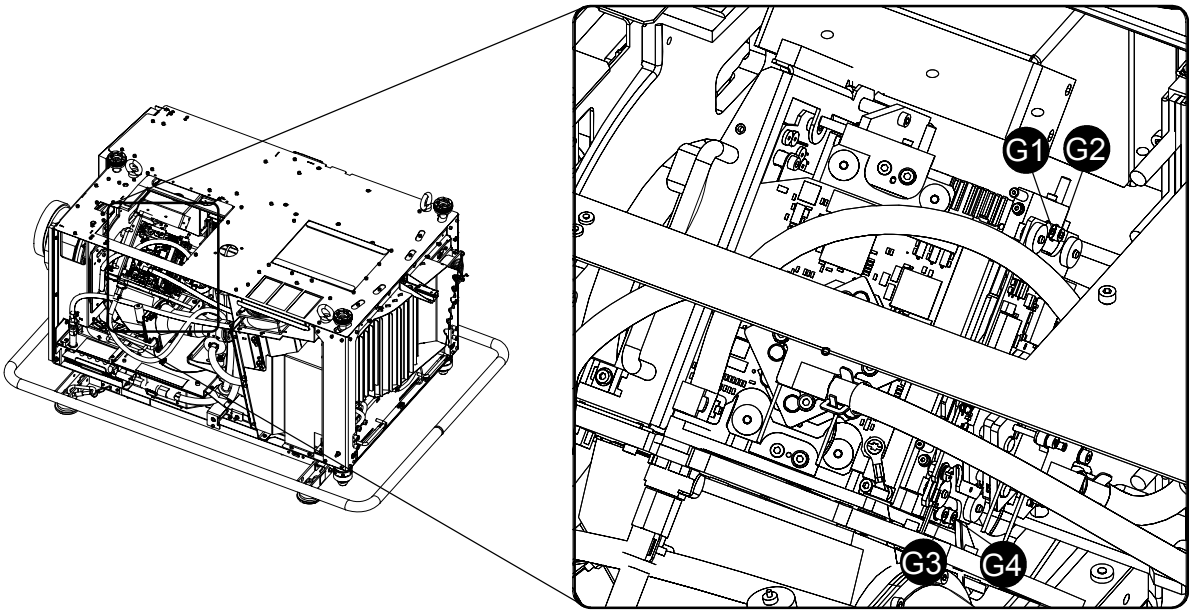


Image 13-2
Lock down screws green

Location of the convergence adjustable screws

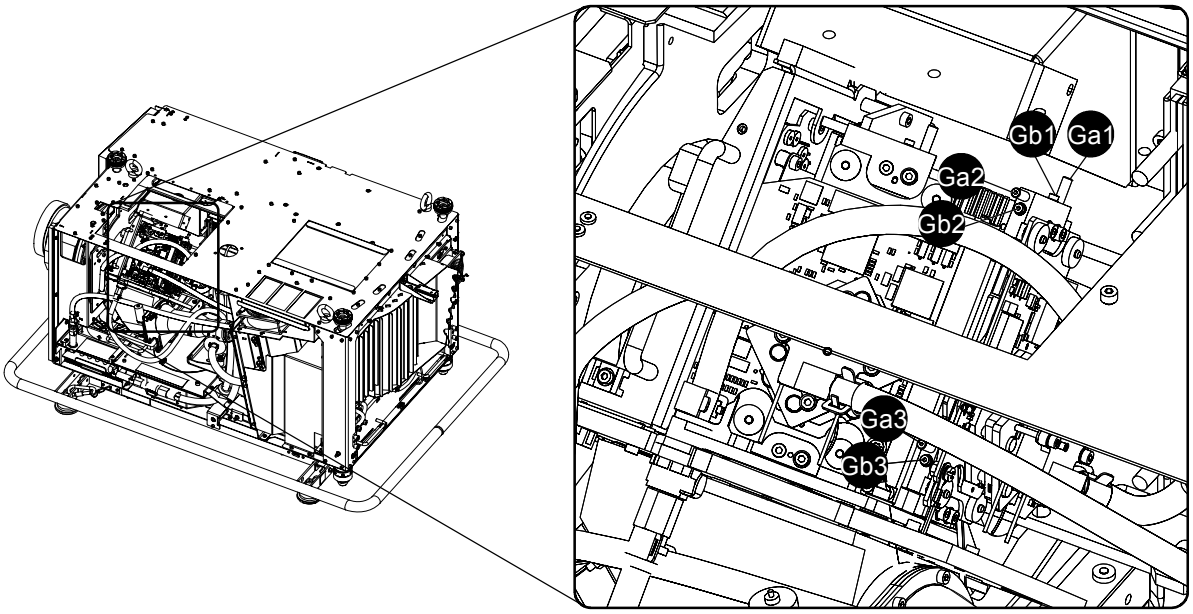


Image 13-3
Convergence screws green

Necessary tools

- 2x R847204 : steel screwdriver with 1/16” ended hex blade.
- R847205 : square drive socket with soldered hexagon key of 2.5 mm
- R847203 : Steel screwdriver with 0.05” ended hex blade
- Allen key 3 mm
- Allen key 2.5 mm

How to re-converge

1. Remove the convergence cover plate (A) in the top plate by removing the necessary screws.

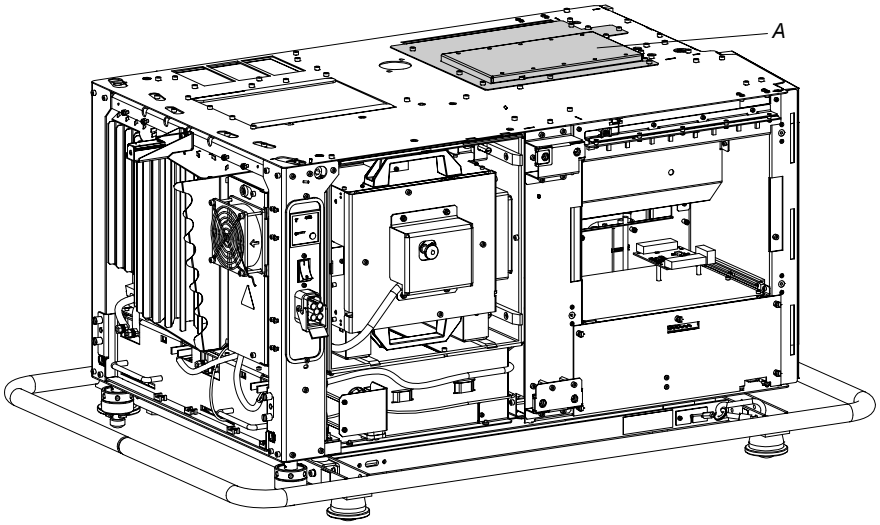


Image 13-4
Convergence cover

2. Is your projector an FLM HD projector?
   If yes, Loosen the 4 screws Cr and the 4 screws Cg on the heat pipes of HD light processors. Then continue with step 3.

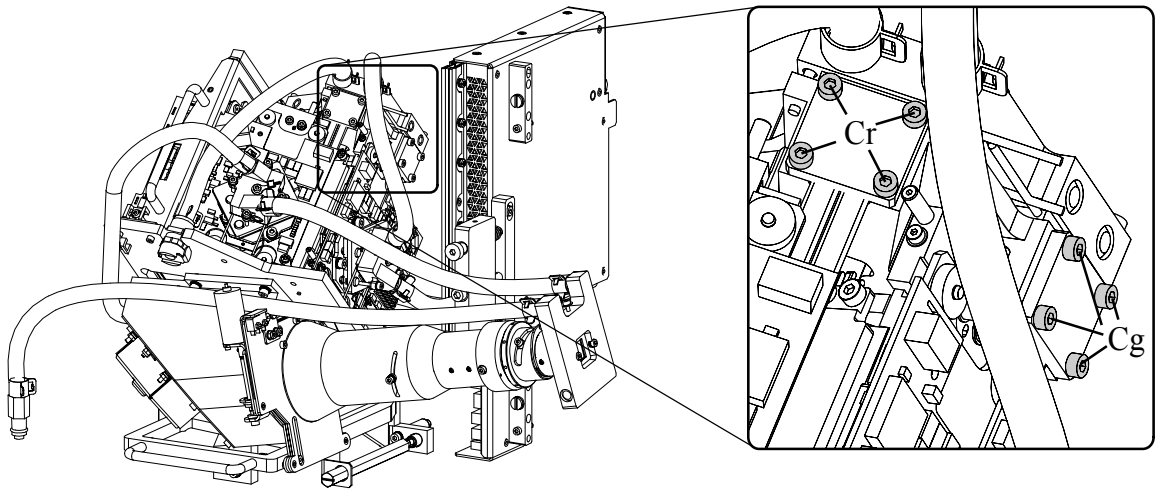


Image 13-5
Heat pipes on HD light processor

   If no, go to step 3

3. Put the square drive socket, with a soldered hexagon key onto a ratchet.
4. Carefully release the 4 lock-down screws, holding the DMD unit onto Prism frame.
   Tip: *Release the lock-down screws in a way the DMD assembly becomes slightly movable. Keep in mind that at the end of the re-convergence, tightening the DMD unit can cause some small convergence drift.*
5. Start the re-convergence in the center of the image as follows (using tool R847204):
   - Adjust the control Gb1 until the crossing of the center Green convergence pattern coincides with the Top left/Bottom right diagonal line of the center Blue convergence pattern.
   - Adjust the control Gb2 & Gb3 simultaneously until the crossing of the center Green convergence pattern coincides with the Top right/Bottom left diagonal line of the center Blue convergence pattern.

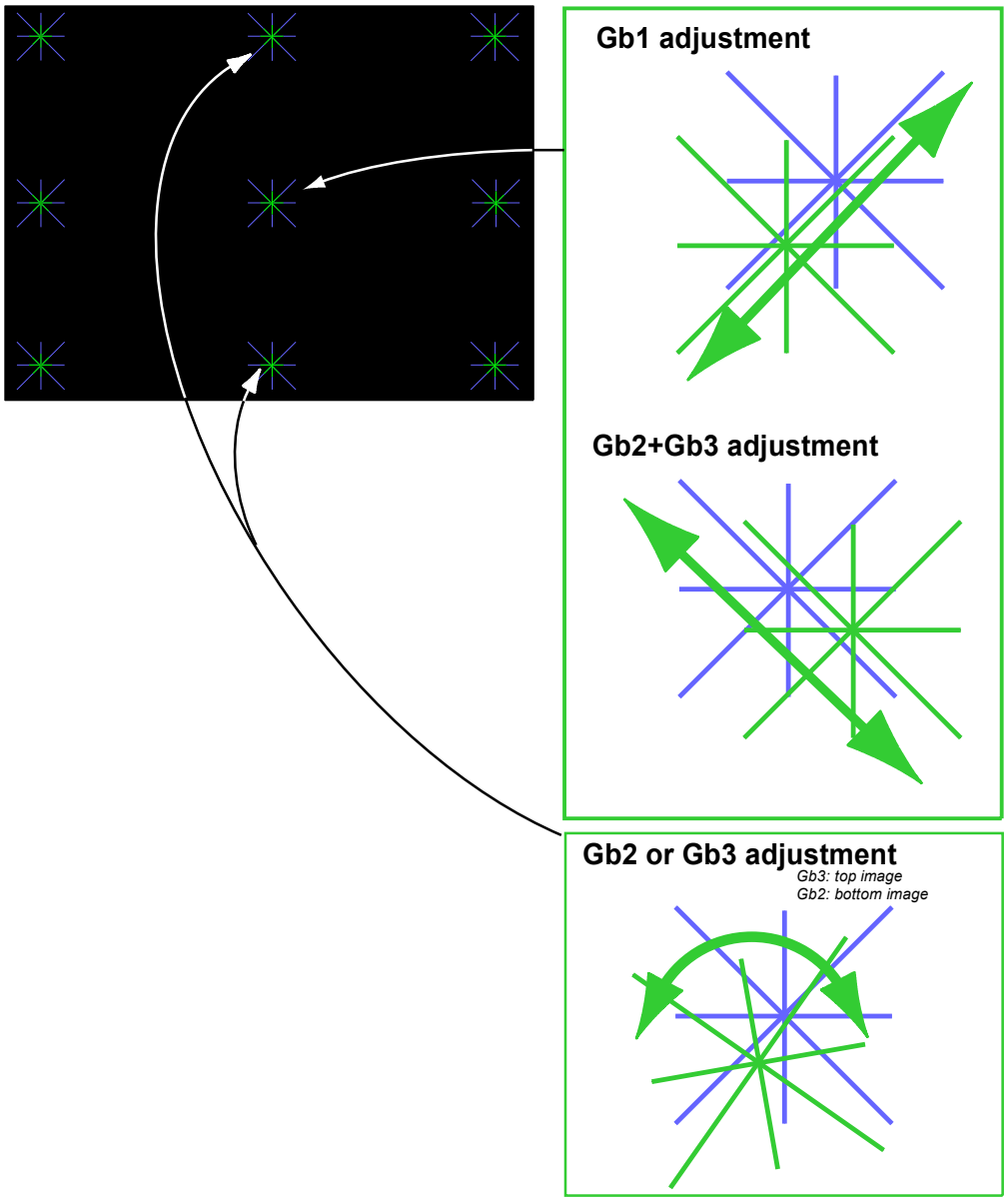


Image 13-6
Green convergence adjustment

6. Continue with re-convergence in center at the Top and the Bottom of the image as follows (using tool R847204):
   - Adjust the control Gb3 for coincidence of the diagonal Green line of the Green convergence pattern with the Blue line of the Blue convergence pattern in the center at the top of the image.
   - Adjust the control Gb2 for coincidence of the diagonal Green line of the Green convergence pattern with the Blue line of the Blue convergence pattern in the center at the bottom of the image.
7. Because the different adjustments interact, step 4 and 5 have to be repeated until full coincidence of both convergence patterns is obtained.
8. Carefully secure the position of the DMD assembly by tightening the 4 lock-down screws.

13.3 Readjustment of the plungers

CAUTION: Do NOT adjust the plungers on the DMD assembly, if small convergence drifts have to be corrected only.

For extreme convergence adjustments, possible in case after the replacement of a DMD assembly, a readjustment of the plungers can be necessary.

Convergence screw is end of course

1. Turn the plunger (A) a few turns counterclockwise.

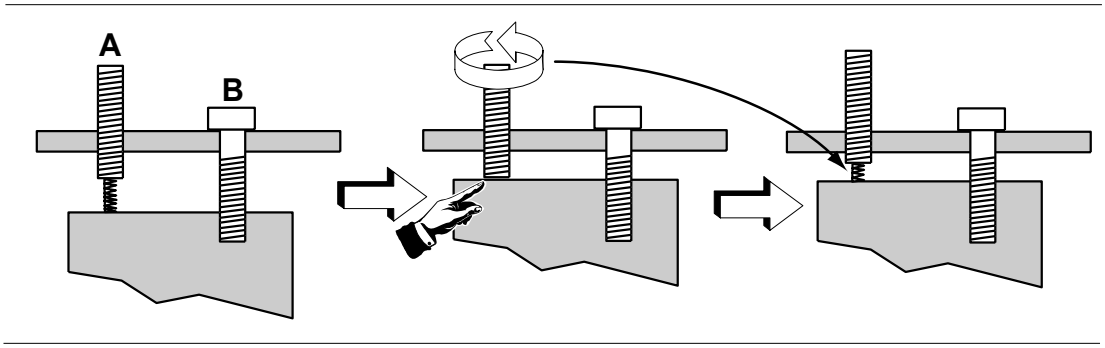


Image 13-7
Readjustment plunger

2. Continue with the fine convergence adjustment

Convergence screw senses no resistance

1. Turn the plunger clockwise until resistance is sensed again.

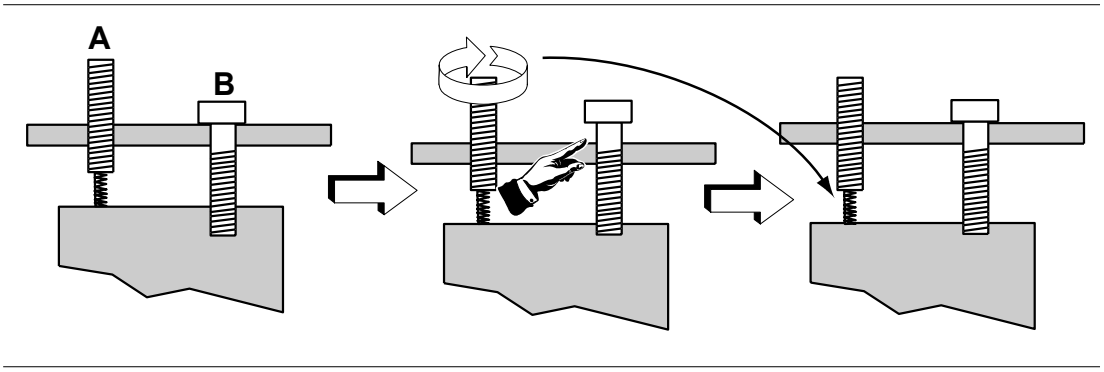


Image 13-8
Readjustment plunger

2. Continue with the fine convergence adjustment

13.4 Re-converging Red on Blue

CAUTION: Be cautious when adjusting the convergence controls, because a small turn causes a large degree of shift.

Location of the lock-down screws

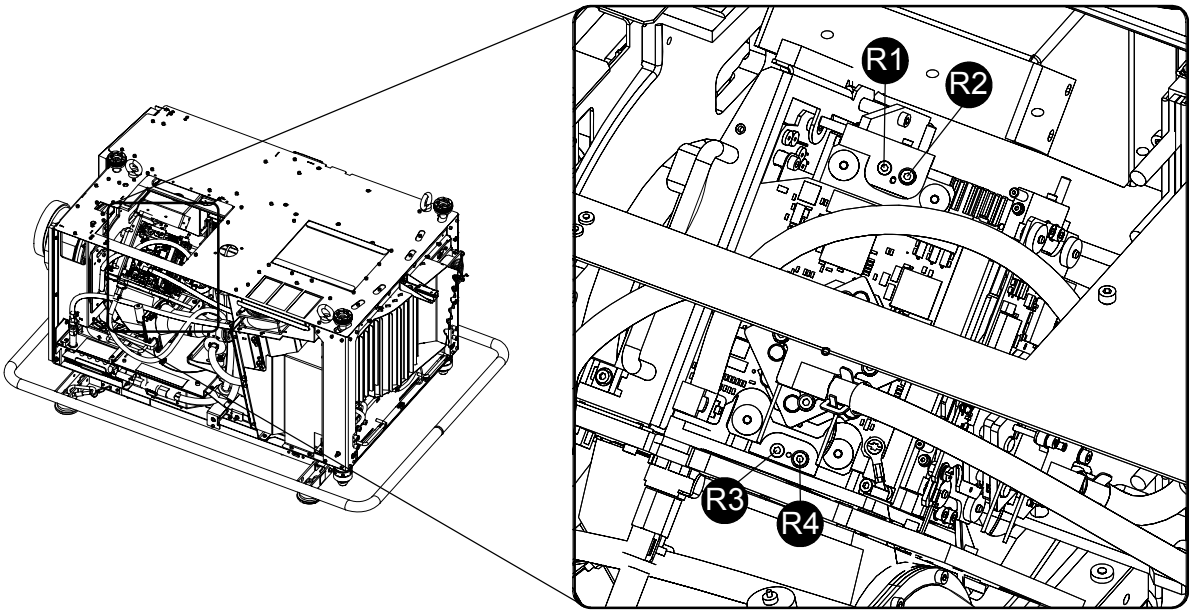


Image 13-9
Lock down screws red

Location of the convergence adjustable screws

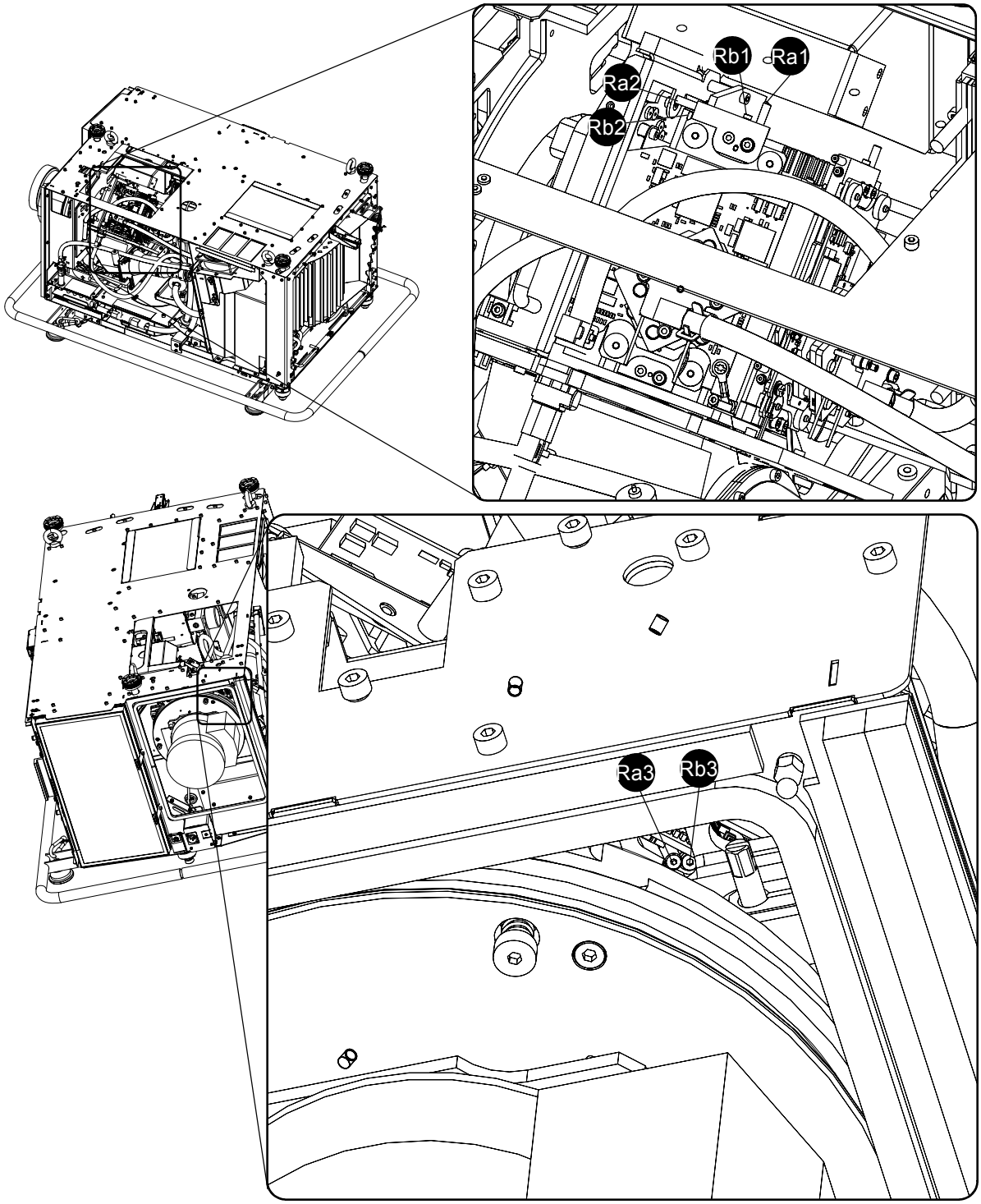


Image 13-10
Convergence screws red

Necessary tools

- 2x R847204 : steel screwdriver with 1/16” ended hex blade.
- R847205 : square drive socket with soldered hexagon key of 2.5 mm
- R847203 : Steel screwdriver with 0.05” ended hex blade
- Allen key 3 mm
- Allen key 2.5 mm

How to re-converge

1. Put the square drive socket, with soldered hexagon key, onto a ratchet.

2. Carefully release the 4 lock-down screws, holding the DMD unit onto Prism frame.
   Tip: *Release the lock-down screws in a way the DMD assembly becomes slightly movable. Keep in mind that at the end of the re-convergence, tightening the DMD unit can cause some small convergence drift.*
3. Start the re-convergence in the center of the image as follows (using tool R847204):
   - Adjust the control Rb1 until the crossing of the center Red convergence pattern coincides with the Top left/Bottom right diagonal line of the center Blue convergence pattern.
   - Adjust the control Rb2 & Rb3 simultaneously until the crossing of the center Red convergence pattern coincides with the Top right/Bottom left diagonal line of the center Blue convergence pattern.

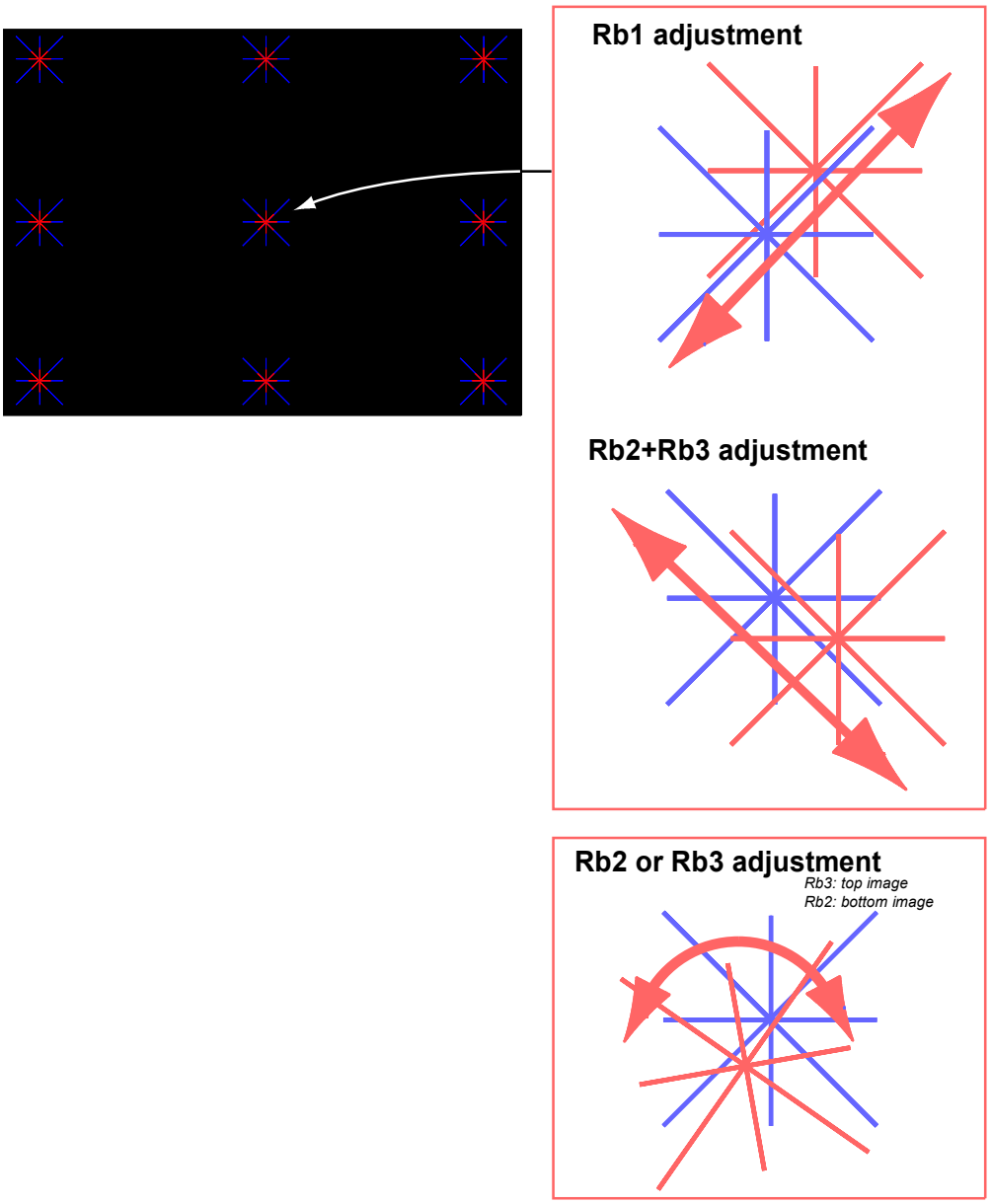


Image 13-11

4. Continue with re-converging the center at the Top and the Bottom of the image as follows (using tool R847204):
   - Adjust the control Rb3 for coincidences of the diagonal Red line of the Red convergence pattern with the Blue line of the Blue convergence pattern in the center at the top of the image.
   - Adjust the control Rb2 for coincidences of the diagonal Red line of the Red convergence pattern with the Blue line of the Blue convergence pattern in the center at the bottom of the image
5. Because the different adjustments interact, step 3 and 4 have to be repeated until full coincidence of both convergence patterns is obtained.
6. Carefully secure the position of the DMD assembly by tightening the 4 lock-down screws.
7. Is the projector an FLM HD projector?
   If yes, Secure the 4 screws on the heat pipes for red and green (Cr an Cg).

If necessary to readjust the plungers, see "Readjustment of the plungers", page 210.

Close the convergence cover, reinstall all covers of the projector.

14. LIQUID COOLING CIRCUIT

About this chapter

This chapter describes how to diagnoses and maintain the liquid cooling circuit of the projector.

WARNING: All actions performed on the Liquid Cooling Circuit should occur in normal ambient conditions (approximately 25 °C). The projector should have sufficiently cooled down (minimum 2 hours).

WARNING: Do not change the air pressure of a calibrated Liquid Cooling Circuit (see marking on pressure vessel), unless stated explicitly in the servicing procedure.

WARNING: Hazardous product: Blue antifreeze diluted 1,2 ethanediol (1/3 ethanediol – 2/3 Demi water).

Not for household use. Keep out of reach of children. Harmful by oral intake. Avoid exposure to pregnant women. Avoid contact with eyes, skin and clothing. Avoid inhalation of the noxious fumes.

Handling the cooling liquid

- Avoid contact of the liquid with Eyes, Skin and Clothing.
- Avoid inhaling noxious fumes.
- Conserve the product in the original package and in a well ventilated room.

Personal protection rules

- Handle the cooling liquid in a well ventilated room.
- Under no circumstances eat, drink and smoke while handling the liquid.
- Wear gloves (Butylrubber, PVC....) and Goggles.
- Wear suitable protection clothing.

Overview

- Introduction
- Diagnostics
- Pressure verification of the liquid cooling circuit
- Excluding the Light Processor Unit
- Draining the liquid cooling circuit
- Filling the liquid cooling circuit
- Refreshing the liquid cooling circuit
- Expelling air from the liquid cooling circuit
- Pressurizing the liquid cooling circuit
- Calibrating the liquid cooling circuit
- Removal of the heat exchanger
- Installation of the heat exchanger
- Cleaning the cooling pump
- Replacement of the pump motor and rotor
- Replacement of the complete cooling pump

14.1 Introduction

Functionality

Much heat has to be extracted from the DMD's and from the light pipe entrance during operation of the projector. The liquid cooling circuit takes care of this. The liquid cooling circuit is a closed loop of flexible tubing comprising of a pump, three cooling blocks for the DMD's, a cooling block for the light pipe entrance, a cooling block for the heat pipes, a heat exchanger, a pressure vessel and a manometer. The cooling liquid inside the circuit absorbs the heat of the cooling blocks. Via the pump, the heated-up liquid is transported to the heat exchanger, which in turn cools down the liquid.

The pressure vessel in the circuit makes it possible to put a small pressure on the cooling liquid. The required pressure exerted via the pressure vessel serves to prevent cavitation and hence ensures the good working condition of the pump. Note that the pressure doesn't influence the cooling capacity of the system.

Parts of the liquid cooling circuit

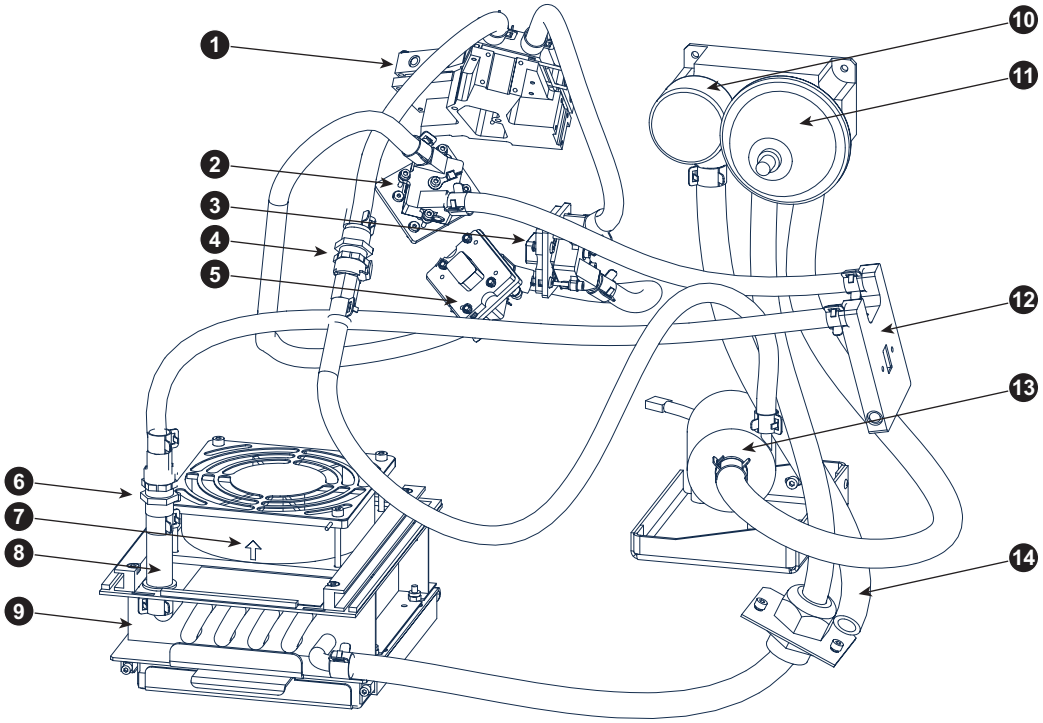


Image 14-1
1 Cooling block heat pipes (DMD front cooling).
2 Cooling block red DMD channel.
3 Cooling block green DMD channel.
4 Valved fitting.
5 Cooling block blue DMD channel.
6 Valved fitting.
7 Fan heat exchanger.
8 Transparent tube for visual check..
9 Heat exchanger.
10 Manometer.
11 Pressure vessel.
12 Cooling block light pipe entrance.
13 Pump.
14 Overflow pipe.

Tools used in the liquid cooling servicing procedures

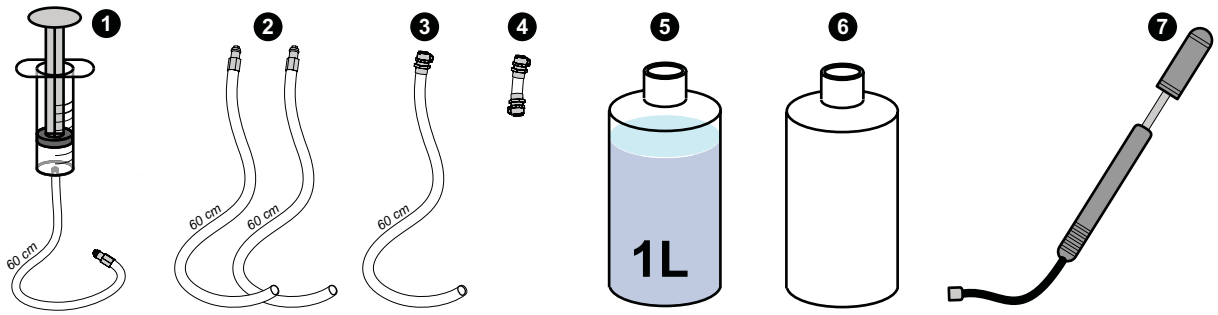
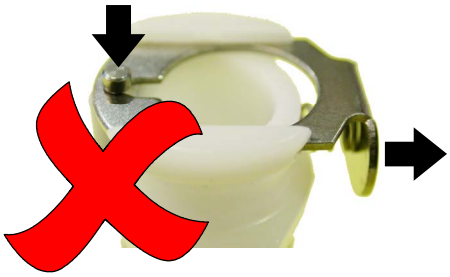
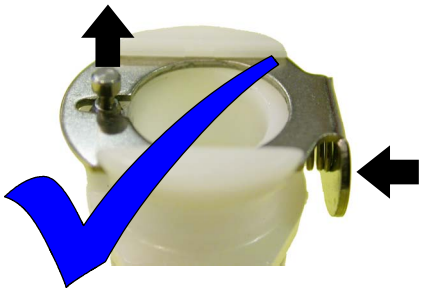


Image 14-2
1 Syringe with plastic tube (60 cm) and male valved fitting.
2 Two plastic tubes of 60 cm with male valved fitting.
3 60 cm plastic tube with female valved fitting.
4 Female/female valved fitting adaptor.

5 Bottle with 1 liter cooling liquid.
6 Empty bottle with a volume of 1 liter.
7 Air pump with Shrader type air hose fitting.

CAUTION: To avoid damage to the connector seal, always depress the connector tab of the female valved fitting prior to inserting the male valved fitting.





14.2 Diagnostics

General

Over extended periods there may be small losses of pressure in the liquid cooling system of the projector. It is therefor recommended to check the pressure at regular intervals. In case the pressure drops below 0,5 bar it is recommended to restore the pressure of the liquid cooling system.

CAUTION: In case of a rapid loss in pressure check the liquid cooling circuit for leakage. Solve the problem before starting up the projector.

Troubleshooting cooling loop

- Any significant or rapid drop in pressure indicates a leakage of liquid. If this be the case, verify whether the circuit shows any visible sign of liquid leakage.
- As critical components rely on this liquid cooling, it is essential that any leakage is detected timely.
- Periodic checking of the liquid cooling pressure is essential to guarantee overall good performance of the projector and the pump.
- The factory pressure preset is approximately 1 bar in the 'Projector Off' status at a room temperature of 25 °C. This may drop slightly during operation.

Too high ambient temperature

Possible cause	Solution
Ambient temperature of the projector is too high.	Measure the ambient temperature nearby the projector air inlet. In case the measured temperature is higher than 40 °C take the necessary measurements to ensure that the ambient temperature is below 35°C (95°F).
Blocked filter at the front side and the left side of the projector	Clean the blocked filter.

One of the DMD's is too high in temperature

Possible cause	Solution
Malfunctioning Peltier element of the involved DMD. Only one DMD is too high in temperature while the other two DMD's have a normal and almost equal temperature.	Replace the malfunction Peltier element.
The wire units of two Peltier elements or their respective temperature sensors (NTC's) have been swapped. While the temperature of one DMD is too high, the other will most likely be too low.	Check the connections of the Peltier elements and there respective temperature sensors.
Poor assembly of DMD.	Make contact with a Barco service center to return the light processor

All DMD's are too high in temperature

Possible cause	Solution
The liquid cooling circuit of the light processor is mistakenly excluded from the main liquid cooling circuit.	Check of the cooling circuit of the light processor is connected with the pump and heat exchanger.
None of the wire units of the Peltier elements or there respective temperature sensors (NTC's) are connected.	Check the connections of the Peltier elements and there respective temperature sensors.
Blocked filter of the heat exchanger.	Clean the blocked filter.

No flow of the cooling liquid

Possible cause	Solution
Interruption of the liquid cooling circuit.	Check if the loop of the liquid cooling circuit is closed.
No or insufficient liquid inside the cooling circuit. The pump is sucking air and sounds noisier then normal.	Fill the cooling circuit with liquid and expel all air. Pressurize the circuit.
Defective pump. When the projector is running, you don't feel any vibrations when touching the pump	Drain the liquid cooling circuit, replace the pump, fill and pressurize the liquid cooling circuit. Tip: It's not necessary to drain the cooling circuit of the light processor. Bypass this part of the cooling circuit.

14.3 Pressure verification of the liquid cooling circuit

CAUTION: The pressure of the Liquid Cooling Circuit should be checked regularly. This pressure, indicated on the internal manometer, should be between 0,5 and 1 bar. If not, corrective action should be taken by qualified technical service personnel.

How to check the pressure of the liquid cooling circuit inside the projector ?

1. Remove the side cover (light processor side) of the projector.
2. Look through the small window, which is provided on the security cover of the light processor and check the pressure indicated on the internal manometer of the liquid cooling circuit.
   Tip: *Use a flashlight.*

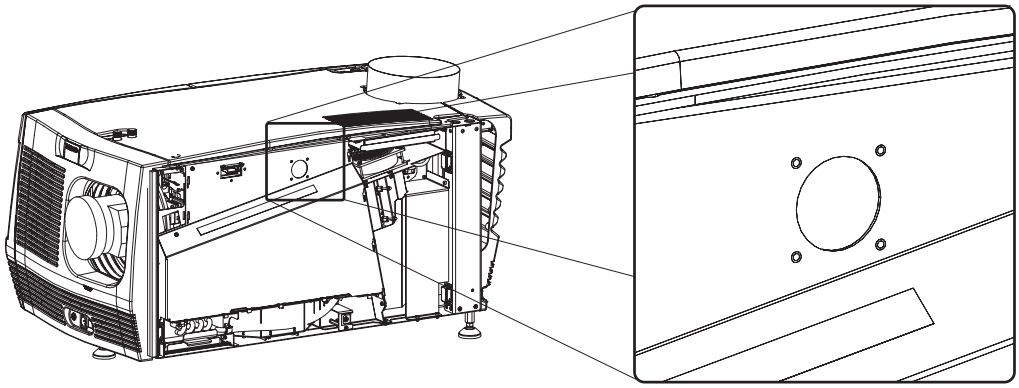


Image 14-3

3. This pressure should be between 0,5 and 1 bar. If the pressure, indicated on the manometer, is out of range, inform the responsible and qualified technicians, so they may take necessary corrective action.
4. Reinstall the side cover of the projector.

14.4 Excluding the Light Processor Unit

When excluding the liquid cooling circuit of the Light Processor?

When service actions are required to the pump, heat exchanger, or other parts of the liquid cooling circuit which are not mounted on the Light Processor unit then the cooling circuit of the Light Processor unit can be excluded from the cooling circuit in the projector. Excluding the Light Processor unit will minimize the risque on air bubbles in the cooling system.

The service procedures for the liquid cooling system such as draining and filling are described for the whole cooling circuit. Nevertheless, you can use the same procedures and exclude the Light Processor if applicable.

CAUTION: Do not exclude the Liquid Cooling Circuit of the Light Processor when expelling air from, pressurizing, or calibrating the liquid cooling circuit.

How to exclude the liquid cooling circuit of the Light Processor?

1. Interrupt the liquid cooling circuit by uncoupling the valved fitting at the heat exchanger. The tube which you are uncoupling comes from the cooling block on the Light Pipe entrance.
2. Interrupt the liquid cooling circuit by uncoupling the valved fitting at the Light Processor unit. The tube which you are uncoupling comes from the pump exit.

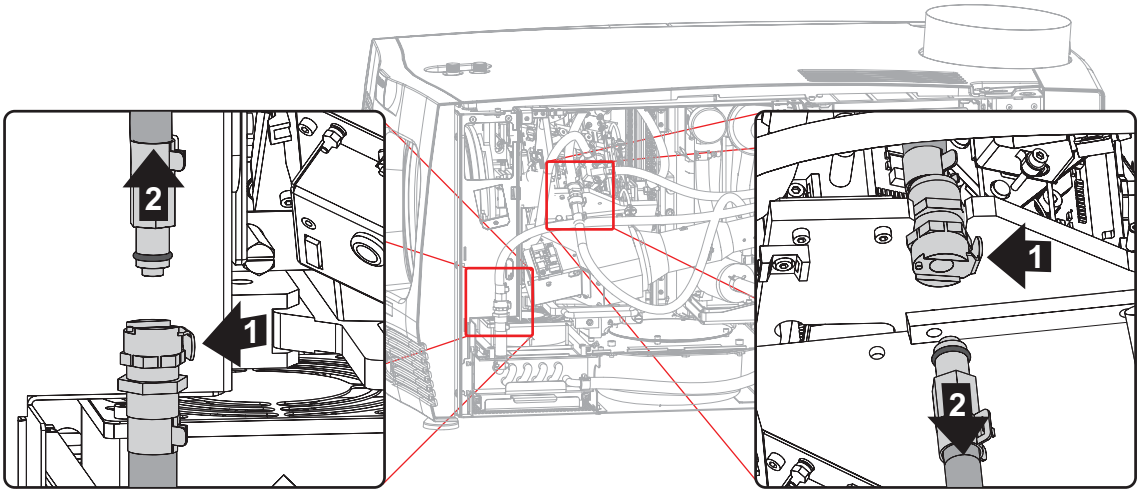


Image 14-4

3. Use the tube that comes from the pump exit side as “OUTPUT” in the draining and filling procedures.

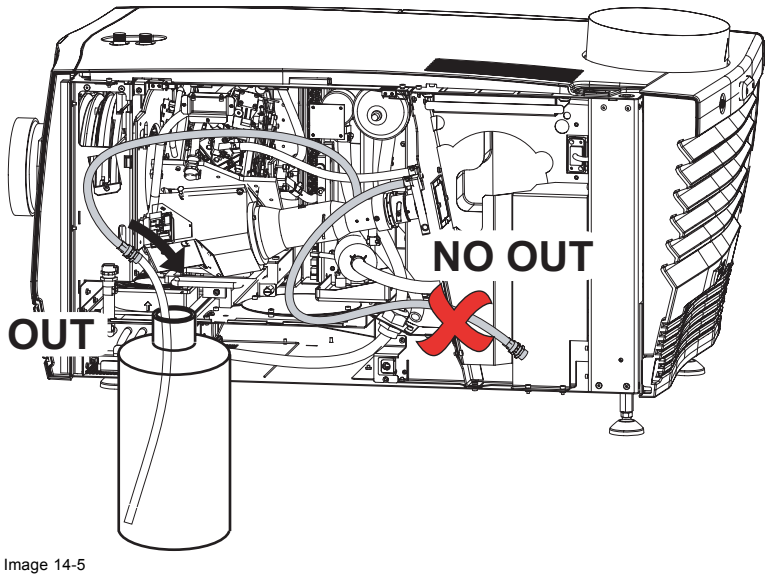


Image 14-5

Connect the tube which comes from the cooling block on the Light Pipe entrance with the valved fitting at the Light Processor.

CAUTION: Do not forget to include the cooling circuit of the Light Processor afterwards.

14.5 Draining the liquid cooling circuit

In case of part replacement, consider only draining that part of the cooling circuit which contains the defective part. E.g. in case of pump replacement; it is preferred to bypass the cooling circuit of the Light Processor. This is to exclude the Light Processor from the problem.

Necessary tools

- Half a meter of plastic tube with male valved fitting.
- Half a meter of plastic tube with female valved fitting.
- Syringe connected with short tube with male valved fitting.
- Empty bottle with a volume of 1 liter.
- Cloths.

How to drain the liquid cooling circuit ?

1. Interrupt the liquid cooling circuit by uncoupling the valved fitting at the heat exchanger.
   Tip: *Sometimes a little cooling liquid will be spilled. Wrap a small cloth around the valved fitting while uncoupling to absorb the spilled cooling liquid.*

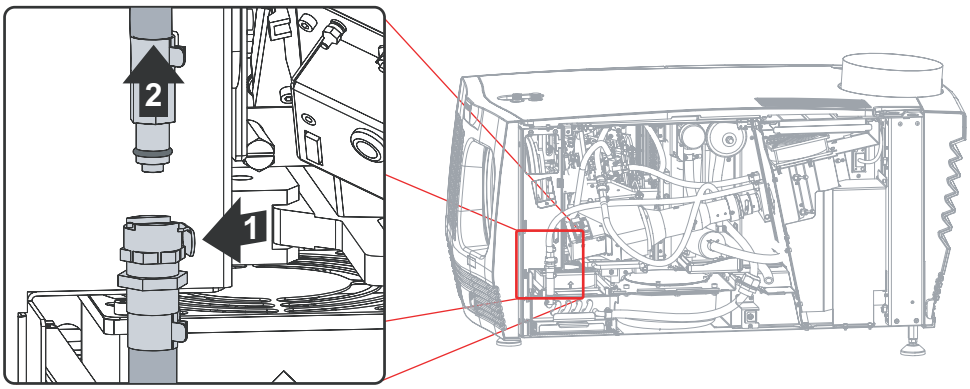


Image 14-6

2. Insert the plastic tube, which contains a female valved fitting, into an empty bottle and then couple the female valved fitting with the exit side of the cooling circuit.
   Note: *Circuit is pressurized, so first insert tube end into empty bottle.*

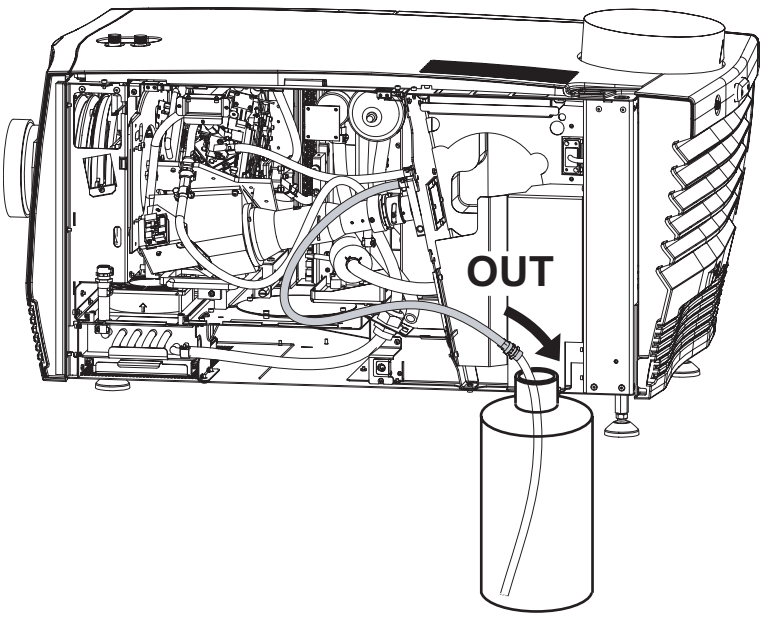


Image 14-7

3. Fill the syringe with air. Press in the valve of the male fitting when extracting air.

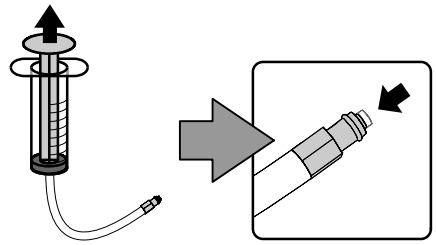


Image 14-8

4. Couple the air filled syringe to the inlet of the cooling circuit and force air into the circuit via the syringe. Liquid will be expelled from the circuit exit side into the empty bottle.

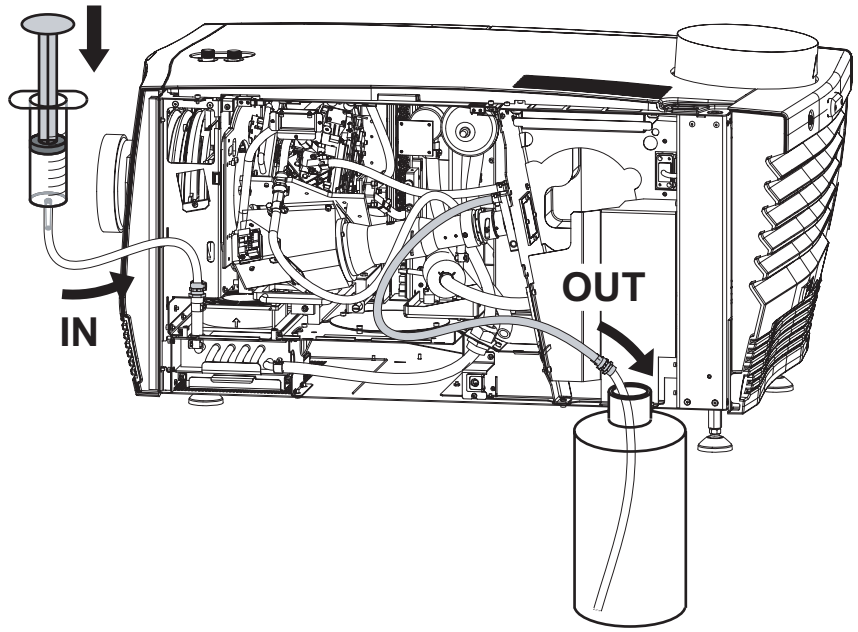


Image 14-9

5. Disconnect the syringe from the cooling circuit and repeat from step 3 until all cooling liquid is drained.

14.6 Filling the liquid cooling circuit

This procedure can only be used to fill an empty (drained) cooling circuit.

Necessary tools

- Half a meter of plastic tube with male valved fitting.
- Half a meter of plastic tube with female valved fitting.
- Syringe connected with short tube with male valved fitting.
- Bottle with cooling liquid.
- Empty bottle with a volume of 1 liter.
- Cloths.

How to fill the liquid cooling circuit?

1. Interrupt the liquid cooling circuit by uncoupling the valved fitting at the heat exchanger.
   Tip: *Sometimes a little cooling liquid will be spilled. Wrap a small cloth around the valved fitting while uncoupling to absorb the spilled cooling liquid.*

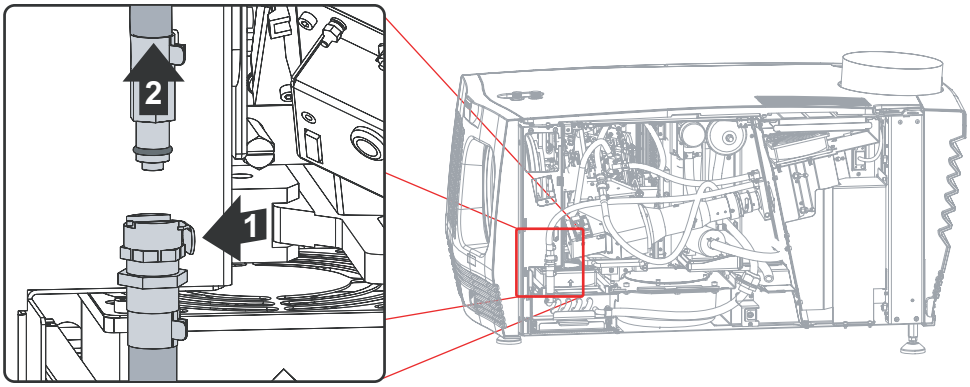


Image 14-10

2. Couple a plastic tube, which contains a female valved fitting, to the exit side of the cooling circuit and lead the tube end to an empty bottle.

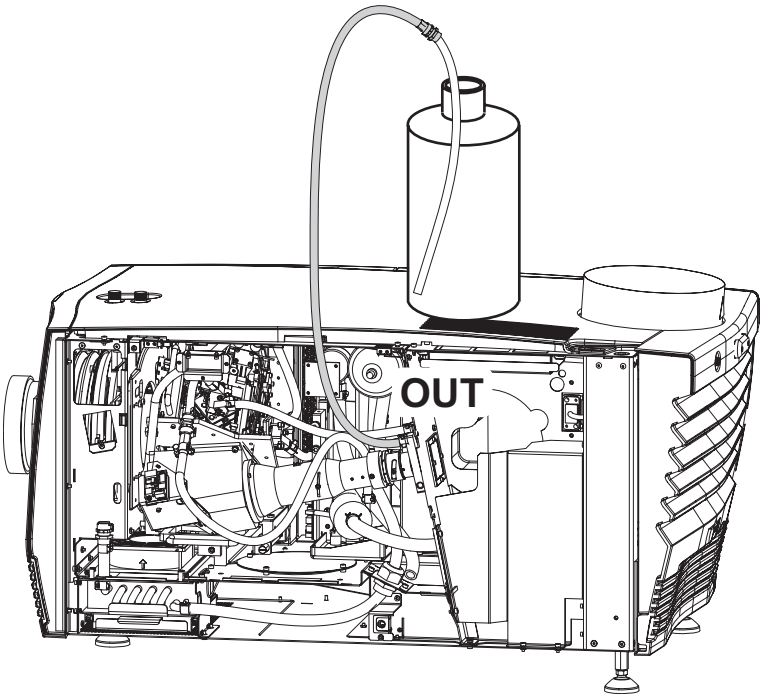


Image 14-11

3. Fill the syringe with cooling liquid as follows:

a) Couple the female (F) fitting of a plastic tube to male (M) fitting of the syringe and submerge the tube end. Make sure that the piston of the syringe is completely pressed in.
b) Extract cooling liquid into the syringe by pulling out the piston.
c) Turn the syringe upside down, so that the air inside the syringe is located at the outlet.
d) Push the piston in until all air bubbles inside the syringe and tubes are expelled. Ensure that the tube end in the bottle remains submerged.
e) Pull out the piston to fill the tubes and syringe completely with cooling liquid. Keep holding the syringe upside down.
f) Disconnect the filled syringe from the tube. Make sure that there is no air inside the tube or syringe. If necessary push the air outside the syringe and tube before disconnecting.

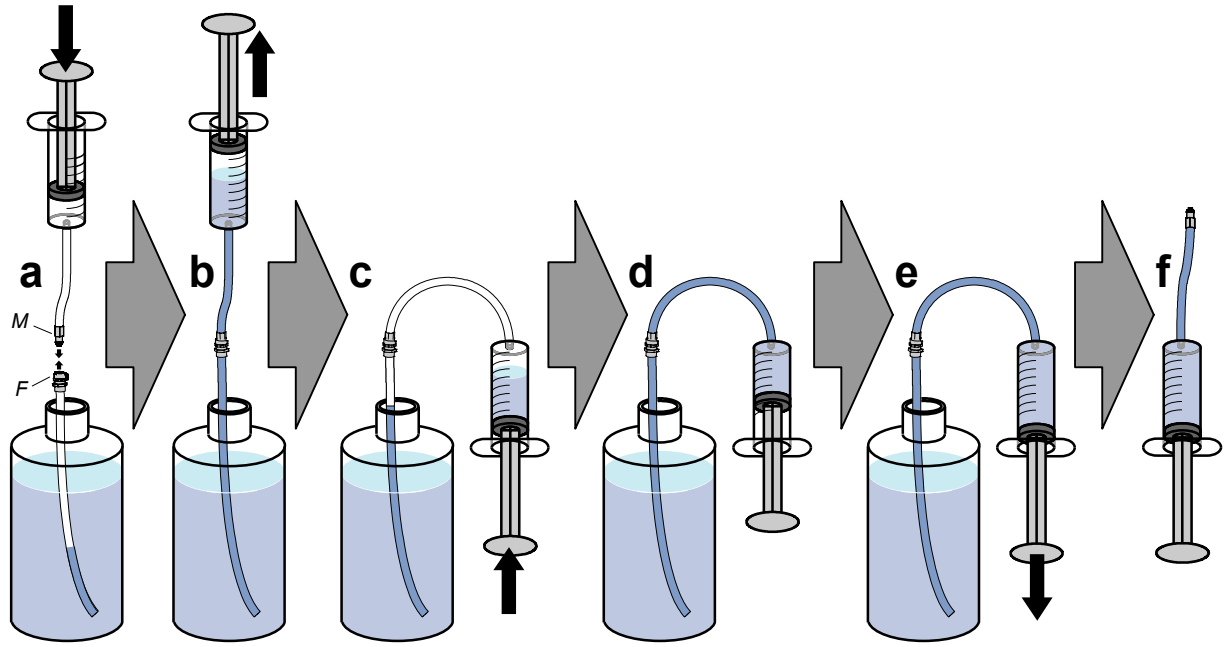


Image 14-12

4. Couple the filled syringe to the inlet of the cooling circuit and press the cooling liquid inside the circuit.
Caution: *Position the empty bottle above the liquid circuit (on top of projector).*

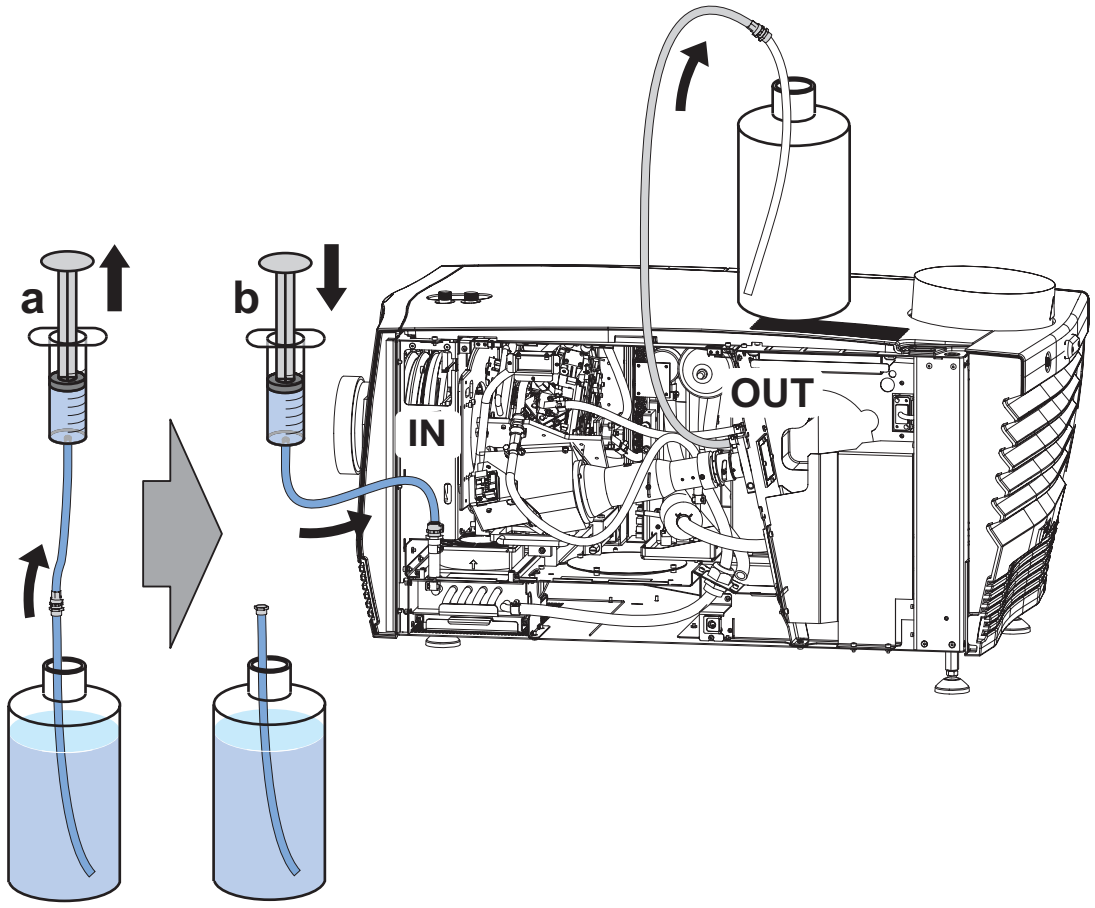


Image 14-13

5. Disconnect the syringe from the cooling circuit and repeat from step 3 until cooling liquid comes out the exit side of the cooling circuit.

14.7 Refreshing the liquid cooling circuit

Over time the cooling liquid may show deterioration and hence less effective cooling characteristics. To maintain sound cooling properties, we advise ANNUAL replacement of the cooling liquid.

Necessary tools

- Half a meter of plastic tube with male valved fitting.
- Half a meter of plastic tube with female valved fitting.
- Syringe equipped with male valved fitting.
- Female/female tube adapter (short tube with female valved fittings at both sides).
- Bottle with 1 liter cooling liquid.
- Empty bottle with a volume of one liter.
- Cloths.

How to refresh the liquid cooling circuit?

1. Interrupt the liquid cooling circuit by uncoupling the valved fitting at the heat exchanger.
   Tip: *Sometimes a little cooling liquid will be spilled. Wrap a small cloth around the valved fitting while uncoupling to absorb the spilled cooling liquid.*

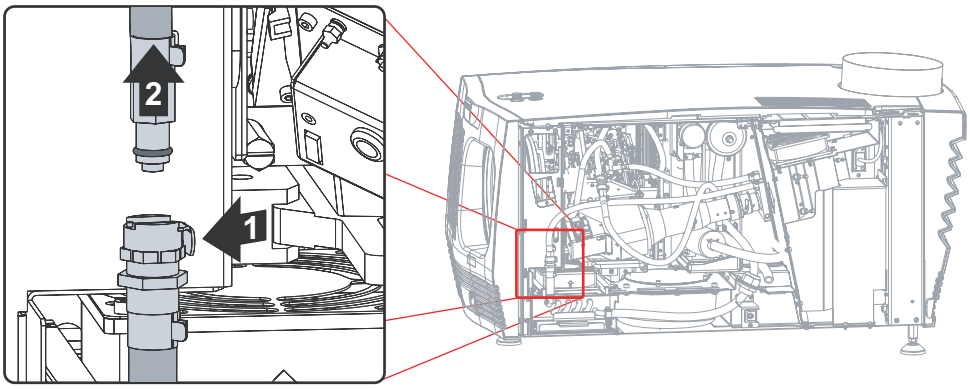


Image 14-14

2. Insert the tube end of the plastic tube, which contains a female valved fitting, into an empty bottle and then couple the female valved fitting with the exit side of the cooling circuit.
   Note: *Circuit is pressurized, so first insert tube end into empty bottle.*
3. Fill a plastic tube, which contains a male fitting, with cooling liquid as follows:
   a) Connect a tube, which contains a male (M) fitting, to the male (M) fitting of the syringe using a female/female (F) adapter.
   b) Submerge the tube end and make sure that the piston of the syringe is completely pressed in.
   c) Extract cooling liquid into the syringe by pulling out the piston.
   d) Disconnect the filled tube from the syringe. Make sure that the tube remains immersed.

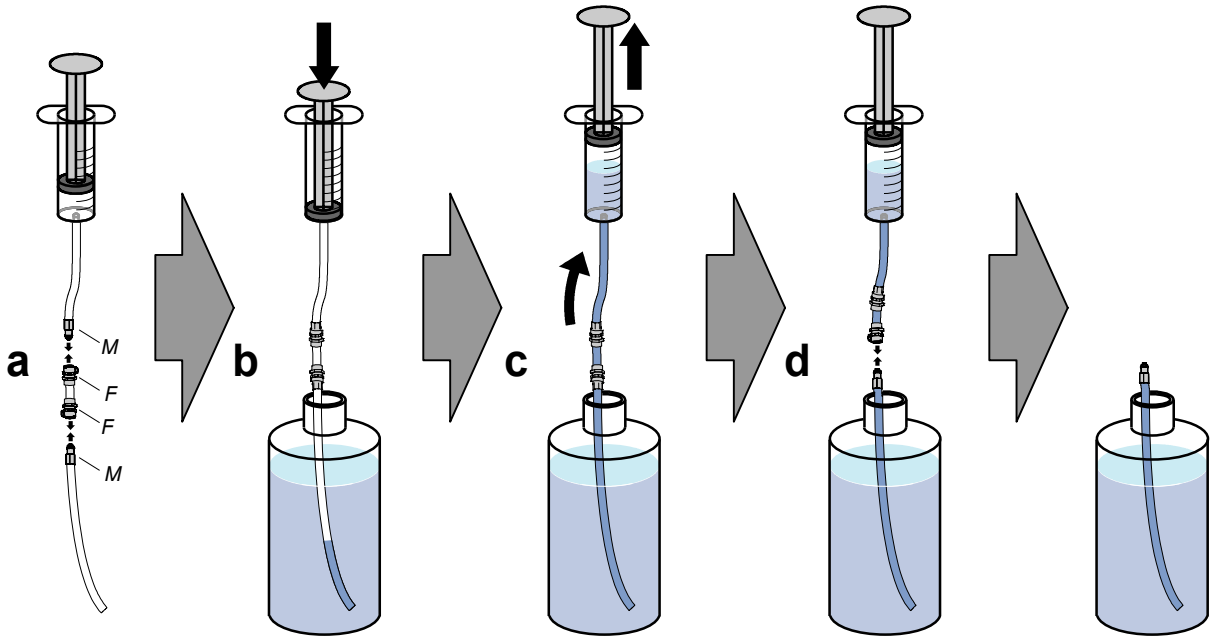


Image 14-15

Caution: *It's important that there is no air inside the tube. The pump is not self priming and hence is only capable of sucking through small volumes of air.*

4. Push the male valved fitting of the filled tube into the female valved fitting at the heat exchanger. This is the entrance of the liquid cooling circuit. Make sure that the inlet of the filled tube remains immersed and that the full bottle is located above the projector.

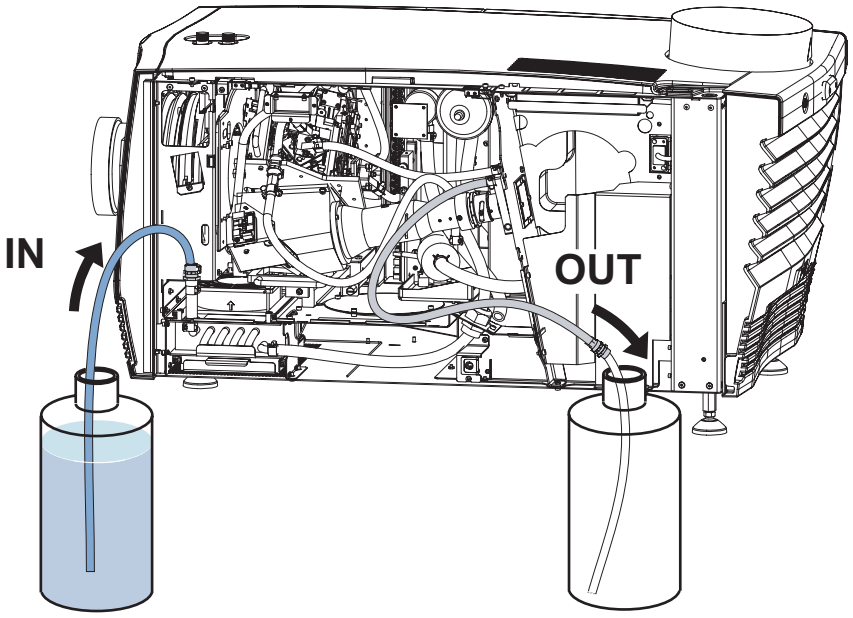


Image 14-16

5. Activate the "Refill mode" in the Communicator software. See user guide of the Communicator. As a result the pump starts and the fresh cooling liquid in the bottle is sucked into the cooling circuit while the old cooling liquid is pressed out of the circuit into the empty bottle.
   Note: *Make sure that the end of the plastic tube remains immersed in the bottle with fresh cooling liquid.*
6. Exit the "Refill mode" after **2/3** of the fresh cooling liquid is sucked up into the circuit.
7. Proceed with expelling the air from the liquid cooling circuit. See procedure page 229.
   Tip: *You can use the bottle with the remaining fresh cooling liquid and the same tubes for the expelling procedure.*
8. Pressurize the liquid cooling circuit. See procedure "Pressurizing the liquid cooling circuit", page 231.

14.8 Expelling air from the liquid cooling circuit

Necessary tools

- Half a meter of plastic tube with male valved fitting.
- Half a meter of plastic tube with female valved fitting.
- Bottle with cooling liquid (minimum 1/3 liter).
- Syringe equipped with male valved fitting.
- Female/female tube adapter (short tube with female valved fittings at both sides).
- Cloths.

How to expel the air from the liquid cooling circuit?

1. Interrupt the liquid cooling circuit by uncoupling the valved fitting at the heat exchanger.
   Tip: *Sometimes a little cooling liquid will be spilled. Wrap a small cloth around the valved fitting while uncoupling to absorb the spilled cooling liquid.*

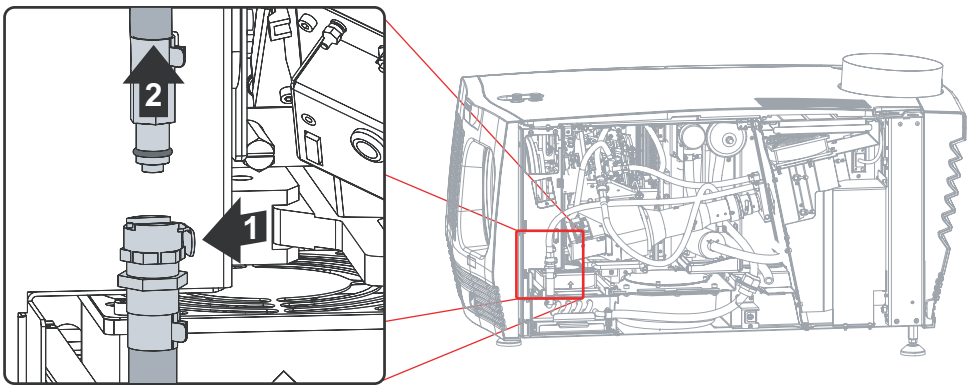


Image 14-17

2. Fill a plastic tube, which contains a male fitting, with cooling liquid as follows:
   a) Connect a tube, which contains a male (M) fitting, to the male (M) fitting of the syringe using a female/female (F) tube adapter.
   b) Submerge the tube end and make sure that the piston of the syringe is completely pressed in.
   c) Extract cooling liquid into the syringe by pulling out the piston.
   d) Disconnect the filled tube from the syringe. Make sure that the tube remains immersed.

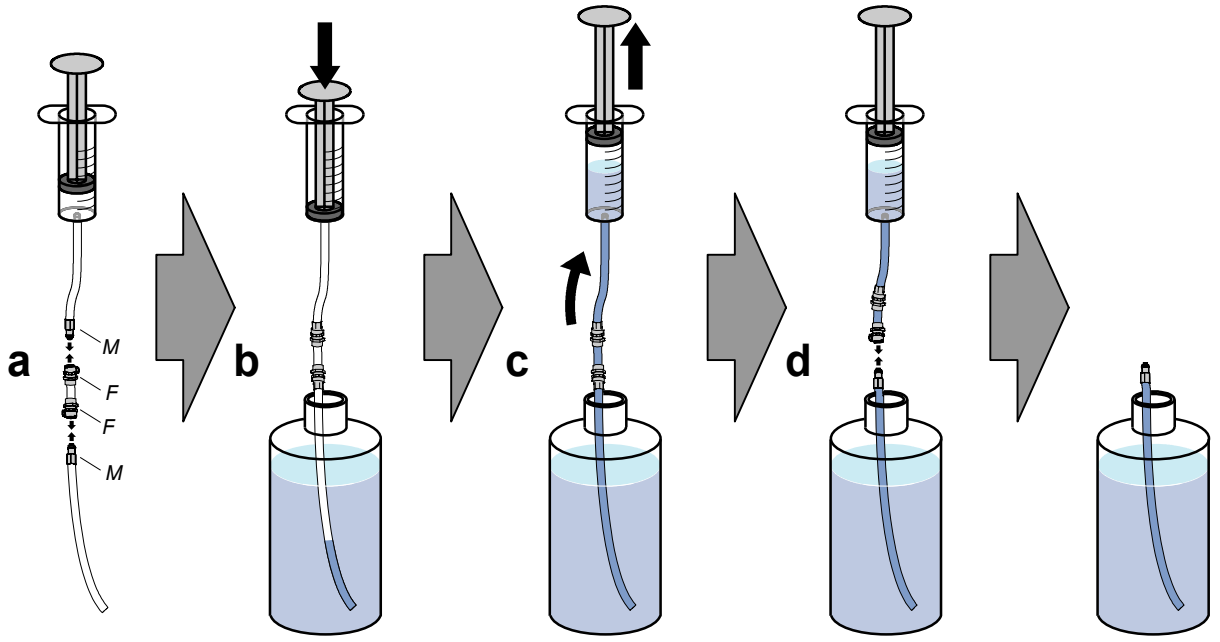


Image 14-18

Caution: *It's important that there is no air inside the tube. The pump is not self priming and hence is only capable of sucking through small volumes of air.*

3. Push the male valved fitting of the filled tube into the female valved fitting at the heat exchanger. This is the entrance of the liquid cooling circuit. Make sure that the inlet of the filled tube remains immersed.
4. Couple the other plastic tube, which contains the female valved fitting, to the other side of the cooling circuit and immerge the tube end without fitting in the same bottle wherein the first tube is immersed. This is the exit of the liquid cooling circuit.

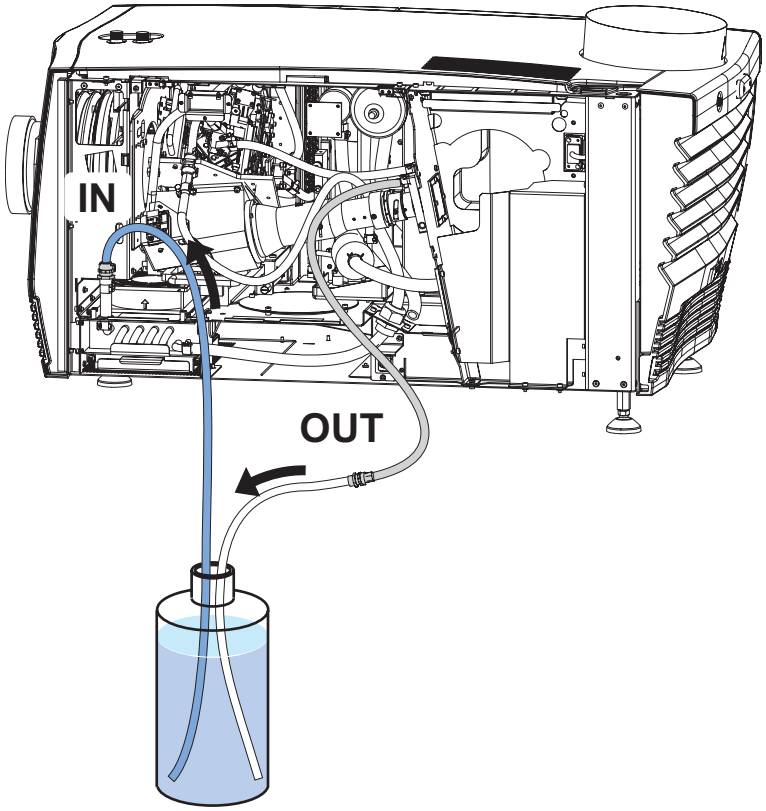


Image 14-19

5. Activate the “Refill mode” in the Communicator software. See user guide of the Communicator. As a result the pump starts and the cooling liquid in the bottle is sucked into the cooling circuit while air bubbles are pressed out of the circuit.
   Note: *The pump cycle will now and then be interrupted to stimulate the air expelling.*

   Caution: *Switch off the projector immediately in case the pump is sucking air (no circulation of liquid). Bypass the cooling circuit of the Light Processor and inject cooling liquid into the main cooling circuit using a syringe. Ensure that you don’t inject air bubbles.*

   Caution: *Make sure that air bubbles coming out of the tube in the bottle doesn’t enter the other tube in the bottle.*

6. Exit the “Refill mode” after all air bubbles are expelled. This will take approximately 10 minutes.
   Tip: *Air bubbles may no longer come out the exit of the tube in the bottle with cooling liquid.*

7. Uncouple the two plastic tubes.
   Note: *Make sure that both ends of the plastic tubes in the bottle remains immersed until the plastic tubes are uncouple from the liquid cooling circuit.*

8. Pressurize the liquid cooling circuit. See procedure page 231.

Check within 24 hours if the pressure remains 1 bar. If not, search for leakage.

14.9 Pressurizing the liquid cooling circuit

Before pressurizing the liquid cooling circuit ensure that the circuit is filled with cooling liquid and that all air bubbles are expelled.

CAUTION: This procedure is only valid in case the Liquid Cooling Circuit is calibrated. This means that the pressure vessel was not subject to any modifications, i.e. releasing or increasing pressure via the valve of the vessel. In case the pressure vessel was subject to modifications use the calibration procedure to pressurize the Liquid Cooling Circuit.

WARNING: All actions performed on the Liquid Cooling Circuit should occur in normal ambient conditions (approximately 25 °C). The projector should have sufficiently cooled down (minimum 2 hours).

Necessary tools

- Half a meter of plastic tube with female valved fitting.
- Syringe connected with short tube with male valved fitting.
- Bottle with cooling liquid.
- Cloths.

How to pressurize the liquid cooling circuit?

1. Interrupt the liquid cooling circuit by uncoupling the valved fitting at the heat exchanger if not yet done.
   Tip: *Sometimes a little cooling liquid will be spilled. Wrap a small cloth around the valved fitting while uncoupling to absorb the spilled cooling liquid.*

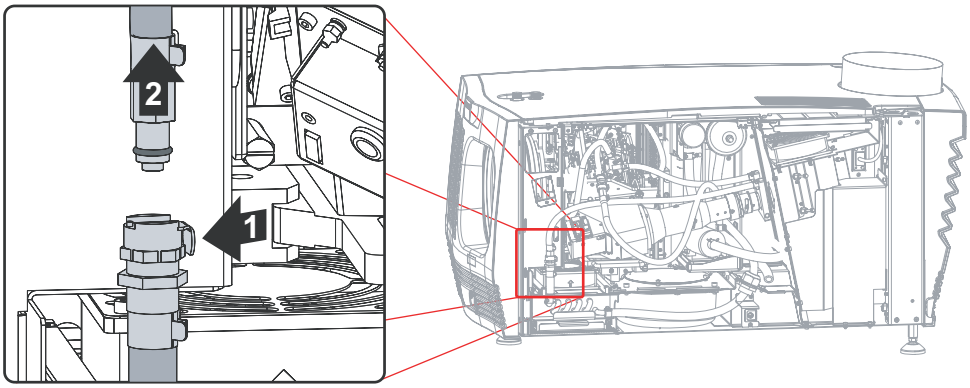


Image 14-20

2. Fill the syringe with cooling liquid as follows:
   a) Couple the female (F) fitting of a plastic tube to male (M) fitting of the syringe and submerge the tube end. Make sure that the piston of the syringe is completely pressed in.
   b) Extract cooling liquid into the syringe by pulling out the piston.
   c) Turn the syringe upside down, so that the air inside the syringe is located at the outlet.
   d) Push the piston in until all air bubbles inside the syringe and tubes are expelled. Ensure that the tube end in the bottle remains submerged.
   e) Pull out the piston to fill the tubes and syringe completely with cooling liquid. Keep holding the syringe upside down.
   f) Disconnect the filled syringe from the tube. Make sure that there is no air inside the tube or syringe. If necessary push the air outside the syringe and tube before disconnecting.

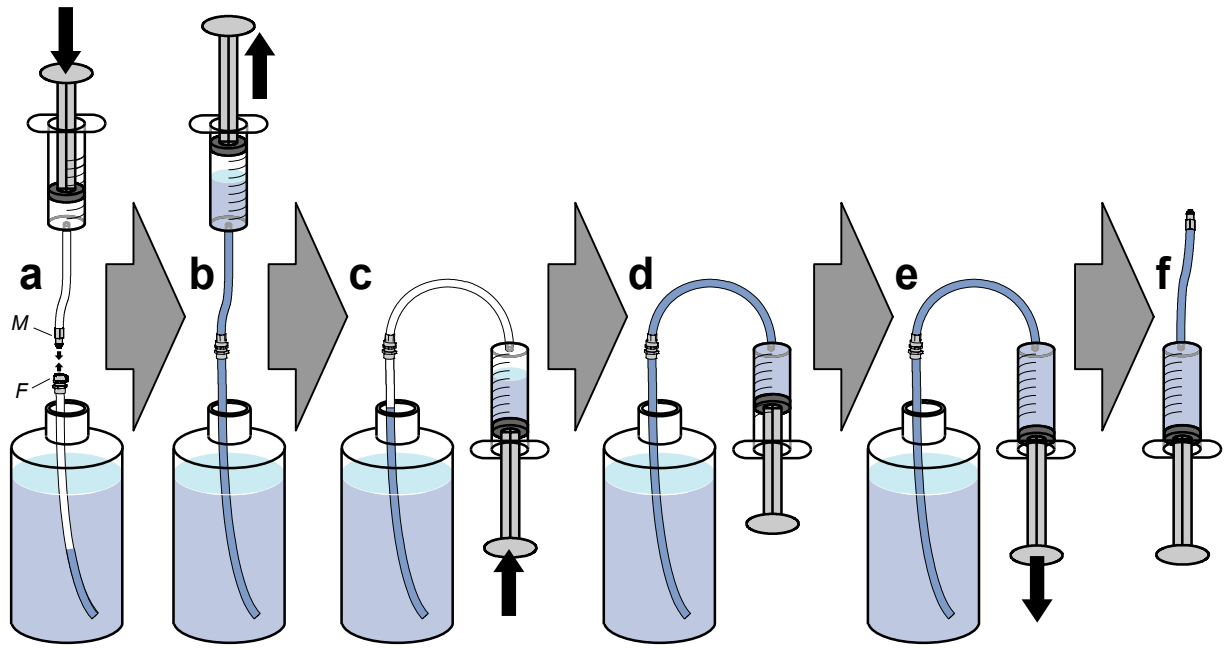


Image 14-21

3. Couple the syringe to the inlet of the cooling circuit and press the cooling liquid inside the circuit until the manometer indicates **1 bar** pressure. Ensure that no air bubbles are injected into the circuit.
   Caution: *Maximum 1 bar of pressure is allowed on the Liquid Cooling Circuit. More pressure than 1 bar may damage the circuit.*

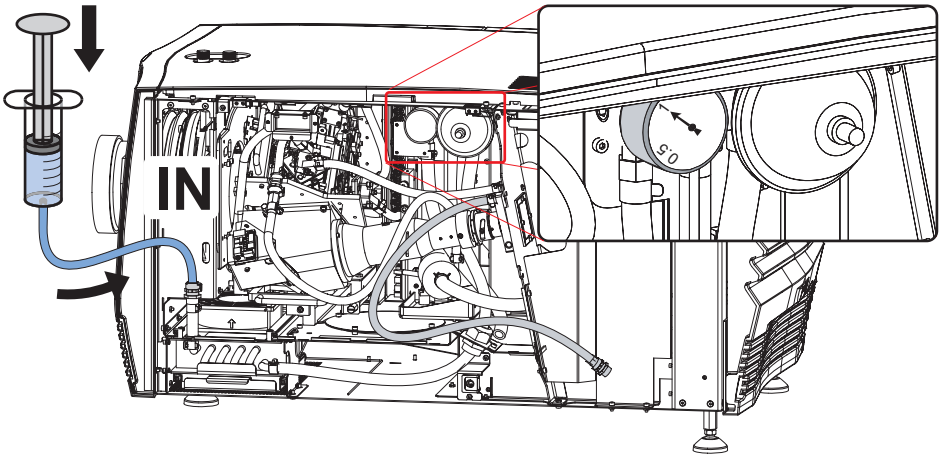


Image 14-22

4. **Pressure to 1 bar** by pushing in the piston of the syringe and then immediately disconnected the syringe. When this is done properly, the manometer should indicate 1 bar.
5. Check if the cooling circuit was correctly calibrated. Proceed as follows:
   a) First empty the syringe but make sure that the tube of the syringe remains filled with cooling liquid.
   b) Couple the syringe (plunger completely pressed in) with the inlet of the cooling circuit. Keep the syringe vertical with the outlet downwards. As a result the pressure of the cooling circuit will drop from 1 to 0 bar and cooling liquid is automatically expelled from the circuit into the syringe.
   c) Check if the amount of expelled liquid is between 50 and 70 ml. If not, start the procedure "Calibrating the liquid cooling circuit", page 233.
   d) Push the plunger of the syringe to reinject the expelled liquid back into the circuit. The pressure would hence return to 1 bar.
6. Disconnect the syringe from the cooling circuit. Make sure that the pressure remains 1 bar.
7. Close up the liquid cooling circuit which you interrupted in step 1.

Check within 24 hours whether the pressure has stabilized close to 1 bar. If not, search for leakage.

14.10 Calibrating the liquid cooling circuit

To check if the pressure vessel is correctly calibrated you may connect the syringe with the cooling circuit and measure the amount of liquid that is automatically expelled. The pressure would have dropped from 1 to 0 bar. The expelled amount of cooling liquid should be between 50 and 70 ml. Make sure that there are no air bubbles in the syringe while doing this. Reinject the expelled liquid back into the circuit. The pressure would hence return to 1 bar.

A calibrated liquid cooling circuit means that there is an air cushion of 75 ml inside the vessel. In other words, the ratio between the volume of cooling liquid in the circuit and the volume of air in the pressure vessel is defined. This is achieved by first filling the vessel completely with liquid consequently expelling air from the vessel. Secondly a predefined volume of cooling liquid is extracted from the circuit. Finally the liquid cooling circuit has to be pressurized to 1 bar by pumping air into the vessel.

Make sure that all air is expelled from the liquid cooling circuit before starting the calibration procedure.

Necessary tools

- Half a meter of plastic tube with female valved fitting.
- Syringe connected with short tube with male valved fitting.
- Bottle with cooling liquid.
- Air pump.
- Cloths.

How to calibrate the liquid cooling circuit?

1. Remove the valve cap of the pressure vessel and release the pressure.

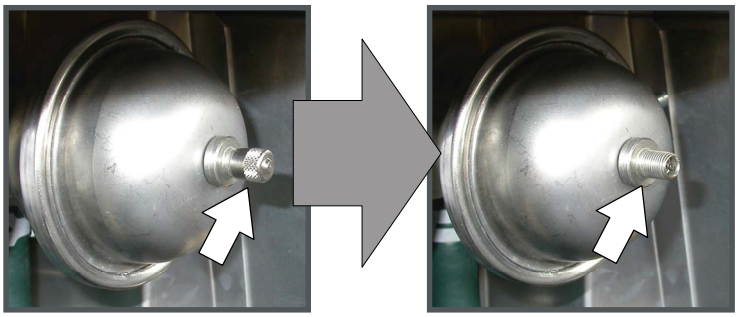


Image 14-23

2. Interrupt the liquid cooling circuit by uncoupling the valved fitting at the heat exchanger if not yet done.
   Tip: *Sometimes a little cooling liquid will be spilled. Wrap a small cloth around the valved fitting while uncoupling to absorb the spilled cooling liquid.*

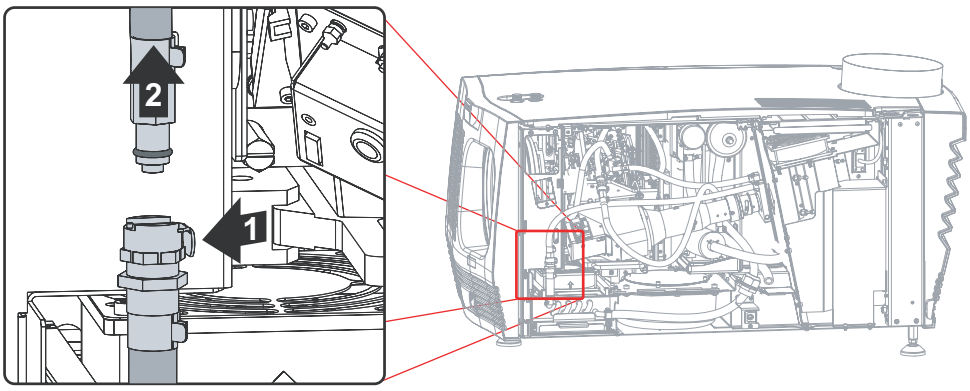


Image 14-24

3. **Fill the syringe with cooling liquid as follows:**

a) Couple the female (F) fitting of a plastic tube to male (M) fitting of the syringe and submerge the tube end. Make sure that the piston of the syringe is completely pressed in.
b) Extract cooling liquid into the syringe by pulling out the piston.
c) Turn the syringe upside down, so that the air inside the syringe is located at the outlet.
d) Push the piston in until all air bubbles inside the syringe and tubes are expelled. Ensure that the tube end in the bottle remains submerged.
e) Pull out the piston to fill the tubes and syringe completely with cooling liquid. Keep holding the syringe upside down.
f) Disconnect the filled syringe from the tube. Make sure that there is no air inside the tube or syringe. If necessary push the air outside the syringe and tube before disconnecting.

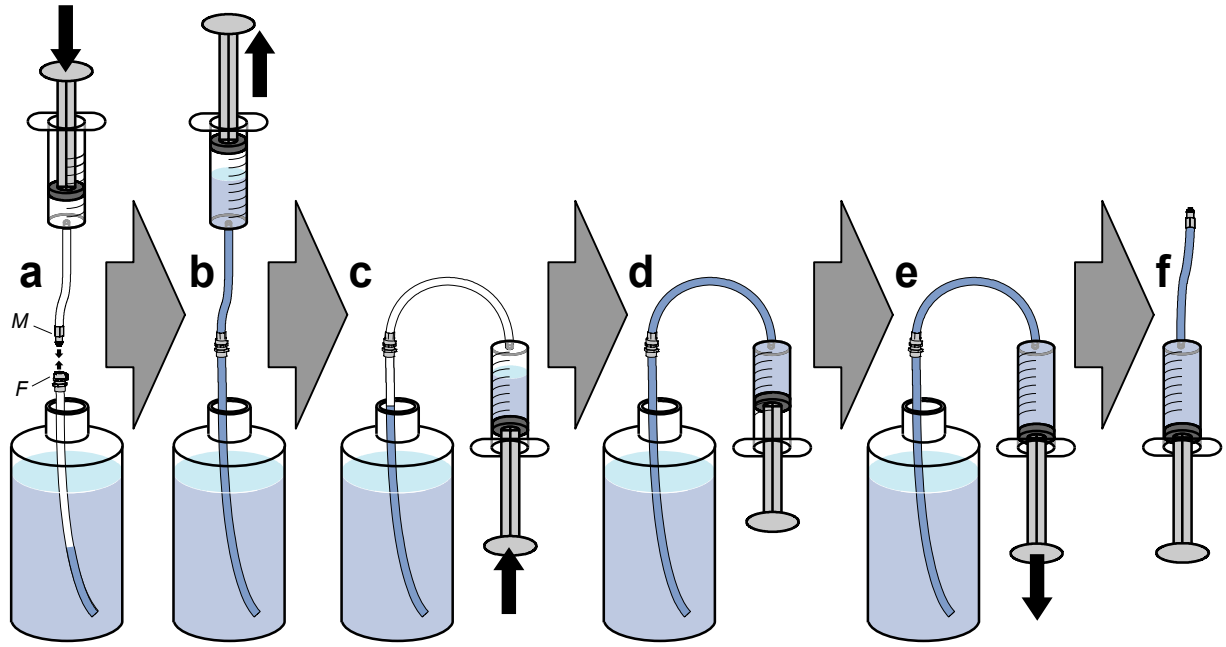


Image 14-25

4. **Fill the pressure vessel with liquid as follows:**
   a) Couple the syringe with the inlet of the cooling circuit. Keep holding the syringe vertical with the outlet downwards.
   b) Increase the pressure by pushing in the piston of the syringe (maximum 1 bar indicated on the manometer).
   c) While pressing, expel air from the pressure vessel.
   d) Continue expelling air while pressurizing the circuit (up to 1 bar) until the valve of the vessel becomes hard to push in. This indicates that the pressure vessel is completely filled with cooling liquid.

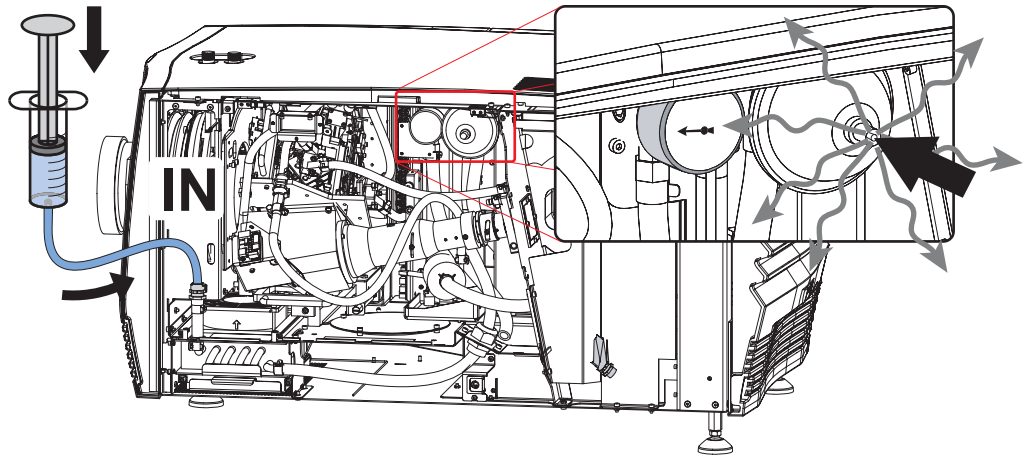


Image 14-26

5. Now that the pressure vessel is liquid filled you have to increase the **pressure to 1 bar** by pushing in the piston of the syringe. Then immediately disconnected the syringe. When this is done properly, the manometer should indicate 1 bar.
6. **Extract 75 ml** back into the syringe by doing the following:

a) First empty the syringe but make sure that the tube of the syringe remains filled with cooling liquid.
b) Couple the syringe (plunger completely pressed in) with the inlet of the cooling circuit. Keep holding the syringe vertical with the outlet downwards.
c) Release the plunger. Note that cooling liquid is pressed into syringe while the pressure drops.
d) Now fill the syringe by slowly pumping air into the vessel (connect air pump to valve).
e) Stop once 75 ml has been expelled.
f) Disconnect the syringe from the cooling circuit.

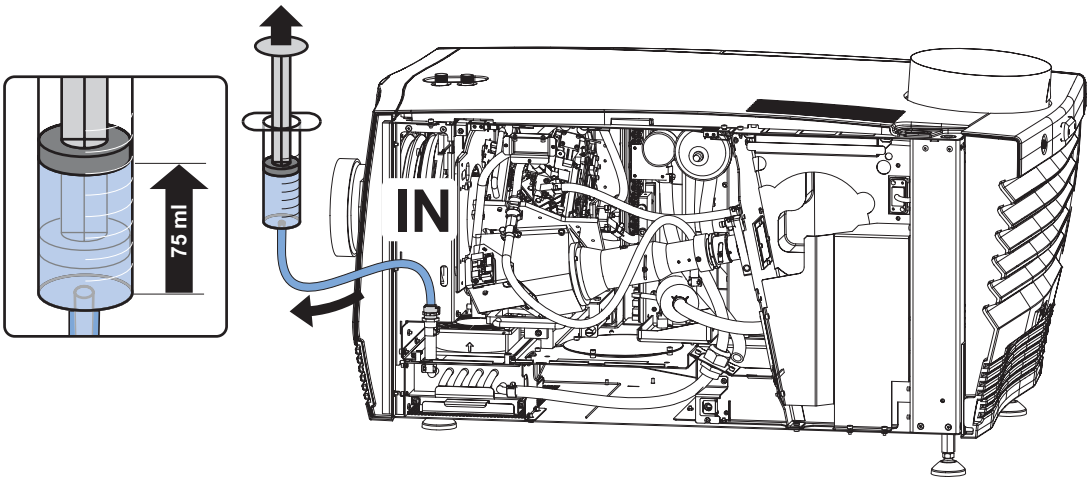


Image 14-27

7. Close up the liquid cooling circuit which you interrupted in step 2.
8. Pump up the air pressure to **1 bar** and reinstall the valve cap tightly of the pressure vessel.

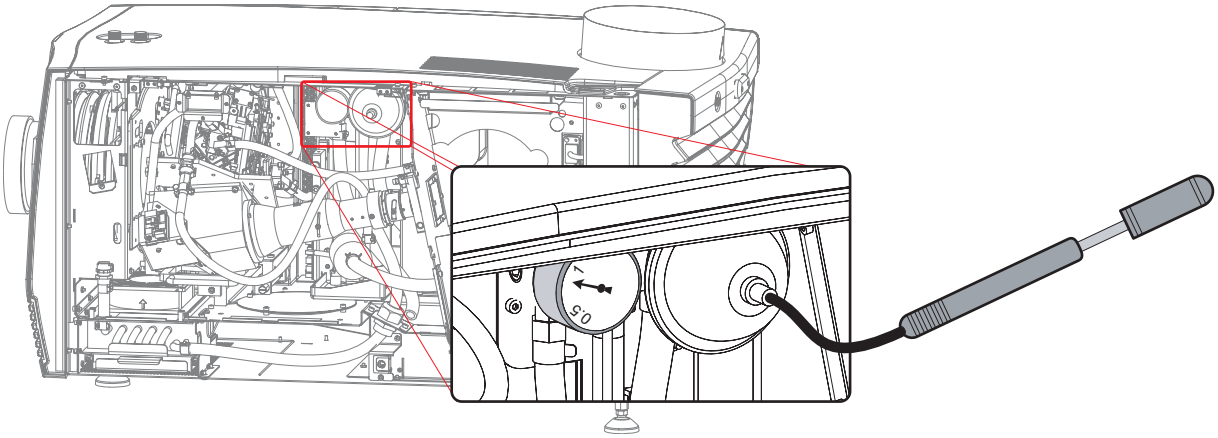
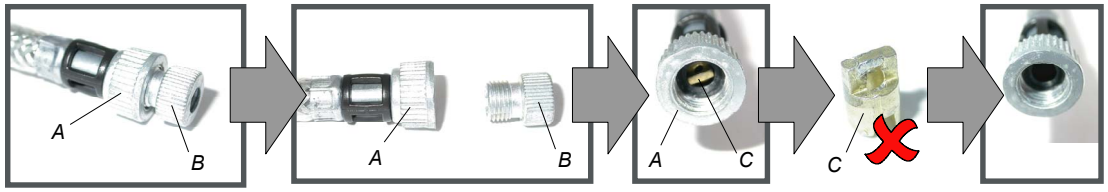


Image 14-28

9. Mark the pressure vessel with the calibration date for future reference.

The air hose fitting of the air pump must be of the Shrader valve type (A) to match with the pressure vessel, so the Presta valve type (B) has to be removed. Futhermore, the pin (C) inside the Shrader valve has to be removed as well.



Check within 24 hours whether the pressure has stabilized close to 1 bar. If not, search for leakage.

14.11 Removal of the heat exchanger

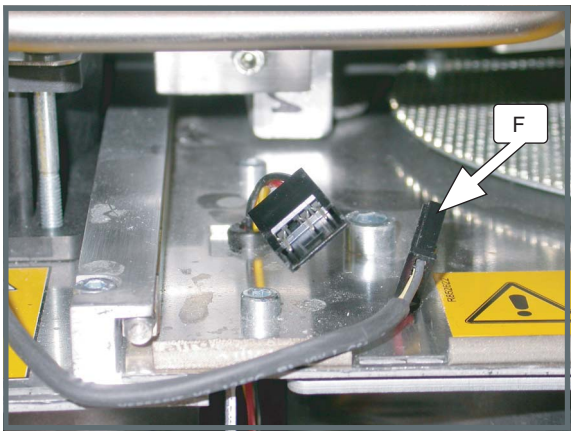
This procedure assumes that the left side cover and the cover of the sealed compartment is already removed.

Necessary tools

- 2,5 mm Allen wrench.
- 3 mm Allen wrench.
- Pair of pliers.
- Universal pliers.
- 7 mm open-end wrench.

How to remove the heat exchanger of the liquid cooling circuit?

1. Disconnect the liquid cooling circuit from the heat exchanger and drain the circuit. See procedure "Draining the liquid cooling circuit", page 222.
   Tip: *Exclude the Light Processor Unit from draining. See chapter "Excluding the Light Processor Unit", page 220.*
2. Disconnect the fan (reference F) of the heat exchanger and the wire unit of the pump (reference P) as illustrated. Use a set of pliers to cut the cable tie which fasten the wire unit of the pump with the tubing.



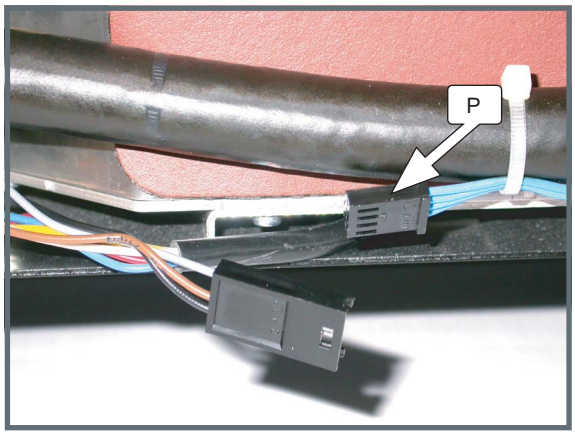


Image 14-29

3. Remove the two screws of the fixation plate for the tubing as illustrated. Use a 3 mm Allen wrench.

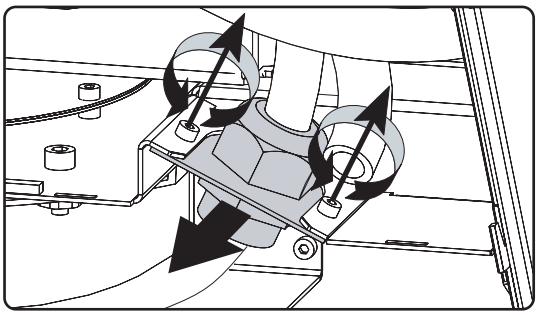


Image 14-30

4. Release the two fixation screws of the heat exchanger assembly and pull out the assembly.

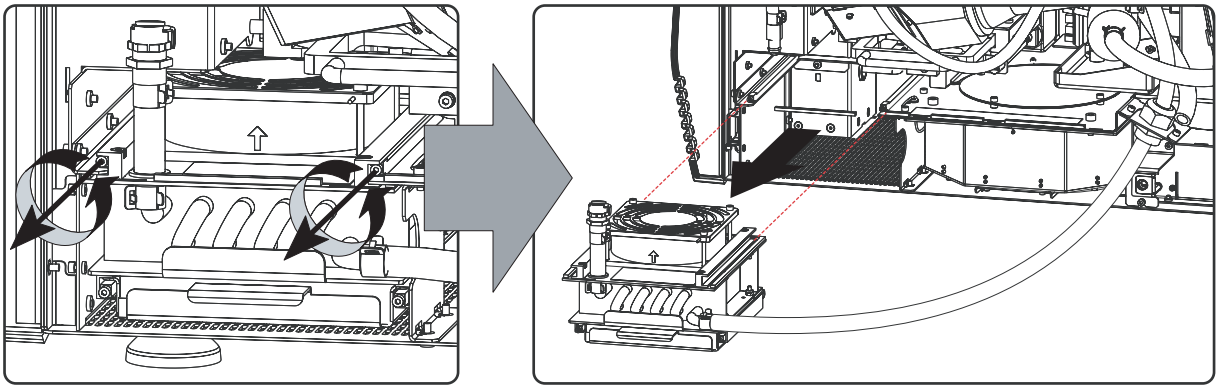


Image 14-31

5. Remove the tubing from the heat exchanger inlet (reference 1) and outlet (reference 2). Use a universal pliers to push both clip tongs to each other in order to open the clip, which securing the tube, and move the clip away.

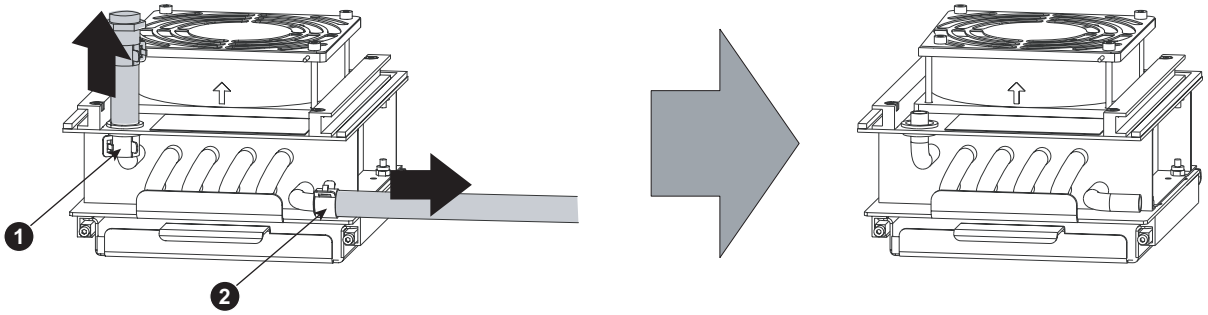


Image 14-32

6. Disassembly the heat exchanger assembly by removing the eight indicated nuts (reference 3). As a result the heat exchanger (reference 5) comes loose from the fan assembly (reference 4) and from the filter assembly (reference 6).

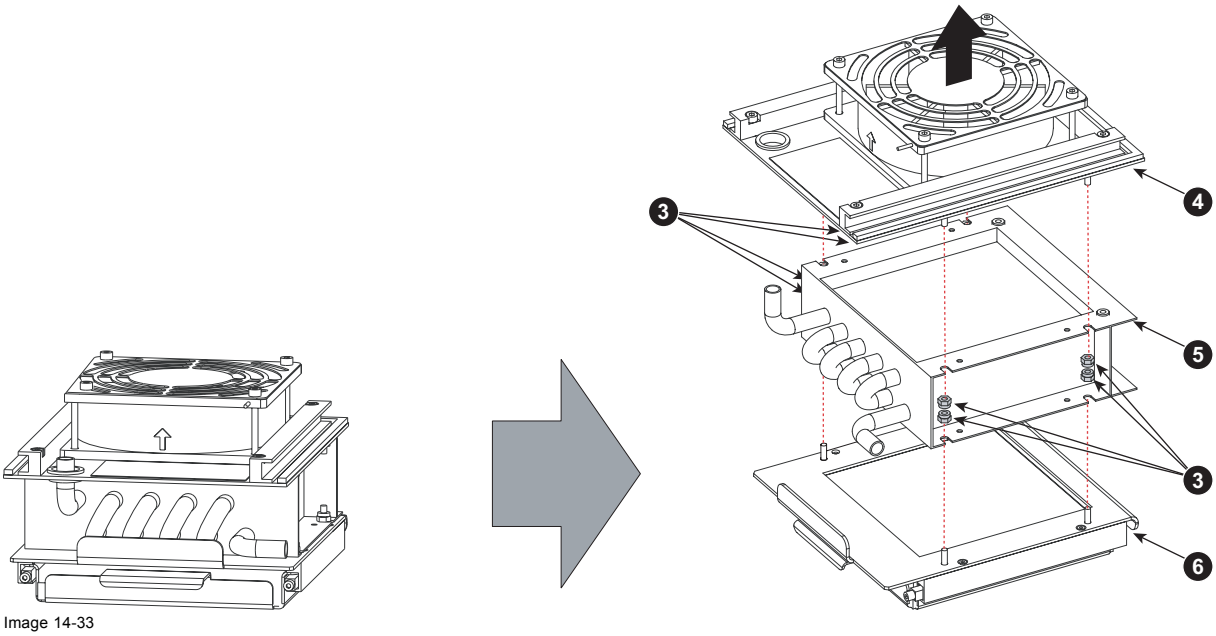


Image 14-33

14.12 Installation of the heat exchanger

Necessary tools

- 2,5 mm Allen wrench.
- 3 mm Allen wrench.
- Pair of pliers.
- Universal pliers.
- 7 mm open-end wrench.

Necessary parts

Cable tie.

How to install the heat exchanger

1. Slide a clip (reference 7 of image 14-34) over the copper inlet tube of the heat exchanger.
2. Mount the heat exchanger (reference 5), the fan assembly (reference 4) and the filter assembly (reference 6) together as illustrated. Use a 7 mm open-end wrench to fasten the eight nuts (reference 3).

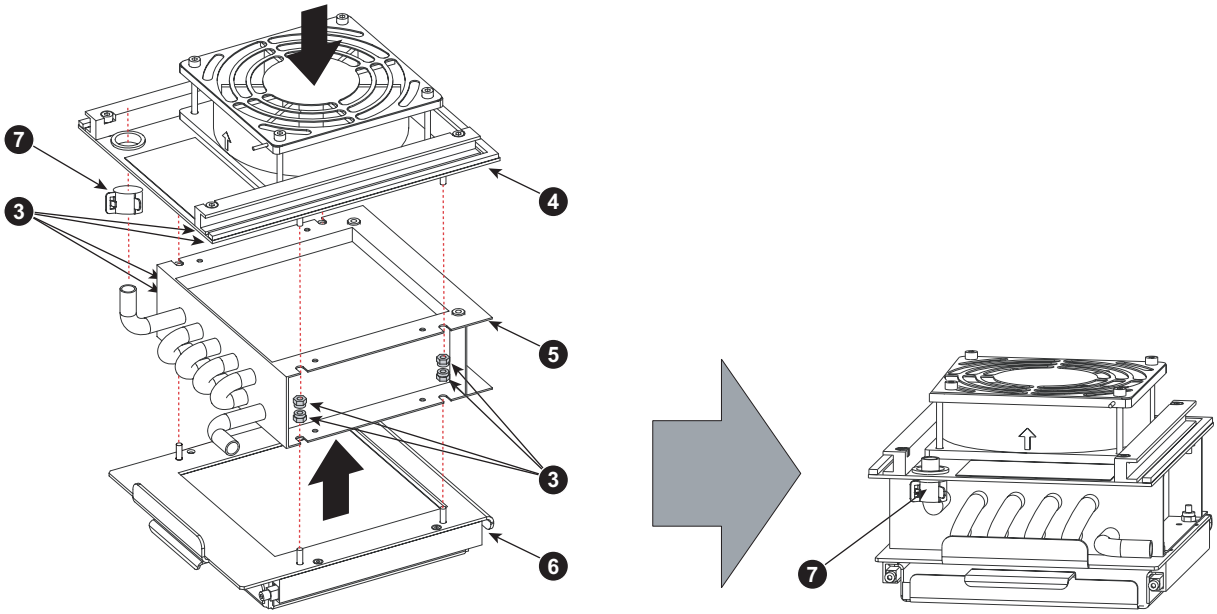


Image 14-34

3. Push the short transparent tube + female valved fitting through the hole in the plate on the inlet of the heat exchanger. Use a universal pliers to secure the tube with the clip (reference 1 of image 14-35) which you provided in step 1.
4. Push the tube coming from the pump on the outlet of the heat exchanger. Use a universal pliers to secure the tube with a clip (reference 2).

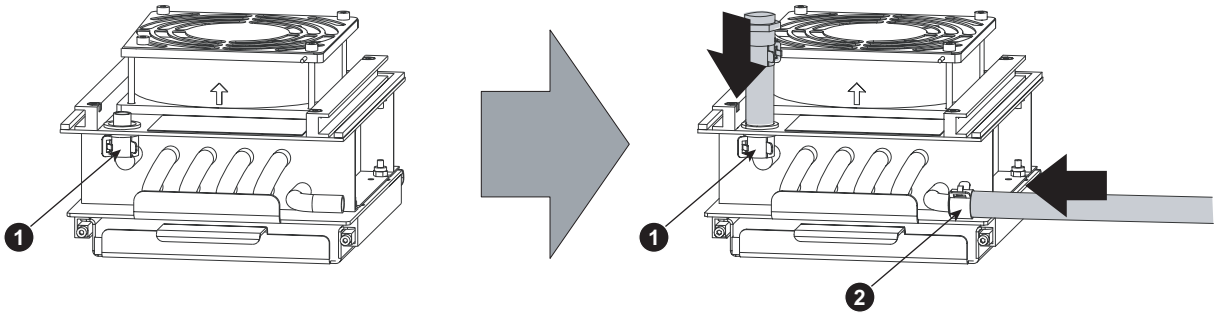


Image 14-35

5. Slide the heat exchanger assembly in its place and fasten the two fixation screws. Use a 2,5 mm Allen wrench.

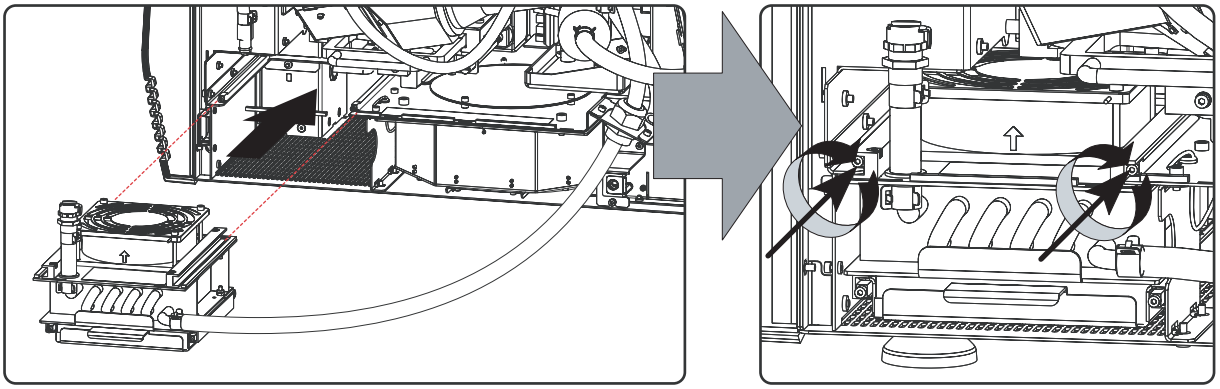


Image 14-36

6. Fasten the fixation plate for the tubing with two screws as illustrated. Use a 3 mm Allen wrench.

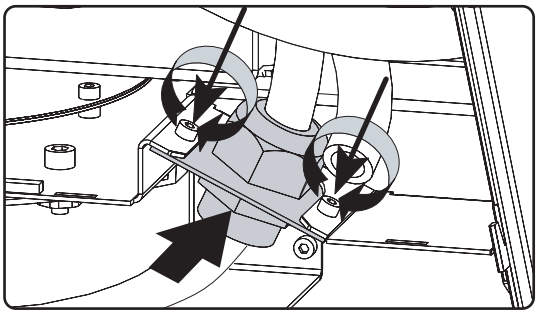


Image 14-37

7. Reconnect the wire unit of the fan (reference F) and the wire unit of the pump (reference P). Use a cable tie (reference T) to secure the wire unit of the pump with the tubing.

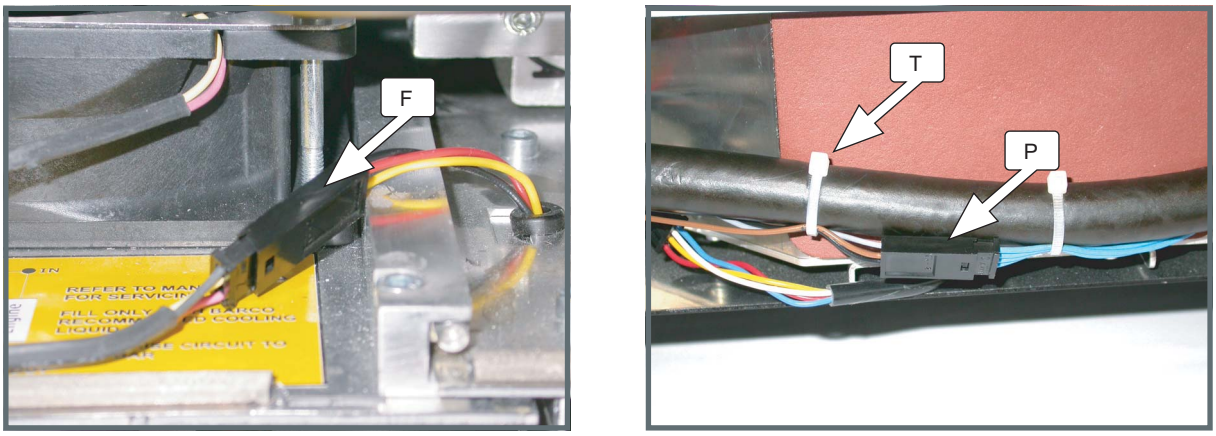


Image 14-38

8. Fill, expel air and pressurize the liquid cooling circuit. See chapter on page 224.

14.13 Cleaning the cooling pump

What can happen?

Due to crystallization inside the pump, the rotor can be jammed. This crystallization can be easily removed and the pump can be reused again. In most cases it will be sufficient to clean the pump instead of replacing it with a new one. However, note that the bearings of the pump are subject to wear. Because of that the complete pump (pump house included) has to be replaced every 4 years.

This procedure assumes that the Light Processor is removed from the projector (see page 170) and that the liquid cooling circuit is drained (see page 222).

Necessary tools

- PH2 Phillips screwdriver.
- Soft cloths.
- Cotton swabs (Q-tips, ear buds).

How to clean the cooling pump?

1. Remove the four screws (reference 1) which fasten the pump house to the pump motor. Use a PH2 Phillips screwdriver.

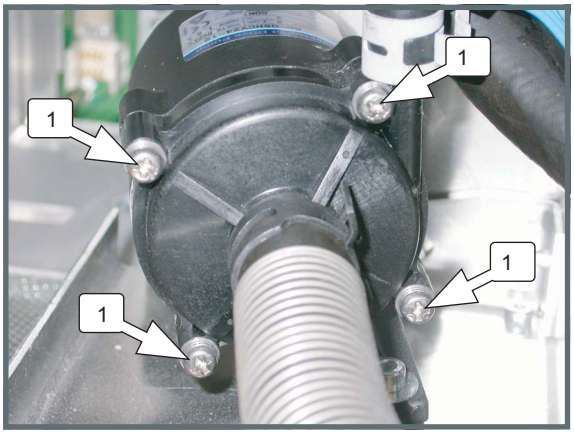


Image 14-39

2. Slide the pump house with hose backwards. Use a cloth to absorb the remaining cooling liquid.

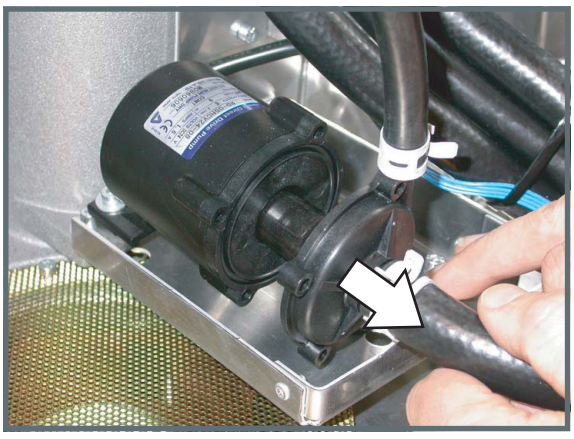


Image 14-40

3. Take the rotor between thumb and finger and slide it out of the pump motor.

Image 14-41

4. Clean the pump house, the rotor and the pump motor with a clean soft cloth. Use cotton swabs to clean the bearing inside the pump motor and pump house.
   Caution: *The bearings of the Pump are fragile. Be careful when cleaning.*
5. Reinsert the rotor and try to turn it smoothly. If not successful stop this procedure and replace the pump completely. See page 246.
6. Slide the pump house with hose back on the pump motor.
   Caution: *Make sure the sealing ring of the Pump motor is not damaged and is on its place.*
7. Fasten the four screws (reference 1) of the pump house crosswise using a PH2 Phillips screwdriver.

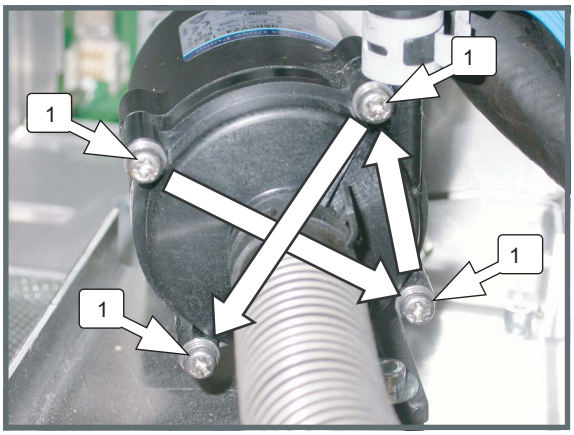


Image 14-42

Refill the liquid cooling circuit (see page 224) in case the pump is successfully cleaned. If cleaning is not possible, replace the pump completely. See page 246.

14.14 Replacement of the pump motor and rotor

When replacing the pump motor and pump rotor?

In case of an electrical failure of the pump you can replace the pump motor and pump rotor without replacing the pump house. This way you do not have to cut the hoses from the pump house which simplify the replacement procedure. However, note that the bearings of the pump are subject to wear. Because of that the complete pump (pump house included) has to be replaced every 4 years.

You have to order a complete pump but you only have to use the pump motor and pump rotor.

This procedure assumes that the Light Processor is removed from the projector (see page 170) and that the liquid cooling circuit is drained (see page 222).

Necessary tools

- 3 mm Allen wrench with ball point.
- 7 mm open-end wrench.
- PH2 Phillips screwdriver.
- Cloths.
- Cotton swab.

How to replace the pump motor and pump rotor?

1. Disconnect the wire unit of the cooling pump.

Image 14-43

2. Remove the four screws (reference 1) which fasten the pump house to the pump motor. Use a PH2 Phillips screwdriver.

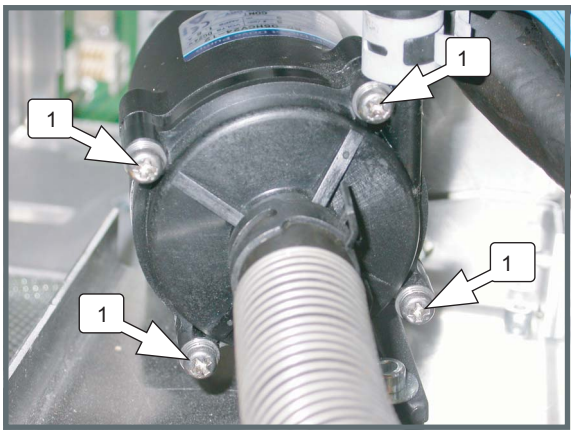


Image 14-44

3. Slide the pump house with hose backwards. Use a cloth to absorb the remaining cooling liquid.

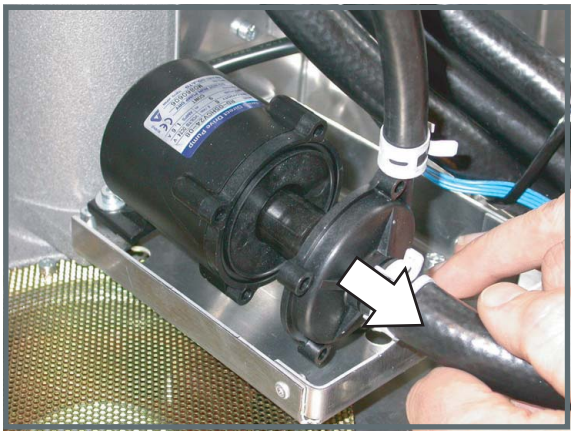


Image 14-45

4. Release the two hexagon socket head cap screws (reference 2) which fasten the pump motor to the seating of the pump. Use a 3 mm Allen wrench to release the screws and a 7 mm open-end wrench to hold the nut (reference 3) when releasing the screw.

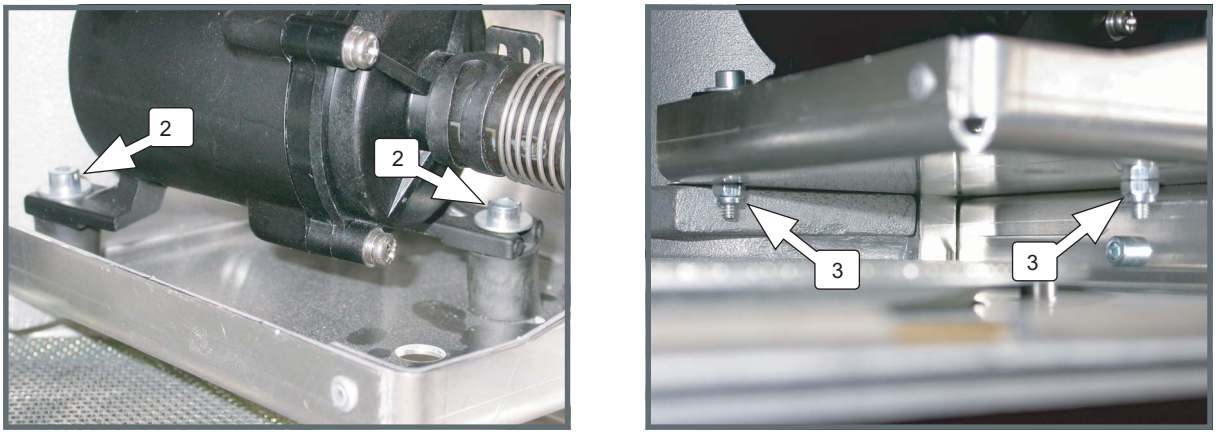


Image 14-46

5. Replace the pump motor and pump rotor.

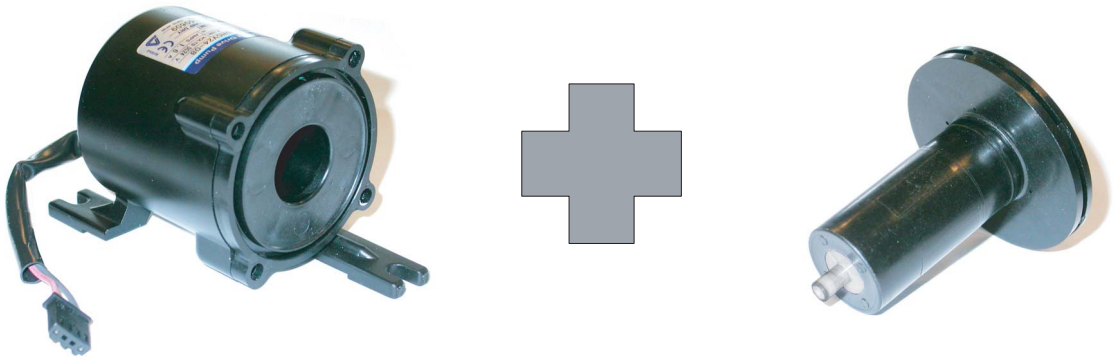


Image 14-47

6. Secure the pump motor with two hexagon socket head cap screws (reference 2). Use a 3 mm Allen wrench to fasten the screws and a 7 mm open-end wrench to hold the nut (reference 3) while fasten the screw.
   Caution: *Make sure that the pump is mounted upon two rubber vibration rings (reference 4).*

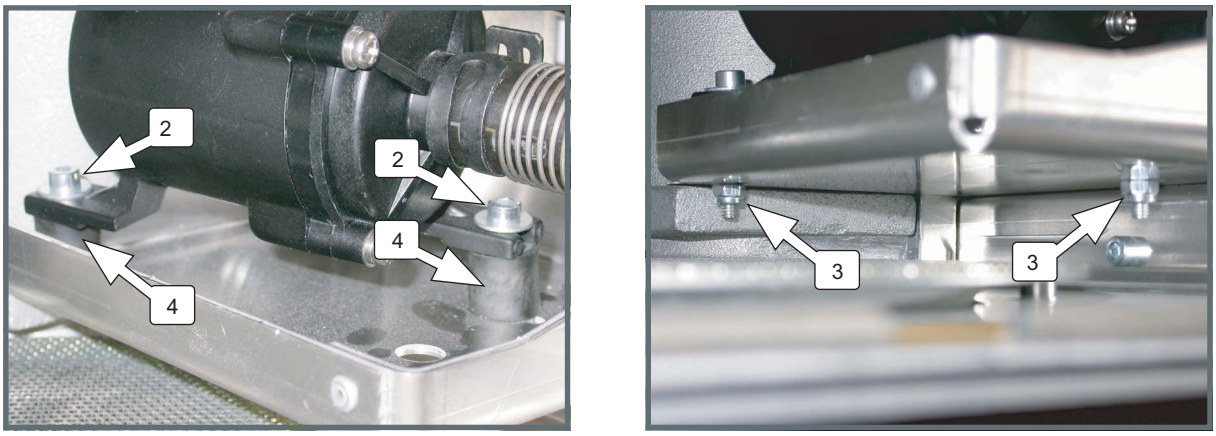


Image 14-48

7. Clean the pump house with a clean soft cloth. Use cotton swabs to clean the bearing of the pump house.
8. Slide the pump house with hose on the new pump motor.
   Caution: *Make sure that the new Pump motor is provide with a new rotor and a new sealing ring.*

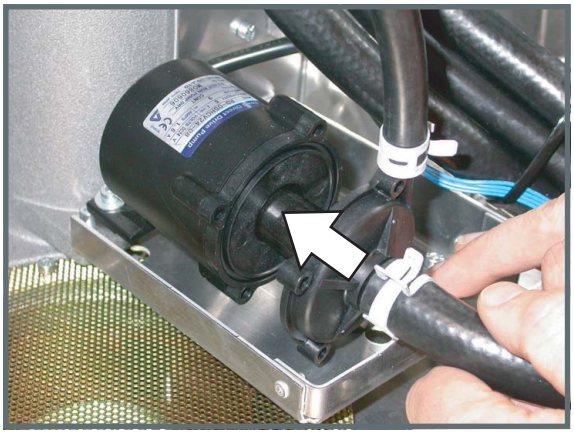


Image 14-49

9. Fasten the four screws (reference 1) of the pump house crosswise using a PH2 Phillips screwdriver.

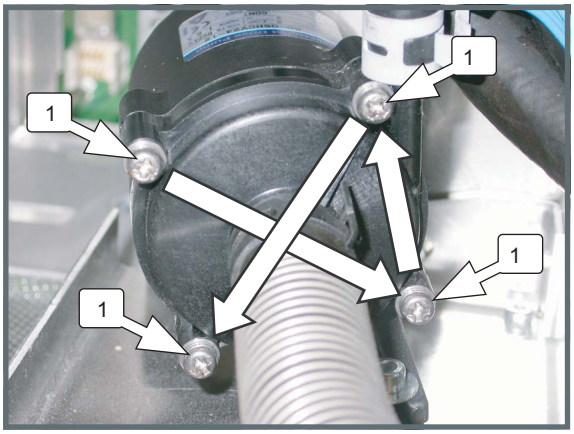


Image 14-50

10. Reconnect the wire unit of the pump.

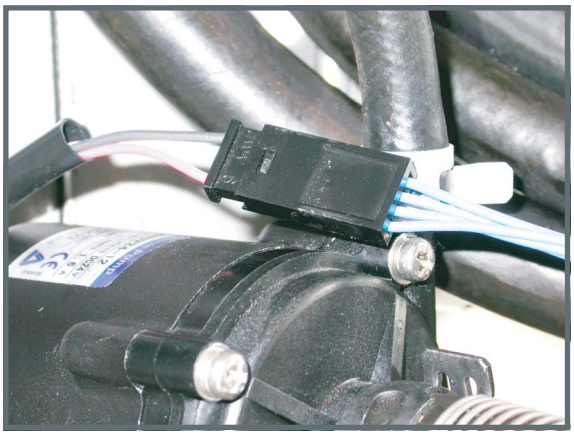


Image 14-51

After the pump is installed you have to fill the cooling circuit with cooling liquid, then expel all air from the circuit and finally pressurize the cooling circuit. See page 224.

14.15 Replacement of the complete cooling pump

This procedure assumes that the Light Processor is removed from the projector (see page 170) and that the liquid cooling circuit is drained (see page 222).

Necessary tools

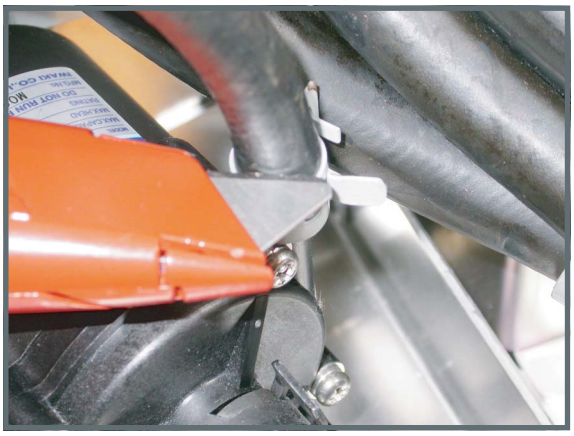
- 3 mm Allen wrench with ball point.
- 7 mm open-end wrench.
- PH2 Phillips screwdriver.
- Cloths.
- Universal plier.
- Knife.

How to replace the pump of the liquid cooling circuit?

1. Disconnect the wire unit of the cooling pump.

Image 14-52

2. Cut both hoses from the pump house. Cut just next to the clip to have a minimal loss in length of the hose.



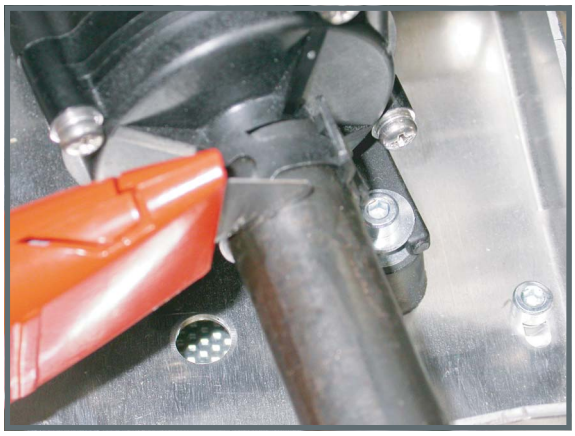


Image 14-53

3. Remove both clips from the pump house. Use an universal plier to push both clip tongs to each other in order to open the clip.
   Note: *It is almost impossible to remove first the clip and then to pull off the hose.*
4. Release the two hexagon socket head cap screws (reference 2) which fasten the pump motor to the seating of the pump. Use a 3 mm Allen wrench to release the screws and a 7 mm open-end wrench to hold the nut (reference 3) when releasing the screw.

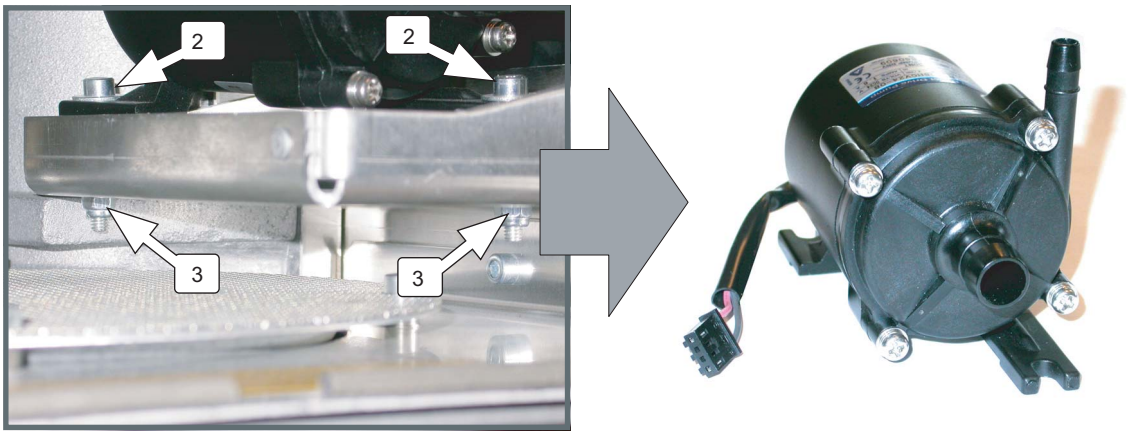


Image 14-54

5. Install a new pump on the seating and fasten with two screws (reference 2), two rubbers reference 4), two washers (reference 5) and two nuts (reference 3). Use a 3 mm Allen wrench to fasten the screws and a 7 mm open-end wrench to hold the nut while fasten the screw.
   Caution: *Make sure that the pump is mounted upon two rubber vibration rings.*

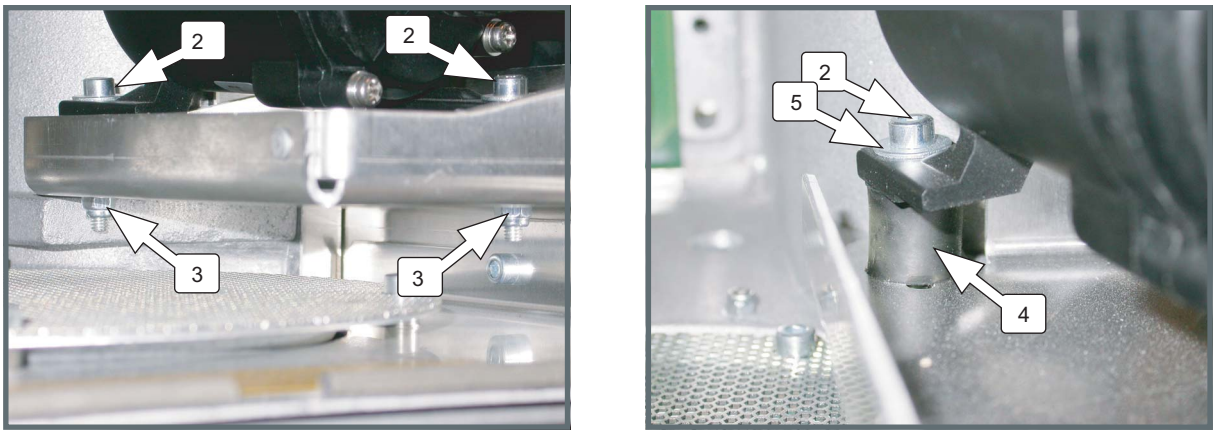


Image 14-55

6. Provide both hoses with a clip (reference 7 & 9) and push the hoses over their respective nipple of the pump house. Note that the thick nipple (reference 6) is the input side of the pump house and has to be connected with the thick hose that comes from the pressure vessel. The small nipple (reference 8) is the output side of the pump house and has to be connected with the hose that comes from the Light Processor.

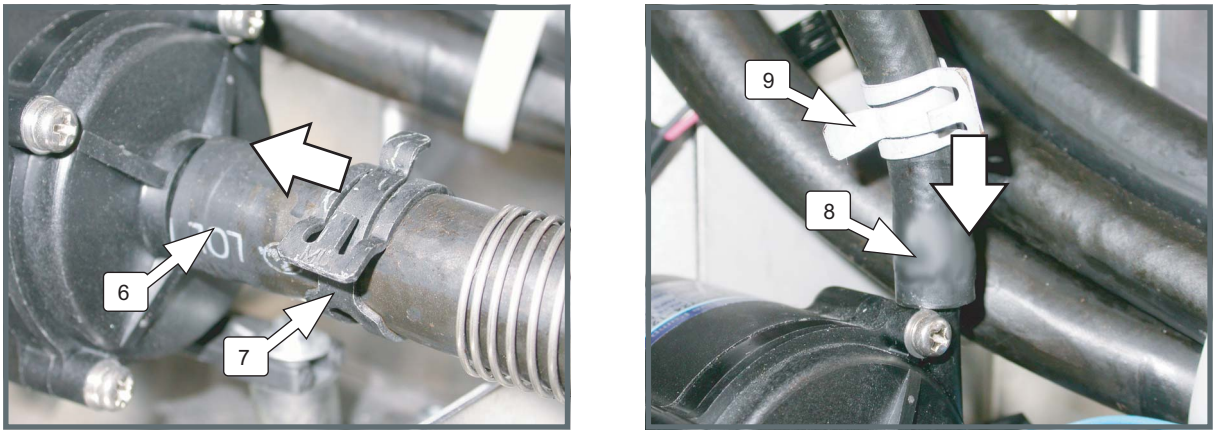


Image 14-56

7. Slide the clip of both hoses over the connection. Use an universal plier to push both clip tongs to each other in order to open the clip and to move the clip over the connection.
8. Reconnect the wire unit of the pump.

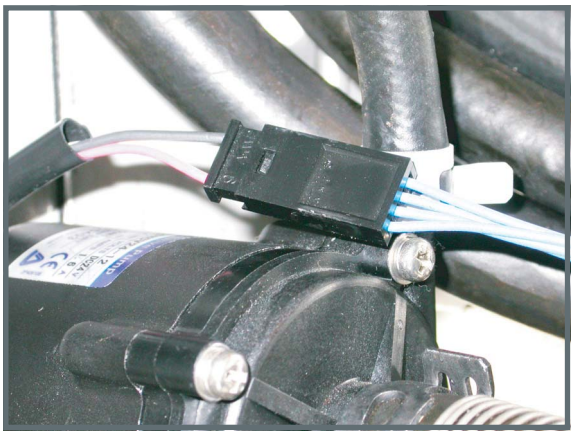


Image 14-57

After the pump is installed you have to fill the cooling circuit with cooling liquid, then expel all air from the circuit and finally pressurize the cooling circuit. See page 224.

15. LENSES AND LENS HOLDER

About this chapter

This chapter describes how to replace the complete lens holder or single parts of the lens holder like the DC motors for lens shift in case of a motorized lens holder. Note that the focus and shift functionality, either motorized or manual, are built into the lens. Included in this chapter are the adjustment procedures for the lens holder (Scheimpflug) and lens cleaning procedure.

CAUTION: Never transport the projector with the lens mounted on it !

Always remove the lens before transporting the projector.

Overview

- Introduction
- Available lenses
- Lens selection
- Lens removal
- Lens installation
- Cleaning the lens
- Removal of the manual lens holder
- Installation of the manual lens holder
- Removal of the motorized lens holder
- Installation of the motorized lens holder
- Removal of the vertical shift motor
- Installation of a new vertical shift motor
- Removal of the horizontal shift motor
- Installation of a new horizontal shift motor
- Scheimpflug adjustment

15.1 Introduction

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 focused on the screen. The shift functionality of the lens holder is either manual or motorized. The motors required for horizontal and vertical shift are built-in in case of a motorized lens holder. The lens holder, either manual or motorized, always has an electrical socket for the zoom and focus functionality of a motorized lens.

Parts identification of the lens holder

The left image below indicates the different parts of the motorized lens holder. The same parts can be found on the right image below which is a manual lens holder. The only difference between both lens holders is that the manual lens holder has two knobs (reference 10 and 11) instead of two built-in motors to shift lens.

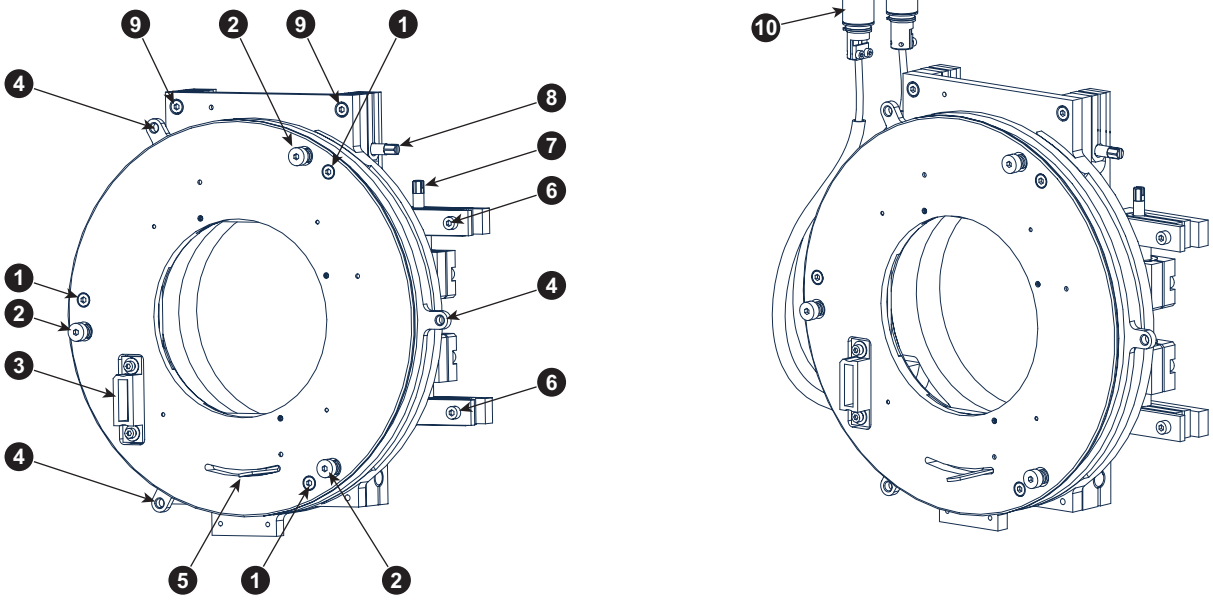


Image 15-1
1 Lock screws of the focus adjustment plate.
2 Screws with retaining springs for pressuring the focus adjustment plate.
3 Electrical socket for motorized lenses (zoom & focus).
4 Focus adjustment plate of the lens holder.
5 Lens lock handle.
6 Lock screws of the swing mechanism.
7 Lens holder swing adjustment screw.
8 Lens holder tilt adjustment screw.
9 Lock screws of the tilt mechanism.
10 Knob for vertical lens shift.
11 Knob for horizontal lens shift.

15.2 Available lenses

Which lenses are available for my projector?

The table below is subject to changes and was last updated on 01/06/2012. Consult my.barco.com for the most recent information about available lenses.

Product Number	Type	Zoom range	Image
R9855957	Motorized	1,2 – 1,81	image 15-2
R98559571	Manual	1,2 – 1,8	
R9855931	Motorized	1,4 – 2,05	image 15-3
R98559311	Manual	1,4 – 2,05	
R9855932	Motorized	1,6 – 2,5	image 15-4
R9855933	Motorized	1,6 – 2,5	image 15-5
R98559321	Manual	1,6 – 2,5	image 15-6
R98559331	Manual	1,6 – 2,5	
R9855934	Motorized	1,95 – 3,2	image 15-7
R9855935	Motorized	1,95 – 3,2	image 15-8
R98559341	Manual	1,95 – 3,2	image 15-9
R98559351	Manual	1,95 – 3,2	
R9855936	Motorized	2,4 – 3,9	image 15-10
R98559361	Manual	2,4 – 3,9	

Image 15-2
R9855957

Image 15-3
R9855931

Image 15-4
R9855932

Image 15-5
R9855933

Image 15-6
R98559321

Image 15-7
R9855934

Image 15-8
R9855935

Image 15-9
R98559341

Image 15-10
R9855936

15.3 Lens selection

Which lens do I need?

1. Go to my.barco.com on https://my.barco.com
2. Login on my.barco.com.
   If you are not yet registered click on **Sign up for my.barco.com** and follow the instructions. With the created login and password, it is possible to enter the my.barco.com.

   When your login is correct, the my.barco.com start page is displayed.
3. Click the **Support** tab, then **Digital cinema calculator** (on the left of the screen) and select the appropriate lens calculator.

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

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

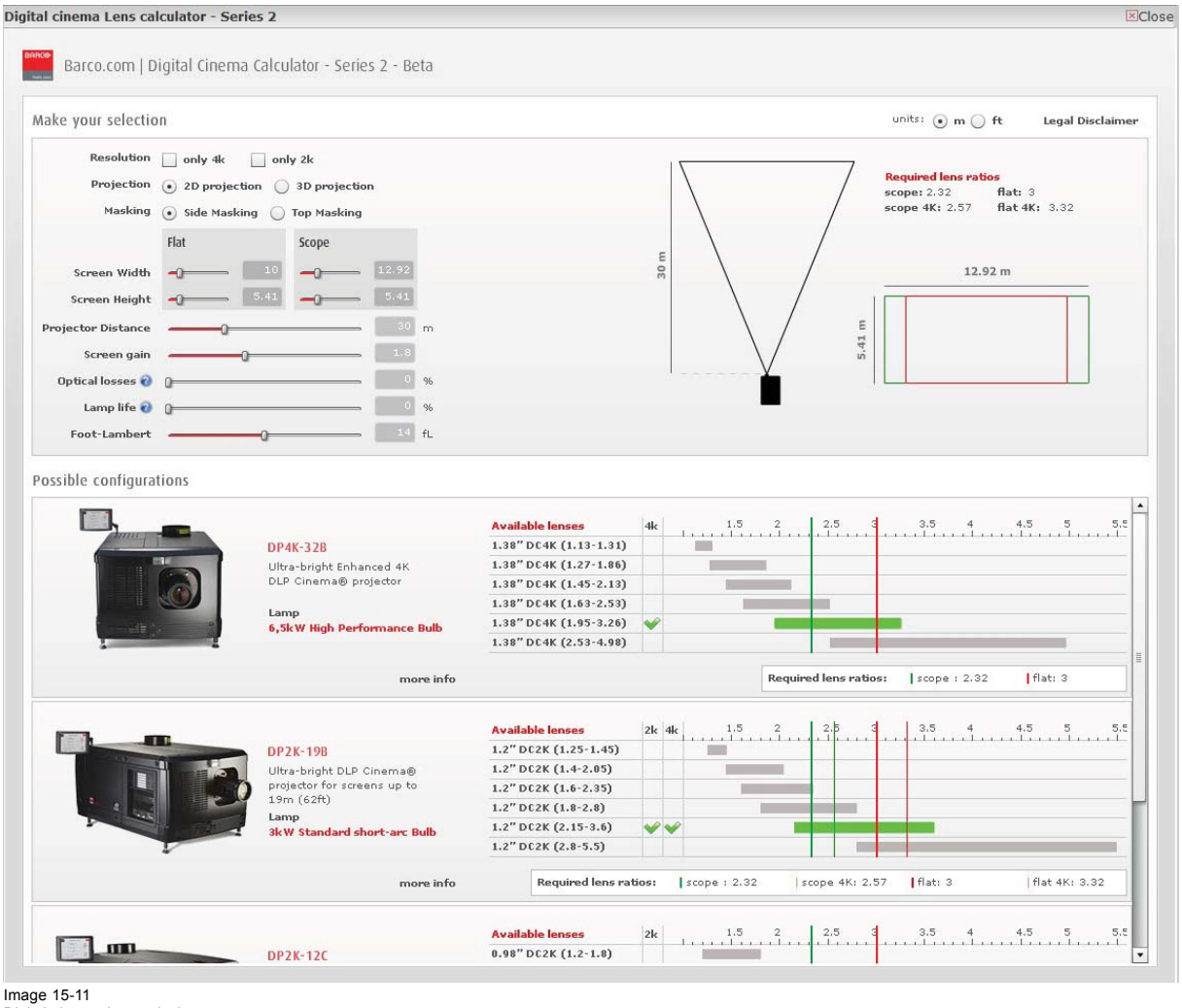


Image 15-11
Digital cinema lens calculator

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

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

15.4 Lens removal

How to remove a lens from the projector lens holder ?

1. Support the lens with one hand while you unlock the lens holder by sliding the lock handle towards the “unlocked” position as illustrated.

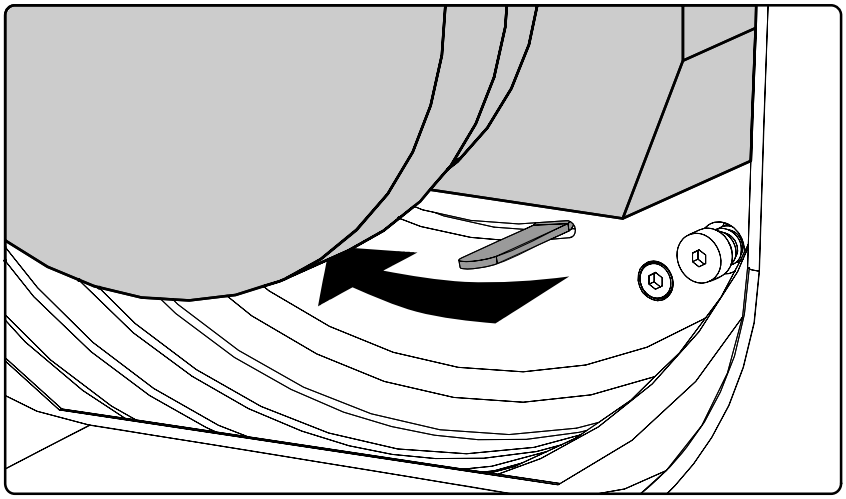


Image 15-12

2. Gently pull the lens out of the lens holder.

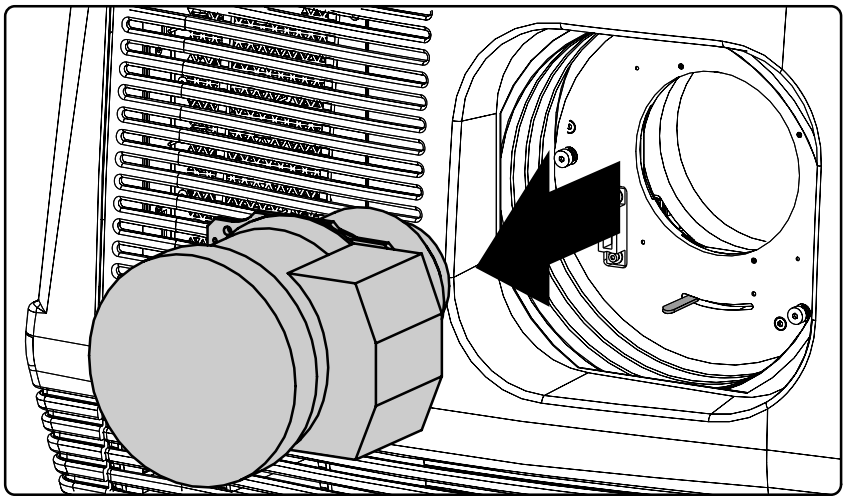


Image 15-13

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 in 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.

15.5 Lens installation

How to install a lens into the projector 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.
3. Place the lens holder in the “unlocked” position by moving the lens lock handle (A) towards the lens power supply socket (B) as illustrated.

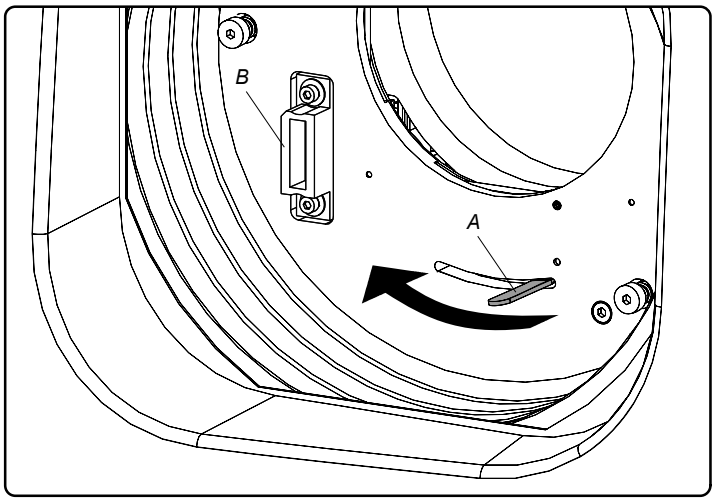


Image 15-14

4. Ensure that the lens holder stands in the On-Axis position (horizontal and vertical mid position).
   Note: *The lens holder is placed default in the On-Axis position at factory.*
5. Gently insert the lens in such a way that the lens connector matches the socket (B).

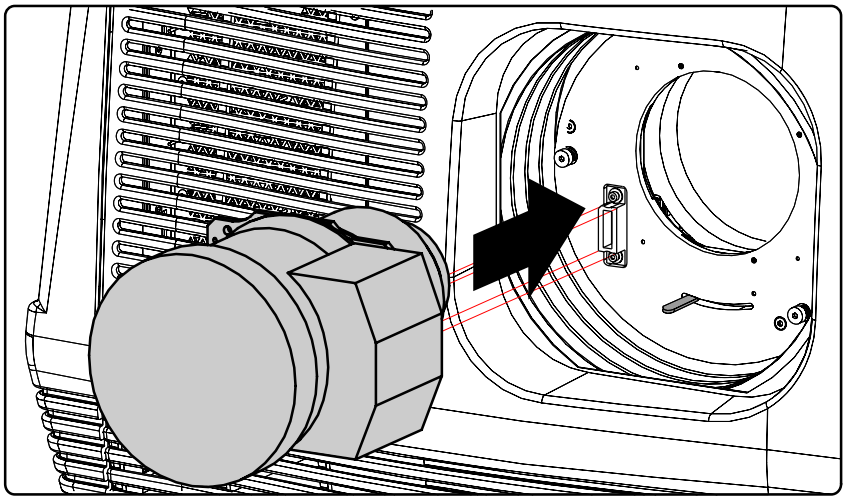


Image 15-15

6. Insert the lens until the connector seats into the socket.
   Warning: *Do not release the Lens yet, as the Lens may fall out of the Lens Holder.*
7. Secure the lens in the lens holder by sliding the lens lock handle into the “locked” position, which is away from the lens power supply socket. Ensure the lens touches the front plate of the lens holder.

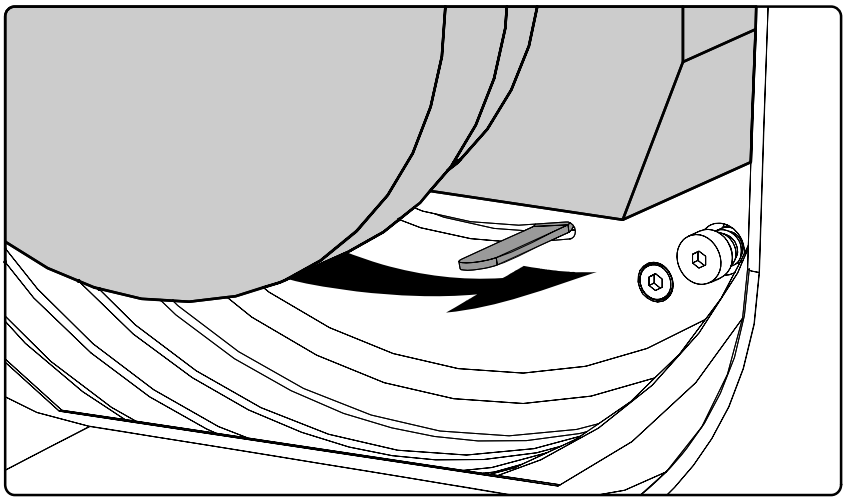


Image 15-16

8. Check if the lens is really secured by trying to pull the lens out of the lens holder.

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

15.6 Cleaning the lens

To minimize the possibility of damage to optical coatings, or scratches to lens surfaces, we have developed recommendations for cleaning. FIRST, we recommend you try to remove any material from the lens by blowing it off with clean, dry deionized air. DO NOT use any liquid to clean the lenses.

Necessary tools

Toraysee™ cloth (delivered together with the lens kit). Order number : R379058.

How to clean the lens ?

1. Always wipe lenses with a CLEAN Toraysee™ cloth.
2. Wipe lenses in a one single direction.
   Warning: *Do not wipe back and forwards across the lens surface as this tends to grind dirt into the coating.*
3. Do not leave the cleaning cloth in either an open room or lab coat pocket, as doing so can contaminate the cloth.
4. If smears occur when cleaning lenses, replace the cloth. Smears are the first indication of a dirty cloth.

CAUTION: Do not use fabric softener when washing the cleaning cloth or softener sheets when drying the cloth.

Do not use liquid cleaners on the cloth as doing so will contaminate the cloth.

Other lenses can also be cleaned safely with this Toraysee™ cloth.

15.7 Removal of the manual lens holder

To remove the lens holder you have to remove the lens, the front cover, the side cover and the light processor first.

Necessary tools

- Side cutter.
- 5,5 mm nut driver.
- 2 mm Allen wrench.
- 3 mm Allen wrench.

How to remove the manual lens holder?

1. Remove the plastic cable tie from the wire three and disconnect the wire units (reference FZ) from the lens holder.

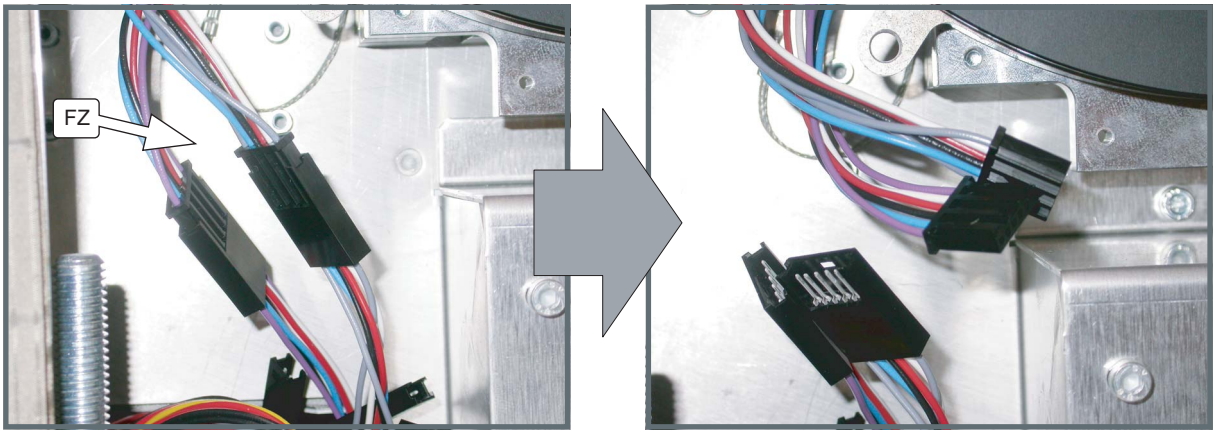


Image 15-17

2. Disconnect the EMC wire unit (reference G1) at the left bottom of the lens holder and the two EMC wire units (reference G2 & G3) at the top of the lens holder. Use a 5,5 mm nut driver.

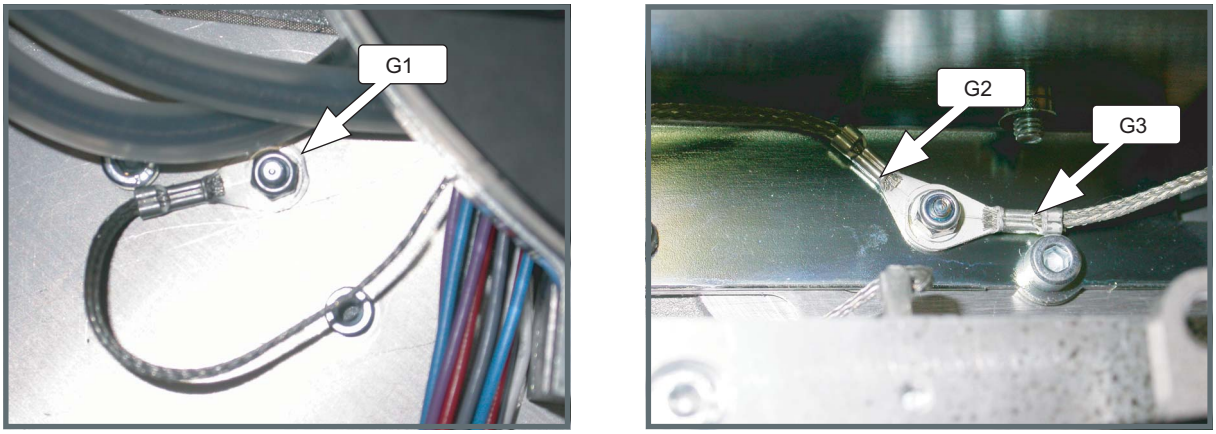


Image 15-18

3. Remove the extender cables from the “shift” adjustment knobs at the top of the projector. Use a 2 mm Allen wrench to release the four screws (reference 1 and 2) which fasten the extender cables.

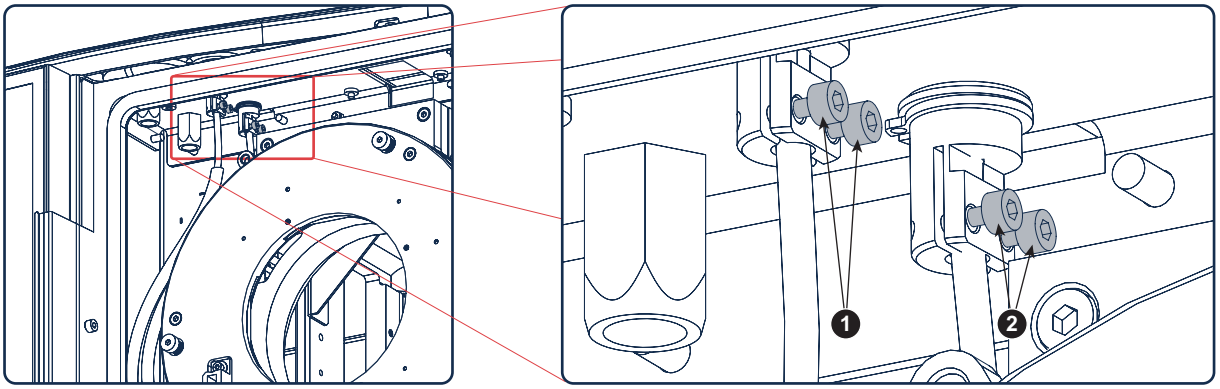


Image 15-19

4. Release the 8 hexagon socket head cap screws and remove the lens holder as illustrated. Use a 3 mm Allen wrench.

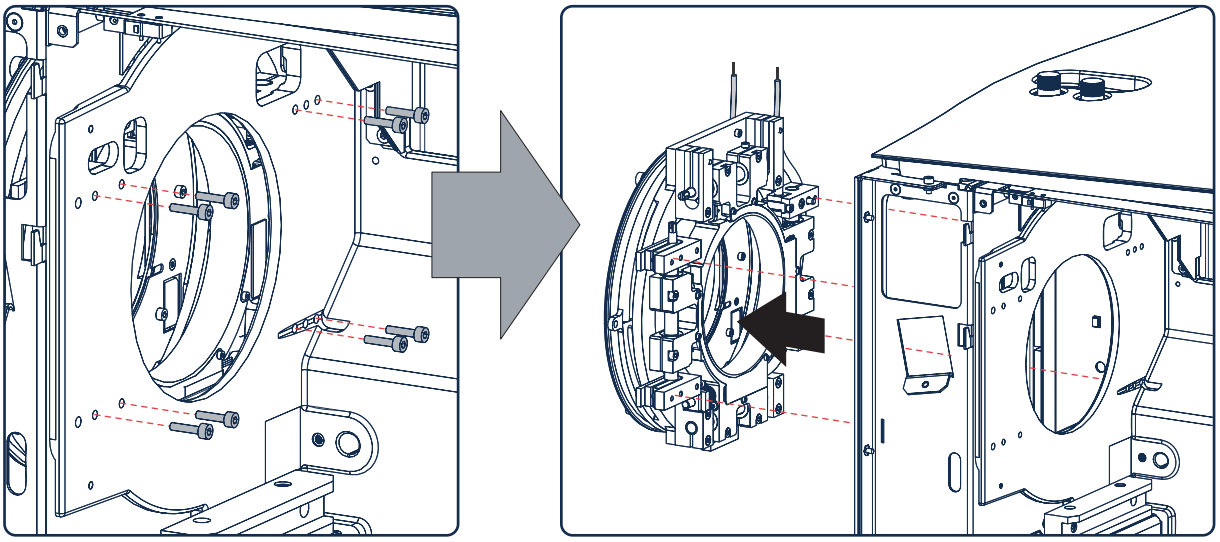


Image 15-20

15.8 Installation of the manual lens holder

Necessary tools

- Side cutter.
- 5,5 mm nut driver.
- 2 mm Allen wrench.
- 3 mm Allen wrench.

Necessary parts

Two cable ties.

How to install the manual lens holder?

1. Install the lens holder and secure with 8 hexagon socket head cap screws as illustrated. Use a 3 mm Allen wrench.
   Note: *Ensure that the positioning pins of the lens holder matches the positioning holes on the projector chassis.*

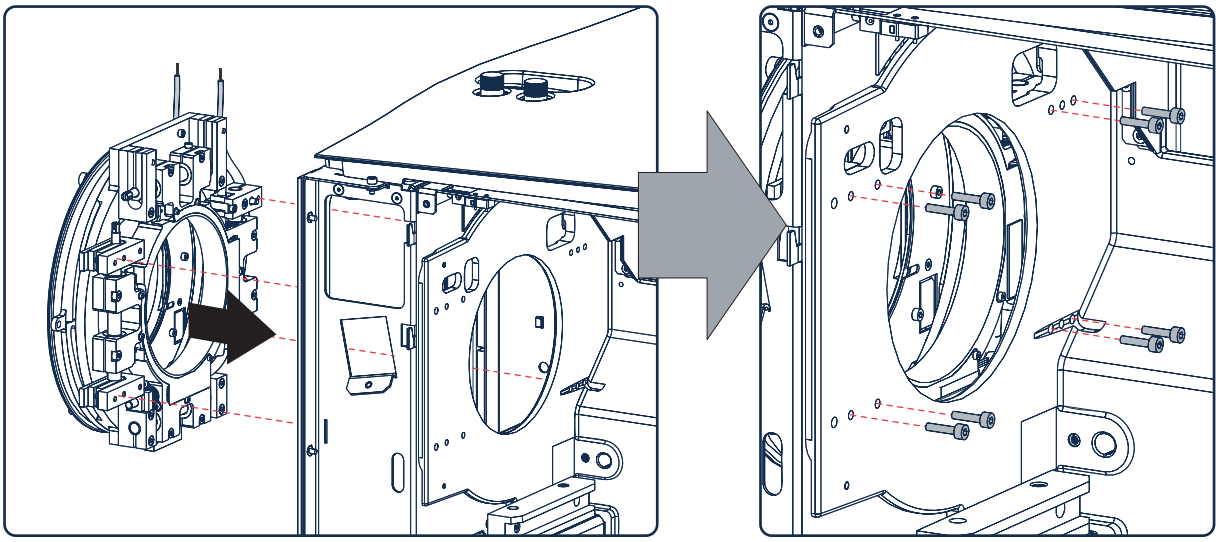


Image 15-21

2. Attach the extender cables with the “shift” adjustment knobs as illustrated. The screws with reference 1 are for the extender of the Vertical shift adjustment. The screws with reference 2 are for the for the extender of the Horizontal shift adjustment.

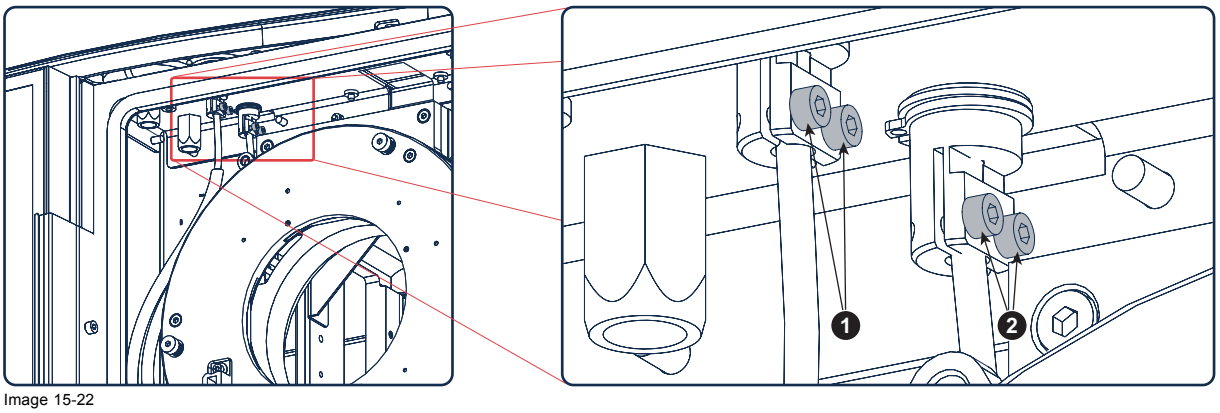


Image 15-22

3. Connect the EMC wire unit (reference G1) at the left bottom of the lens holder and the two EMC wire units (reference G2 & G3) at the top of the lens holder with the projector chassis.

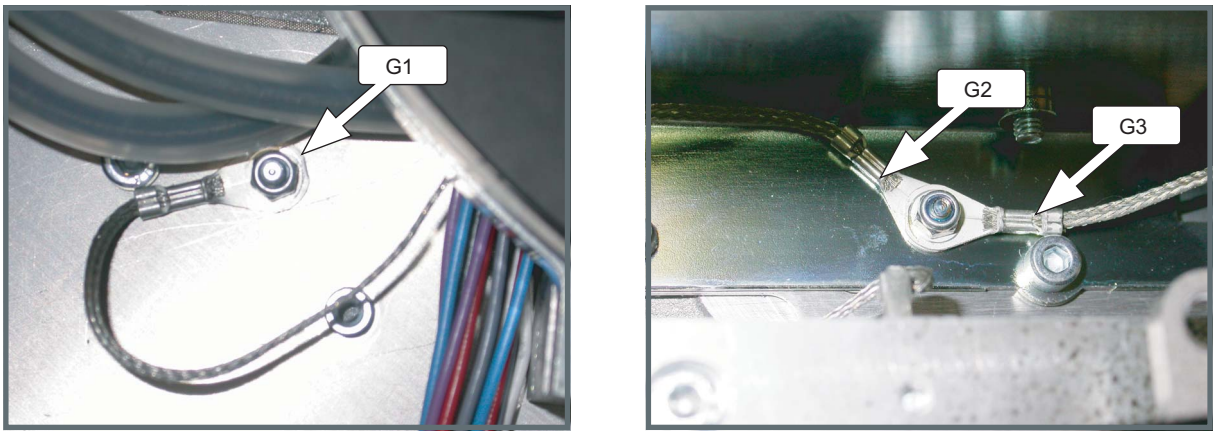


Image 15-23

4. Connect the wire units (reference FZ) from the lens holder with their respective wire units of the projector. Make sure that you connect the wire units of the same color with each other. Tie the wire units together with two cable ties.

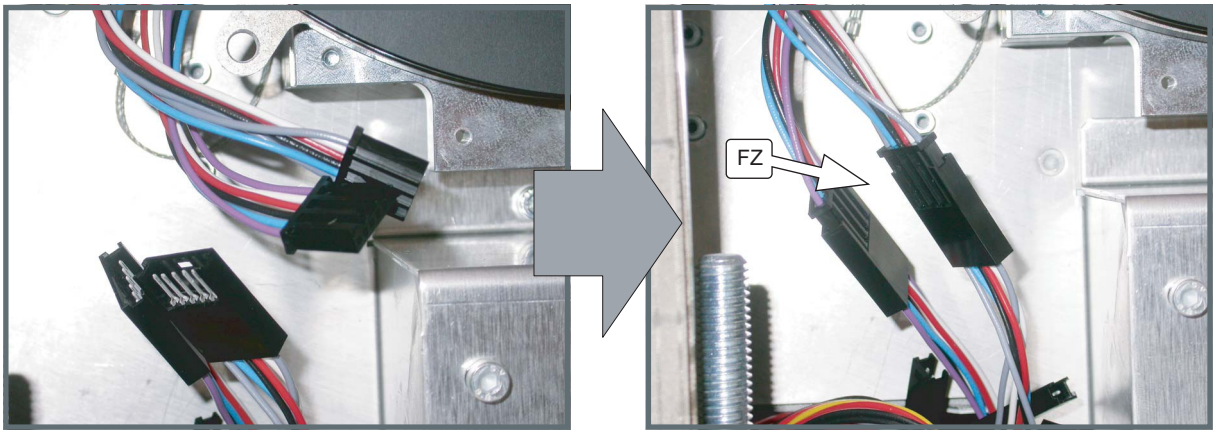


Image 15-24

The lens holder has to be adjusted after installation. See procedure "Scheimpflug adjustment", page 275.

15.9 Removal of the motorized lens holder

To remove the lens holder you have to remove the lens, the front cover, the side cover and the light processor first.

Necessary tools

- Side cutter.
- 5,5 mm nut driver.
- 3 mm Allen wrench.

How to remove the motorized lens holder?

1. Remove the plastic cable tie from the wire three and disconnect the wire units (reference FZ) and two flat cables (reference SH) from the lens holder.

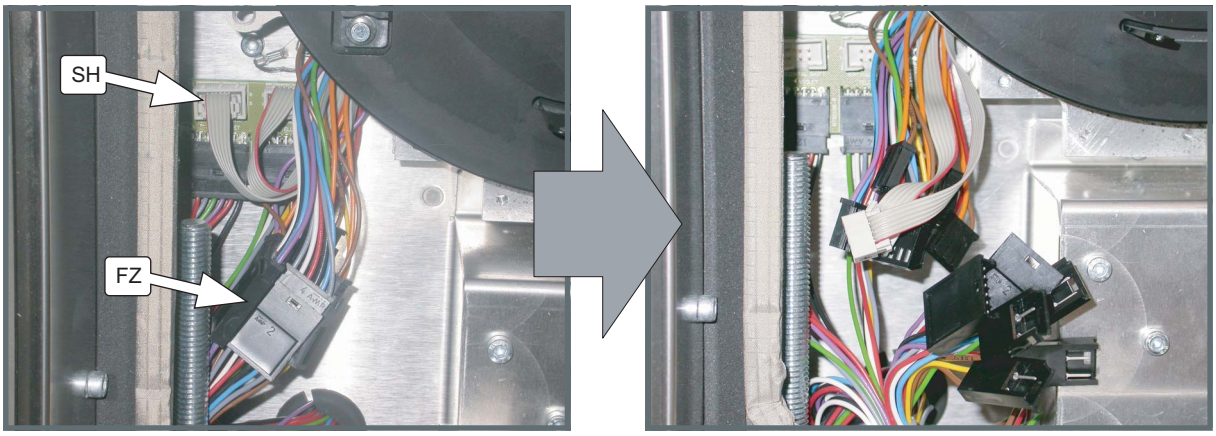


Image 15-25

2. Disconnect the EMC wire unit (reference G1) at the left bottom of the lens holder and the two EMC wire units (reference G2 & G3) at the top of the lens holder. Use a 5,5 mm nut driver.

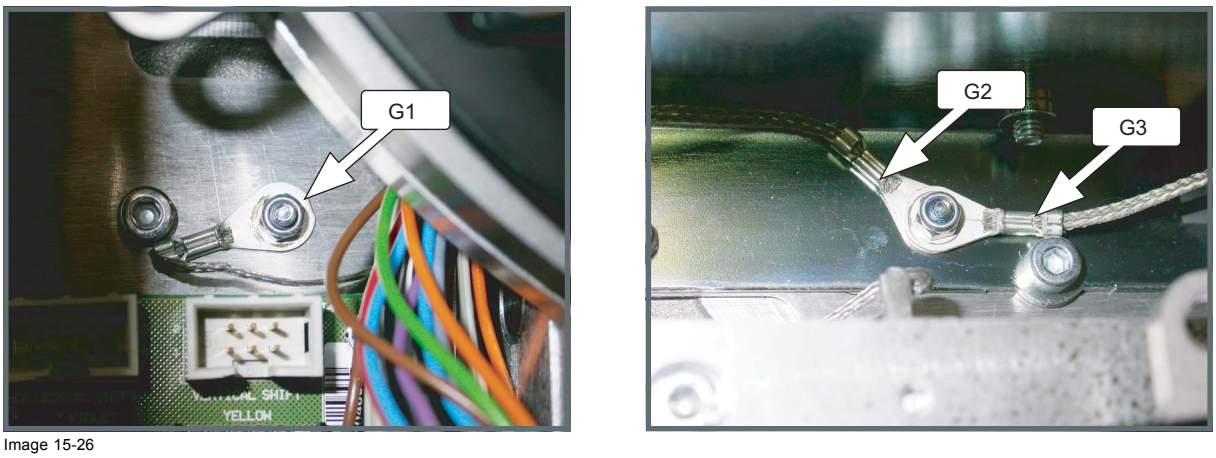


Image 15-26

3. Release the 8 hexagon socket head cap screws and remove the lens holder as illustrated. Use a 3 mm Allen wrench.

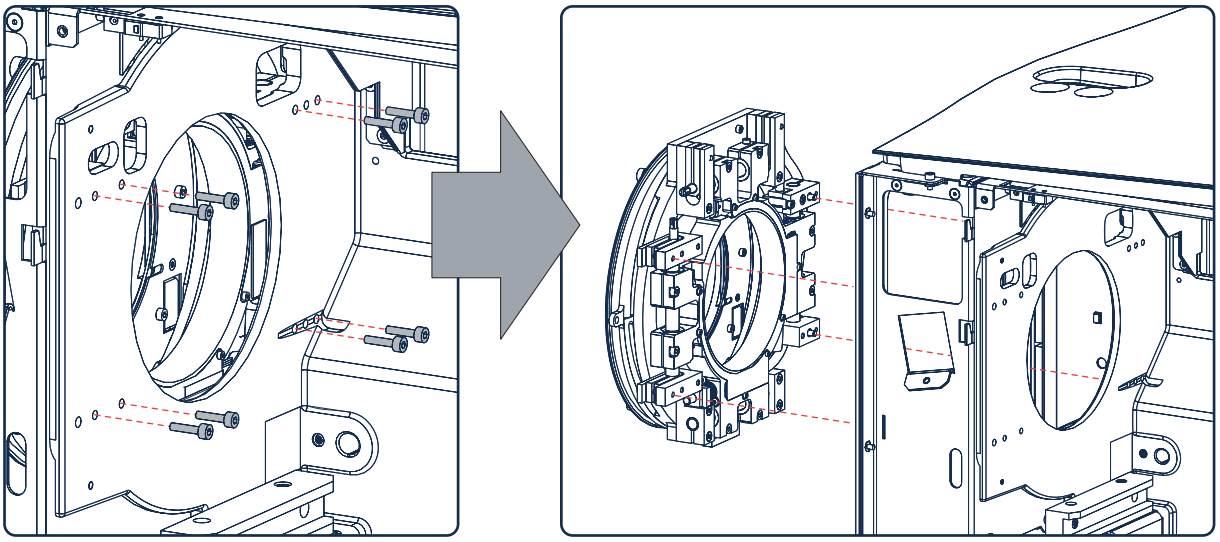


Image 15-27

15.10 Installation of the motorized lens holder

Necessary tools

- Side cutter.
- 5,5 mm nut driver.
- 3 mm Allen wrench.

Necessary parts

Two cable ties.

How to install the motorized lens holder?

1. Install the lens holder and secure with 8 hexagon socket head cap screws as illustrated. Use a 3 mm Allen wrench.
   Note: *Ensure that the positioning pins of the lens holder matches the positioning holes on the projector chassis.*

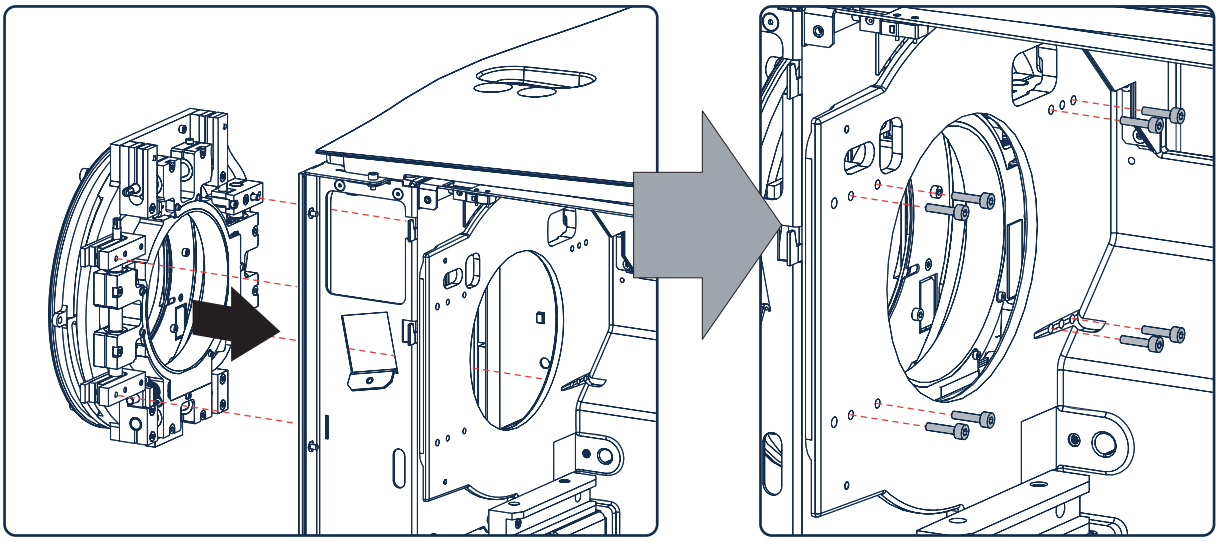


Image 15-28

2. Connect the EMC wire unit (reference G1) at the left bottom of the lens holder and the two EMC wire units (reference G2 & G3) at the top of the lens holder with the projector chassis.

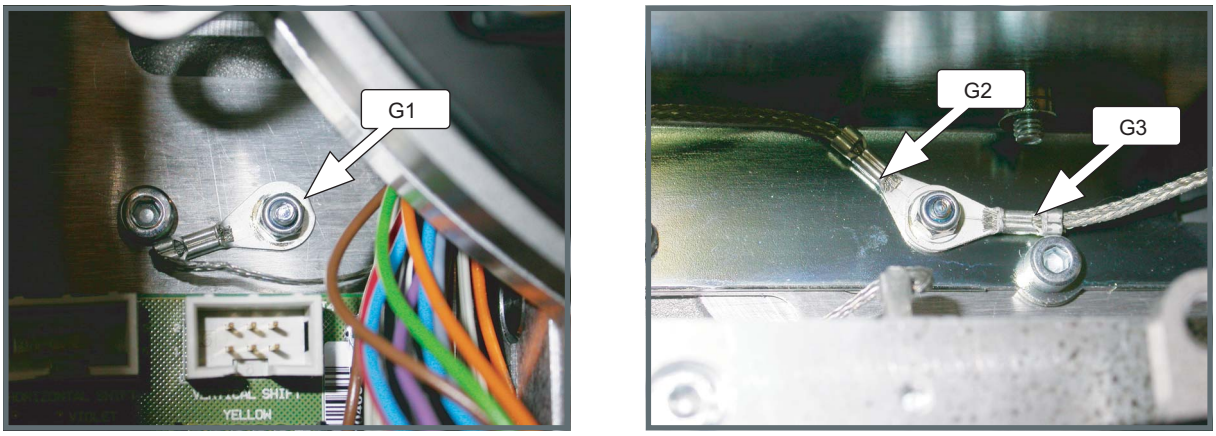


Image 15-29

3. Connect the flat cables of the lens holder shift motors with the interconnection board at the left bottom of the lens holder. Note that one flat cable is marked with “V” and the other with “H”. The sockets on the interconnection board are marked with “Vertical” and “Horizontal”. Make sure you connect the “V” marked flat cable with the “Vertical” marked socket.

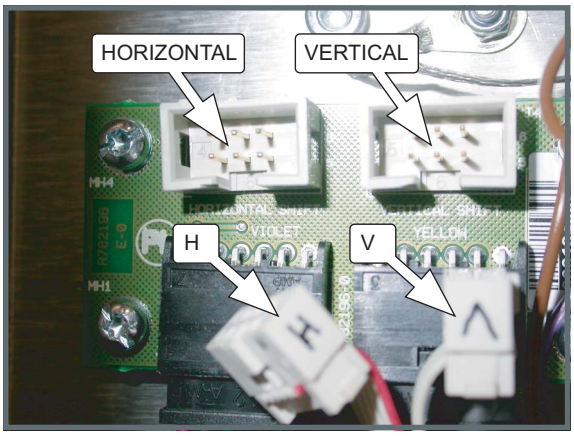


Image 15-30

4. Connect the wire units from the lens holder with their respective wire units of the projector. Make sure that you connect the wire units of the same color with each other. Tie the wire units together with two cable ties.

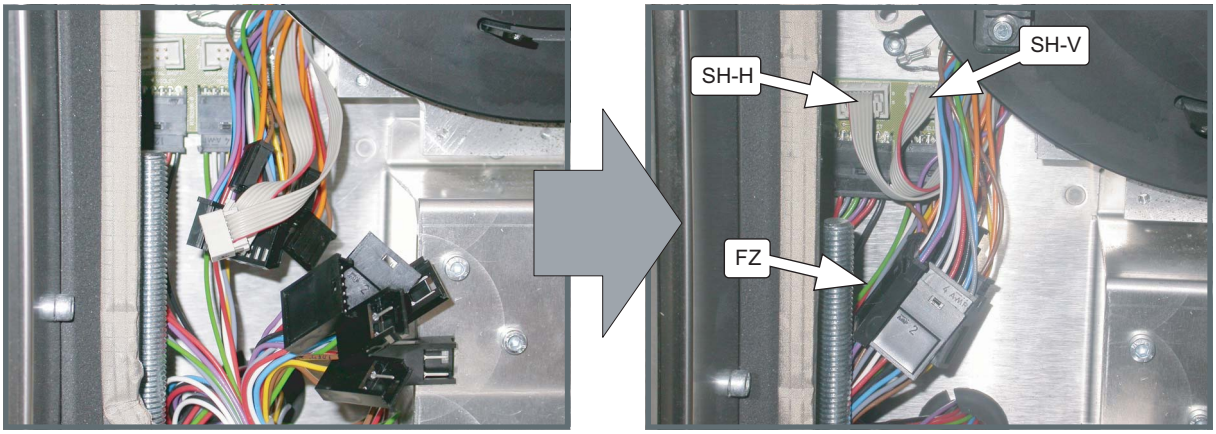


Image 15-31

The lens holder has to be adjusted after installation. See procedure "Scheimpflug adjustment", page 275.

15.11 Removal of the vertical shift motor

The motorized lens holder must be removed from the projector before starting to remove the vertical shift motor of the lens holder. This procedure assumes that the lens holder is already removed from the projector. See removal procedure page 262.

Necessary tools

- 3 mm Allen wrench.
- 2,5 mm Allen wrench.
- 2 mm Allen wrench.
- 1,5 mm Allen wrench.

How to remove the vertical shift motor from the motorized lens holder?

1. Remove the cover (reference 2) of the vertical shift motor by releasing the four screws (reference 1) as illustrated.

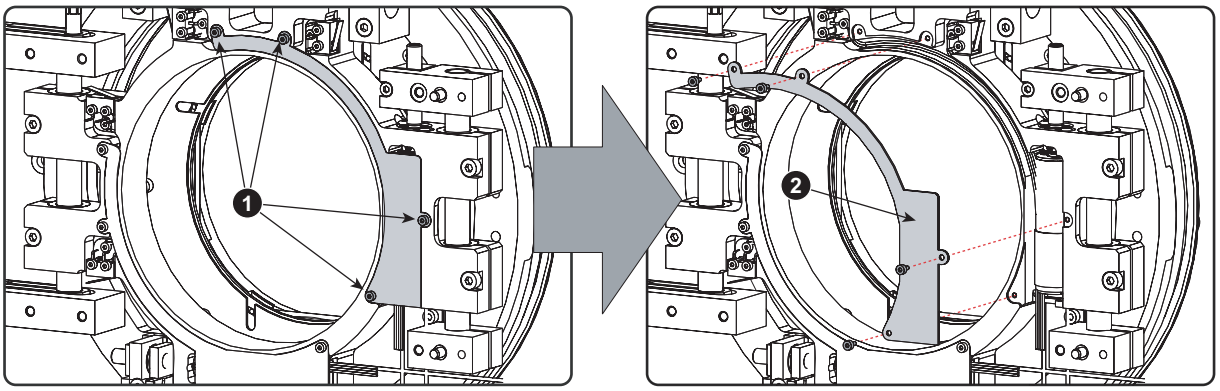


Image 15-32

2. Remove the screw with reference 3 in image 15-33.
3. Loosen the screw (reference 4) at the back side of the guiding block (reference 6) and slide the axe (reference 5) out of that block.

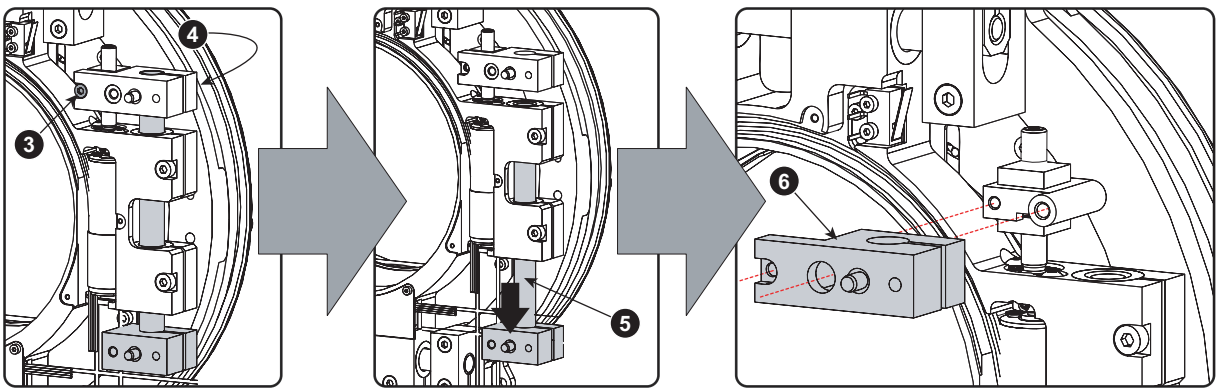


Image 15-33

4. Take off the guiding block (reference 6 of image 15-33).
5. Disassemble everything (reference 7 to 11 of image 15-34) mounted on the revolving rod (reference 12 of image 15-34).
6. Remove the revolving rod (reference 12) by the two fixation screws (reference 13) and the set screw (reference 14).

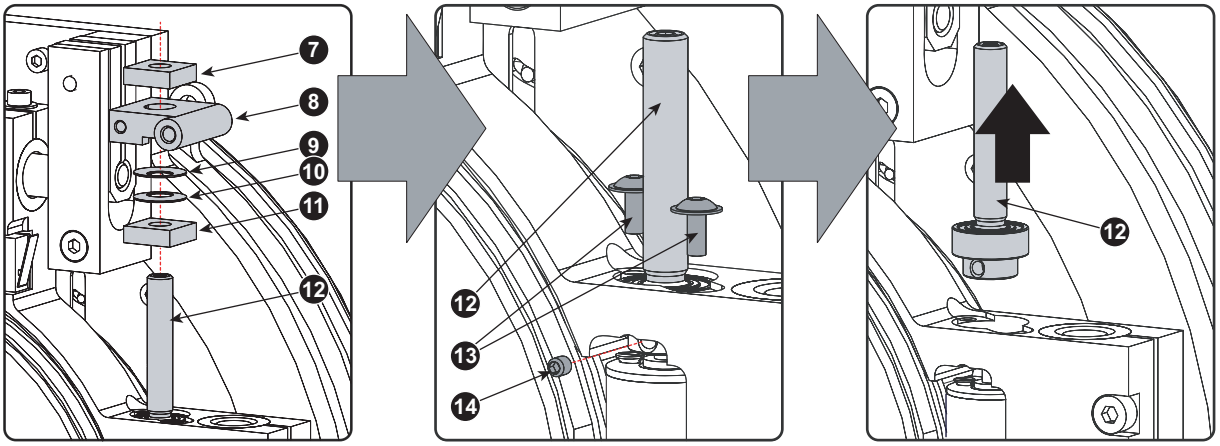


Image 15-34

7. Take out the motor unit, remove both screws (reference 15) which fasten the small plate (reference 16). This small plate must be reused when installing a new motor.

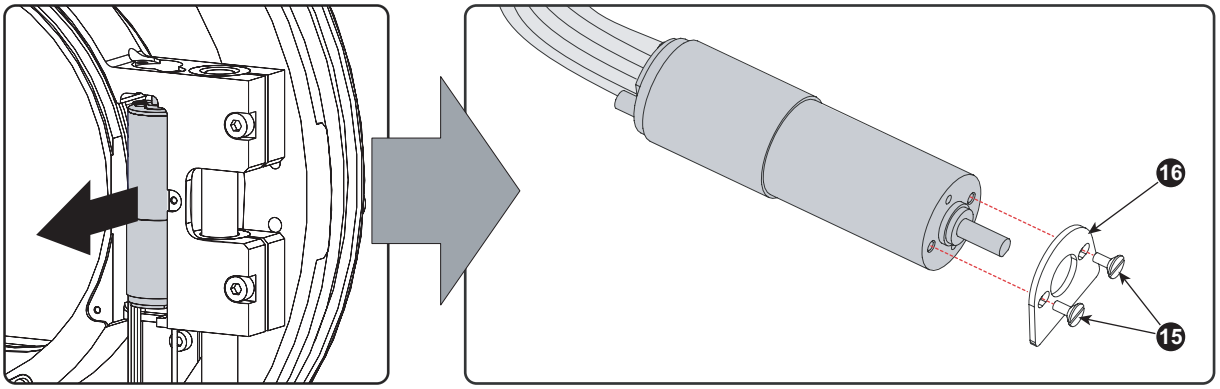


Image 15-35

15.12 Installation of a new vertical shift motor

This procedure assumes that the motorized lens holder is removed from the projector. See page 262.

Necessary tools

- 3 mm Allen wrench.
- 2,5 mm Allen wrench.
- 2 mm Allen wrench.
- 1,5 mm Allen wrench.

How to mount the vertical shift motor of the motorized lens holder?

1. Fixate the small plate (reference 16) with two screws (reference 15) on the motor and insert the motor in its compartment with the rounded side of the small plate upwards. Fold the flat cable of the motor in the same direction of the rounded side of the small plate.

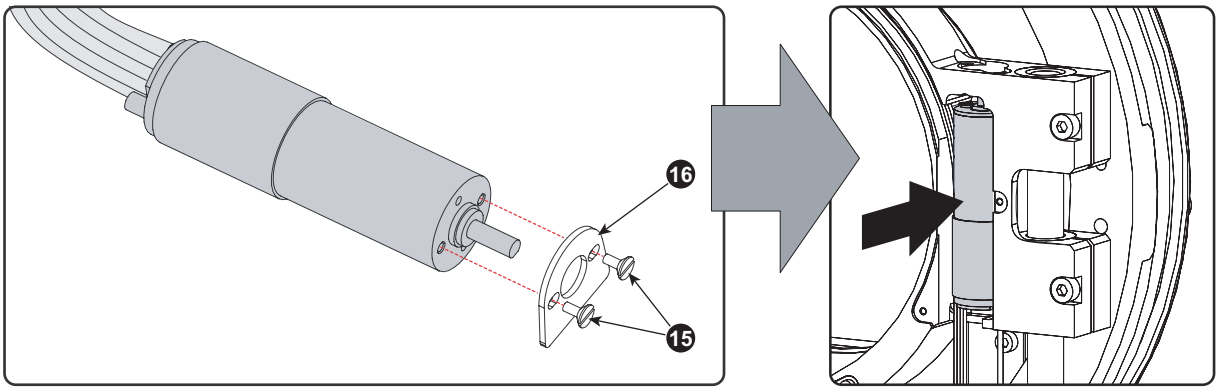


Image 15-36

2. Install the revolving rod (reference 12) and fasten with two fixation screws (reference 13) and one set screw (reference 14).

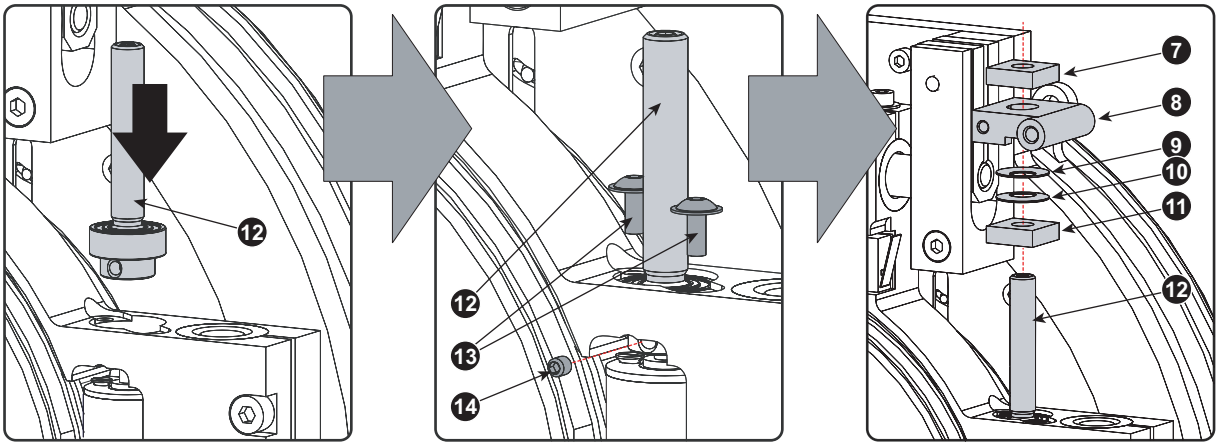


Image 15-37

3. Turn the first square nut (reference 11) on the revolving rod until the middle. Then slide both washers (reference 10 & 9) on the revolving rod with the spherical side towards each other. Continue with the connection piece (reference 8) and finally, turn again a square nut (reference 7) on the revolving rod.
4. Tighten both square nuts (reference 7 & 11) slightly until all play is removed. This will avoid any backlash when the motor changes direction. Excessive tightening of the nuts will impede easy turning of the spindle, hence overloading the motor.
5. Place the guiding block (reference 6) on its place and slide the axe (reference 6) upwards in the hole of the guiding block so that the end of the axe is equal with the side of the guiding block.

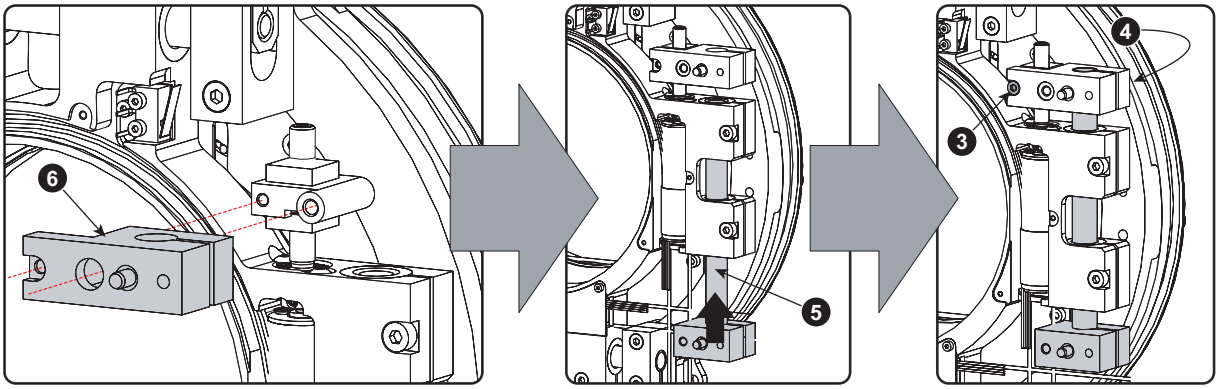


Image 15-38

6. Secure the position of the guiding block and axe with two screws (reference 3 & 4).
7. Guide de flat cable of the motor in the groove and install the cover plate (reference 2) with four screws (reference 1).

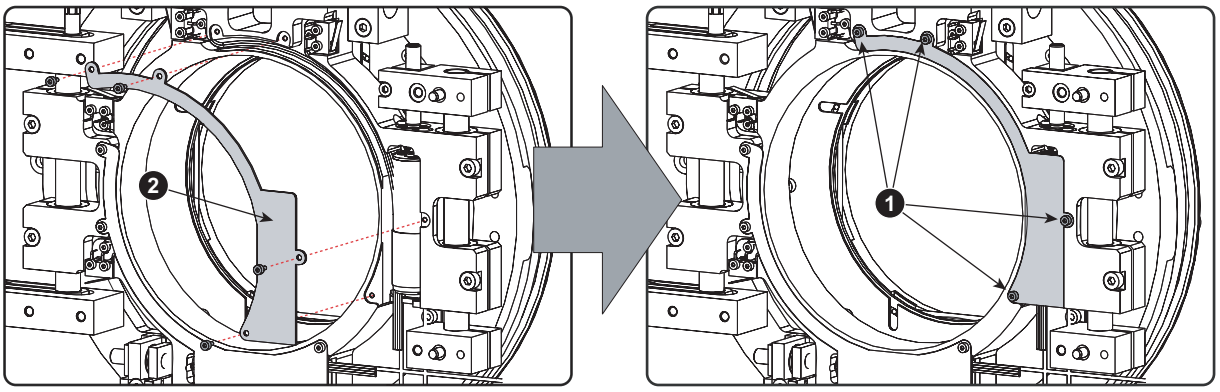


Image 15-39

To reinstall the motorized lens holder see installation procedure page 264.

15.13 Removal of the horizontal shift motor

The motorized lens holder must be removed from the projector before starting to remove the vertical shift motor of the lens holder. This procedure assumes that the lens holder is already removed from the projector. See removal procedure page 262.

Necessary tools

- 3 mm Allen wrench.
- 2,5 mm Allen wrench.
- 2 mm Allen wrench.
- 1,5 mm Allen wrench.

How to remove the horizontal shift motor of the motorized lens holder?

1. Remove the cover (reference 2) of the horizontal shift motor by releasing the four screws (reference 1) as illustrated.

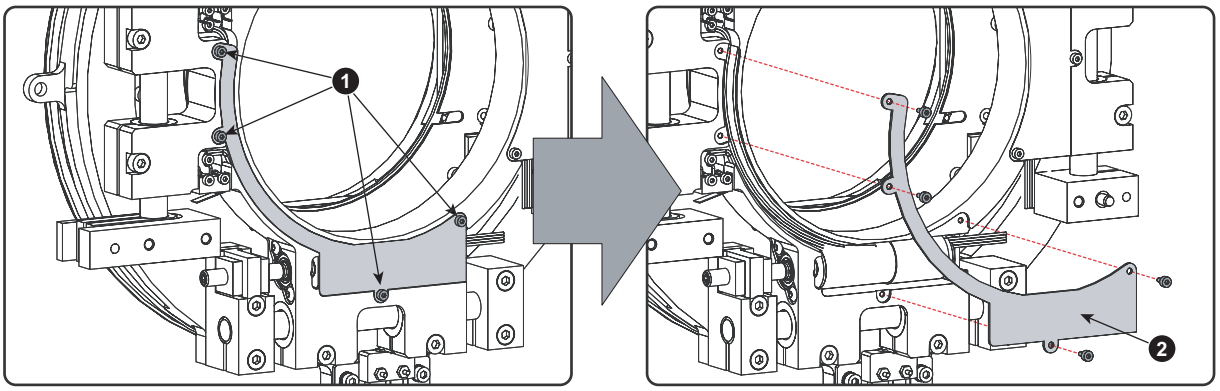


Image 15-40

2. Remove out the screw with reference 3 in image 15-41.
3. Loosen the screw (reference 4) of both guiding blocks and slide the axe (reference 5) out of these block.

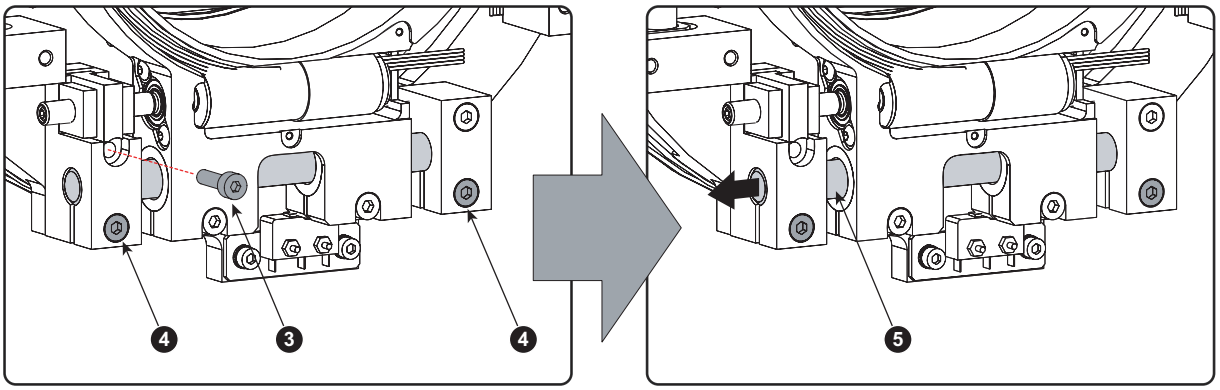


Image 15-41

4. Pivot the rear part of the lens holder upwards until the horizontal shift motor and revolving rod becomes free.

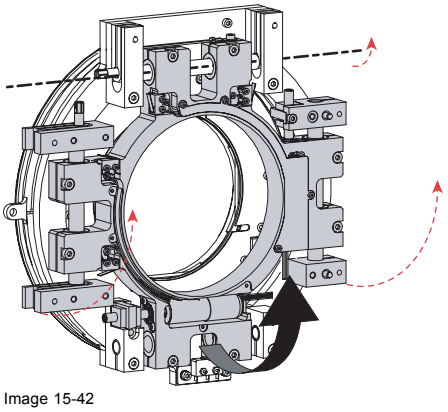


Image 15-42

5. Disassemble everything (reference 6 to 10) mounted on the revolving rod (reference 11).

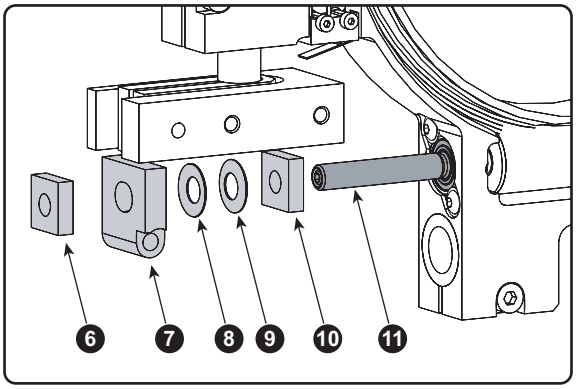


Image 15-43

6. Remove the revolving rod (reference 11) by releasing the two fixation screws (reference 12) and the set screw (reference 13).

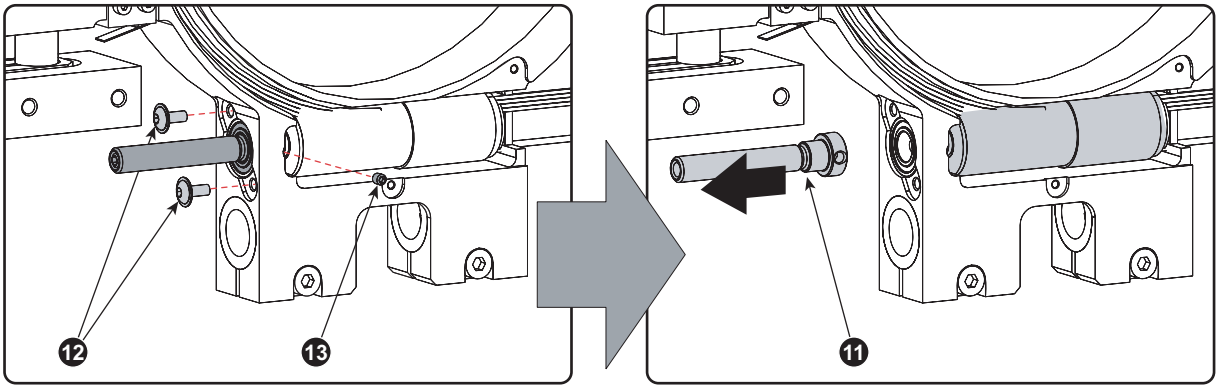


Image 15-44

7. Take out the motor unit (reference 14), remove both screws (reference 15) which fasten the small plate (reference 16). This small plate must be reused when installing a new motor.

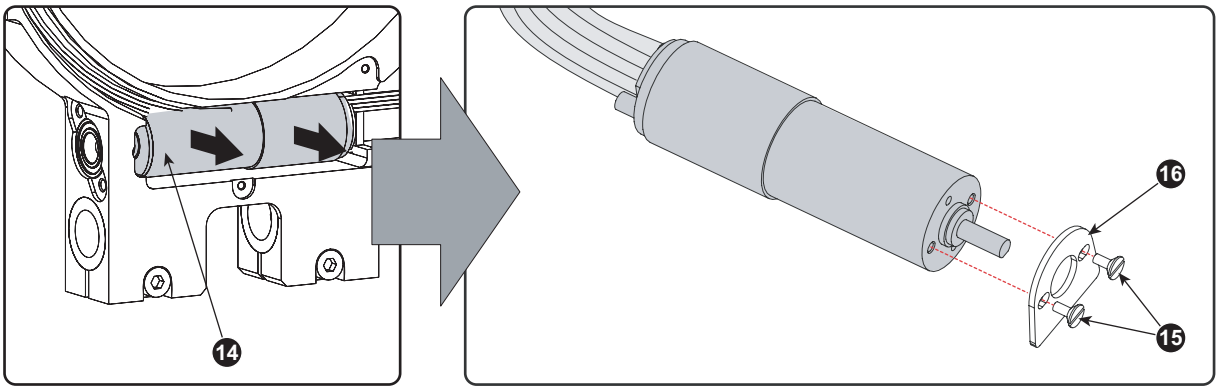


Image 15-45

15.14 Installation of a new horizontal shift motor

This procedure assumes that the motorized lens holder is removed from the projector. See page 262.

Necessary tools

- 3 mm Allen wrench.
- 2,5 mm Allen wrench.
- 2 mm Allen wrench.
- 1,5 mm Allen wrench.

How to mount the horizontal shift motor of the motorized lens holder?

1. Fixate the small plate (reference 16) with two screws (reference 15) on the motor and insert the motor in its compartment with the rounded side of the small plate upwards. Fold the flat cable of the motor in the same direction of the rounded side of the small plate.

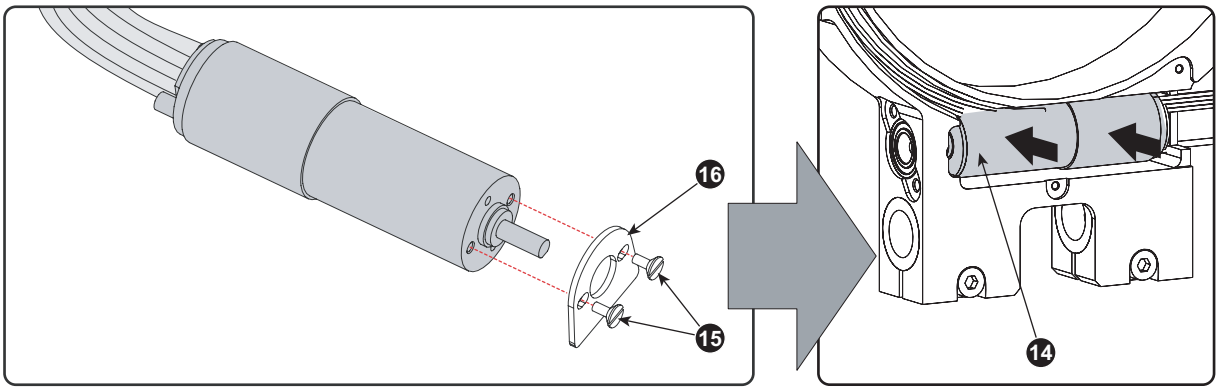


Image 15-46

2. Install the revolving rod (reference 11) and fasten with two fixation screws (reference 13) and one set screw (reference 14).

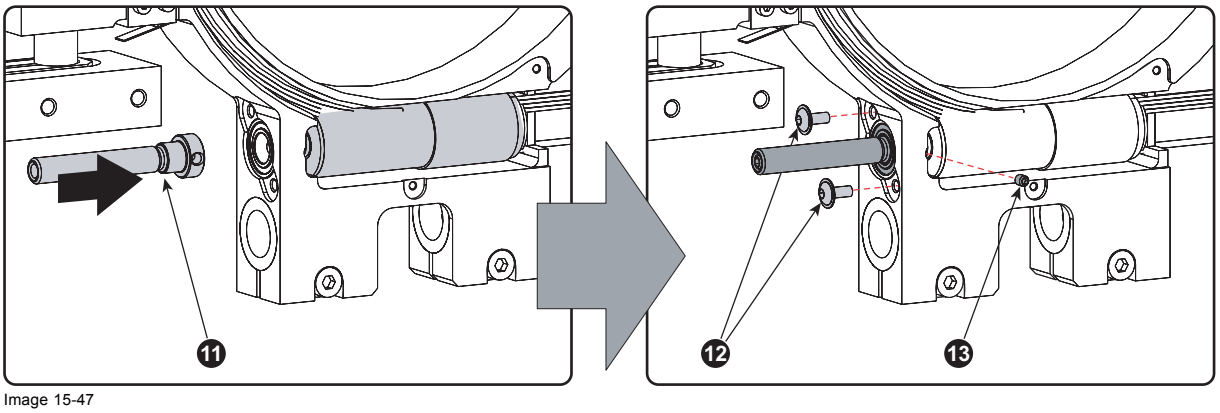


Image 15-47

3. Turn the first square nut (reference 10) on the revolving rod midway down the revolving rod. Then slide both washers (reference 9 & 8) on the revolving rod with the spherical side towards each other. Continue with the connection piece (reference 7) and finally, turn again a square nut (reference 6) on the revolving rod.

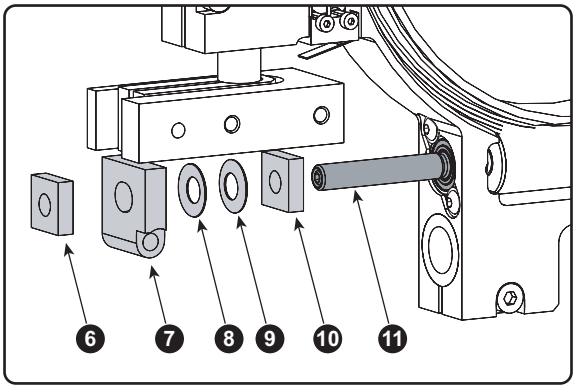


Image 15-48

4. Tighten both square nuts (reference 6 & 10) slightly until all play is removed. This will avoid any backlash when the motor changes direction. Excessive tightening of the nuts will impede easy turning of the spindle, hence overloading the motor.
5. Pivot the assembly back on its place. Make sure that the connection pieces matches its socket. If not so, move the assembly on the axe until it match.

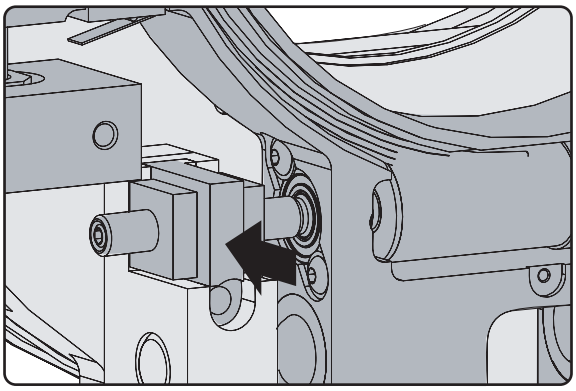


Image 15-49

6. Slide axe (reference 5) on its place so that the end of the axe is equal with the side of the guiding block.

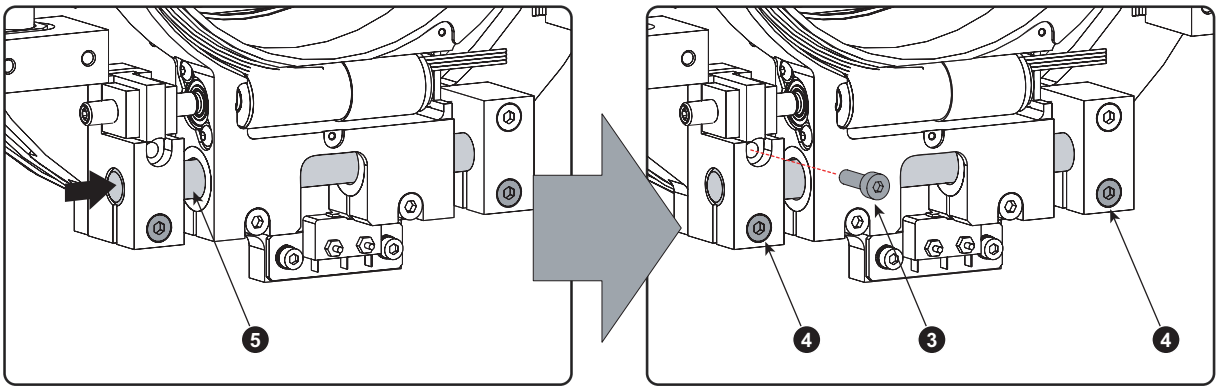


Image 15-50

7. Secure the position of the guiding block and axe with two screws (reference 3 & 4 image 15-50).
8. Guide the flat cable of the motor in the groove and install the cover plate (reference 2) with four screws (reference 1).

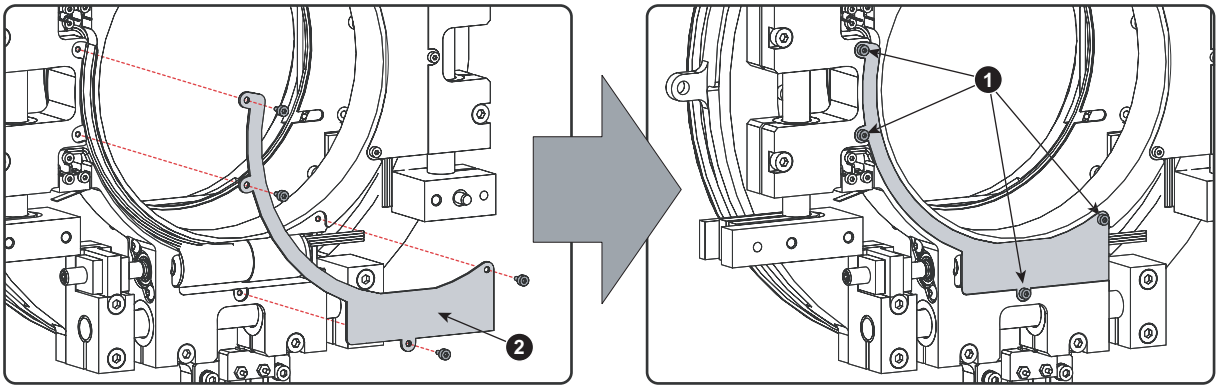


Image 15-51

To reinstall the motorized lens holder see installation procedure page 264.

15.15 Scheimpflug adjustment

What has to be done ?

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 happen 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 know as Sheimpflug’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).

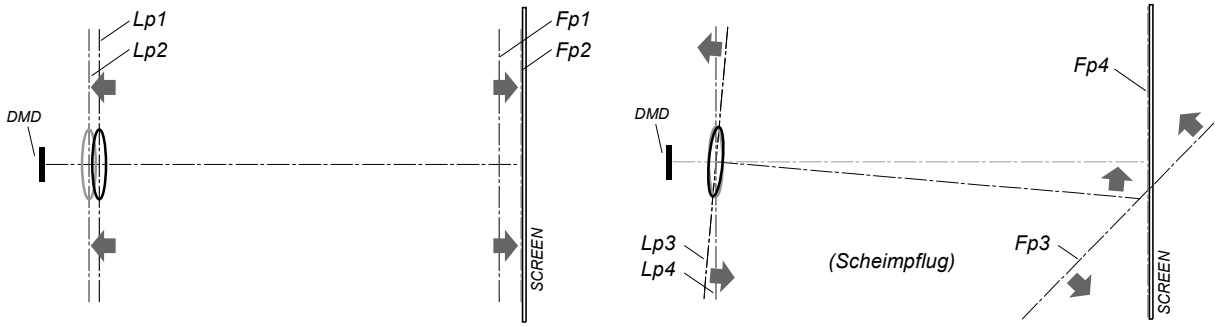


Image 15-52

The lens holder has three adjustment mechanisms. The first mechanism allows to shift the lens back and forward, the second mechanism allows to tilt the lens and the third mechanism allows to swing the lens. Note that all three adjustment mechanisms stand in relation with each other. So, a change to one of them will also effect the adjustment result of the two others. Therefore, all three adjustment points have to be alternately and repeatedly adjusted until the projected image is completely focused on the screen.

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.

Necessary tools

- 3 mm Allen wrench.
- 5,5 mm nut driver or flat screw driver.
- White paper sheet.

How to set up the projector for lens holder adjustment?

1. Place the projector upon a stable pedestal in its final location.
2. Remove the front cover, side cover and top cover of the projector.
3. Switch on the projector and project the internal green focus pattern.
4. Focus the projected image as sharp as possible upon the screen.

How to adjust the lens holder?

1. Loosen (not remove) the following lock screws of the lens holder adjustment mechanism using a 3 mm Allen wrench:
   a) The three screws of the lens holder front plate. Note that the three retaining springs of the lens holder plate are not strong enough to keep some heavy lenses into position while adjusting the lens holder. If this is the case you have to fasten these screws immediately after adjusting the focus shift plate.
   b) The two screws of the lens holder tilt mechanism.
   c) The two screws of the lens holder swing mechanism.

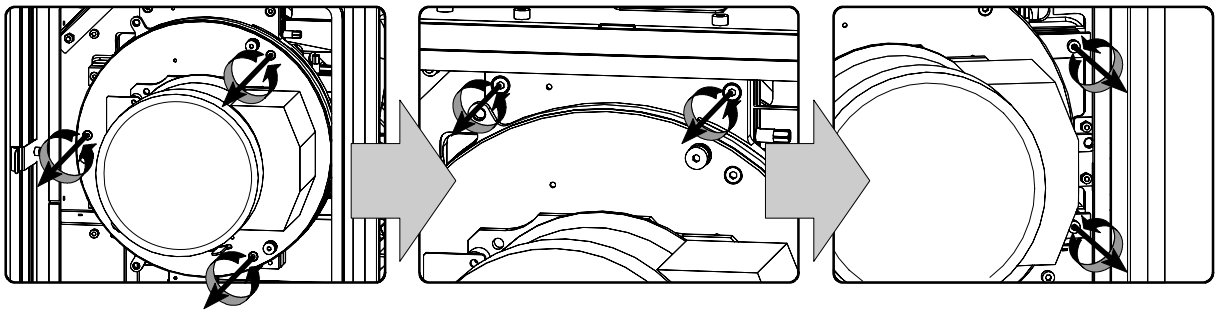


Image 15-53

2. Rotate the focus shift plate of the lens holder until the centre (F) of the projected pattern is most sharp on the screen.
   Tip: *Use a white paper to search for the "sharp focus plane". The sharp focus plane is located behind the screen in case you can't focus the projected pattern on the paper somewhere between the screen and the lens. Knowing that will help you to determine in which direction you have to rotate the focus shift plate. Rotate the plate counterclockwise in case you can't find the sharp focus plane somewhere between screen and lens.*

   Tip: *Immediately fasten the three screws of the lens holder front plate in case of using a projection lens which is to heavy for the three retaining springs of the lens holder plate.*

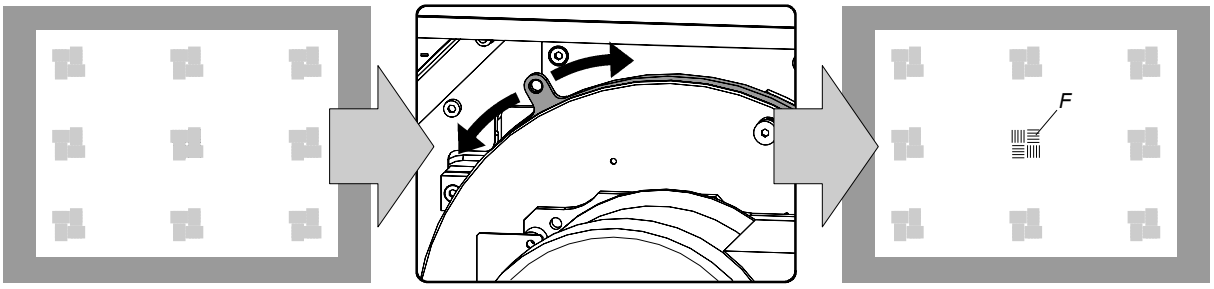


Image 15-54

3. Adjust the screw (bit by bit) of the lens holder swing mechanism until the mid left and mid right of the projected pattern is most sharp on the screen. Use a 5,5 mm nut driver or a flat screw driver.
   Tip: *Use a white paper to search for the "sharp focus plane" at the left or right side of the projected pattern. Turn the adjustment screw a bit and check if the sharp focus plane has come closer to the screen. If not, turn the adjustment screw in the opposite direction and check again.*

   Note: *A simultaneous readjustment of the focus shift plate will be necessary to get the mid left and mid right of the projected pattern equally focused as the centre.*

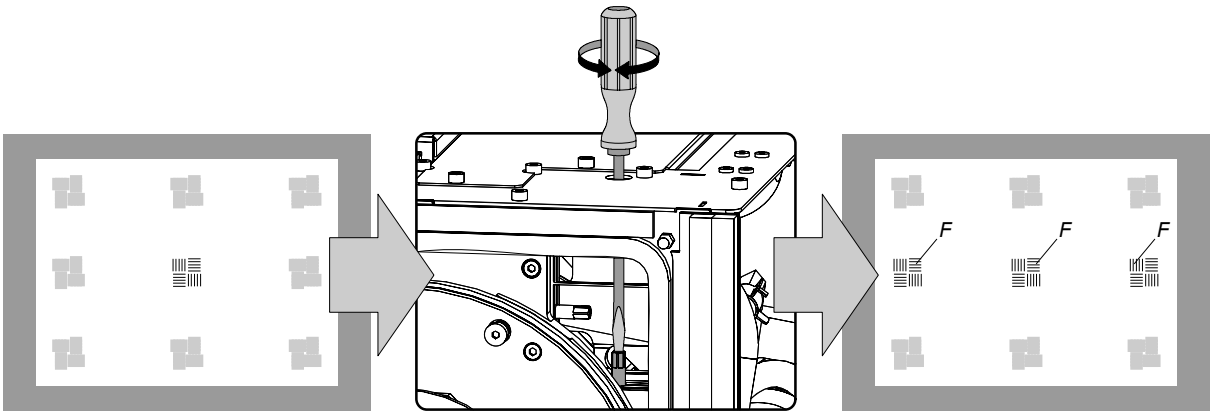


Image 15-55

4. Adjust the screw of the lens holder tilt mechanism until the mid top and mid bottom of the projected pattern is most sharp on the screen. Use a 5,5 mm nut driver or a flat screw driver.
   Tip: *Use a white paper to search for the "sharp focus plane" at the top or bottom side of the projected pattern. Turn the adjustment screw a bit and check if the sharp focus plane has come closer to the screen. If not, turn the adjustment screw in the opposite direction and check again.*

   Note: *A simultaneous readjustment of the focus shift plate will be necessary to get the mid top and mid bottom of the projected pattern equally focused as the centre.*

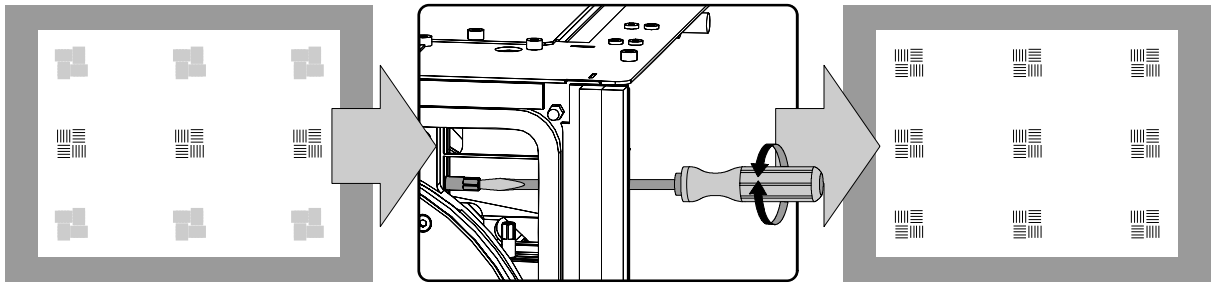


Image 15-56

5. Repeat from step 2 until the projected focus pattern is as sharp as possible in the centre, left, right, top and bottom of the screen.
6. Optimize the focus of the projected image as follows:
   a) Place the zoom lens in TELE position (smallest projected image) and adjust the focus using the lens focus barrel or motorized focus control.
   b) Place the zoom lens in WIDE position (largest projected image) and adjust the focus using the focus shift plate of the lens holder.
   c) Repeat step “a” and “b” until the projected image is as sharp as possible.
7. Fasten all lock screws of the lens holder adjustment mechanism.

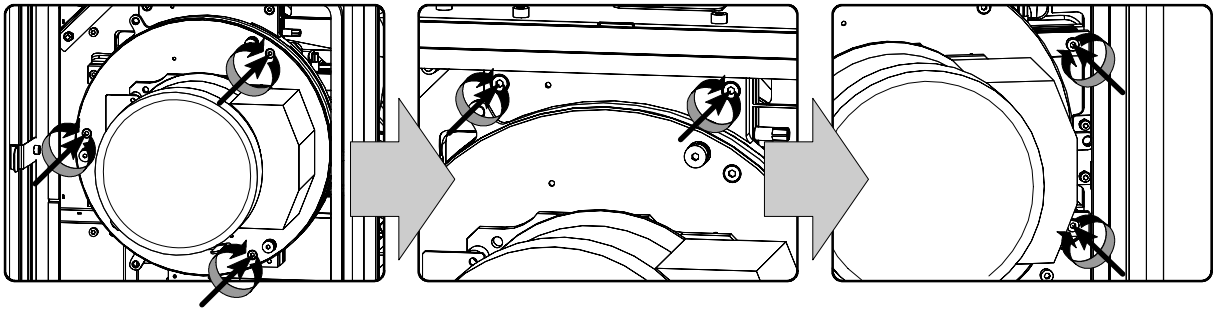


Image 15-57

8. Reinstall the top cover, the side cover and the front cover of the projector.

16. INPUT & COMMUNICATION UNIT

About this chapter

This chapter describes how to replace the complete Input & Communication unit or one of its components.

Overview

- Introduction
- Local Keypad of the DP-2000/DP-1500 projector
- Communication ports of the DP-2000/DP-1500 projector
- About General Purpose Inputs & Outputs (GPIO)
- Source input ports of the DP-2000/DP-1500 projector
- Removal of the Input & Communication unit
- Installation of the Input & Communication unit
- Authorization to clear security warning on DP-1200/DP-1500/DP-2000
- Replacing a board of the Input & Communication unit
- Replacement of the Button module
- Replacement of the Local Keypad
- Replacement of the Signal Backplane
- Replacement of the Status Light

16.1 Introduction

Input & Communication unit

The Input & Communication unit is a closed metal box which can easily be removed, as a drawer, from the projector chassis. The input/output ports are integrated in the Signal Backplane which is located at the bottom of the unit. Next to the input and communication boards this unit also contains the TI boards (Interface and Processor) and the Barco Cinema Controller board. These boards are directly plugged in on the Signal Backplane with board to board connectors.

The front panel of the Input & Communication unit is equipped with a Local Keypad. The socket of the security key (Dallas button) is located at the right side of the Local Keypad.

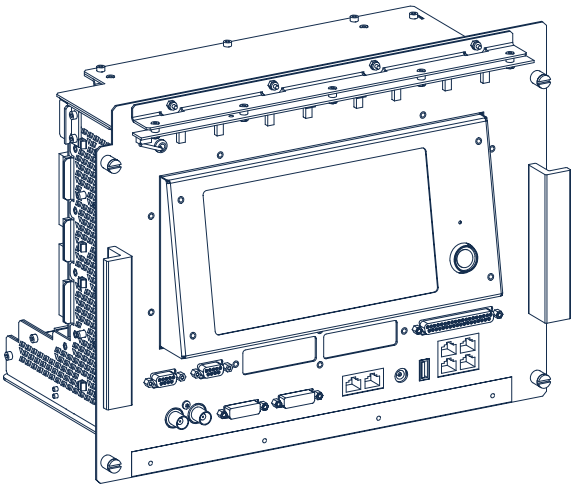


Image 16-1

Parts location of the Input & Communication unit

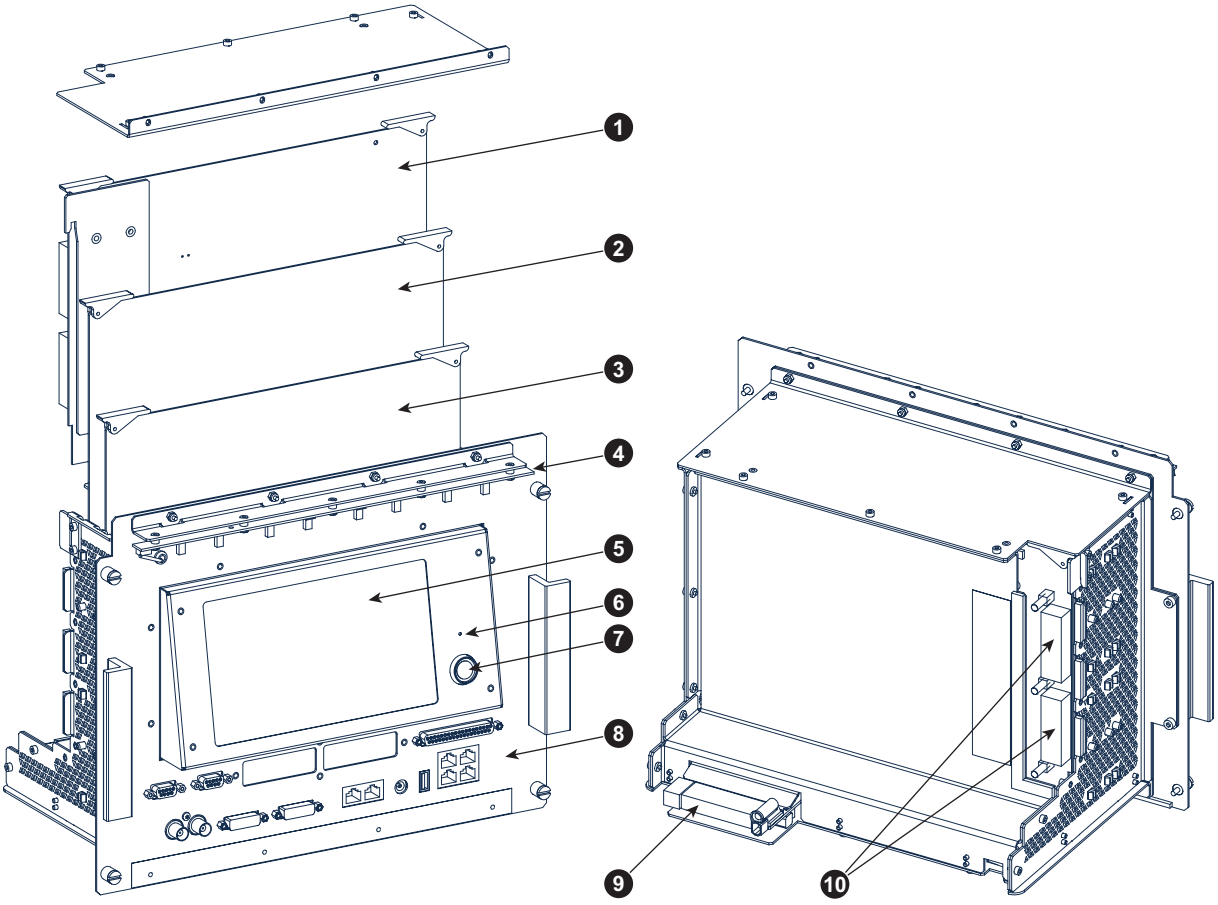


Image 16-2
1 Barco Cinema Controller board.
2 TI Interface Board.
2 TI Processor Board.
3 Backlight.
5 Local Keypad.

6 TI reset button.
7 Security key socket (Dallas key).
8 Input and communication sockets (RS232, SMPTE, DVI, Ethernet, GPIO, etc.)
9 Power socket of the Signal Backplane.
10 Barco Cinema Controller board to board connectors to the Formatting Interface Board.

TI boards reset button

There is a small hole in the front panel above the security socket (Dallas button). Behind this hole a small reset button is located which can be used by a technician to reset the TI boards (Interface & Processor). Activating the reset button can be useful if:

- the projector doesn't responds upon any command (not serial or Ethernet).
- a TI board is not responding or there is a startup problem or the projector IP address is recently changed.

The difference with the "Reboot projector" button on the Communicator Touch Panel is that the TI reset button only reset the TI system. So, the lamp remains on and the image remains projected while the TI boards are resetting. Futhermore, the TI reset button is a hardware reset while the reset via the Communicator Touch Panel is a software reset which require communication.

Note that failures of the TI boards are logged in the projector log files. But in most cases of a TI board failure the projector will suffer with communication problems as well which disable the reading of the log files until the projector is rebooted.

Functionality TI Interface board

- Stores all projector files (factory and site specific) on 64Mb Flash ROM Chip.
- Handles all Ethernet and serial communication internally to TI.
- Handles communication to content server and cinelink encryption (key exchanges, certificate exchanges).
- Stored and generates test patterns (uncorrected test patterns are generated on EFIB.
- Handles electronic masking (overlay).
- Handles all GPIO control.
- Handles advanced image settings/image orientation.
- Handles Input selection for DVI/SMPTE 292 and bit rate/packing rate (limitation of 12 bit until EFIB then 16 bit).
- Passes 3D sync from the Formatting Interface Board to GPO for external sync of 3D systems (realD, etc).
- Handles error reporting and messages.
- Handles logging of TI log files and security logging.
- Handles monitoring of security access intrusion.
- Handles communication of firmware updates to other TI boards.
- Handles reporting of firmware version to the Barco Communicator.
- Handles control subtitling and metadata.
- Internal TI clock is stored here.
- Handles TI SNMP functions.
- Certificate is stored here.
- Handles management of security keys.

Handling a secured TI Interface board

To protect the decrypting key on TI Interface board the TI Interface board is enclosed with a security kit. This security kit (black housing around the TI Interface board) is very sensible. For that it is important to handle the secured TI Interface board at all times.

1. Do not make scratches upon the surface of the security kit which is mounted around the TI Interface board. A small scratch will permanently disable the TI Interface board. Caution must be applied during installation.
2. The security kit is not too sensitive to rubbing. Rubbing with a cloth is OK, but rubbing with 'sandpaper' would be bad.
3. Do not apply excessive pressure at the corners of the (bottom) clamps or the corners of the enclosures. If sufficient enough a tamper event will occur.
4. Applying a label is no problem. Use labels which are pre-printed or use a felt pen only to mark on the label. Do not use a ball point pen.
5. Do not put a label on the security kit that you intend to remove.
6. Never try to dismantle the security kit. Consult Barco in case of damage.

Functionality TI Processor board

- Handles all aspects of resizing.
- Handles all aspects of cinema processing and pass through of standard processing (cannot resize in standard) (in standard processing the color processor is bypassed).

Functionality Barco Cinema Controller board

- Stores Dallas key on projector (manages Barco security keys).
- Controls lamp and LPS.
- Contains main Barco Linux processor (but integrated on the board).
- Contains 8 port Ethernet switch.
- Connects all TI boards in the Input & Communication unit to the Formatting Interface Board.
- All key assigns to macros stored here.
- Controls all communication to Barco boards.
- Firmware updates travel through this board prior to final Barco board destination → Firmware updates are actually done from this board. (update, is loaded to this board then upgrade is performed to other boards from here).
- Controls and communicates with Local Keypad and Button module.
- Stores serial number (main).
- Communicates to the Lamp Info Module and all other Barco modules.

Functionality Signal Backplane

- Provides connection from HDCP upgrade to TI Interface Board then to TI Color Processor Board and then to the Barco Cinema Controller.
- Provides connection to RS-232 and GPIO connectors via ribbon cables.
- Signal backplane physically has the SDI, DVI, Ethernet ports, USB connector, DC power connector attached to it.
- Has connector that transfers power from the Power Backplane to the boards in the Input & Communication unit.
- Has tamper switch for the Input & Communication unit.

16.2 Local Keypad of the DP-2000/DP-1500 projector

Identification of the keys

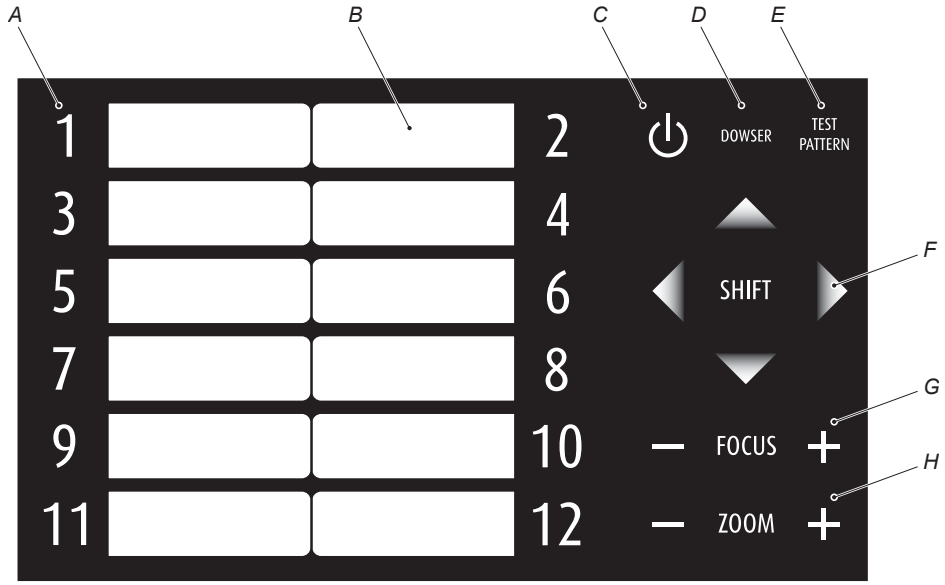


Image 16-3
A Numeric keyboard.
B Marker area for macro name.
C Standby/Operation switch.
D Dowser Open/Close switch.
E Test Pattern toggle switch.
F Lens holder shift left/right & up/down keys.
G Lens focus keys.
H Lens zoom keys.

Numeric keys: All the numeric keys (A) of the local keypad have a blue backlight during normal operation. Only when the authorization process is activated with the security key, then the backlight color of the numeric keys 1 to 10 changes to orange. Each key can be linked to a macro which allows you to setup the projector to your requirements with one push on a button. Note that each numeric key has a marker area (B) where you can write down the name of the macro.

Standby key: Standby key (C) switches ON or OFF the lamp and lamp electronics. The lamp cooling fans remain active for about 5 minutes. The speed of the other fans is reduced. The backlight color of the standby key remains red in standby mode and changes to green in operation mode.

Dowser key: The dowser key (D) opens or closes the dowser. The backlight color of the dowser key is green when the dowser is open and red when the dowser is closed.

Pattern key: The pattern key (E) gives you direct access key to the internal test patterns of the projector.

Shift keys: The shift keys (F) allows you to shift the lens up/down or left/right. This functionality is only available in case of a motorized lens shift

Focus keys: The focus keys (G) allows you to focus the projected image on the screen. This functionality is only available in case of a motorized lens and lens holder.

Zoom keys: The zoom keys (H) allows you to zoom in or out the projected image on the screen. This functionality is only available in case of a motorized lens and lens holder.

16.3 Communication ports of the DP-2000/DP-1500 projector

Location of the communication ports

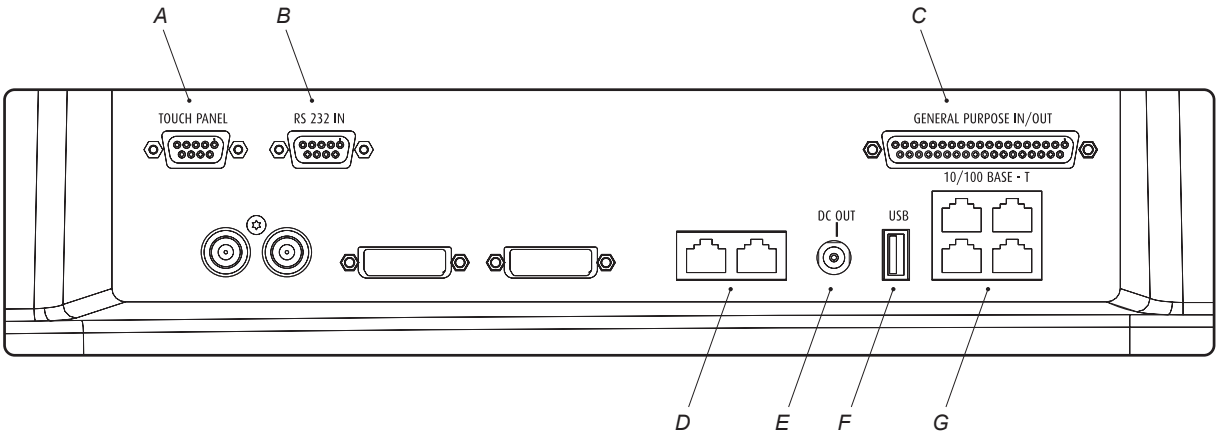


Image 16-4
A Communication port for the touch panel.
B RS232 input port.
C General purpose input/output port (GPIO).
D (Future expansion).
E +12 VDC output port (maximum 2 ampere).
F Master USB port type A.
G Four Ethernet ports RJ45.

TOUCH PANEL

This female DB-9 connector allows you to use a standard serial cable up to 10 meter to connect the touch panel interface with the projector. Note that the RS232 protocol is used on this connection.

RS232 IN

This female DP-9 connector is only used for service purposes. Do not use this connector to communicate with the projector.

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.

GENERAL PURPOSE IN/OUT

This 37 pins connector can be used to send or receive trigger signals from other devices. These input/output pins can be programmed by macros created on the Communicator touch panel. See user's guide of the Touch panel, section Macro editor, for more information about this functionality. Note that the General Purpose Inputs accept 24 volt maximum.

DC OUT

This fuse protected mono jack socket provides a +12 VDC voltage and maximum 1,5 ampere. The DC OUT socket has ground (GND) in the middle and +12V on external pin. This is opposite of the Barco Touch Panel Communicator power connection. So, a cross cable is needed when connecting the DC OUT directly to the Touch Panel.

USB port

The communication interface is equipped with a master USB port, type "A" connector (F). This USB port is for future expansion.

10/100 BASE - T

The DP-2000 projector can be connected to a LAN (local area network) using one of the Ethernet ports (G) on the communication interface. Once connected to the LAN, users are capable of accessing 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 in case there is a DHCP server or the user can insert the correct IP-address of the projector 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 permits to detect potential errors and consequently improve the time to servicing.

As there is a need to daisy chain projectors when they are in Ethernet network, an Ethernet switch is build 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 avoid.

The switch used is a stand alone 10/100Mbit Ethernet switch. This assures no influence on the network speed. Whenever a slow (10Mbit) device is connected the speed between the 100Mbit devices remains 100Mbit.

16.4 About General Purpose Inputs & Outputs (GPIO)

General Purpose inputs

Eight (8) opto-isolated general purpose inputs are available. These inputs are used to trigger the execution of macro files. For more explanation about the association of a macro to a GPI, consult the user guide of the Communicator touch panel.

Input voltage

The inputs can be directly driven from a TTL or CMOS output.

- Minimum voltage : V_{min} = 3,3 V
- Maximum voltage : V_{max} = 24 V

External power supply

When interfacing with contact closure outputs, an external power supply needs to be provided. Depending upon the configuration a suitable pull-up resistor needs to be added as well.

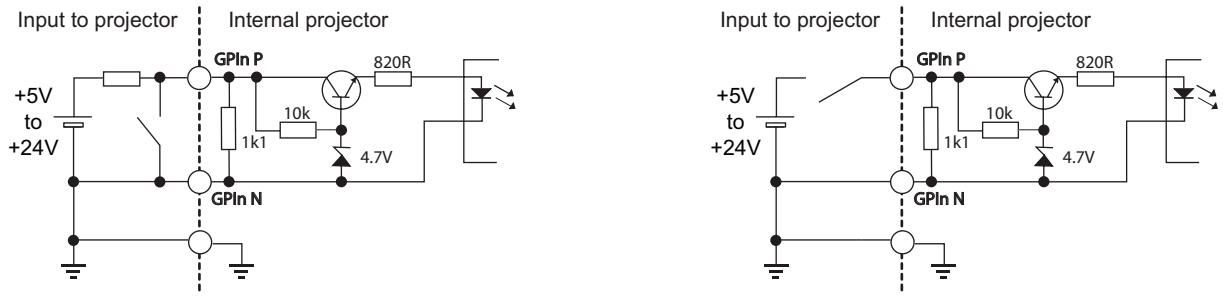


Image 16-5
Left diagram: with pull-up resistor. Right diagram: without pull-up resistor.

Cables

When long cable connections are required the use of shielded cables with twisted pairs is recommended. One twisted pair is to be assigned to each GP Input pair.

How to make the connection

When the power supply used to provide the DC voltage is isolated from ground (for example in the case of an AC adapter) it is recommended that the minus pole of that power supply is connected to ground (or to the projector chassis). This will avoid high common mode voltages at the projector GP Inputs. If that same power supply is used for other parts of the system, take care not to create ground loops. In any case when shielded cables are used that shield should be connected to the projector chassis.

General Purpose outputs

Eight (8) opto-isolated outputs are available, where seven are general purpose and one for a fixed purpose. The seven general purpose outputs can be controlled via software while the fixed output provides the status of the system. When this output is closed (current is flowing), then the system is OK.

About an output

The output can generate a falling edge, rising edge, toggle or continuous toggle.

- **Generate Falling Edge** – generate a falling edge on the external GPO port if the present state of the output is high. If the present state of the external GPO is low, no edge will be generated.
- **Generate Rising Edge** – generate a rising edge on the external GPO port if the present state of the output is low. If the present state of the external GPO is high, no edge will be generated.
- **Generate Toggle** – generate a toggle on the external GPO port. If the present state of the output is low, a rising edge will be generated, followed by a falling edge. If the present state of the output is high, a falling edge will be generated, followed by a rising edge. The rate of toggle will be the vertical sync rate (edge transition at each vsync).
- **Generate Continuous Toggle** - This command will generate a continuous toggle of the external GPO port. This toggle will continue until a *Generate Falling Edge*, *Generate Rising Edge*, or *Generate Toggle* command is received. The rate of toggle will be the vertical sync rate (edge transition at each vsync).

Output transistor

- Maximum output driving voltage : V_{max} = 70 V
- Maximum current : I_{max} = 30 mA
- Maximum power dissipation : 120 mW

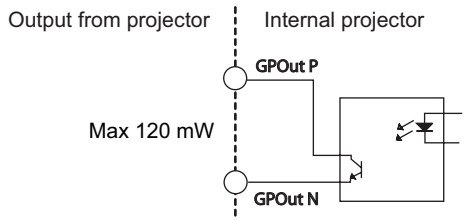

Output from projector
Internal projector
GPOut P
Max 120 mW
GPOut N

Image 16-6

16.5 Source input ports of the DP-2000/DP-1500 projector

Location of the source input ports

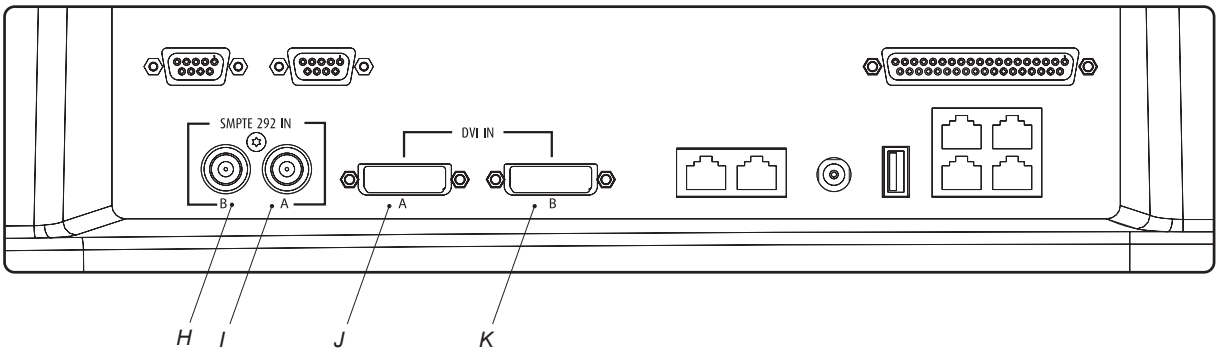


Image 16-7
H SMPTE 292 input port A.
I SMPTE 292 input port B.
J DVI-D input port A.
K DVI-D input port B.

SMPTE

Society of Motion Picture and Television Engineers - A global organization, based in the United States, that sets standards for baseband visual communications. This includes film as well as video standards.

DVI

Digital Visual Interface is a display interface developed in response to the proliferation of digital flat panel displays.

The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video. This standard uses TMDS (Transition Minimized Differential Signal) from Silicon Image and DDC (Display Data Channel) from VESA (Video Electronics Standards Association).

DVI can be single or dual link.

16.6 Removal of the Input & Communication unit

Removing and reinstalling the Input & Communication unit will result in an authorization request upon startup.

Necessary tools

7 mm flat screw driver.

How to remove the Input & Communication unit from the projector ?

1. Switch off the projector
2. Ensure that no cables are connected to one of the ports of the Input & Communication unit.
3. Remove the input cover.
4. Release the four captive screws in the corners of the Input and Communication unit as illustrated.

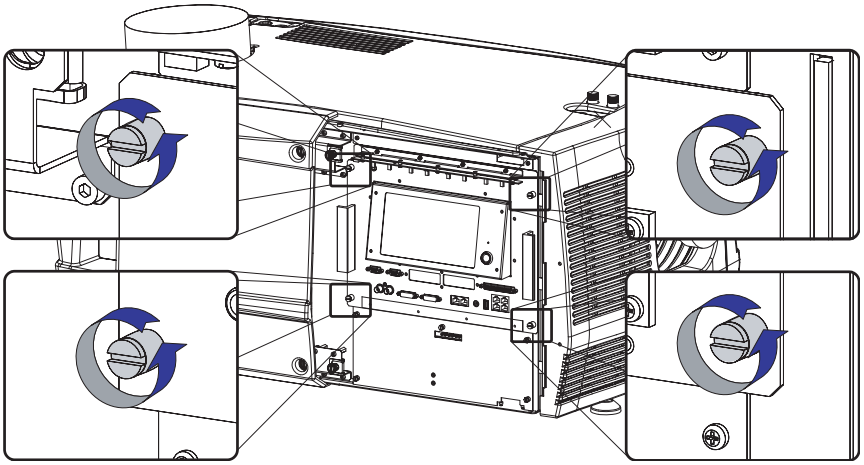


Image 16-8

5. Pull the Input & Communication unit out of its compartment, using the side handles provided.

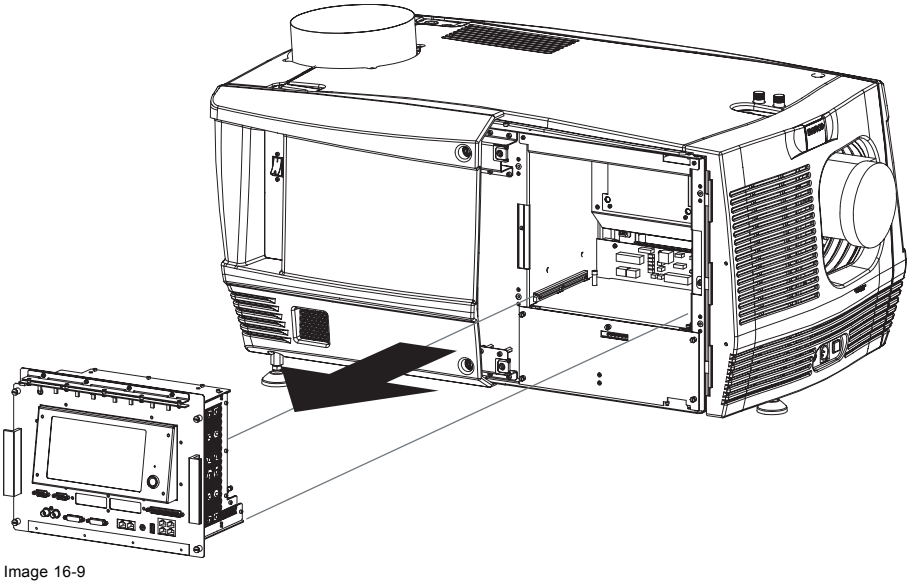


Image 16-9

16.7 Installation of the Input & Communication unit

Removing and reinstalling the Input & Communication unit will result in an authorization request upon startup.

Necessary tools

7 mm flat screw driver.

How to install the Input & Communication unit of the projector ?

1. Ensure that the projector is switched off.
2. Remove the input cover, if not removed yet.
3. Hold the Input & Communication unit by its handles and gently slide the unit into the guides at the bottom of the Input & Communication compartment.
   Caution: *It is important to be careful when plugging the Input & Communication unit into the socket (C) of the Formatting Interface Board. Always slide the Input & Communication unit at right angles into position. Neglecting this may result in damage to the pins of the Formatting Interface Board or Input & Communication unit.*

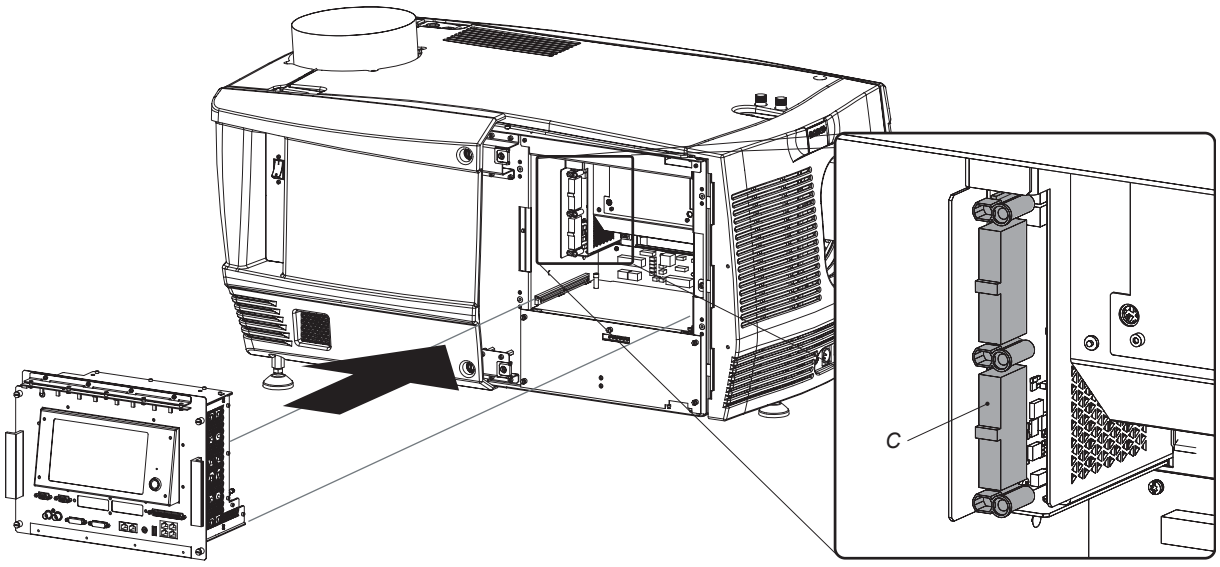


Image 16-10

4. Push the Input & Communication unit forward until you feel the connectors of the unit fit in their sockets. The back of the front plate of the unit must touch the chassis of the projector.
5. Secure the Input & Communication unit by fastening the four captive screws in the corners of the unit.

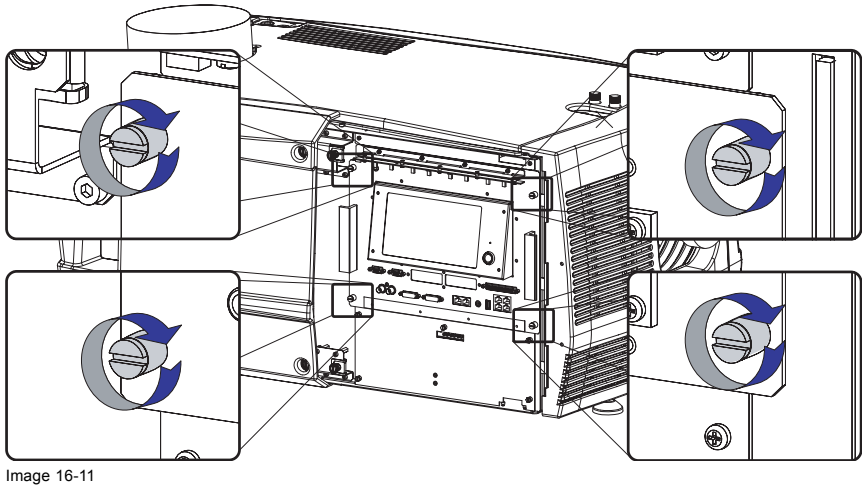


Image 16-11

When changing the Input & Communication Unit, a code must be entered before you can continue using your projector. This code contains the serial number of your projector and the different keys necessary for your projector. This unique code can only be generated by Barco. Therefor, copy the UN code an send it to Barco together with the installed keys. See procedure “Request for new serial number and corresponding keys” in the user guide of the Communicator software.

16.8 Authorization to clear security warning on DP-1200/DP-1500/DP-2000

When is an authorization required to clear the security warning?

If the Input & Communication unit has been removed or the sealed compartment has been opened an authorization will be required to clear the security warning.

Necessary tools

- Security key (Dallas iButton®).
- Authorization pin code.

Authorization procedure to clear security warning

1. Ensure that the Input & Communication unit is properly installed.
2. Start up the projector (standby mode).
3. Initiate authorization by holding the security key in the security socket D..

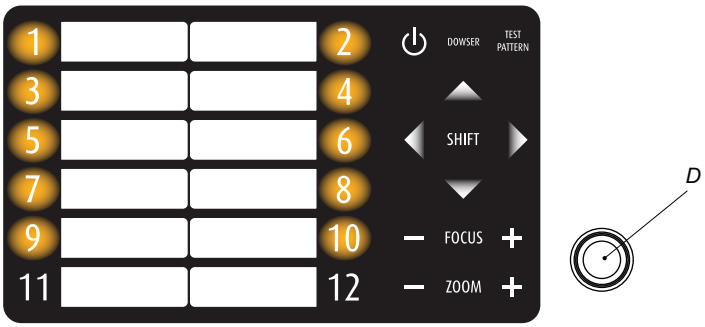


Image 16-12

The color of the backlight of the numeric keys 1 to 10 of the local keypad changes from blue to yellow.

4. Enter pin code within 5 seconds. Maximum five (5) attempts permitted.
   - In case no keys are pressed, the color of the backlight of the numeric keys 1 to 10 changes back to blue.
   - In case of an **incorrect code** entry, the color of the backlight of the numeric keys 1 to 10 changes to **red** for 1 second and than back to blue.
   - In case of a **correct code** entry, the color of the backlight of the numeric keys 1 to 10 changes to **green** for 1 second and than back to blue.

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

16.9 Replacing a board of the Input & Communication unit

Before swapping the TI Interface Board, try to make a copy of the created macro files, so you can restore them later in the new TI Interface Board. See chapters “Cloning” and “Restoring” in the user guide of the Communicator software.

This procedures assumes that the Input & Communication unit is removed from the projector.

Necessary tools

- 5,5 mm nut driver or open-end wrench.
- 2,5 mm Allen wrench.

How to replace a board of one of the slots in the Input & Communication unit?

1. Remove the top cover of the Input & Communication interface. Use for that a 5,5 mm nut driver to release the four nuts (2) and a 2,5 mm Allen key to release the six hexagon socket head cap screws (1) as illustrated.

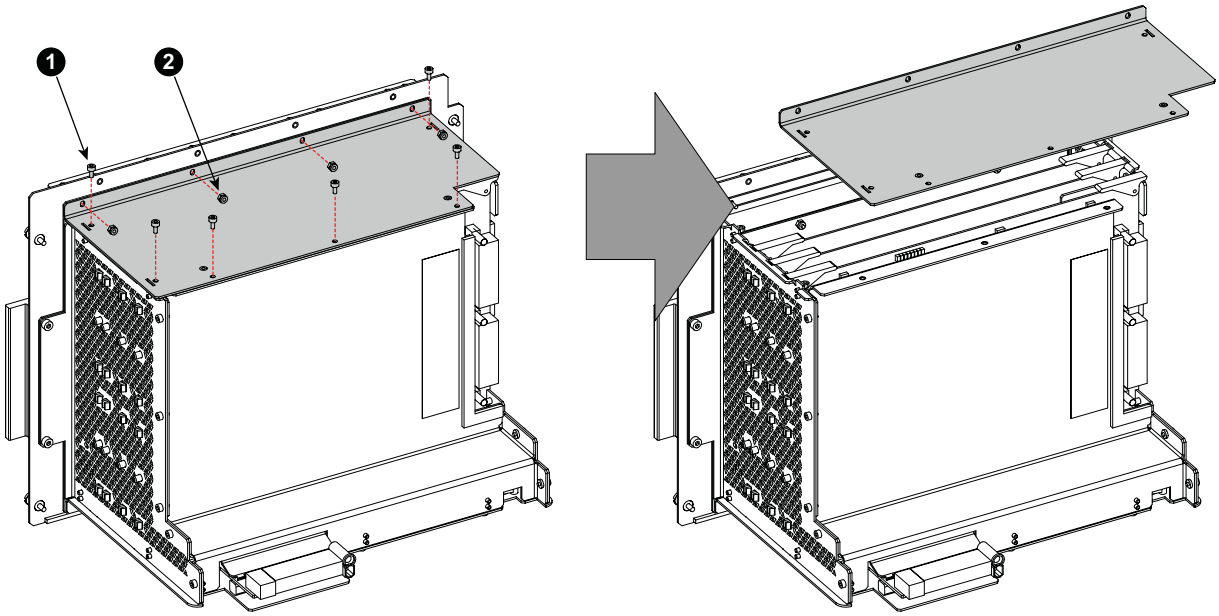


Image 16-13

2. Unlock and pull out the board you wan to replace. (TI interface board, TI processor board, Barco controller board or Expansion slot terminator board).
   Note: *To remove the Expansion slot terminator board you have to remove the TI interface board and the TI processor board first.*

   Caution: *Handle the TI Cinema Interface board which is enclosed with a security kit (black housing around the board) with care. Note that the security kit is very sensitive. A small scratch will permanently disable the TI Cinema Interface board. Never try to dismantle the security kit. Consult Barco in case of damage. The security kit is needed to protect the decrypting key.*

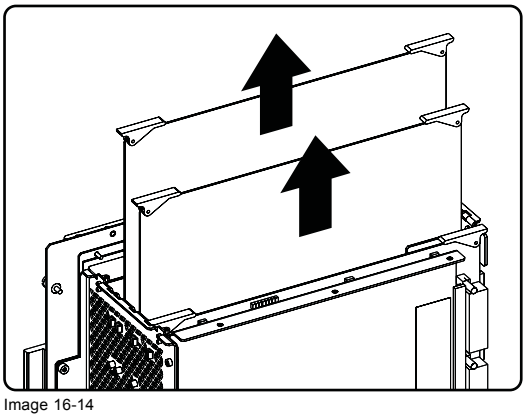


Image 16-14

3. To remove the Expansion slot terminator board (reference 1) you have to remove the TI interface board and the TI processor board first.

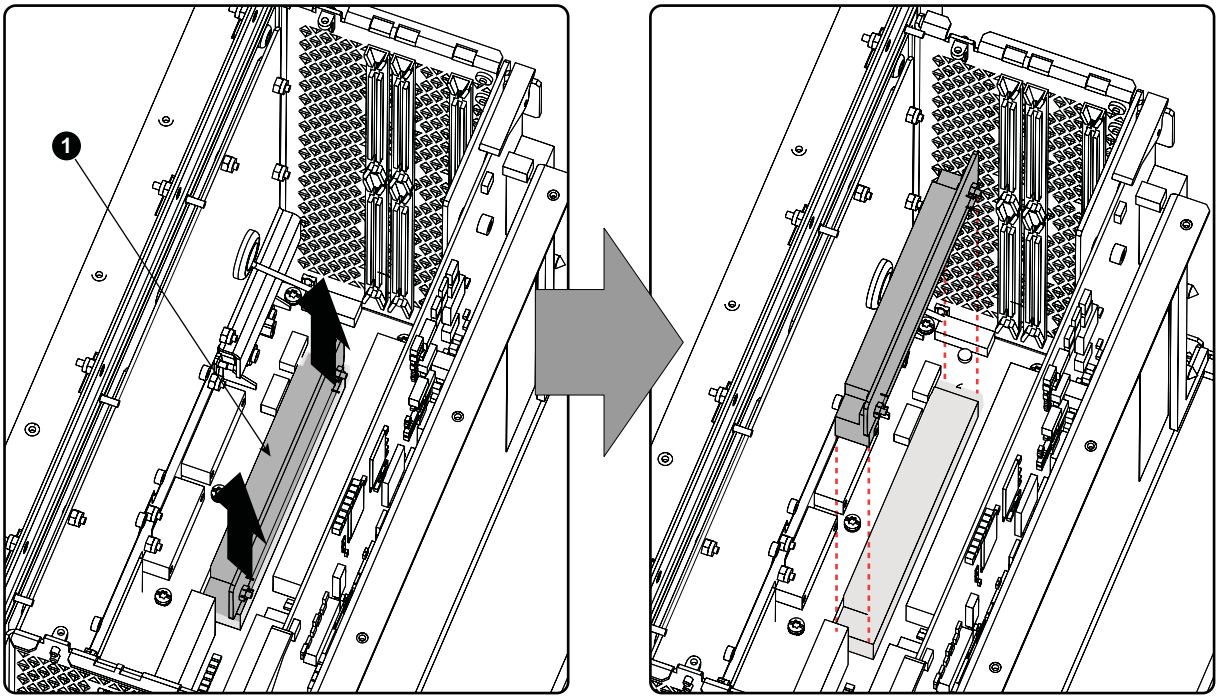


Image 16-15

4. Install the new board(s). Make sure that the handles of all boards are completely sunken in the card cage.

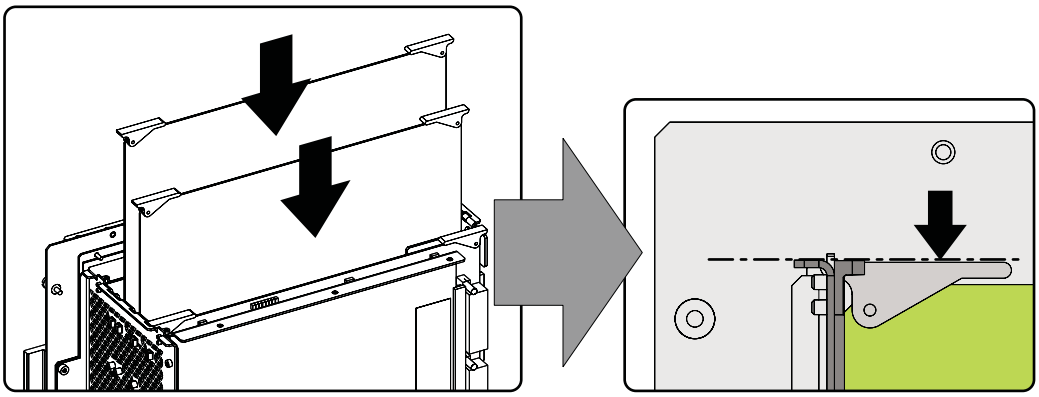


Image 16-16

5. Reinstall the top cover of the Input & Communication unit. Use for that a 5,5 mm nut driver to fasten the four nuts (2) and a 2,5 mm Allen key to fasten the six hexagon socket head cap screws (1) as illustrated.

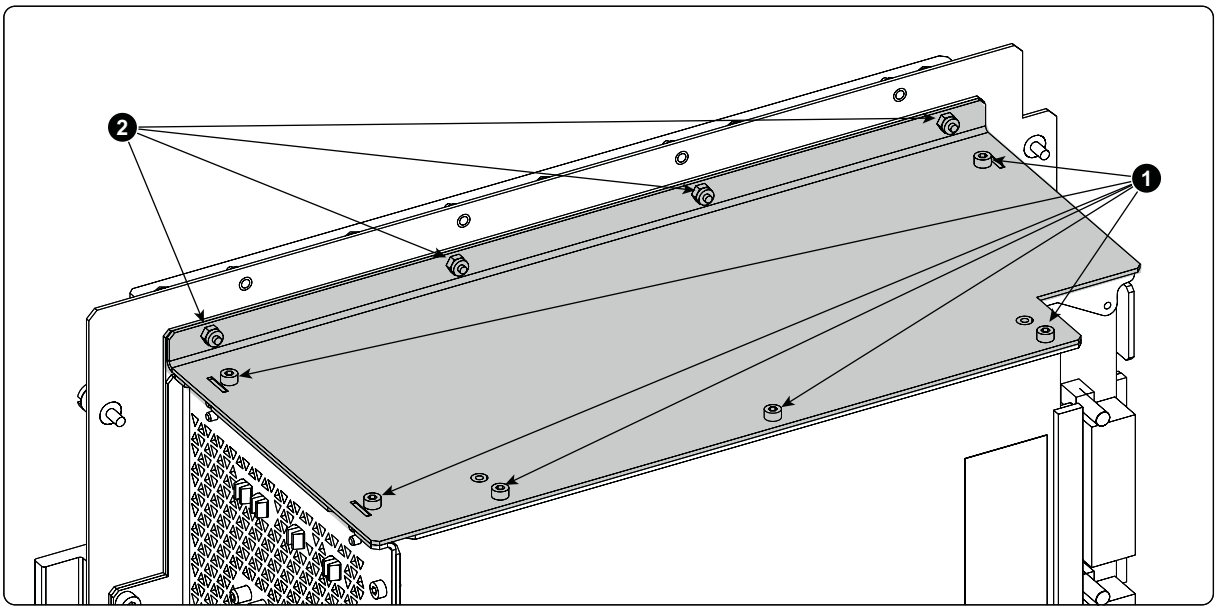


Image 16-17

6. Did you swap one of the TI boards?
   If yes, download the latest version of the **"TI software release**" from the secured Barco web site and update the TI firmware of all TI boards. See chapter "Updating TI Boards", page 309.

7. Did you swap the Barco Controller Board?
   If yes, request a new serial number from Barco and enter the new serial using the Communicator software. See procedure **"Request for new serial number and corresponding keys"** in the user guide of the Communicator software.

When replacing the Barco Controller Board, a code must be entered before you can continue using your projector. This code contains the serial number of your projector and the different keys necessary for your projector. This unique code can only be generated by Barco. Therefor, copy the UN code an send it to Barco together with the installed keys. See procedure "Request for new serial number and corresponding keys" in the user guide of the Communicator software.

16.10 Replacement of the Button module

To remove the Button module from the Input & Communication unit the Cinema Interface board, the Cinema Processor board and the Barco Controller has to be removed first. This procedure assumes that all boards which are plugged directly into the Signal Backplane at the bottom of the Input & Communication unit are removed.

Necessary tools

- 2,5 mm Allen wrench.
- 5 mm nut driver.
- 5,5 mm nut driver.
- T10 Torx driver.

How to replace the Button module from the Input & Communication unit?

1. Remove the rear cover from the Input & Communication unit. Use a 2,5 mm Allen wrench to remove the ten screws (reference 1) which fasten the rear cover plate as illustrated.

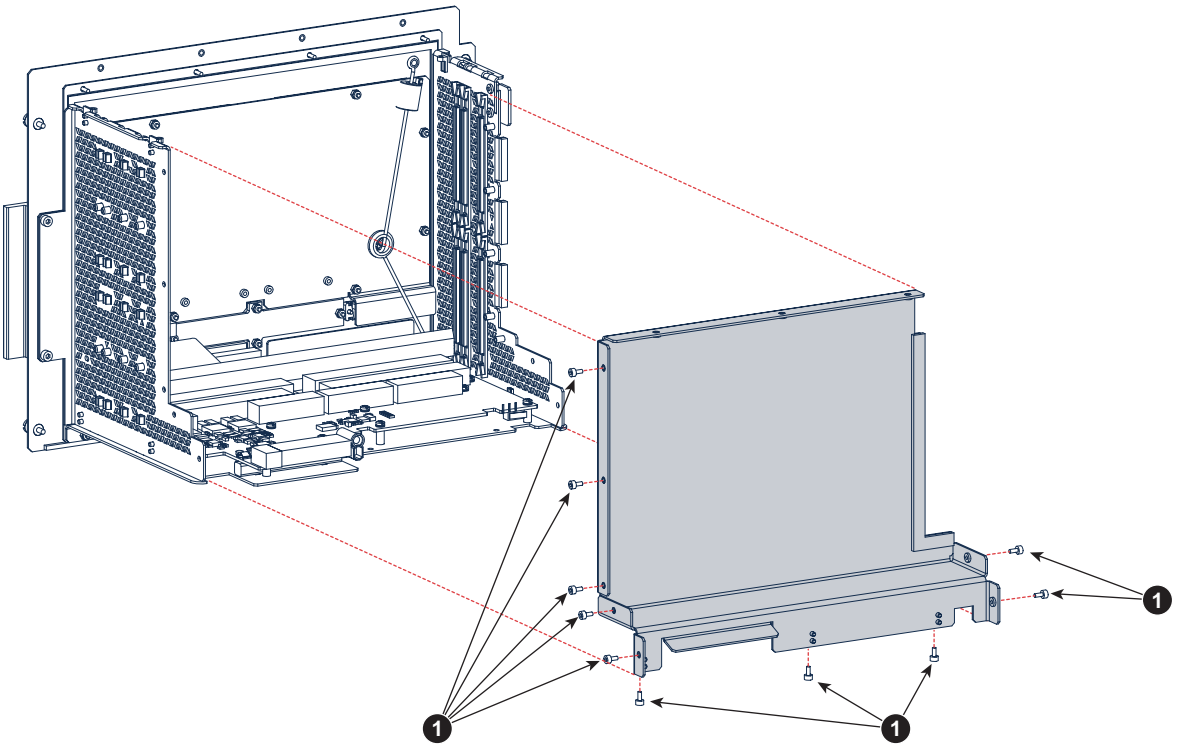


Image 16-18

2. Disconnect the wire unit (reference C) of the backlight at the front top of the Input & Communication unit. First pull out the rubber sealing (reference R) and then guide the wire unit through the hole of the front plate.

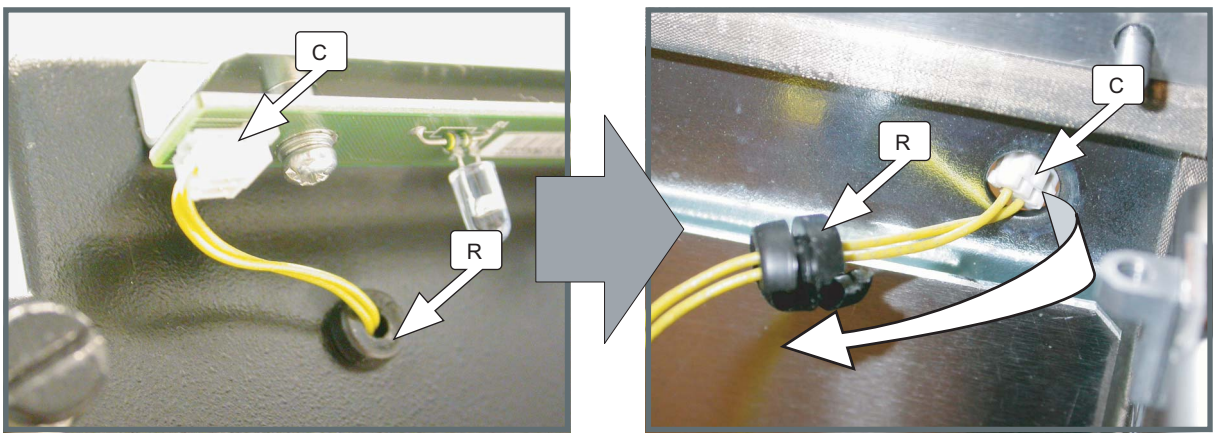


Image 16-19

3. Disconnect the wire unit (reference D) of the Button module from the Signal Backplane.

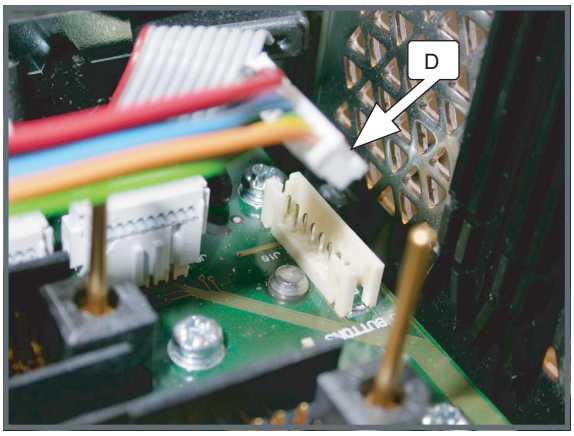


Image 16-20

4. Remove the two screws (reference 2) of the “General Purpose In/Out” (GPIO) connector at the front side of the Input & Communication unit. Use a 5 mm nut driver.

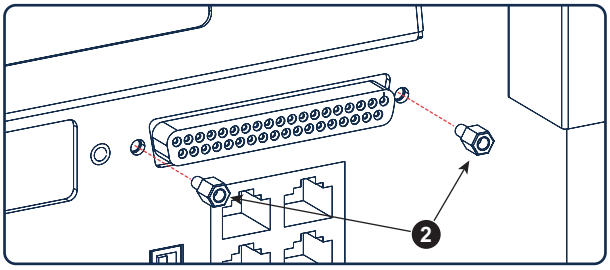


Image 16-21

5. Remove the GPIO board by unscrewing the two Torx screws (reference 3) as illustrated. Use a T10 Torx driver. Note that the GPIO board remains connected via its flat cable to the Signal Backplane of the Input & Communication unit.

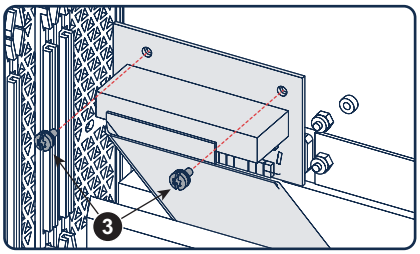


Image 16-22

6. Remove the cover plate of the Button module. Use a 5,5 mm nut driver to release the eight nuts (reference 4). As a result the Button module assemble (Local Keypad included) comes loose from the front panel of the Input & Communication unit.
   Caution: *Do not loose the spacers (reference 5) which are located between the Button module assembly and the front panel of the Input & Communication unit.*

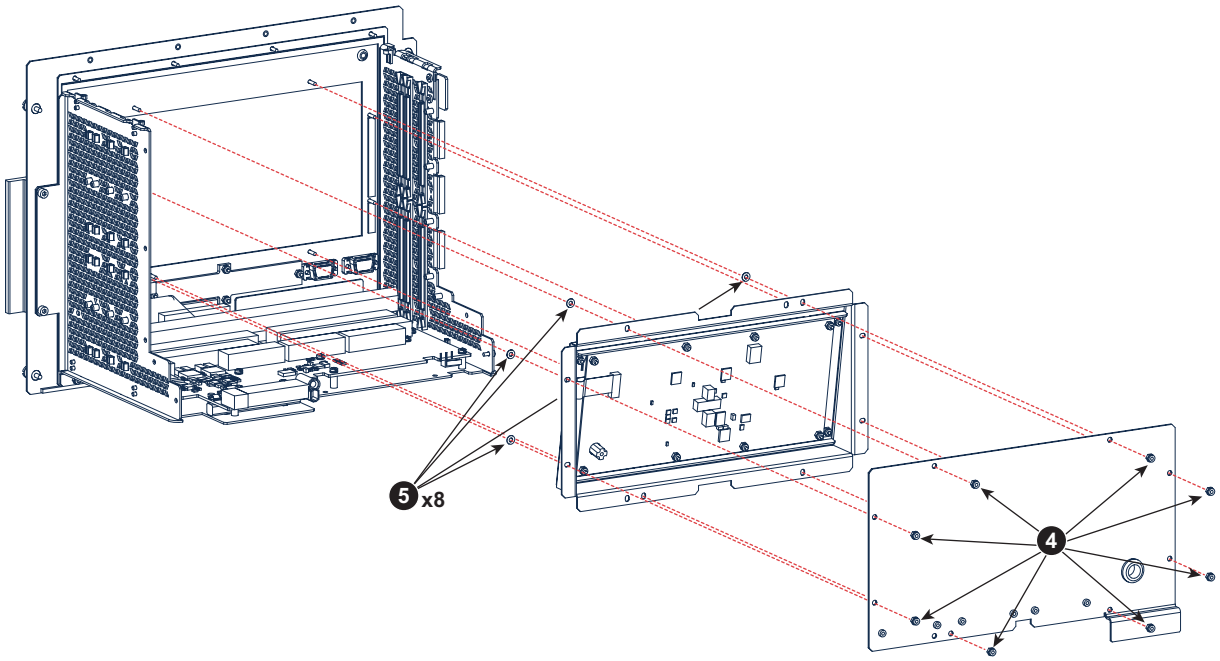


Image 16-23

7. Disconnect the two wire units (reference E & F) from the Button module.

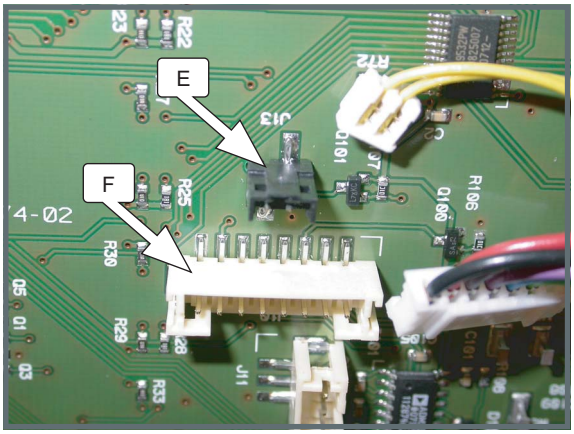


Image 16-24

8. Disconnect the flat cable of the Local Keypad. Pull out the lock at both sides of the socket prior to removing the flat cable.

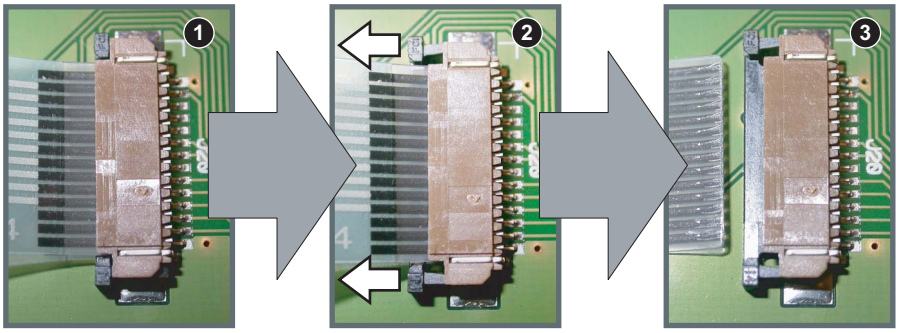


Image 16-25

9. Replace the Button module from the assembly. Use a 5,5 mm nut driver to release the 8 nuts (reference 6) which fasten the Button module.
   Caution: *Do not loose the thick spacers (reference 7) which are located underneath the Button module.*

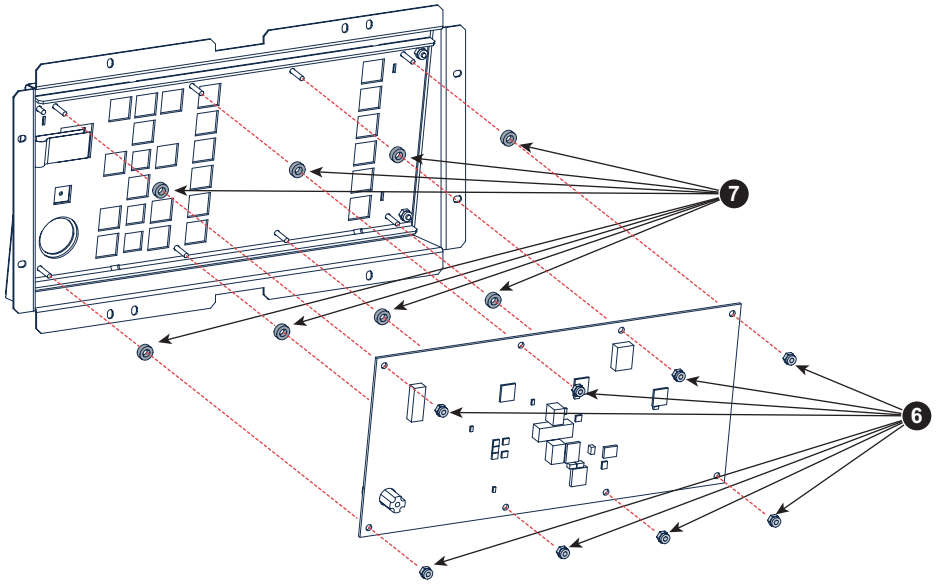


Image 16-26

10. Reconnect the flat cable of the Local Keypad. First unlock the socket (1), then insert the flat cable (2) and finally lock the socket (3).

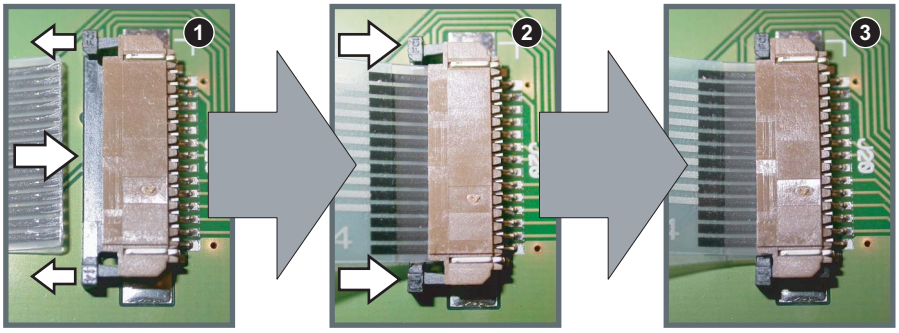


Image 16-27

11. Reconnect the two wire units (reference E & F) with the Button module.

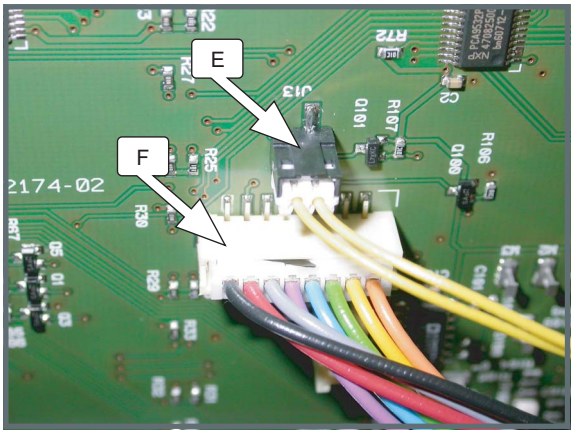


Image 16-28

12. Reinstall the Button module assembly and the Button module cover plate. Fasten the eight nuts (reference 4) with a 5,5 mm nut driver. Make sure that each fixation point is provided with a washer (reference 5) between the front panel and the Module assembly.

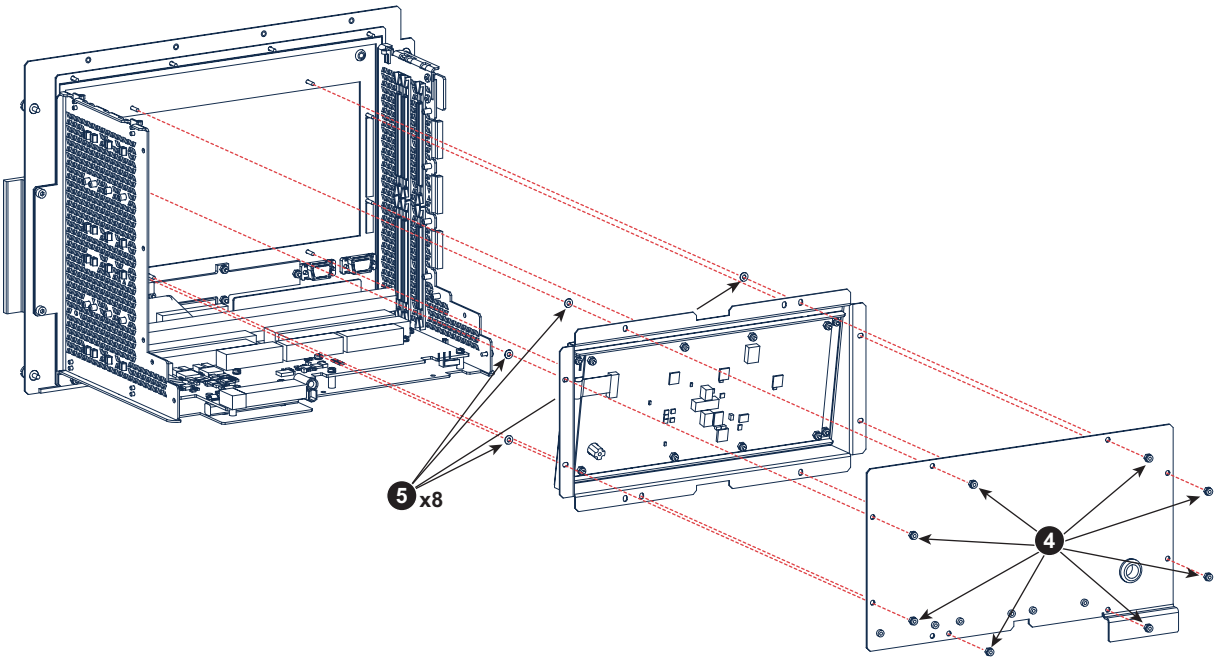


Image 16-29

13. Fasten the GPIO board with two Torx screws (reference 3). Use a T10 Torx driver.

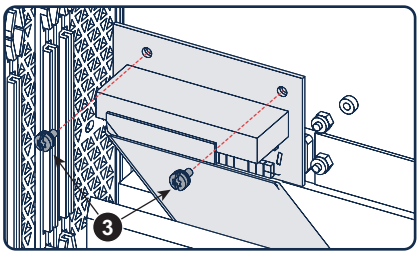


Image 16-30

14. Insert the two screws (reference 2) at the front side of the GPIO connector. Use a 5 mm nut driver.

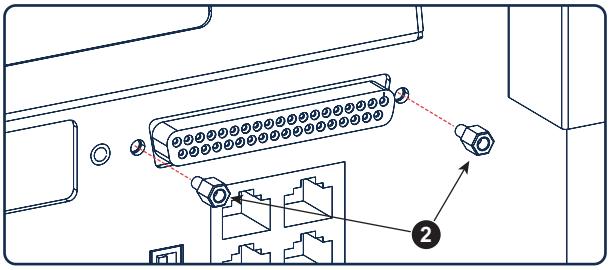


Image 16-31

15. Reconnect the wire unit (reference D) of the Button module with the Signal Backplane.

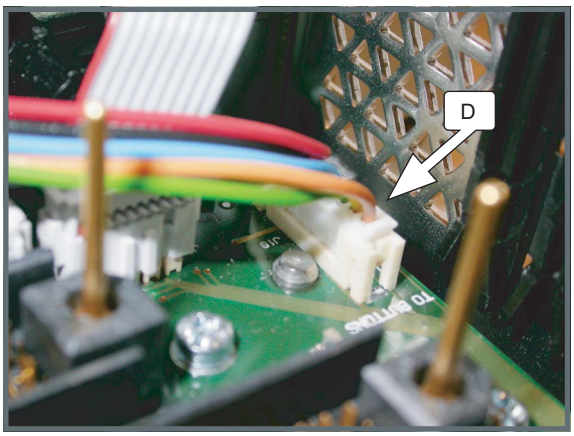


Image 16-32

16.Reconnect the wire unit (reference C) of the backlight and reinstall the rubber sealing (reference R).

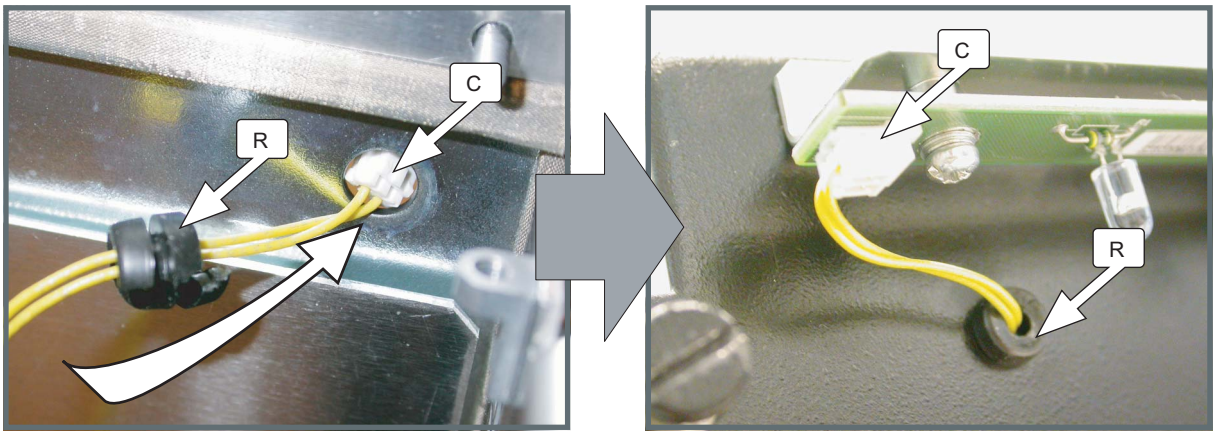


Image 16-33

17.Reinstall the rear cover from the Input & Communication unit. Use a 2,5 mm Allen wrench to fasten the ten screws.

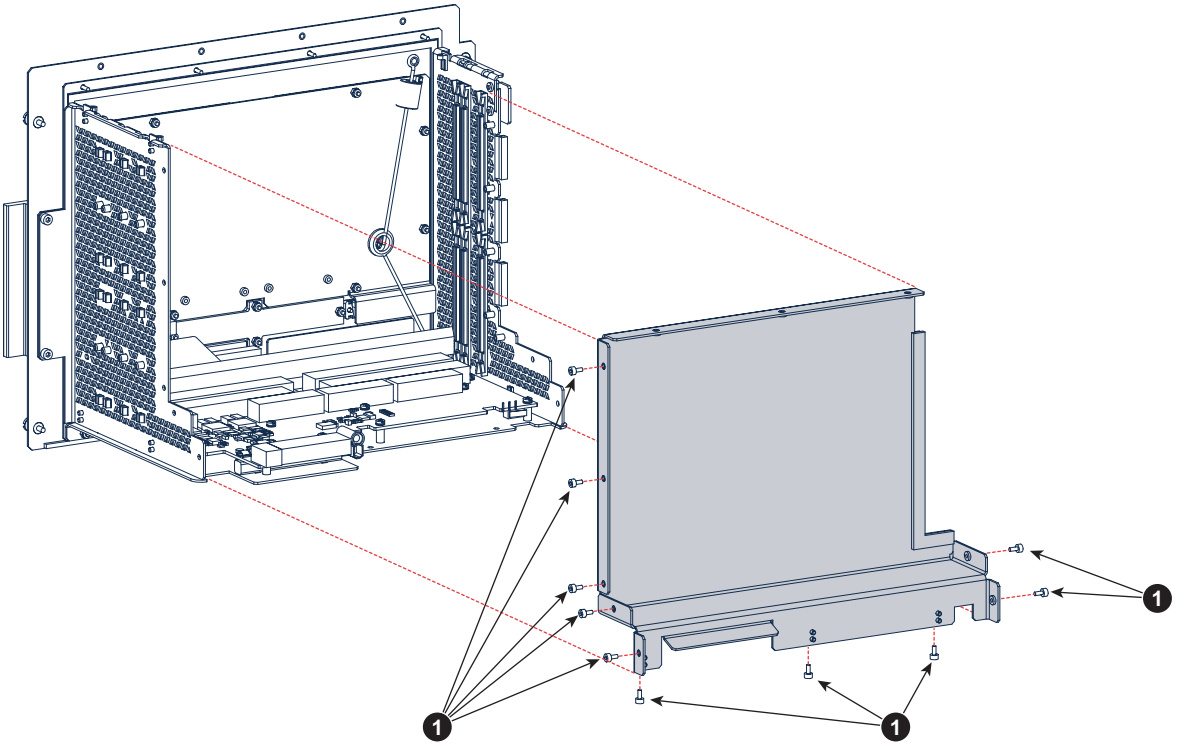


Image 16-34

16.11 Replacement of the Local Keypad

To replace the Local Keypad the Button assembly has to be removed from the Input & Communication unit. See procedure "Replacement of the Button module", page 296. This procedure assumes that the Button assembly is already removed from the Input & Communication unit.

Necessary tools

- 5,5 mm nut driver.
- T10 Torx driver.

How to replace the Local Keypad from the Input & Communication unit?

1. Disconnect the flat cable of the Local Keypad. Pull out the lock at both sides of the socket prior to removing the flat cable.

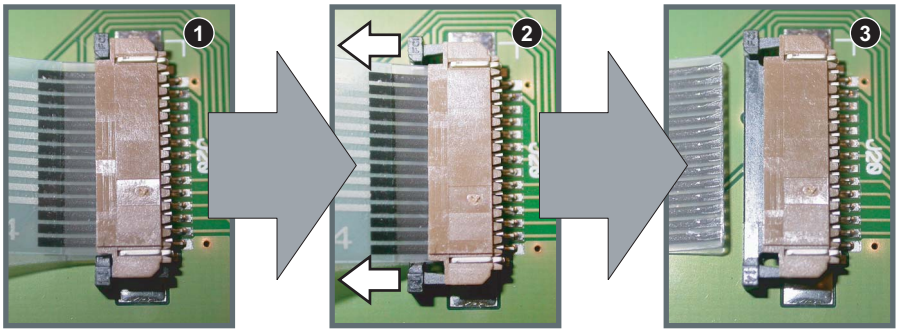


Image 16-35

2. Remove the front plate of the Button module assembly by releasing the four nuts (reference 1) as illustrated. Use a 5,5 mm nut driver.
   Caution: *Do not loose the four spacers (reference 2) between the assembly and the front plate.*

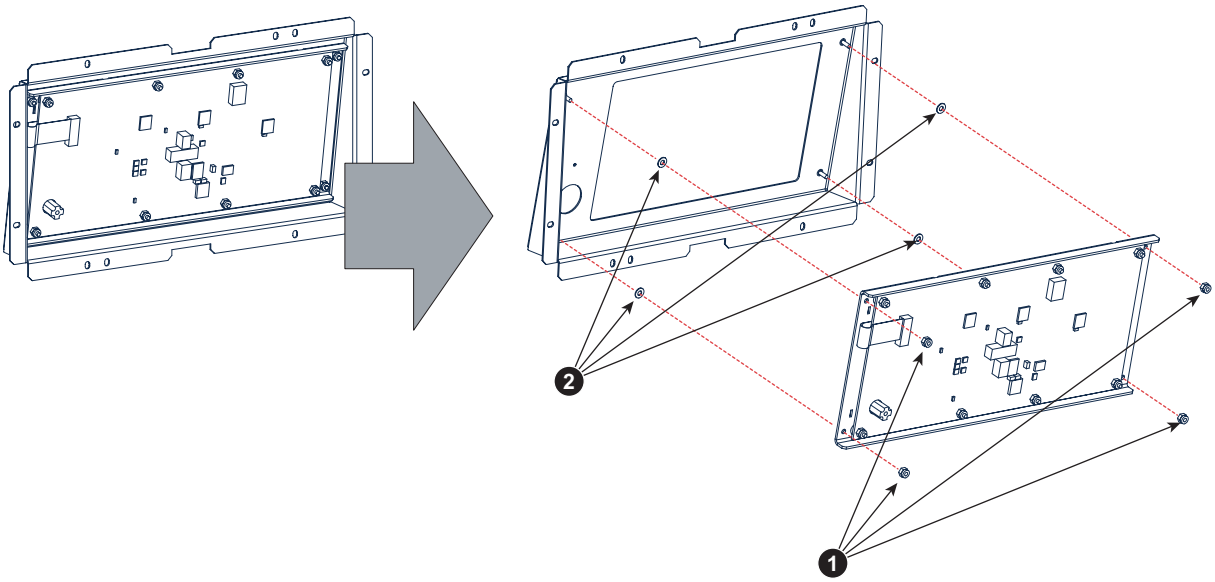


Image 16-36

3. Peel off the Local Keypad from its support plate.
4. Stick a new Local Keypad upon the support plate. Make sure to position the new Local Keypad correctly within the marks upon the support plate. Makes sure to guide the flat cable of the Local Keypad through the opening in the support plate.

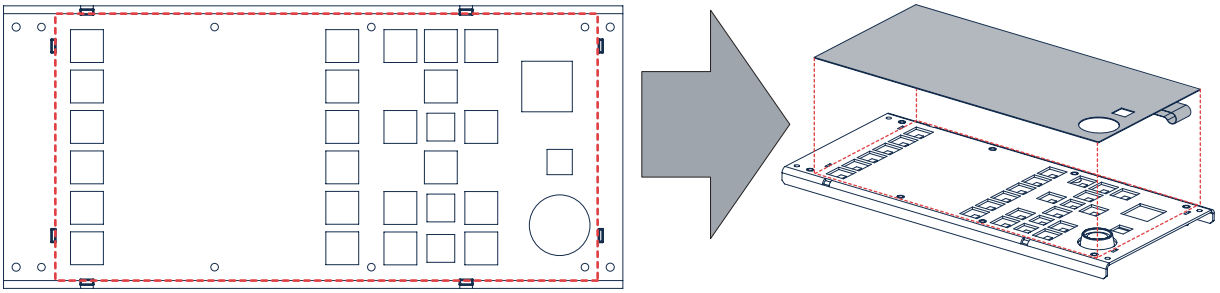


Image 16-37

5. Reinstall the front plate on the Button module assembly. Use a 5,5 mm nut driver to fasten the four nuts (reference 1 image 16-36). Make sure to provide each fixation point with a washer (reference 2 image 16-36) between the front plate and the Button module assembly.
6. Connect the flat cable of the Local Keypad. First unlock the socket (1), then insert the flat cable (2) and finally lock the socket (3).

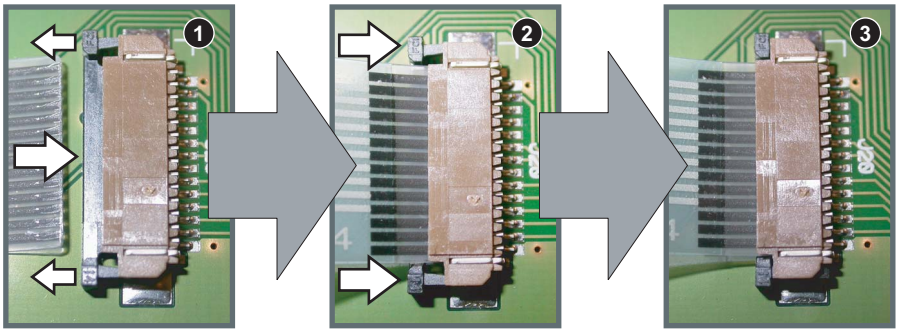


Image 16-38

See procedure "Replacement of the Button module", page 296, to reinstall the Button module assembly in the Input & Communication unit.

16.12 Replacement of the Signal Backplane

To remove the Signal Backplane from the Input & Communication unit the Cinema Interface board, the Cinema Processor board and the Barco Controller has to be removed first. This procedure assumes that all boards which are plugged directly into the Signal Backplane at the bottom of the Input & Communication unit are already removed.

Necessary tools

- 2,5 mm Allen wrench.
- 5 mm nut driver.
- 5,5 mm nut driver.
- T10 Torx driver.

How to replace the Signal Backplane from the Input & Communication unit?

1. Remove the screw (reference 1) of the SMPTE 292 INPUT socket at the front side of the Input & Communication unit. Use a T10 Torx driver.
2. Remove the four nuts (reference 2) of the DVI INPUT sockets at the front side of the Input & Communication unit. Use a 5 mm nut driver.

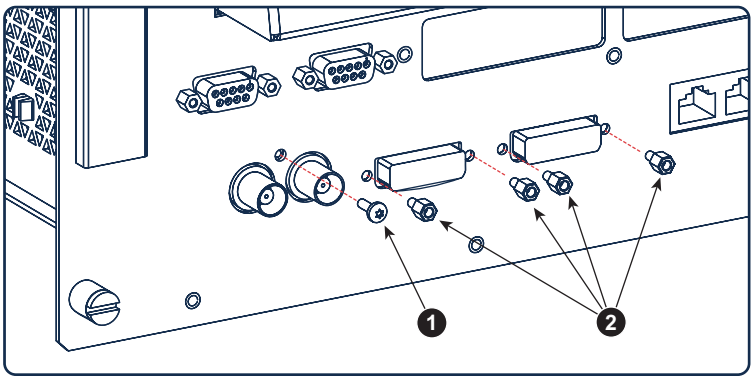
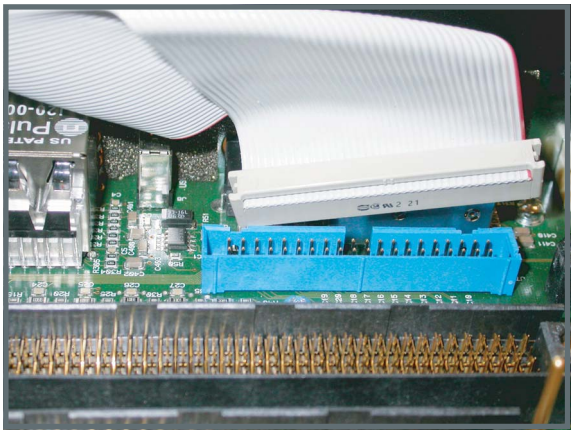


Image 16-39

3. Disconnect all wire units from the Signal Backplane.



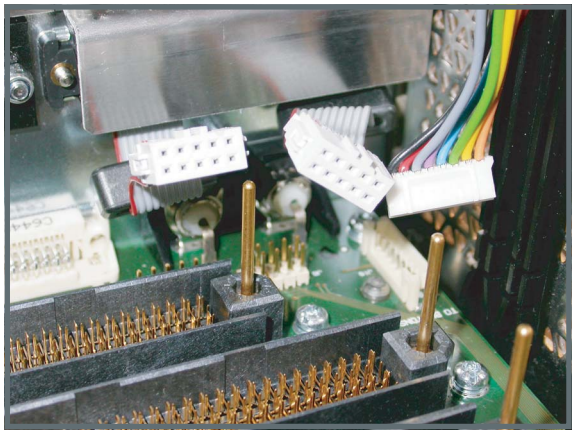


Image 16-40

4. Remove the bottom cover plate of the Input & Communication unit. Use a 5,5 mm nut driver to release the four nuts (reference 4) and a 2,5 mm Allen wrench to release the seven hexagon screws (reference 3). Note that the Signal Backplane remains attached to the bottom cover plate.

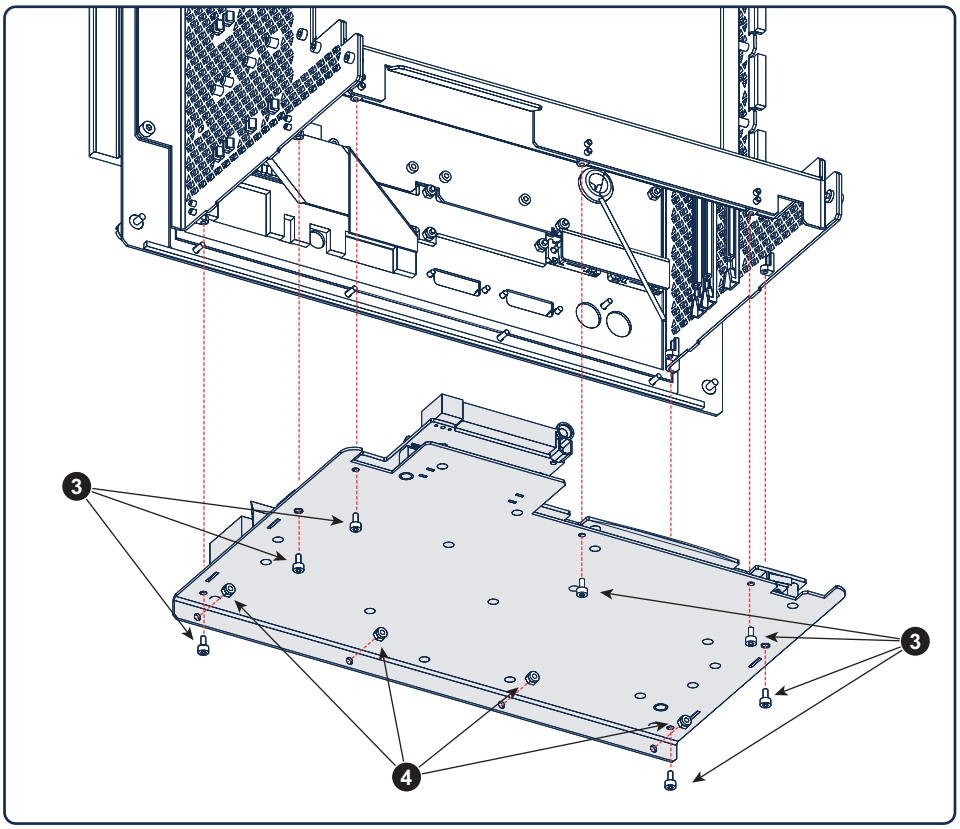


Image 16-41

5. Remove the Signal Backplane from the bottom cover and install a new one. Use a T10 Torx driver to release/fasten the 18 Torx screws (reference 5).

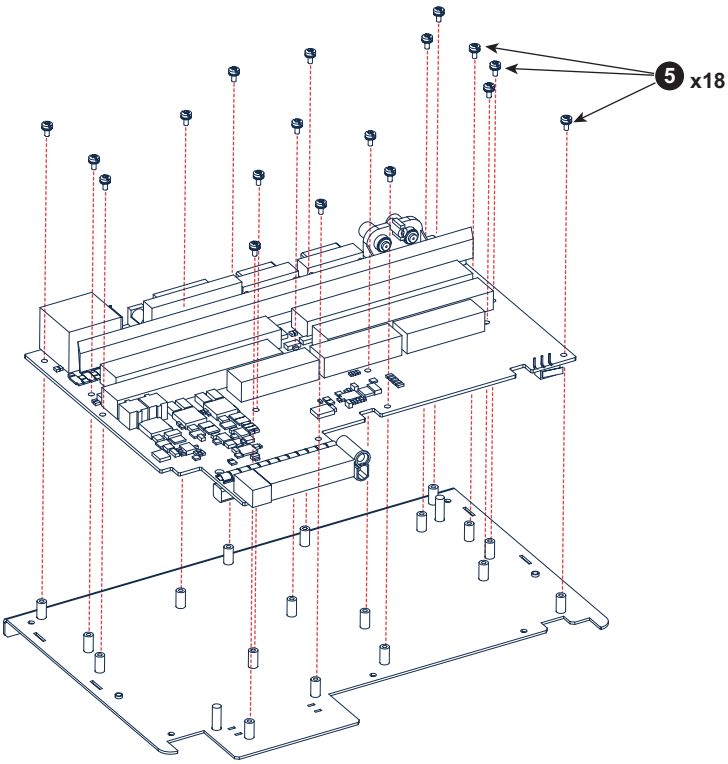


Image 16-42

6. Reinstall the bottom cover plate with new Signal Backplane into the Input & Communication unit. Use a 5,5 mm nut driver to fasten the four nuts (reference 4 image 16-41) and a 2,5 mm Allen wrench to fasten the seven hexagon screws (reference 3 image 16-41).

7. Reconnect the GPIO flat cable (reference A), the two DVI flat cables (reference B) and the Button module wire unit (reference C) with the Signal Backplane.

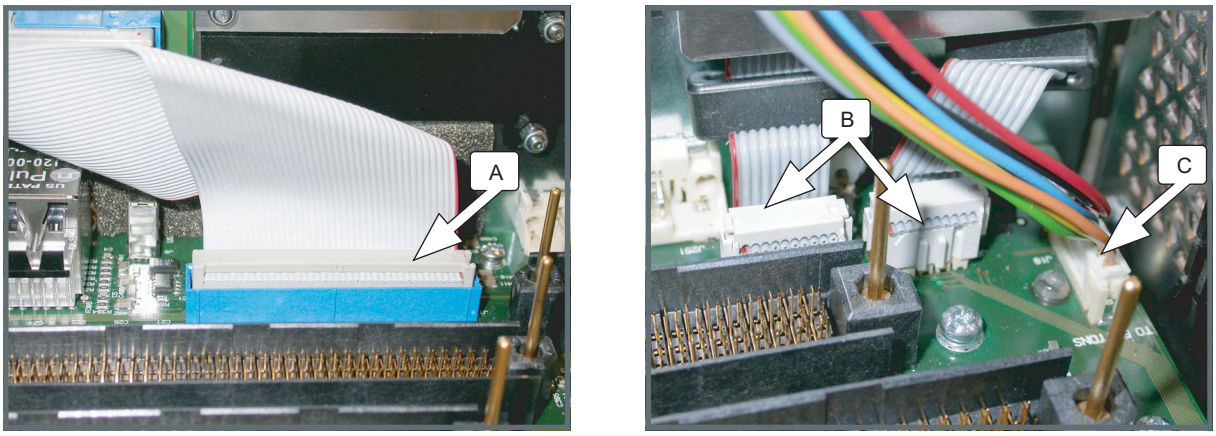


Image 16-43

8. Insert the screw (reference 1 image 16-39) of the SMPTE 292 INPUT socket at the front side of the Input & Communication unit. Use a T10 Torx driver.
9. Insert the four nuts (reference 2 image 16-39) of the DVI INPUT sockets at the front side of the Input & Communication unit. Use a 5 mm nut driver.

16.13 Replacement of the Status Light

To access the Status Light board the rear cover of the projector has to be removed. This procedure assumes that the rear cover is already removed.

Necessary tools

2,5 mm Allen wrench.

How to replace the Status Light from the projector?

1. Remove the two indicated screws (reference 1) of the Status Light board. As a result the board will come loose but remains connected via the wire unit.
2. Disconnect the wire unit (reference 2) of the Status Light board.

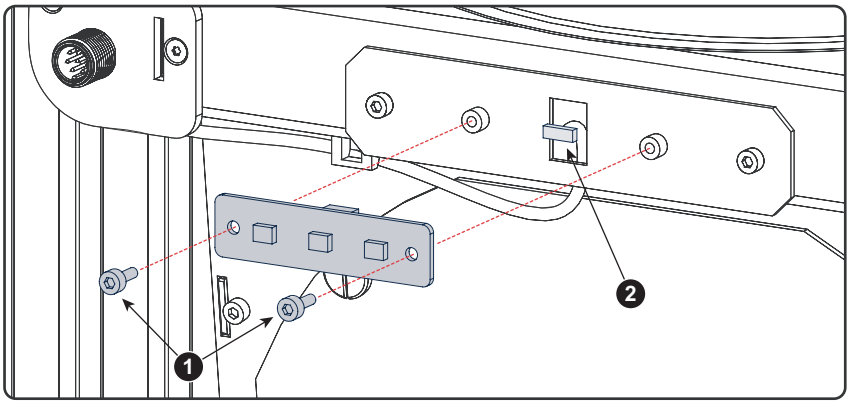


Image 16-44

3. Connect a new Status Light board with the wire unit.
4. Fasten the new Status Light board with two screws. Use a 2,5 mm Allen wrench.

17. UPDATING TI BOARDS

About this chapter

If one of the TI boards, such as the Formatting Interface Board; the TI Interface Board; or the TI Processor Board, is replaced with a new one then the TI firmware must be updated. This chapter contains the procedures for updating the TI firmware.

Overview

- Installation of the Update Package
- Start up the update program
- Make a serial connection (RS232)
- Make an Ethernet connection (10/100 BASE-T)
- Installation of the new software release
- Logging of the operation
- Special functions
- Factory Install Options
- Recovery option - Stay in Boot option

17.1 Installation of the Update Package

How to install?

1. Download the Update package from the secured Barco web site and copy this file (.zip format) into a new directory.
2. Unzip the package file into this directory.

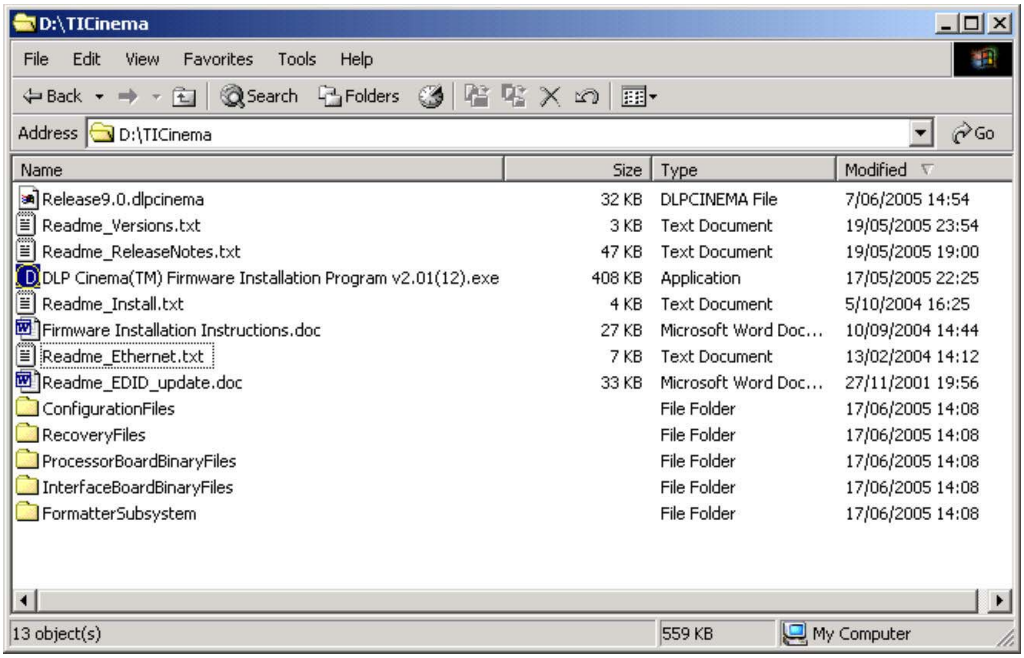


Image 17-1
Unzipped package file

The directory contains:

- An update program file (.exe)
- Software update file (.dlpcinema)
- read me and instruction files (.txt and .doc)
- a configuration files directory containing configuration files.
- a recovery files directory containing recovery files.
- a processor board binary files directory with binary files for the processor board.
- an interface board binary files directory with binary files for the interface board.
- a formatter sub system directory.

17.2 Start up the update program

How to start up ?

1. Browse to the installation directory of the TI update software.
2. Double click on *DLP Cinema(TM) Firmware Installation Program v2.01(12).exe* to start up the update program.
   Note: *The version indication in the startup file can be different for other releases.*

   The start up window will be displayed.

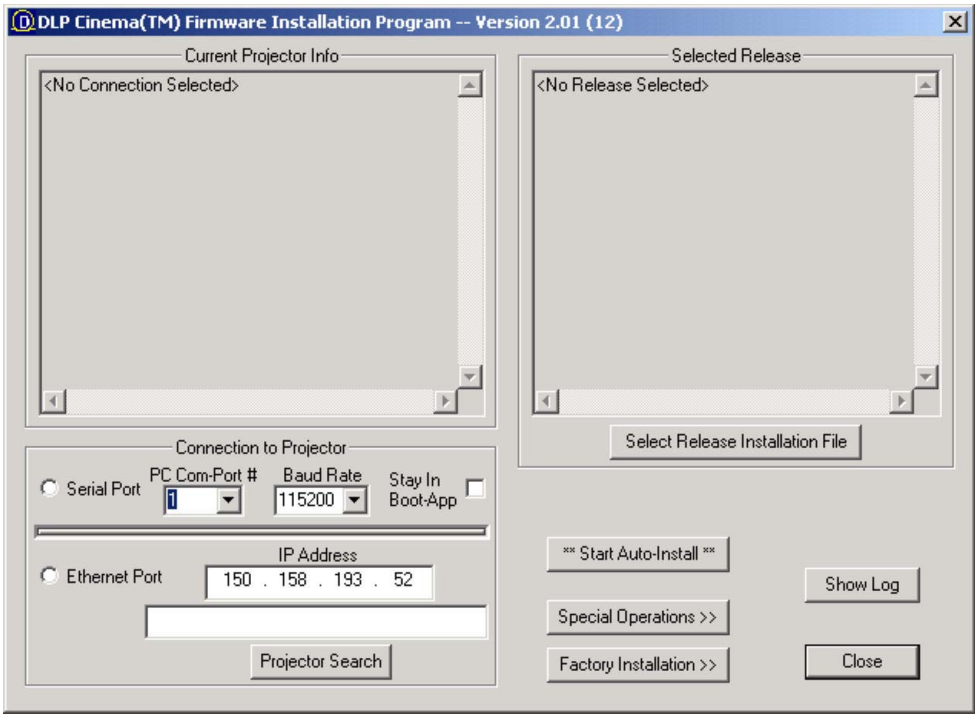


Image 17-2
Start up of update program

17.3 Make a serial connection (RS232)

Necessary parts

A fully wired straight serial cable

Software connection

1. Connect the local PC with the RS232 port of the Input & Communication unit.
2. Select first the PC com-port by clicking on the combo box just below *PC com-port #* (1).

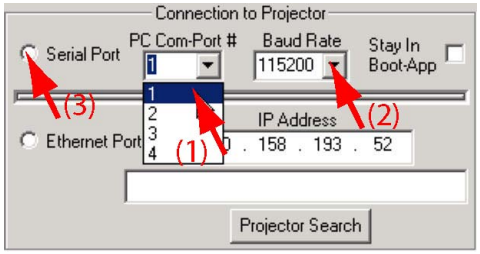


Image 17-3
Serial connection setup

3. Select the baud rate by clicking on the combo box just below *Baud Rate* (2).
4. Check the radio button in front of *Serial Port* (3).

   The connection will be established. A login message will be displayed. Click **OK** to continue.
5. Enter the userid and password.

Image 17-4
Login window

Defaults are:

- User Id: Service
- Password: Heal Thyself

Both are case sensitive.

When correct, the *Current Projector Info* of the selected projector will be filled out.

17.4 Make an Ethernet connection (10/100 BASE-T)

A crossed or non crossed Ethernet cable can be used. the projector switched automatically for the correct cable.

The PC's IP Address MUST be within the same subnet as the projector's IP Address in order for communication to be possible. This requires checking the PC's and projector's Subnet-Mask settings.

IP address examples

First example

- PC IP Address : 192.168.100.5
- PC Subnet Mask : 255.255.255.0
- Projector IP Address : 192.168.100.2
- Projector Subnet Mask: 255.255.255.0

Result : Communication possible. PC address is in the subnet range of the projector's IP address.

Second example

- PC IP Address : 10.16.236.100
- PC Subnet Mask : 255.255.255.0
- Projector IP Address : 192.168.100.2
- Projector Subnet Mask: 255.255.255.0

Result : No communication possible. PC address is not in the subnet range of the projector's IP address.

Third example

- PC IP Address : 192.168.200.1
- PC Subnet Mask : 255.255.255.0
- Projector IP Address : 192.168.100.2
- Projector Subnet Mask: 255.255.255.0

Result : No communication possible. PC address is not in the subnet range of the projector's IP address. The third group in the PC IP address and Projector IP address must be the same.

Fourth example

- PC IP Address : 192.168.200.1
- PC Subnet Mask : 255.255.0.0
- Projector IP Address : 192.168.100.2
- Projector Subnet Mask: 255.255.0.0

Remark : Communication possible. PC address is in the subnet range of the projector's IP address. The third group in the IP¨ addresses can be any value as the third group in the subnet mask is 0.

Software connection

1. Connect the local PC with one of the Ethernet ports (100/10 BASE-T) of the Input & Communication unit.
2. Click in the IP address input field and fill out directly the IP address of the projector (1a).
   Note: *The IP address must be the TI/Cinema IP address. To read out that address, look for the Cinema IP address via the touch panel or look for the TI IP address via the Communicator software.*

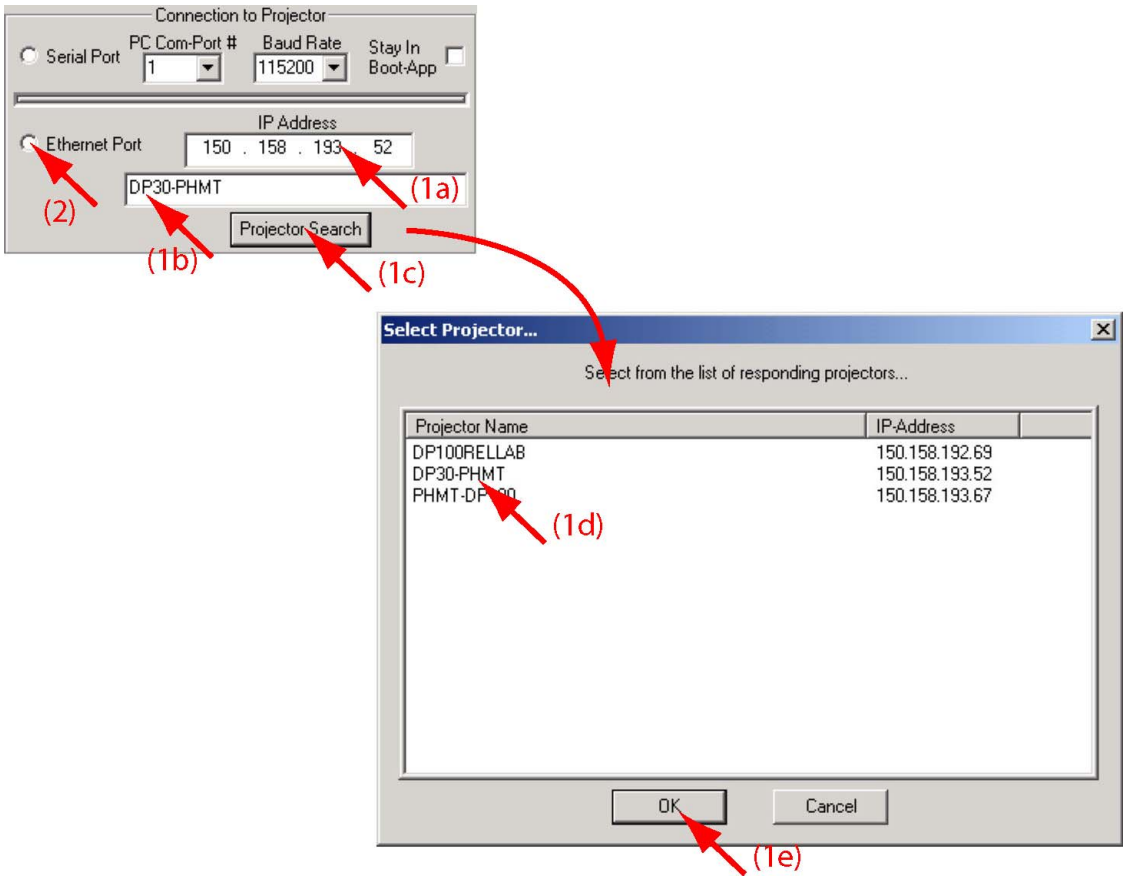


Image 17-5
Make Ethernet connection

Or,
click in the host name input field just below the IP address and fill out the host name of the projector to perform a DNS-lookup (requires the local network to be configured to support this) (1b).
Or,
click on **Projector Search** (1c).

The projector scans the network and build up a list of available projectors with host name and IP address (only possible for projectors on the local subnet AND that have Release 5.1 or later installed).

3. Select the desired projector out of the list (1d) and click **OK** (1e).

   The IP address and host name will be filled out.

4. Check the radio button in front of *Ethernet Port* (2).

   The program will prompt the user to login to the projector.

5. Enter the userid and password.
   Defaults are:
   - UserId: Service
   - Password: Heal Thyself

   Both are case sensitive.

   When correct, the *Current Projector Info* of the selected projector will be filled out.

17.5 Installation of the new software release

How to install ?

1. Click on **Select Release Installation File** (1).

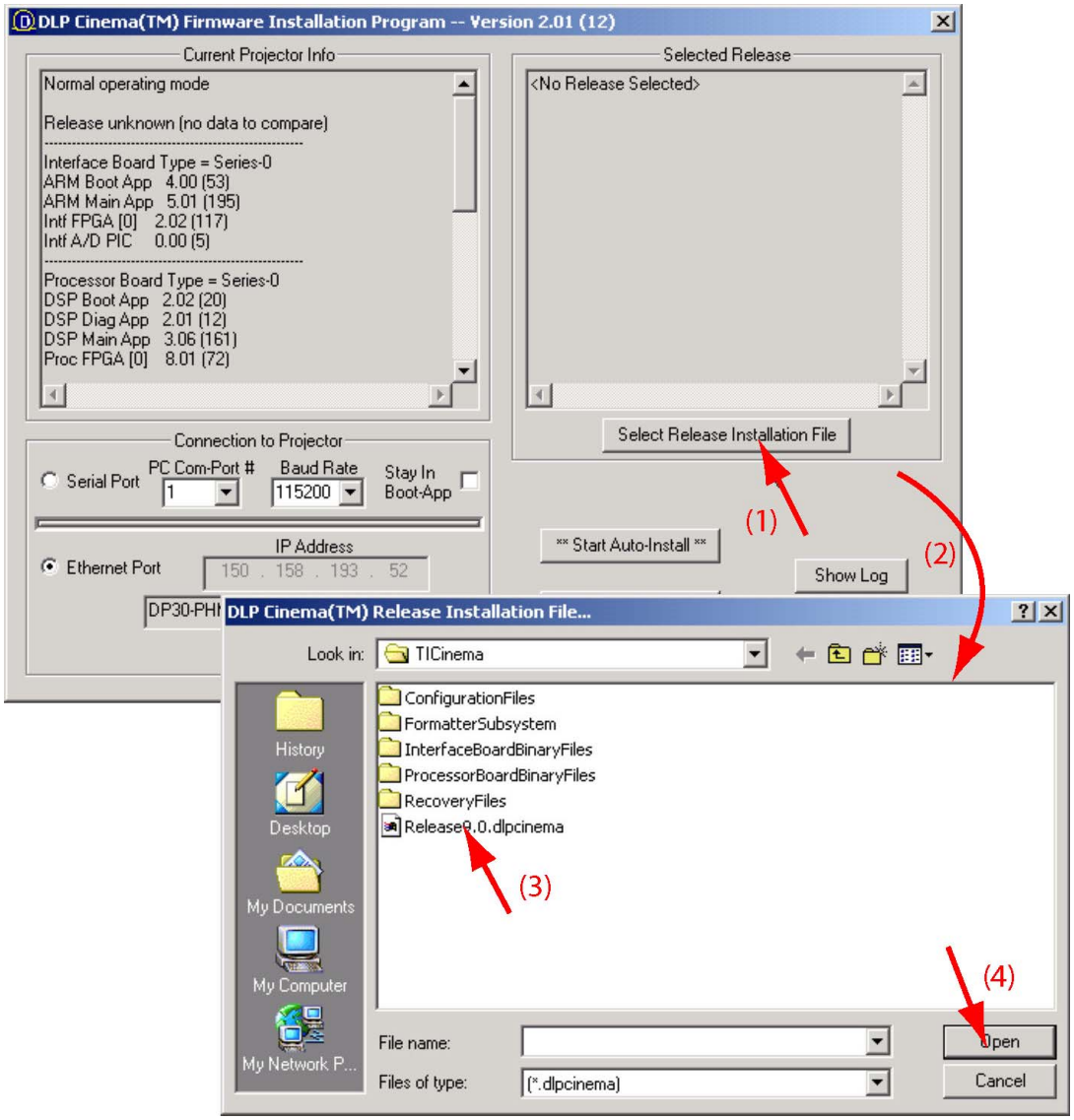


Image 17-6
Select Release file

A browser window opens (2).

2. Browse to the directory that contains the Release to be installed.
   Note: *The release files are indicated as .dlpcinema .*

3. Click on the file to select (3) and click **Open** (4).

Or,
double click on the file (3).

The content of the file will be displayed in *Selected release* (5) after a validation. A comparison with the actual loaded software is possible.

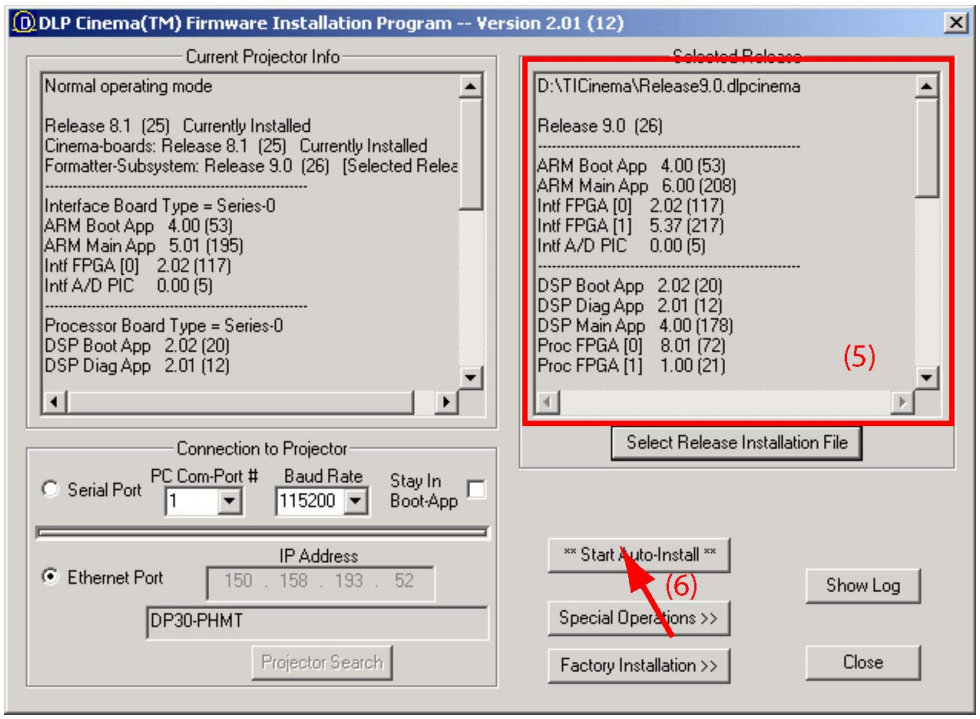


Image 17-7
Start auto-install

4. Click on Start Auto-Install (6).

   The verification and installation process will be started. It installs anything that does not exactly match the release.

   It includes also the resetting of the projector and the re-connection to verify the installation.

   A success or error dialog box will be displayed when completed.

CAUTION: Do not reset or switch off the projector during an installation operation. A reset during some operations may leave the affected board in the projector in a non-functional state, requiring factory recovery.

In case of failures, always send a copy of this log file to your Barco representative.

CAUTION: Log files are not saved automatically. A Dump log to file has to be done.

17.6 Logging of the operation

What is possible?

The program maintains a log of all operations performed.

To show this log, click on **Show Log**.

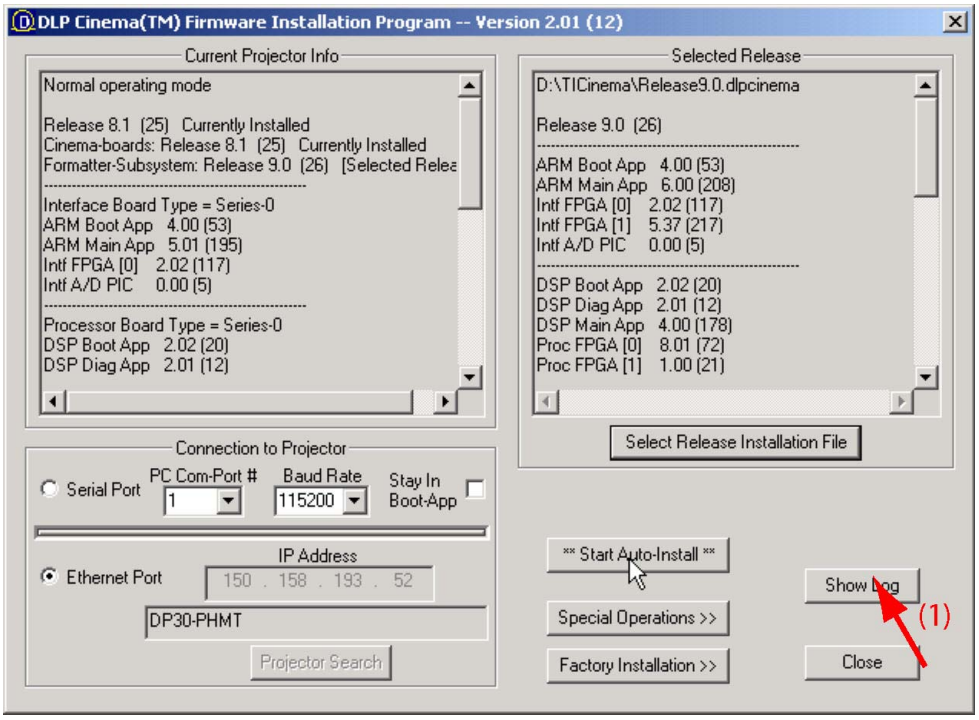


Image 17-8
Show logging started

The log window opens.

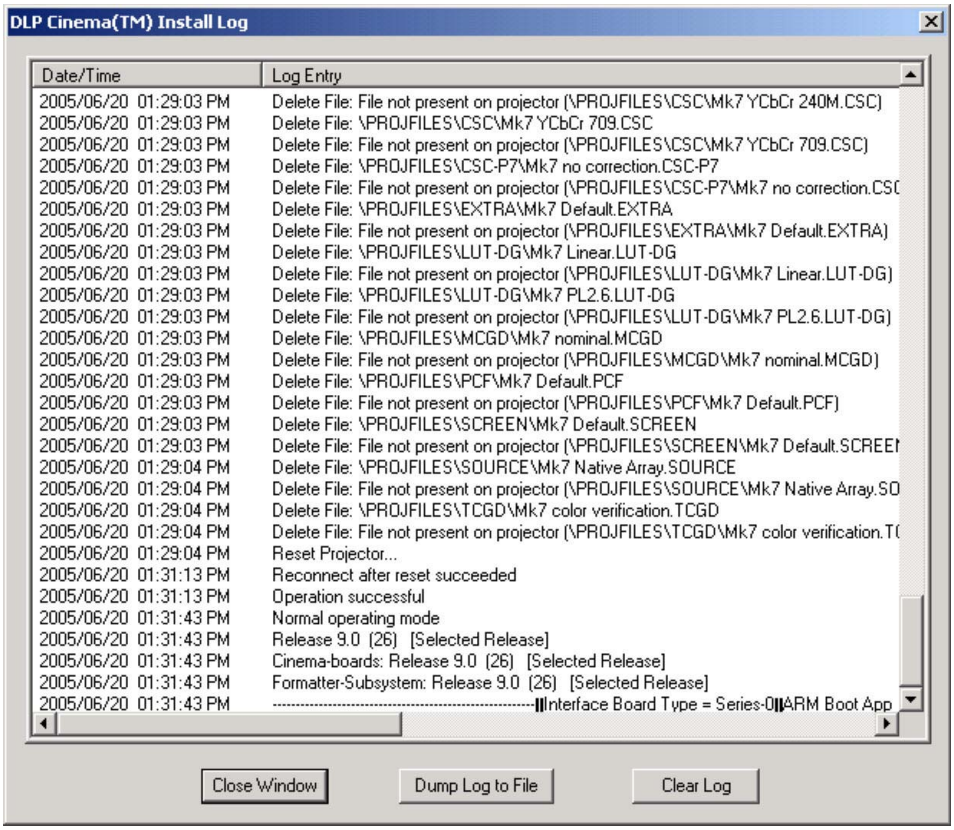


Image 17-9
Log info

By clicking on one of the buttons, the following is possible with the log:

- **Dump to file** : the log will be dumped into a file on the hard disk. A name and location will be asked first.
- **Clear log** : the log will be cleared. All information will be removed.

Log files are not saved automatically to disk. To save the file execute a *Dump to file*.

17.7 Special functions

Overview

To select a special installation and/or verification function, click on **<<Special Operations>>**. Before clicking on Special Operations, a connection to the projector must be present and a release file must be selected.

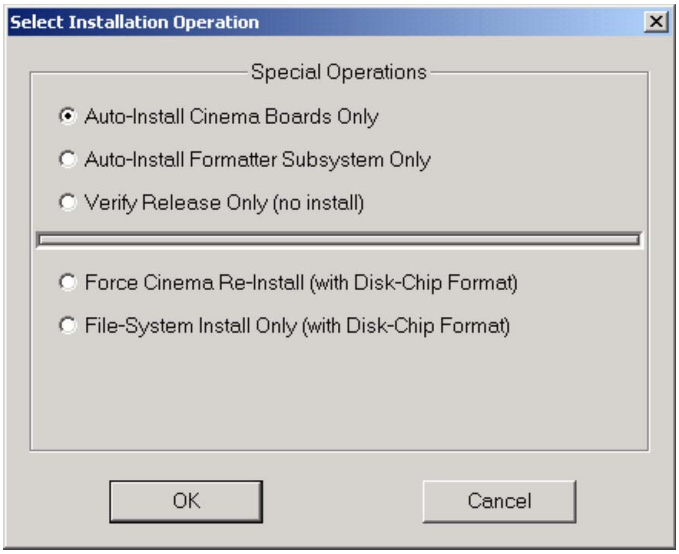


Image 17-10
Special operations

Auto-Install Cinema Boards Only	will only verify and install components related to the Interface and Processor boards. Use only if cinema boards are replaced (interface board, processor board)
Auto-Install Formatter Subsystem Only	will only verify and install components related to the Formatter subsystem. Use only when the engine was replaced.
Verify Release Only	will check all components of a Release supported by this program. No changes will be made to the projector.
Force Cinema Re-Install (see note)	will reinstall all Cinema components (Disk-Chip and flash) whether or not they are up to date. This rarely needed and is intended for special recovery purposes only.
Fill-System Install Only (see note)	will format the Disk-Chip and install all files (no other flash components are touched). This is intended for special file-system recovery only.

Note : with these options you will loose all default MACRO, PCF and SCREEN files. These options should not be used.

17.8 Factory Install Options

CAUTION: Never use these options in the field. Only for factory use.

Overview

These options are intended for factory use for brand new boards.

For special factory-install operations, select **Factory Installation >>** to open the dialog window to select the function to perform. Before click on **Factory Installation**, a connection to the projector must be present and a release file must be selected.

17.9 Recovery option - Stay in Boot option

Problem

The main software of the interface board can get corrupt when the projector was reset while a software update was busy. In that case the projector might be in a state where it tries to load the main software continuously, but it fails as the software is corrupt.

It is possible to force the projector to load only its boot application and not to start its main application. This is called Stay in Boot.

The Stay in Boot option can be activated only when connected via a Serial connection (RS232/RS422).

How to activate

1. Check Stay in Boot App.

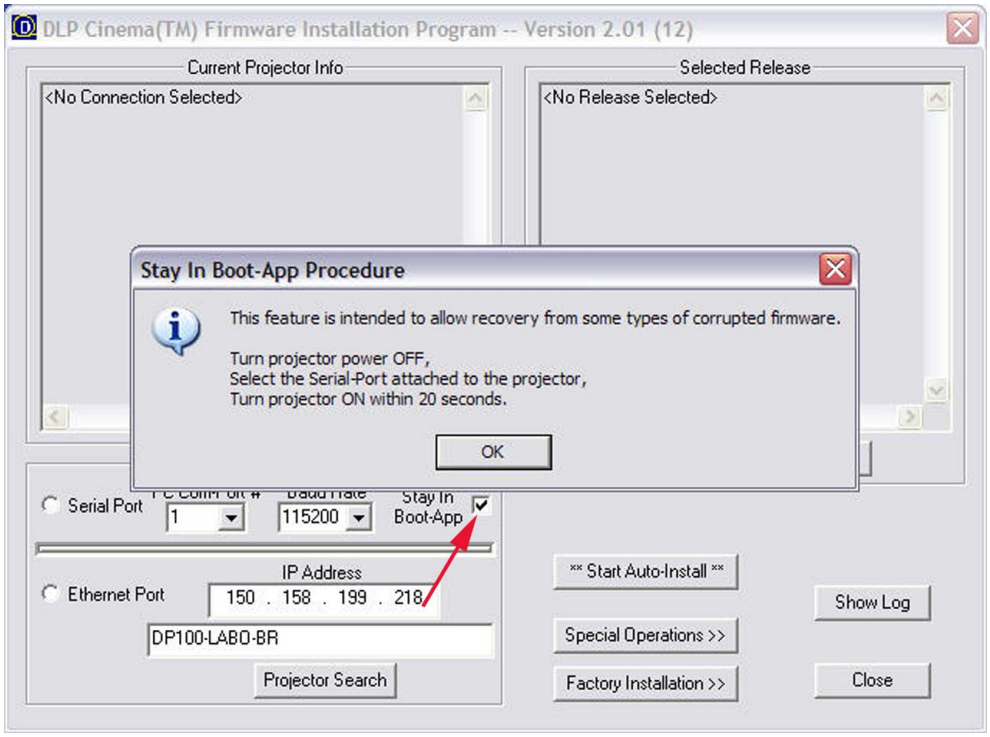


Image 17-11
Stay in boot mode

A message will be displayed to indicate that a recovery will take place.

2. Click **OK** to continue.

   When the boot application is successfully started, a message will be displayed. The current projector info will indicated that the boot application is running.

3. Click on **Select Release Installation file** and select the release file.

   The content of the file will be displayed.

4. Click on **Start Auto Install**.

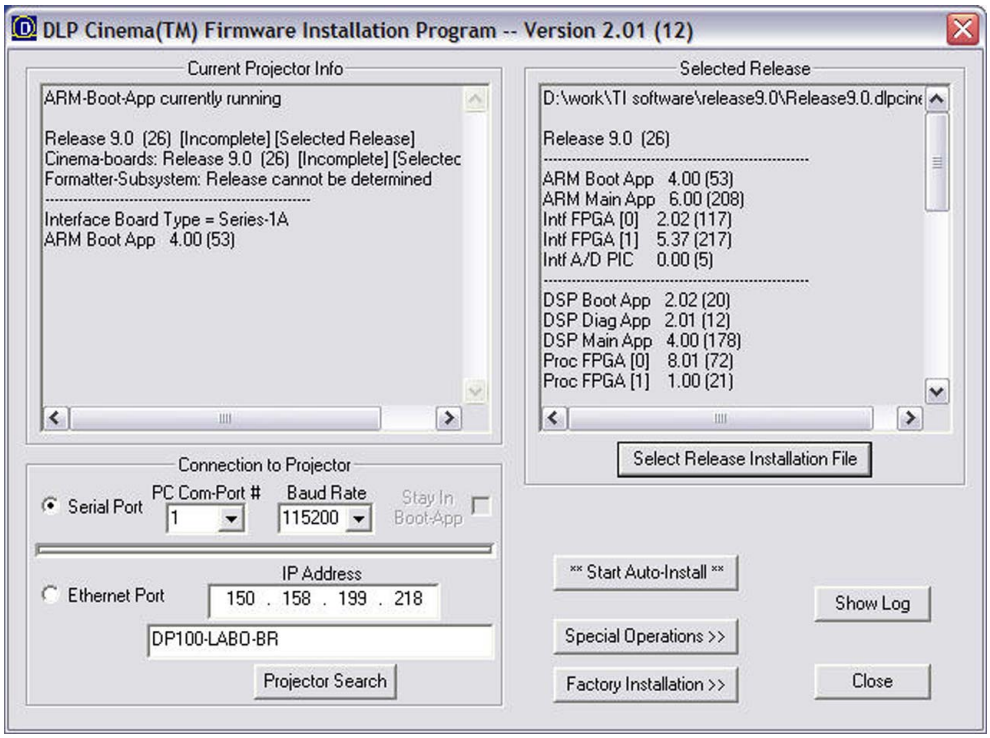


Image 17-12
Start auto install of ARM application

The verification and installation process will be started. It installs the ARM_main_app.

18. COMMUNICATOR TOUCH PANEL

Overview

- Introduction
- Installing the touch panel interface
- Reposition the touch panel interface

18.1 Introduction

Communicator Touch Panel for digital cinema projectors

The Communicator Touch Panel is designed for multi-user command and control, the Communicator enables users to learn quickly and operate efficiently - using an elegant and flexible touch panel interface. The interface's commonality means that operators can intuitively use any model in the product line, without restriction, and its user-friendly nature translates directly into a short and enjoyable learning curve.

Image 18-1

Flexible touch panel interface

The touch panel interface can be mounted upon a swivel arm which easily fits on top of the DP-2000/DP-1500 projector. One central locking mechanism of the swivel arm allows an instant fixation of the touch panel interface in any position.

The touch panel interface can also be installed further away from the DP-2000/DP-1500 projector. For that you can use a serial (RS232) cable up to 10 meter or an Ethernet cable up to 50 meter to realize a direct data communication between the DP-2000/DP-1500 projector and the Communicator Touch Panel.

The touch panel interface can also be connected with a Local Area Network (LAN) just like the DP-2000/DP-1500 projector. In this case both devices can communicate with each other as well.

The touch panel interface requires a voltage supply +12 VDC and 1,5 ampere. Note that the DP-2000/DP-1500 projector has a 12 VDC output which can be used to power up the touch panel interface. Nevertheless, the use of a separate +12 VDC adaptor (1,5 ampere minimum) is required in case the touch panel interface is installed more then a few meters away from the DP-2000/DP-1500 projector.

A crossed DC cable has to be used when connecting the +12 VDC output from the Input & Communication unit of the DP-2000/DP-1500 projector directly with the Touch Panel interface.

Parts location of the touch panel interface

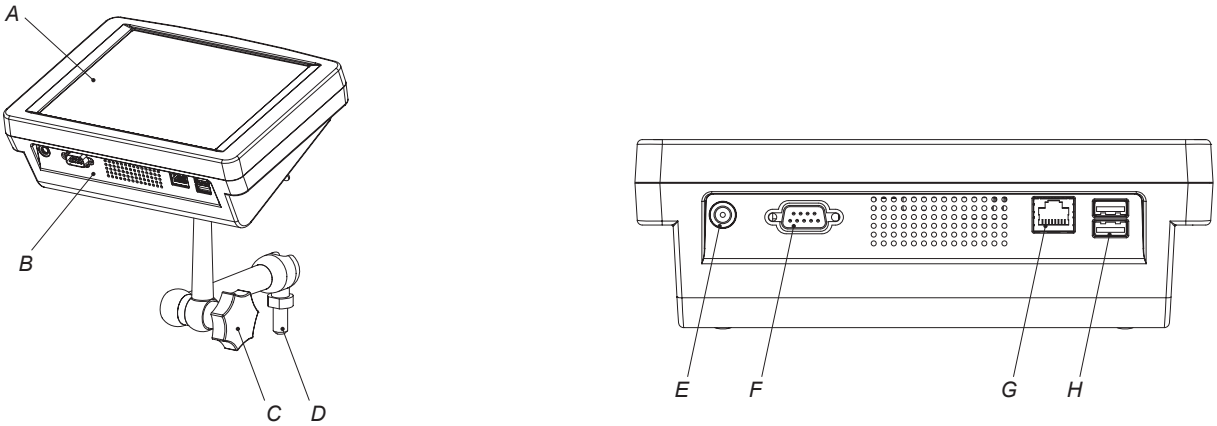


Image 18-2
A Touch screen.
B Communication ports.
C Knob to operate central swivel clamp.
D Base of swivel arm.
E Power input (12 VDC – 1,5 A).
F RS323 port (9 pins SUB-D).
G Ethernet port (RJ45).
H Two USB ports to connect USB stick, mouse or keyboard.

CAUTION: Refer to the user guide of the Communicator Touch Panel for more information about usage guidelines.

18.2 Installing the touch panel interface

Necessary tools

- 17 mm wrench.
- 10 mm wrench.

How to install the touch panel interface upon the DP-2000/DP-1500?

1. Assemble the mounting plate and the swivel arm together as illustrated. First place the nut (N) upon the rod of the mounting plate, then add the lock washer (L), then fasten the mounting plate and the swivel arm together. When the arm is mounted, turn nut (N) against the arm to secure the position.

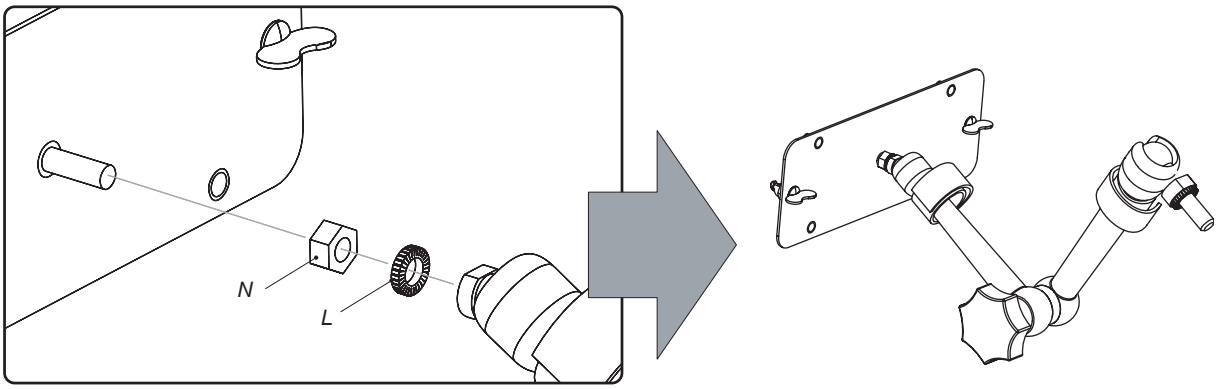


Image 18-3
Assemble swivel arm

2. Slide a washer (M) over the base of the swivel arm and Insert the base of the swivel arm into the mounting hole at the top of the DP-2000/DP-1500as illustrated.

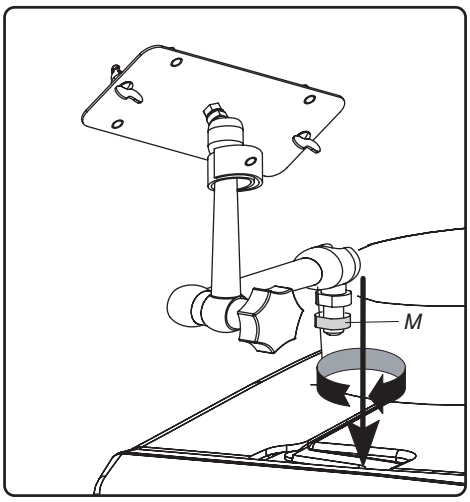


Image 18-4
Mount swivel arm

3. Place the touch panel interface upon the mounting plate of the swivel arm and fasten the two wing nuts (W) as illustrated.

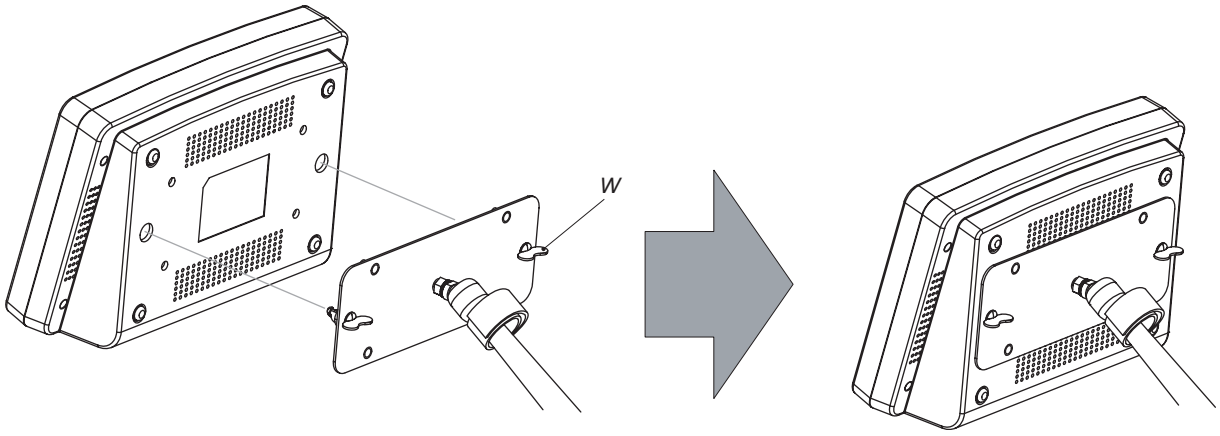


Image 18-5
Mount touch panel

4. Connect the circular plug of the multi cable with the circular socket at the rear side of the DP-2000/DP-1500.

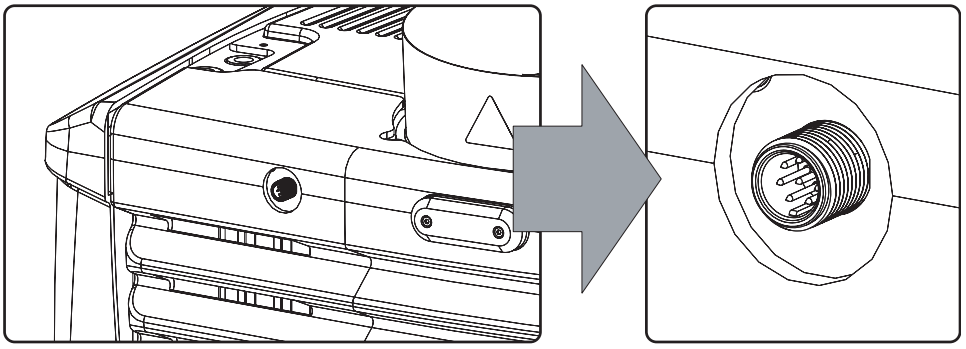


Image 18-6
Connections

5. Attach the multi cable to the swivel arm using the two Velcro strips.

6. Connect the DC plug, the RJ45 Ethernet plug and the D-SUB plug into their respective sockets on the touch panel interface.

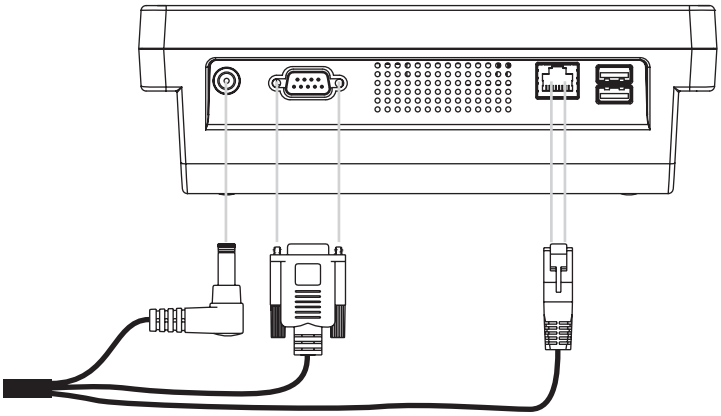


Image 18-7
Connections

18.3 Reposition the touch panel interface

How to reposition the touch panel interface?

1. Hold fast the touch panel interface.
2. Release the central swivel clamp by turning the big black knob (K) counterclockwise.

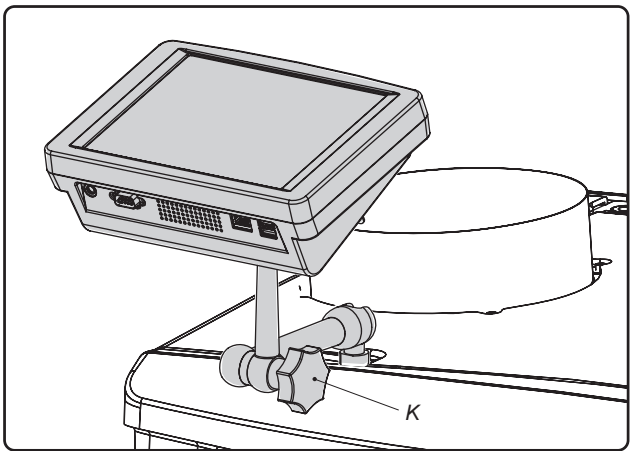


Image 18-8

3. Move the touch panel interface into the desired position.
4. Fasten the central swivel clamp by turning the big black knob clockwise.

CAUTION: Never release the central swivel lock without supporting the Touch Panel interface.

19. POWER INPUT

About this chapter

This chapter gives the procedures to replace the mains switch and the mains filter.

WARNING: Always disconnect the power cord from the local power net before start any service action on the Mains Input of the projector.

Overview

- Introduction
- Getting access to the Mains Input components
- Replacement of the mains ON/OFF switch
- Replacement of the mains input filter
- Closing the Mains Input compartment

19.1 Introduction

Power Input

The power input of the projector is located at the rear side of the projector. The electrical connection with the local power net is fixed wired. The local power net is connected with a built-in 3-terminal strip. The power is applied to the mains filter via the mains switch. Three power cables are connected with the output side (LOAD) of the mains filter. One cable leads to the Power Backplane and is used to provide the electronics of the projector with power. The two other cables go to the Lamp Power Supply module (one cable per LPS unit).

More recent production series of the DP-2000/DP-1500 digital projector are equipped with 5,5 ampere protected C13 power output socket and a C14 power input socket to provide the electronics of the projector with power. By default the power output and input socket are connected with a short power cable. When an Uninterrupted Power Supply (UPS) is required, the short cable is removed and the UPS is connected to the power input C14 socket.

Power Input parts location

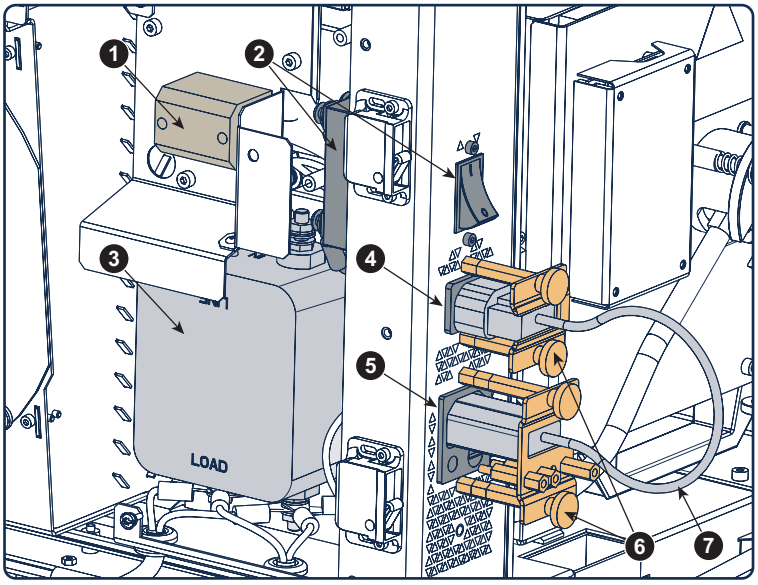


Image 19-1
1 Terminator block.
2 Automatic circuit breaker with ON/OFF switch.
3 Mains input filter.
4 Power input C14 socket for projector electronics (UPS purpose).
5 Protected power output C13 socket.
6 Adjustable brackets for securing the power plugs.
7 Loop through power cable.

19.2 Getting access to the Mains Input components

This procedure explains how to disconnect the power cord and how to remove the terminator block in order to get access to the mains filter and mains ON/OFF switch. This procedure assumes that the rear cover and lamp cover of the projector are already removed.

Necessary tools

- 3 mm Allen wrench.
- Flat blade screw driver.

How to get access to the Mains Input components?

1. Make sure that the power cord of the projector is powerless.
2. Remove the cover of the AC compartment by releasing the three captive dumb screws.

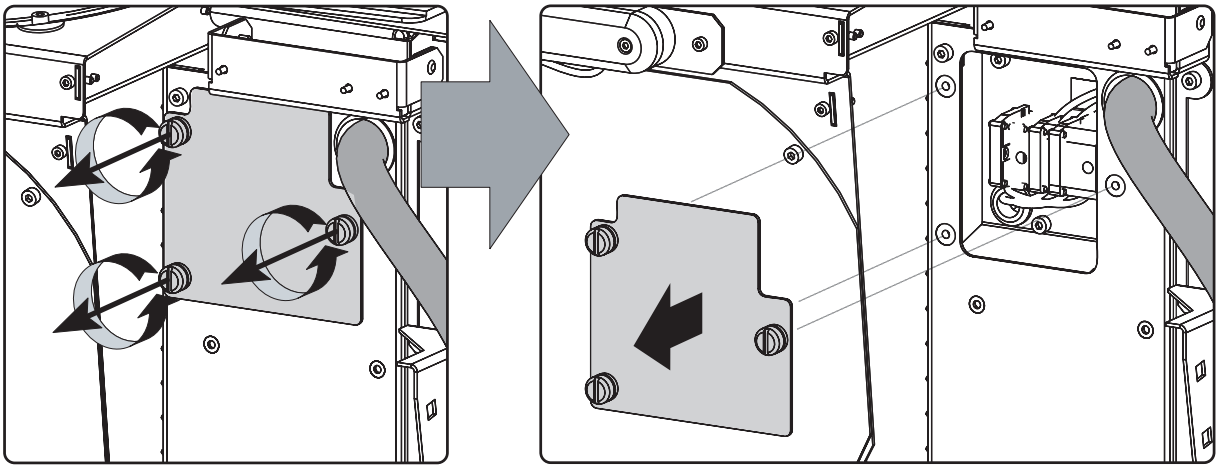


Image 19-2

3. Disconnect the AC power cord from the 3–terminal strip and guide the AC power cord out of the compartment.
4. Disconnect both wire units (reference A & B) from the LPS communication interface as illustrated.

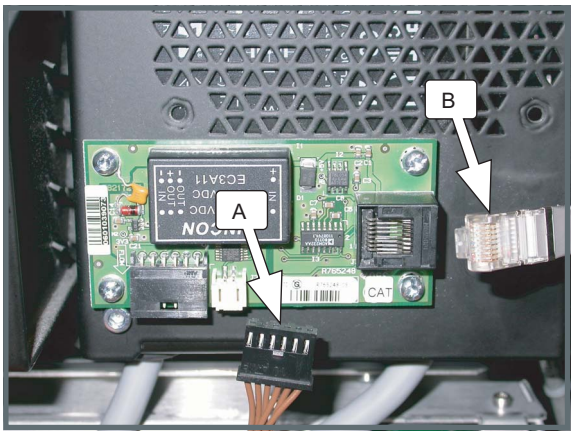


Image 19-3

5. Remove the cover plate by releasing the 5 hexagon socket head cap screws as illustrated. Use a 3 mm Allen wrench.

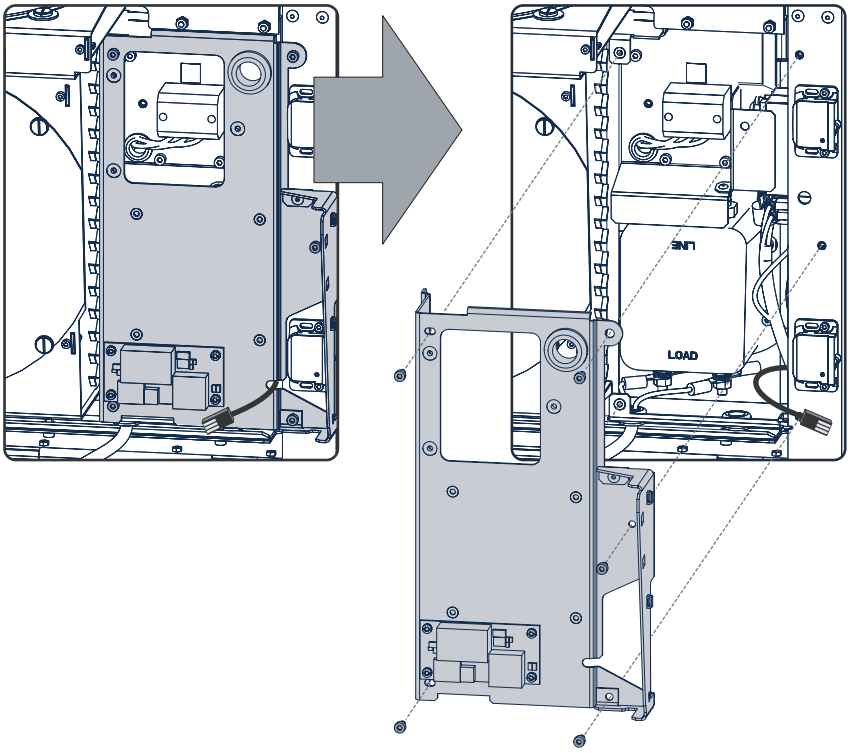


Image 19-4

6. Disconnect the three wires from the 3-terminal strip. Use a flat blade screw driver.
7. Remove the 3-terminal strip together with its mounting plate by releasing the 4 hexagon socket head cap screws as illustrated. Use a 3 mm Allen wrench.

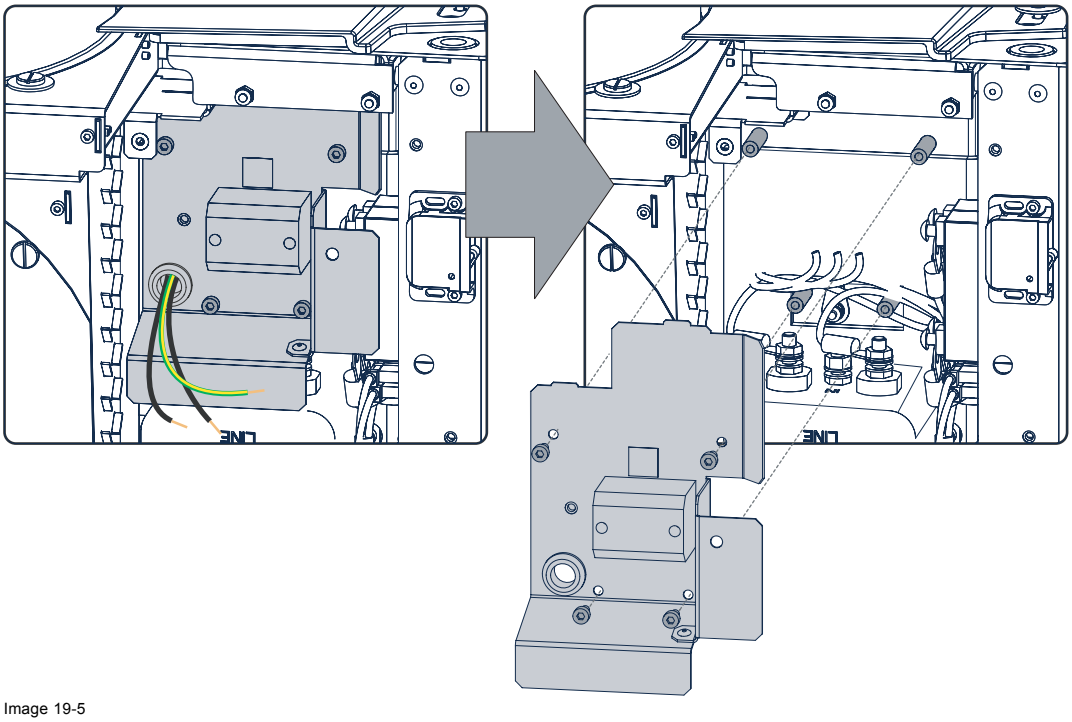


Image 19-5

19.3 Replacement of the mains ON/OFF switch

This procedure assumes that the Mains Input components are accessible. See page 331.

Necessary tools

- 2,5 mm Allen wrench.
- Flat blade screw driver.

How to replace the mains ON/OFF switch?

1. Remove the two hexagon socket head cap screws which securing the ON/OFF switch. Use a 2,5 mm Allen wrench. Note that the ON/OFF switch is still connected with the mains input filter. Once the switch is detached from the projector chassis it will be easier to disconnect the wires as described in the next step.

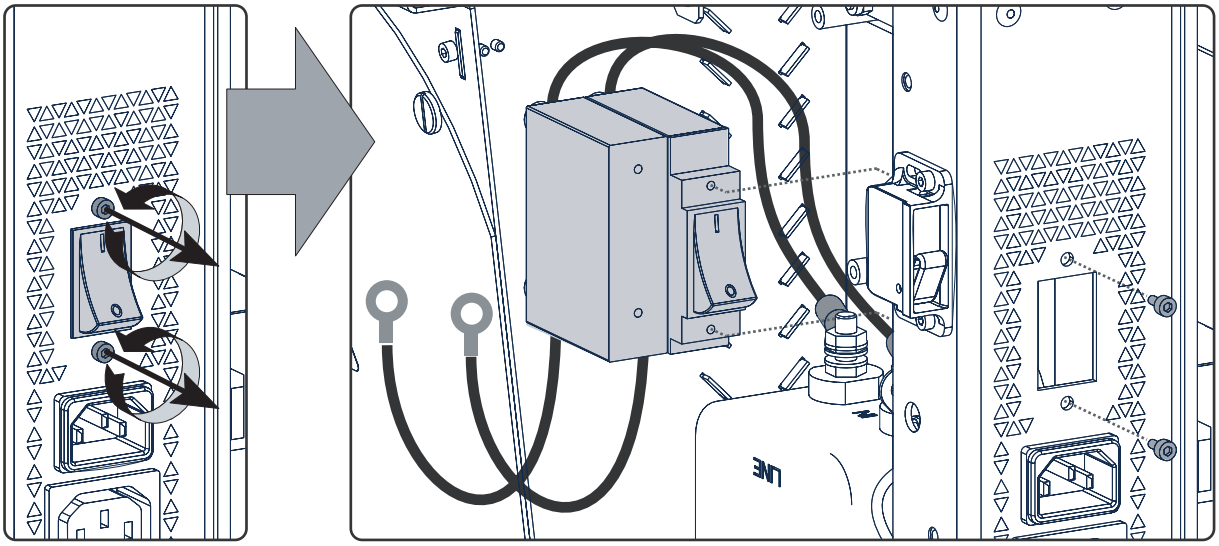


Image 19-6

2. Remove the connection screws at the back side of the ON/OFF switch and slide off the eye connectors. Do not drop the washers inside the projector. Use a flat blade screw driver.
3. Connect the two wires from the mains filter (reference 3 image 19-7) with the two upper pins of the ON/OFF switch. Slide a lock washer followed by a washer over the screw and then the eye connector of the wire. Turn in the screw and tighten completely.
   Note: *The top side of the ON/OFF switch is the upper side when holding the ON/OFF switch vertically with the indication "1" (reference 1 image 19-7) points to the top of the projector.*
4. Connect the two loose wires (reference 2 image 19-7) with the two lower pins of the ON/OFF switch. Slide a lock washer followed by a washer over the screw and then the eye connector of the wire. Turn in the screw and tighten completely.

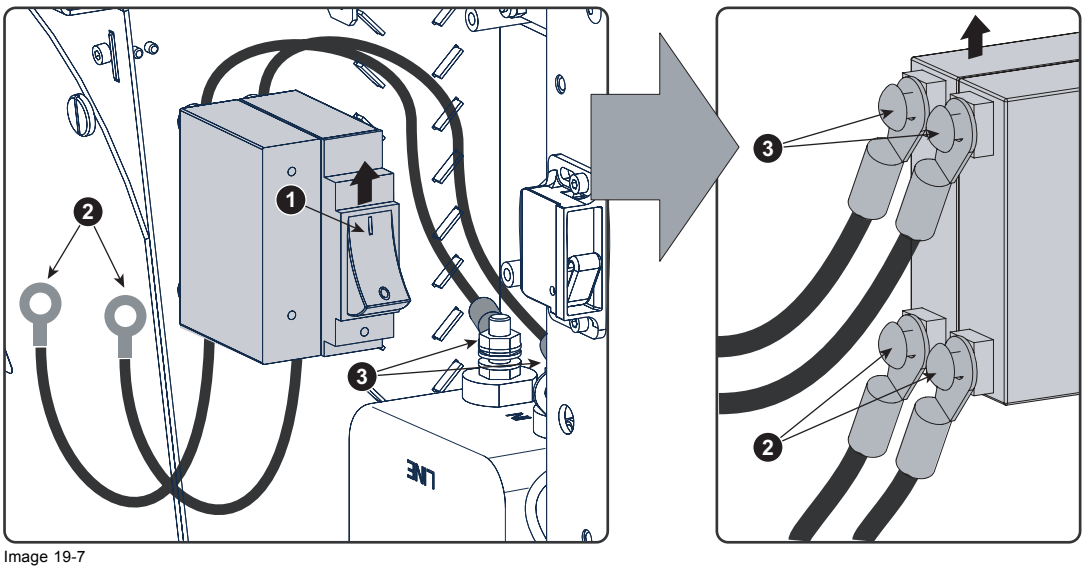


Image 19-7

5. Slide the new ON/OFF switch from the inside of the projector through the cabinet. Make sure that the indication “1” (reference 1) points to the top of the projector.

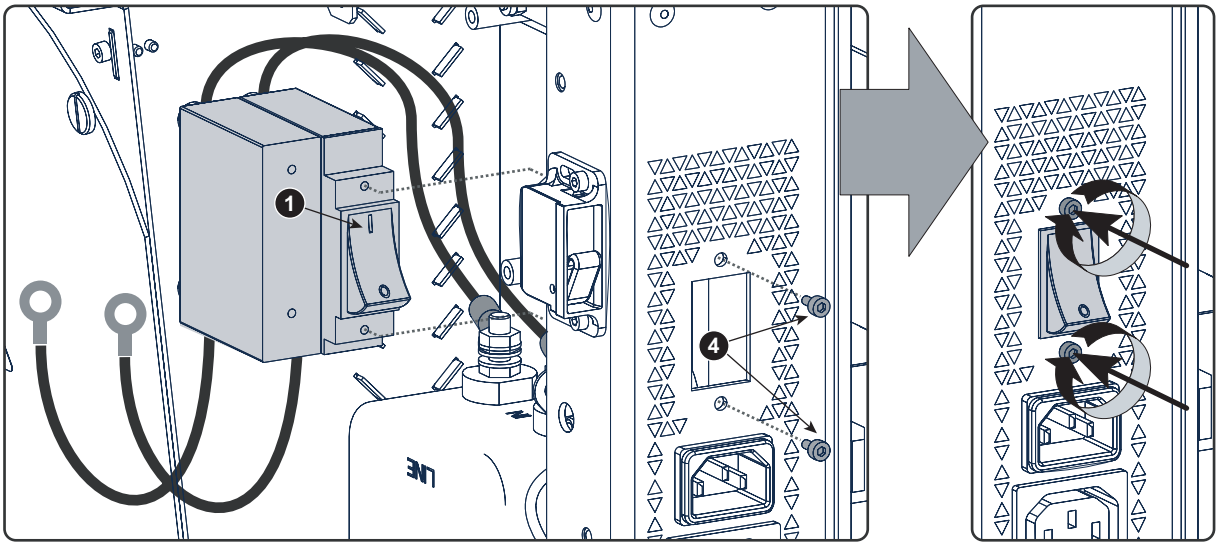


Image 19-8

6. Fasten the ON/OFF switch with two hexagon socket head cap screws (reference 4 image 19-8). Use a 2,5 mm Allen wrench.
7. Proceed with "Closing the Mains Input compartment", page 337.

19.4 Replacement of the mains input filter

This procedure assumes that the Mains Input components are accessible. See page 331.

Necessary tools

- 3 mm Allen wrench.
- 10 mm open-end wrench.

How to replace the mains input filter?

1. Remove both nuts on the “LOAD” side (reference A and B of image 19-9) of the mains input filter and slide off all eye connections. Do not drop the lock washers in the projector. Use a 10 mm open-end wrench.
2. Remove both nuts on the “LINE” side (reference C and D of image 19-9) of the mains input filter and slide off all eye connections. Do not drop the lock washers in the projector. Use a 10 mm open-end wrench.

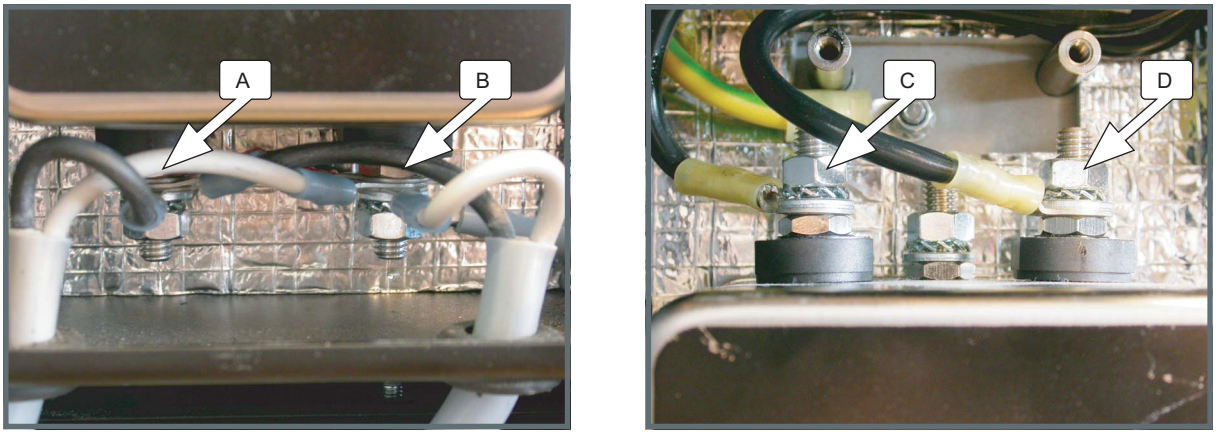


Image 19-9

3. Remove the mains input filter by releasing the four hexagon socket head cap screws as illustrated. Use a 3 mm Allen wrench.

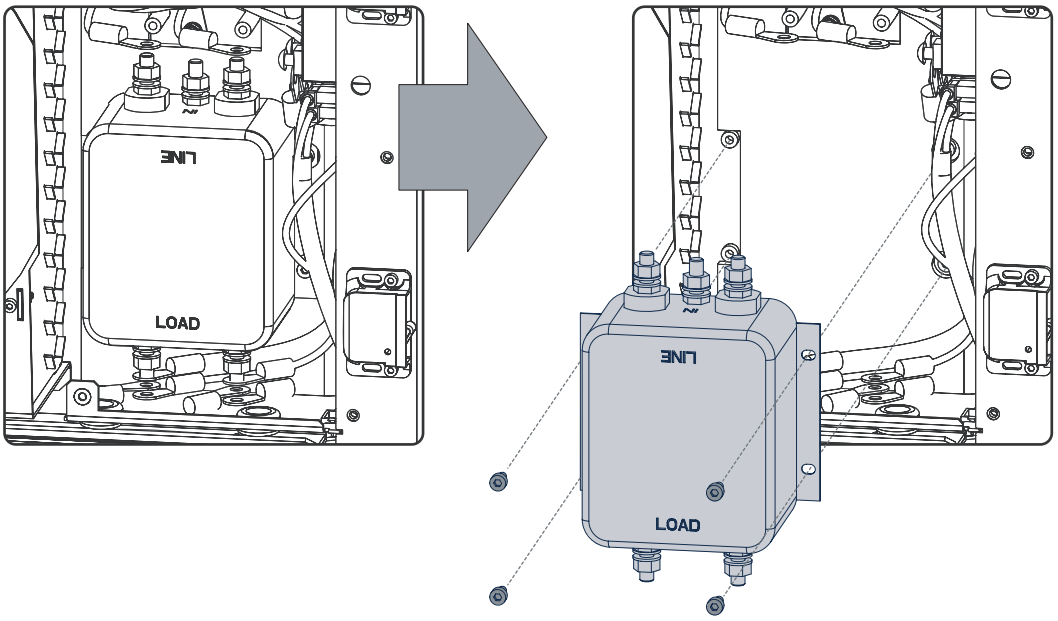


Image 19-10

4. Place a new mains input filter on its position and fasten with four hexagon socket head cap screws. Make sure that the “LOAD” side is facing downwards. Use a 3 mm Allen wrench.
5. Connect both wires of the LPS cables with the “LOAD” side of the mains input filter (reference A and B of image 19-9). First slide the eye connections of the wires with the same color over the pin, then slide a washer followed by a lock washer over the pin and secure with a nut. Use a 10 mm open-end wrench.

6. Connect both wires (reference C and D of image 19-9) from the ON/OFF switch with the “LINE” side of the mains input filter. First slide the eye connections of the wire over the pin, then slide a washer followed by a lock washer over the pin and secure with a nut. Use a 10 mm open-end wrench.
7. Proceed with "Closing the Mains Input compartment", page 337.

19.5 Closing the Mains Input compartment

Necessary tools

- 3 mm Allen wrench.
- Flat blade screw driver.

How to close the Mains Input compartment?

1. Guide the ground wire and the two wires from the ON/OFF switch through the opening in the mounting plate of the 3-terminator strip and secure the mounting plate with four hexagon socket head cap screws as illustrated. Use a 3 mm Allen wrench.

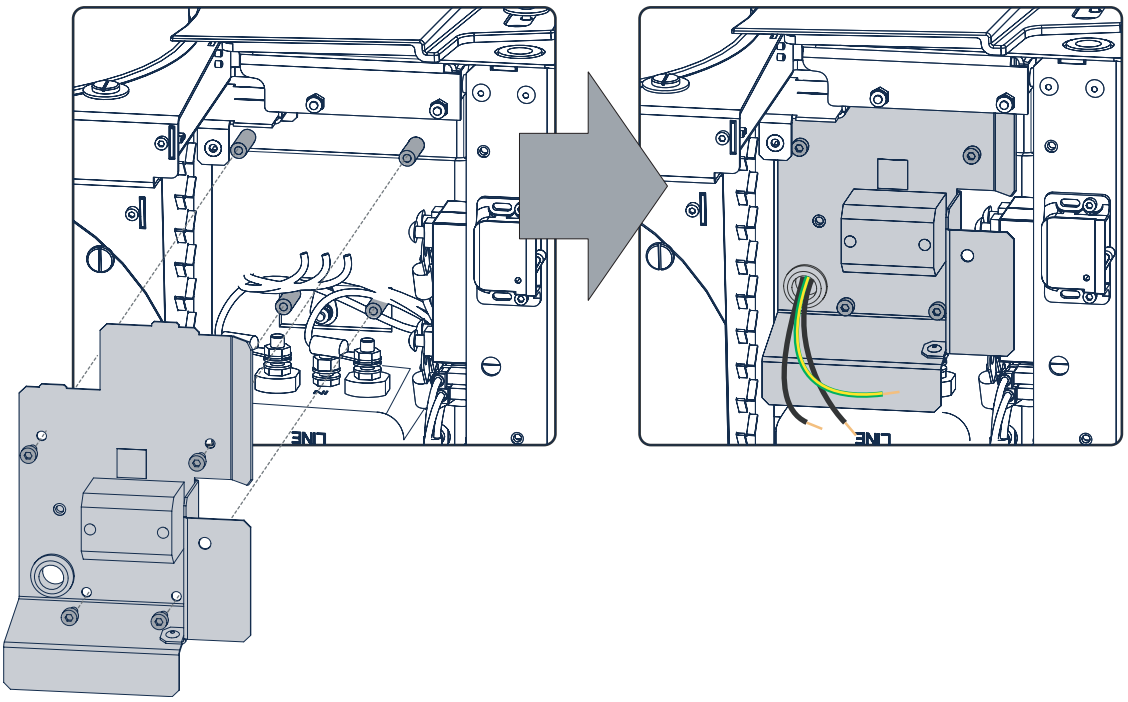


Image 19-11

2. Connect the ground wire and the two wires from the ON/OFF switch with the lower pins of the 3-terminator strip. Make sure to connect the ground wire with the marked ground pin of the 3-terminator strip.
3. Fasten the cover plate with five hexagon socket head cap screws as illustrated. Use a 3 mm Allen wrench. Make sure that the network cable (reference 1) for the LPS communication interface remains accessible.

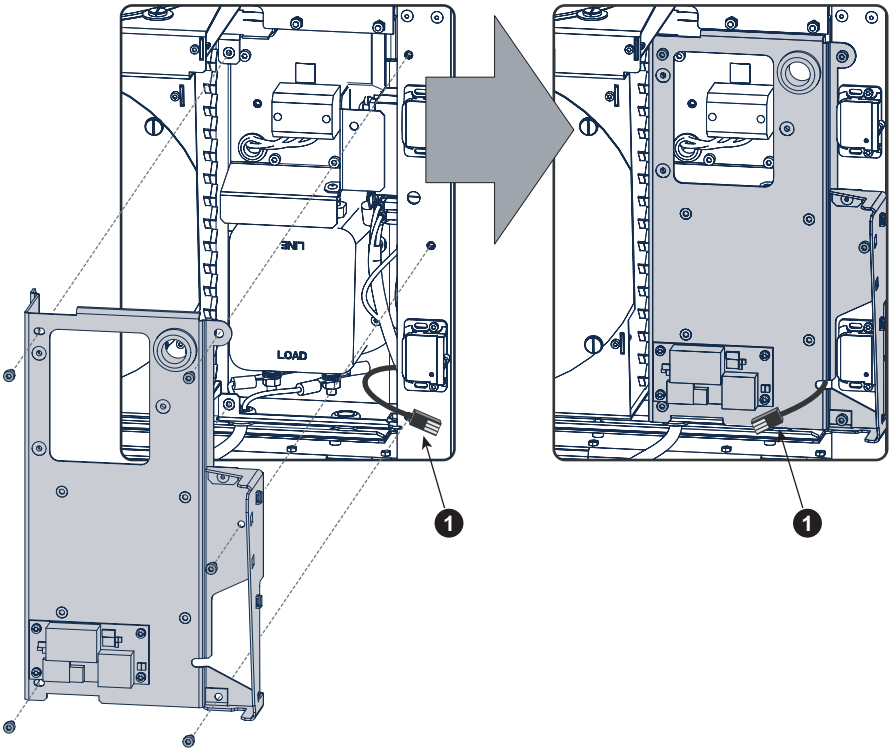


Image 19-12

4. Guide the AC power cord through the cable gland and connect the wires to the 3-terminal strip as illustrated.
   Warning: *Always connect first the ground wire (PE).*

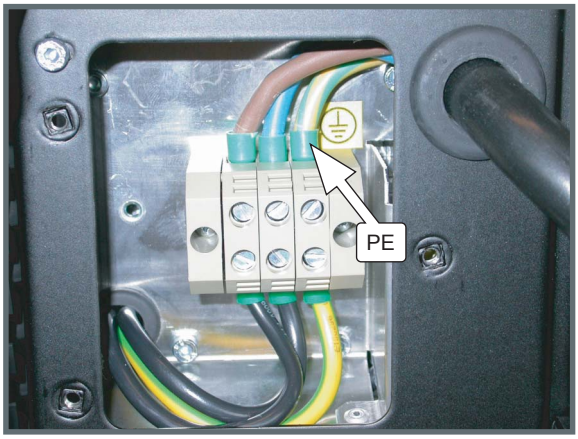


Image 19-13

5. Reinstall the cover of the main AC compartment.

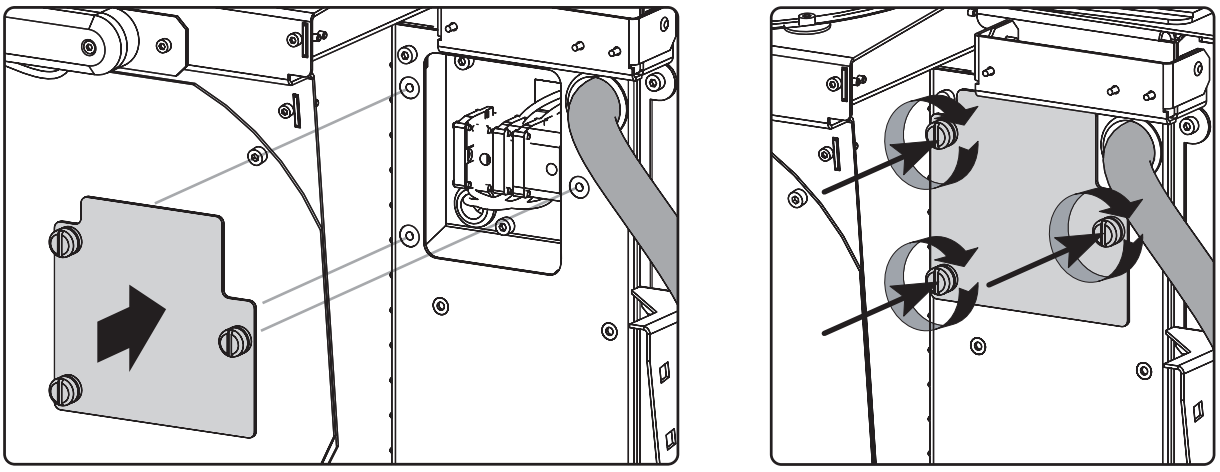


Image 19-14

6. Connect the wire units A and B with the LPS communication interface as illustrated. A is the CTRL wire unit between LPS and interface and B is the communication cable between Power Backplane and interface.

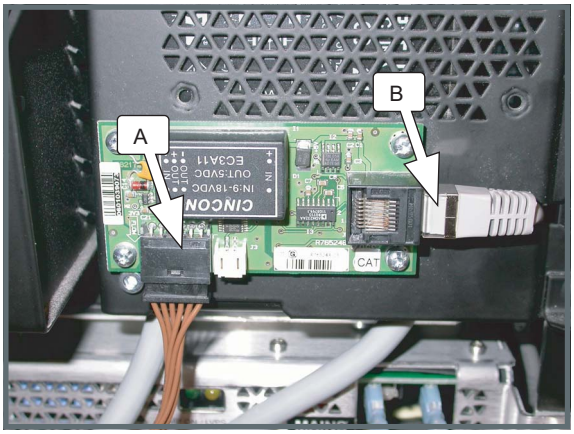


Image 19-15

20. POWER COMPARTMENT

About this chapter

This is chapter describes the different parts of the power compartment which is located underneath the Input & Communication unit.

WARNING: RISK OF ELECTRIC SHOCK. Switch off and unplug before removing the cover of the power compartment.

CAUTION: DOUBLE POLE / NEUTRAL FUSING

Overview

- Introduction
- Diagnostic LEDs of the power compartment
- Replacement of the Switched Mode Power Supply
- Replacement of the Fan & Motor Control board
- Replacement of the Power Backplane

20.1 Introduction

Power compartment

The power compartment is located underneath the Input & Communication unit of the projector. The power compartment contains the Switch Mode Power Supply (SMPS), the Fan & Motor Control Board and the Power Backplane. The compartment is sealed with a metal cover. An opening is made in the metal cover to see the diagnostic LEDs of the Fan & Motor Control Board.

Parts of the power compartment

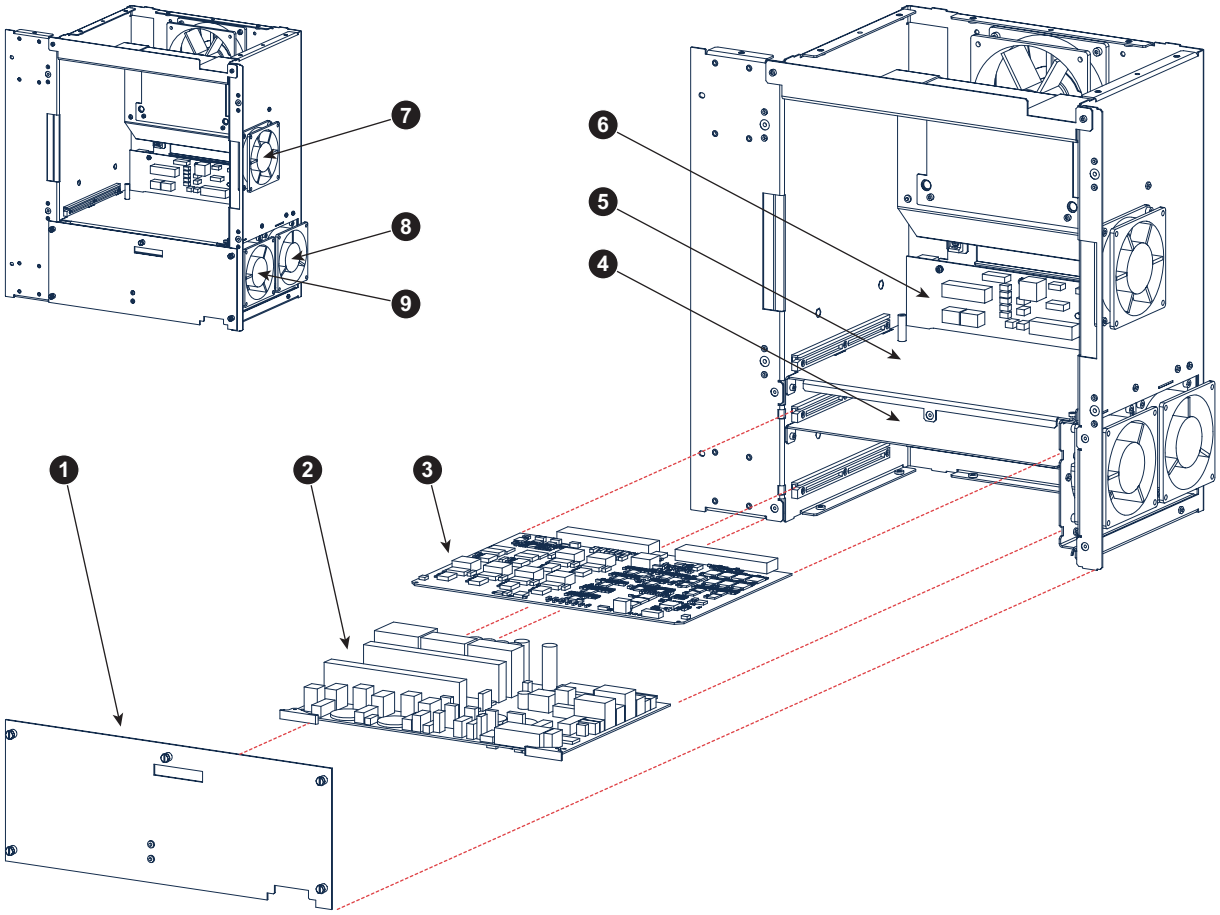


Image 20-1
1 Cover plate of the power compartment.
2 SMPS board (Switch Mode Power Supply).
3 Fan & Motor Control board.
4 Lower shield plate.
5 Upper shield plate.
6 Power Backplane.
7 Fan for cooling the Input & Communication compartment.
8 Right fan for cooling the power compartment.
9 Left fan for cooling the power compartment.

20.2 Diagnostic LEDs of the power compartment

Diagnostic LEDs

The Fan & Motor Control board is equipped with 7 diagnostic LEDs. These LEDs can be seen through a hole in the cover plate of the power compartment. Note that the projector input cover must be removed to see the cover plate of the power compartment.

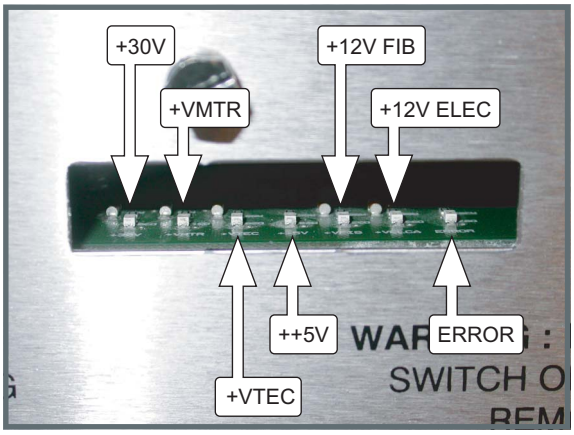


Image 20-2

+30V	Indicates that the +30V is present. The +30V is used as a base voltage to drive all fans and motors. Note that the +VMTR is derived from the +30V.
+VMTR	Indicates that the voltage to drive all motors (e.g. lens zoom, shift) is present. Note that the +VMTR is derived from the +30V.
+VTEC	Indicates that the voltage to drive the Peltier elements (TEC), which are mounted on the Light Processor unit, is present.
++5V	Indicates that the standby voltage of 5 volt is present.
+12V FIB	Indicates that the supply voltage of 12 volt for the Formatting Interface Board (FIB) is present.
+12V ELEC	Indicates that the supply voltage of 12 volt for the Input & Communication unit is present.
ERROR	Indicates that their is a problem with one of the power voltages listed above.

20.3 Replacement of the Switched Mode Power Supply

Necessary tools

7 mm nut driver.

How to replace the Switched Mode Power Supply?

1. Remove the cover plate of the power compartment by releasing the five retaining screws (reference 1). Use a 7 mm nut driver.

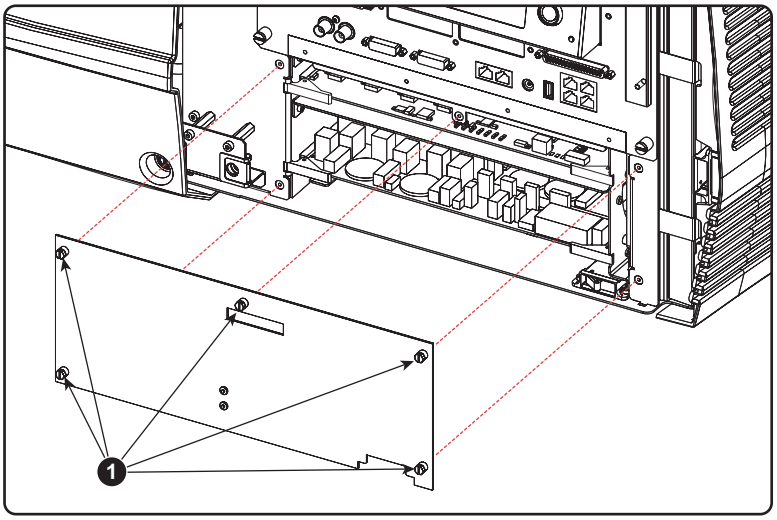


Image 20-3

2. Unlock the SMPS board by pulling open both lids of the board. Note the SMPS board is the lowest board in the power compartment.

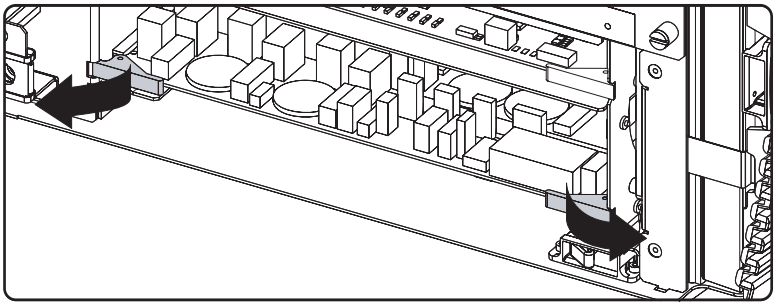


Image 20-4

3. Pull out the unlocked SMPS board from the compartment.

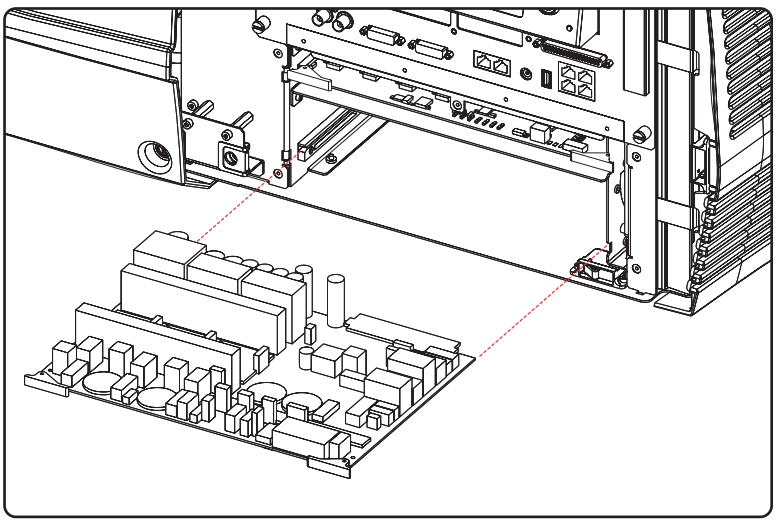


Image 20-5

4. Insert a new SMPS board. Ensure that the SMPS board is completely inserted.

5. Reinstall the cover plate of the power compartment. Use a 7 mm nut driver to fasten the five retaining screws (reference 1) of the cover plate.

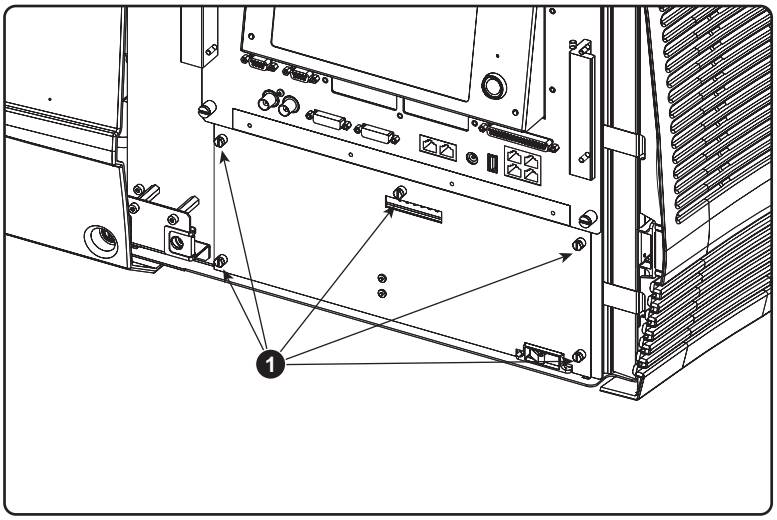


Image 20-6

20.4 Replacement of the Fan & Motor Control board

Necessary tools

7 mm nut driver.

How to replace the Fan & Motor Control board?

1. Remove the cover plate of the power compartment by releasing the five retaining screws (reference 1). Use a 7 mm nut driver.

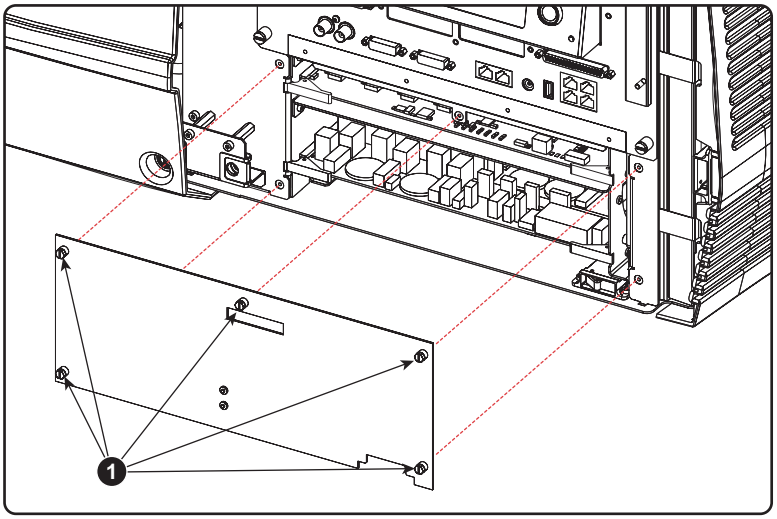


Image 20-7

2. Unlock the Fan & Motor Control board by pulling open both lids of the board. Note the Fan & Motor Control board is the upper board in the power compartment.

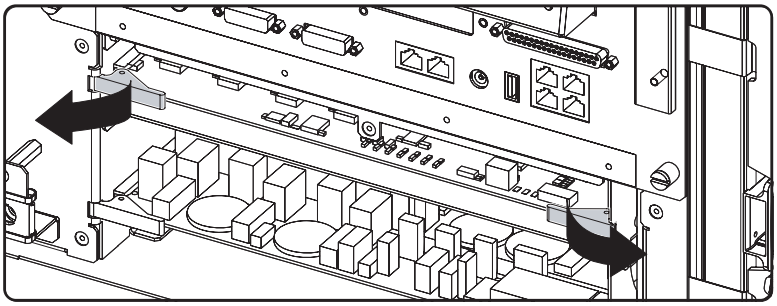


Image 20-8

3. Pull out the unlocked Fan & Motor Control board from the compartment.

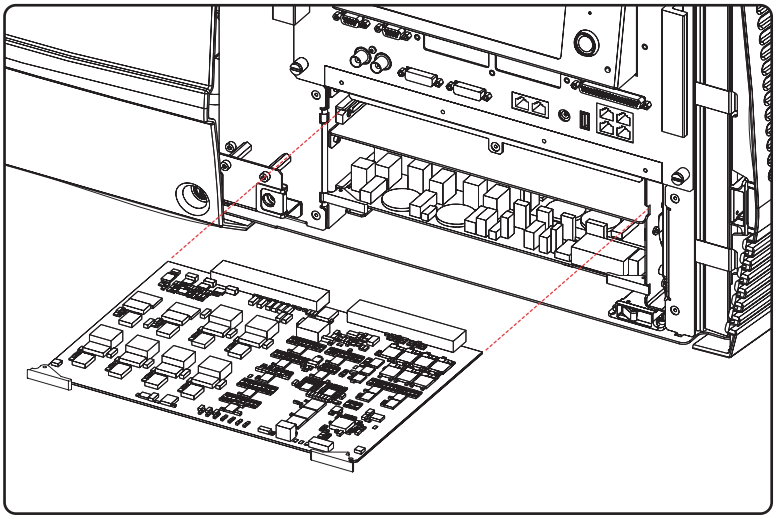


Image 20-9

4. Insert a new Fan & Motor Control board. Ensure that the Fan & Motor Control board is completely inserted.

5. Reinstall the cover plate of the power compartment. Use a 7 mm nut driver to fasten the five retaining screws (reference 1) of the cover plate.

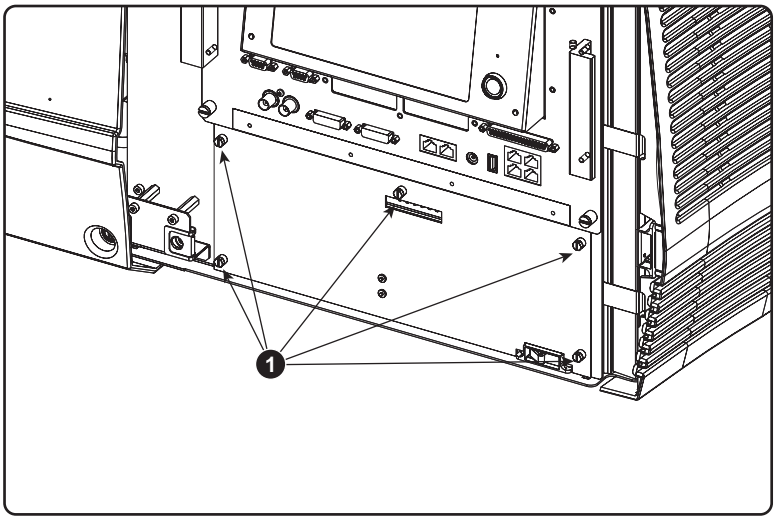


Image 20-10

20.5 Replacement of the Power Backplane

This procedure assumes that the Light Processor, SMPS board and Fan & Motor Control board are already removed.

Necessary tools

- 7 mm nut driver.
- 2,5 mm Allen wrench.
- T10 Torx screwdriver.

How to replace the Power Backplane of the power compartment?

1. Remove the lower shield plate from the power compartment as illustrated. Use a 2,5 mm Allen wrench to release the three screws (reference 1) at the left side and the three screws (reference 2) at the right side.

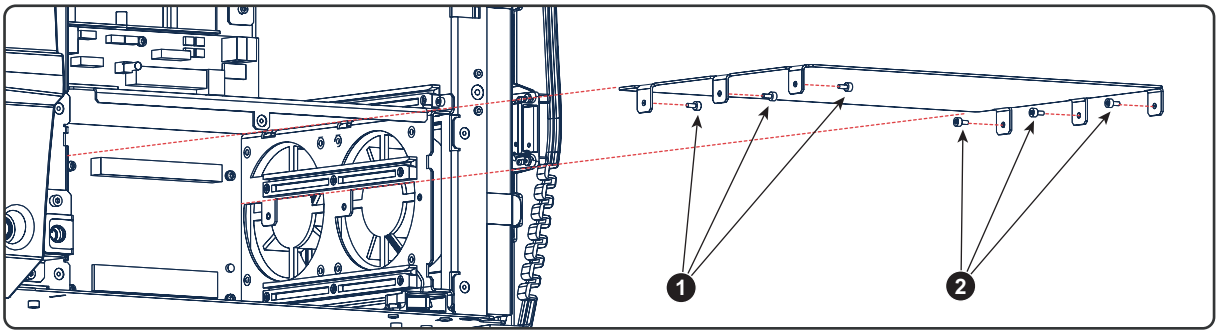


Image 20-11

2. Remove the upper shield plate from the power compartment as illustrated. Use a 2,5 mm Allen wrench to release the three screws (reference 3) at the left side and the three screws (reference 4) at the right side.

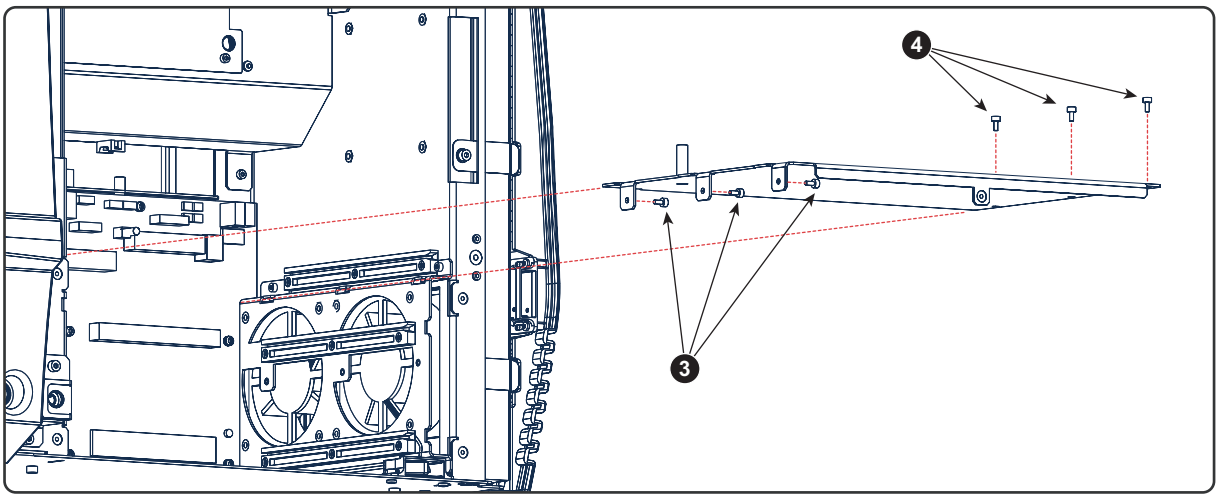


Image 20-12

3. Release the fan assembly by removing the four indicated screws (reference 5). Use a 2,5 mm Allen wrench. Note that the fan assembly can not be removed. But releasing the four screws gives the fan assembly sufficient play to remove the Power Backplane in the next steps.

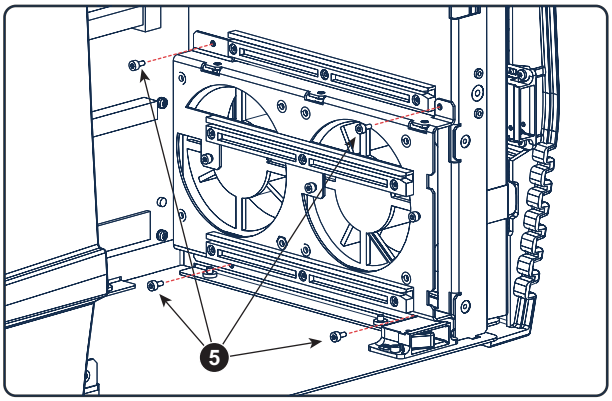


Image 20-13

4. Disconnect all wire units from the Power Backplane.

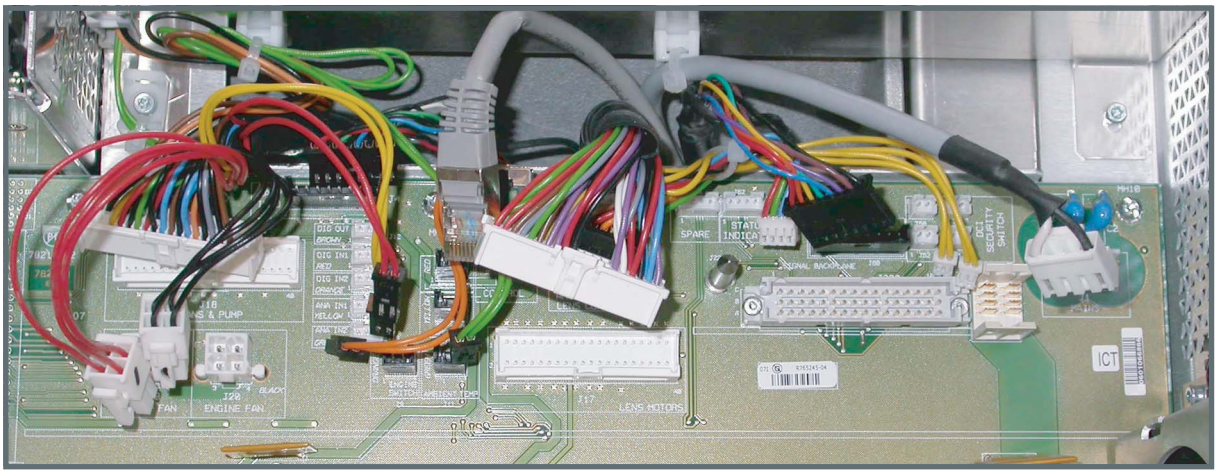


Image 20-14

5. Release the eleven screws (reference 6) which fasten the Power Backplane. Use a T10 Torx screwdriver. Note that two wire units have a ground eye lid which is secured by two of the upper screws.

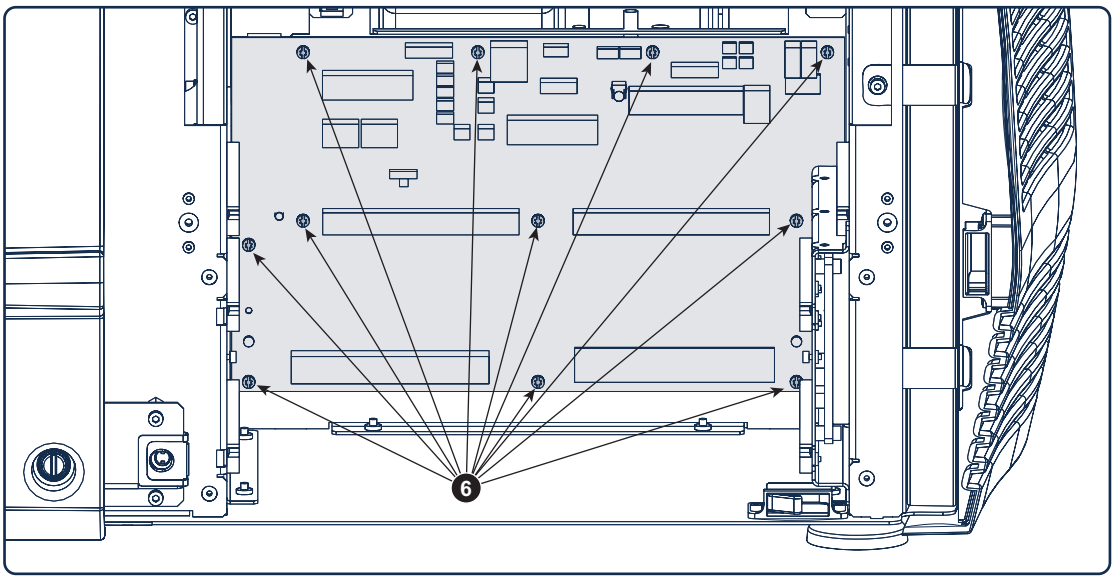


Image 20-15

6. Gently remove the Power Backplane from the power compartment and replace with a new one.

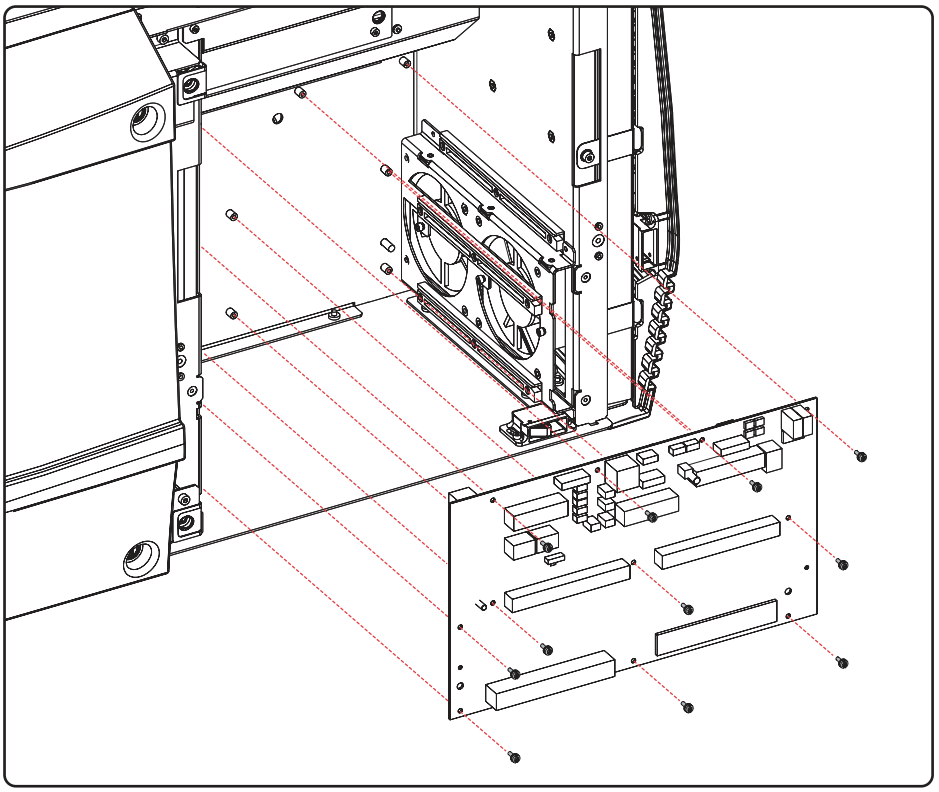


Image 20-16

7. Fasten the new Power Backplane with 11 screws (reference 6 image 20-15). Use a T10 Torx screwdriver. Note that two wire units have a ground eye lid which have to be secured with two of the upper screws as illustrated below.

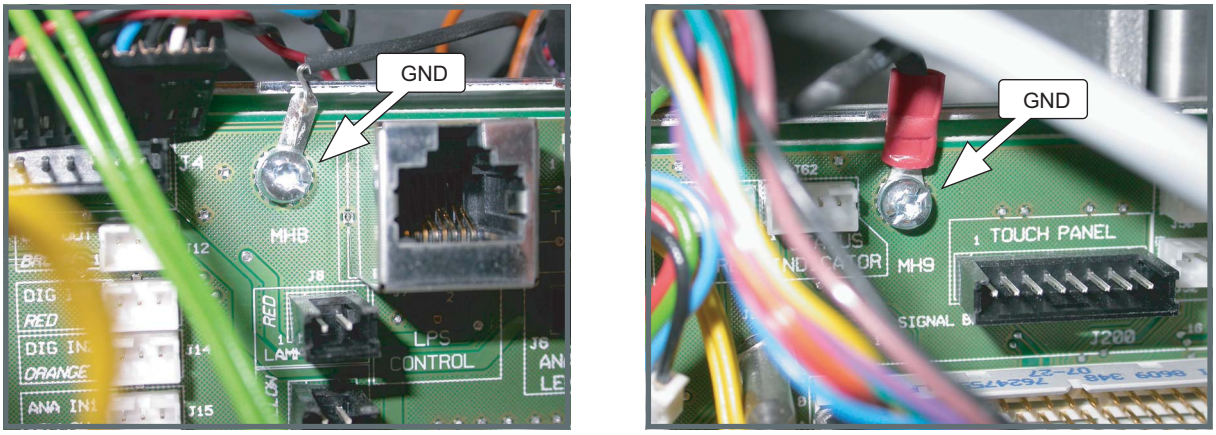


Image 20-17

8. Reconnect all wire units with the Power Backplane. Note that the color of the wire units are screened next to each socket on the Power Backplane.

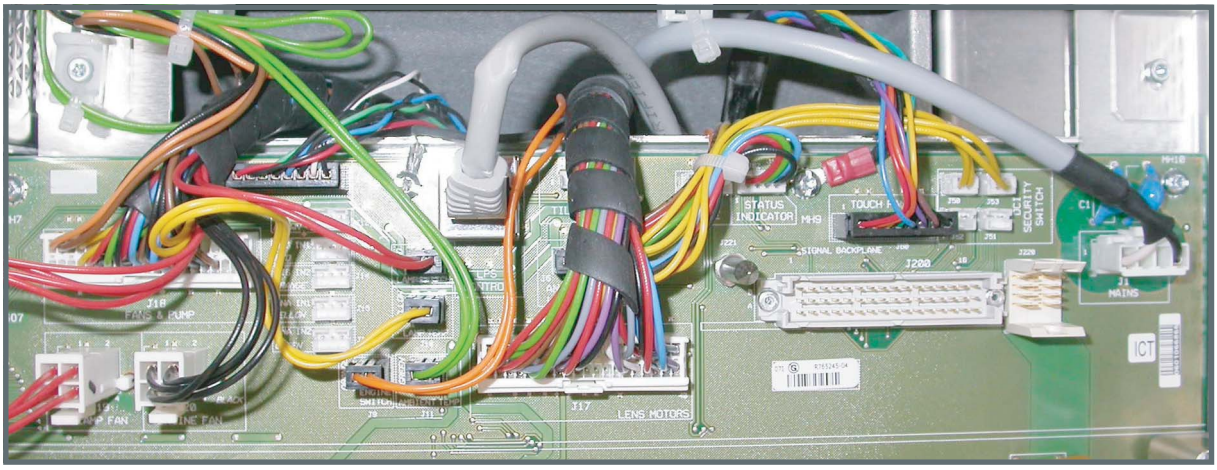


Image 20-18

9. Secure the fan assembly. Use a 2,5 mm Allen key to fasten the four screws (reference 5 image 20-13).
10. Reinstall the upper shield plate from the power compartment. Use a 2,5 mm Allen wrench to fasten the three screws at the left side and the three screws at the right side (image 20-12).
11. Reinstall the upper shield plate from the power compartment. Use a 2,5 mm Allen wrench to fasten the three screws at the left side and the three screws at the right side (image 20-11).

21. LAMP POWER SUPPLY

About this chapter

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

Overview

- Introduction
- LPS diagnostic LEDs
- Removing the LPS module
- Installation of the LPS module
- Replacement of the LPS communication interface

21.1 Introduction

Functionality of the Lamp Power Supply

The Lamp Power Supply (LPS) of the DP-2000/DP-1500 digital projector is actually a dual LPS connected in parallel. Both LPS units are enclosed in one casing. The front side of the LPS casing contains the input/output connectors and diagnostic LED's of the LPS units. The rear side is equipped with fans. The whole LPS module slides into the LPS compartment at the rear bottom of the DP-2000/DP-1500 projector and can easily been replaced.

To ignite the lamp the voltage on the output pins of the LPS units is brought up to 140 volt. This high 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 units is dropped to the typical arc voltage of the lamp e.g. 28 volt for a 3 kW lamp.

Each LPS unit can deliver maximum 2500 watts and maximum 100 amps. In normal situation, each LPS unit deliver the half of the required power. So, for a 3 kW lamp having an arc voltage of 28 volt, each LPS unit deliver 53,57 amps at 28 volt which is equal to 1500 watt.

When one of the two LPS units suddenly fails during the event the other LPS unit will continue delivering 53,57 amps at 28 volt. As a result the projectors light output will be reduced. In case the projector starts up and one LPS unit remains down the other LPS unit will run on its maximum power and deliver 89,3 amps at 28 volt which is equal to 2500 watt.

In case one or both LPS units fails an error will be logged in the projector log file.

Parts

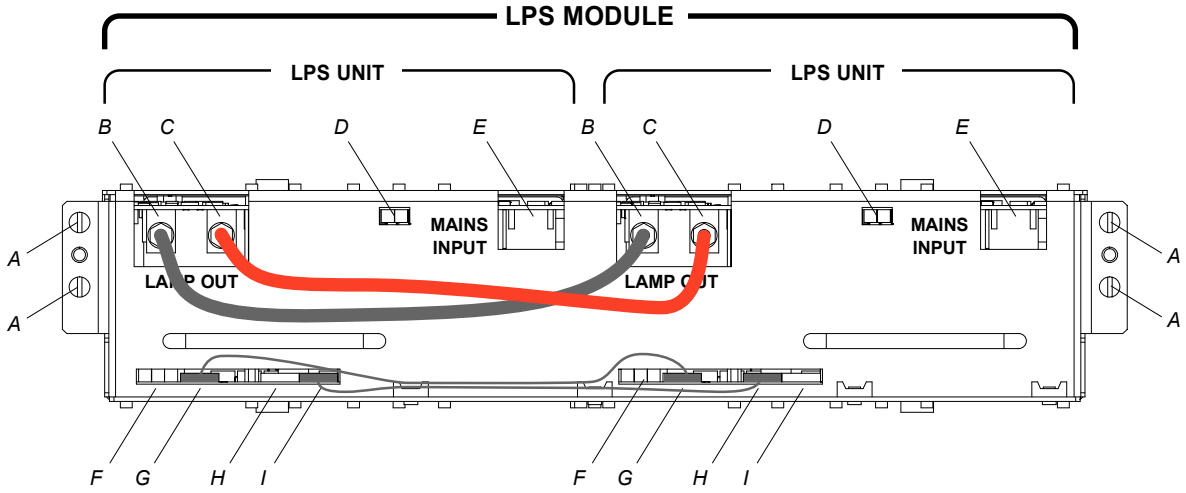


Image 21-1

A Captive screw.

B Lamp output pin "–".

C Lamp output pin "+".

D Status LED's: "LAMP ON / LVPS OK".

E Mains input.

F Status LED's: "ERR", "PFC OK" & "LPS OK".

G Socket for "ADDRESS" cable.

H Socket for "CTRL OUT" cable.

I Socket for CTRL IN" cable.

21.2 LPS diagnostic LEDs

Status LEDs on LPS unit

The LPS module contains in total 10 status LEDs. There are 5 LEDs per LPS unit: one orange, three green and one red LED. The orange LED “LVPS OK” lights up immediately after the projector is switched on. All other status LEDs of the LPS unit remain off. This is the standby status of the LPS unit. Once the command to start up the projector is sent to the LPS units, the green LEDs are lighting up one after the other. First the green LED “PFC OK” turns on, then the green LED “LPS OK” and finally when the lamp is ignited, the green LED “LAMP ON” is lit.

The red LED “ERR” remains off unless an error is detected inside the LPS unit or both LPS units were ordered to shutdown due to a malfunction somewhere else inside the projector.

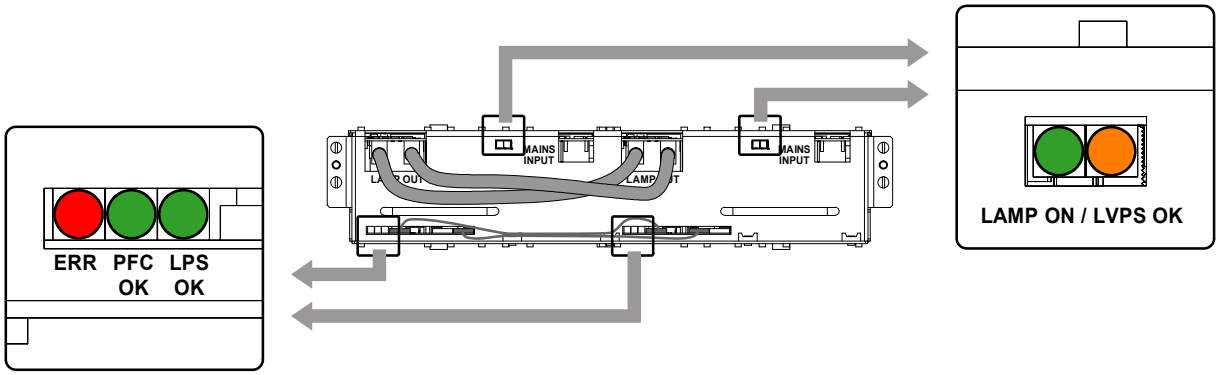


Image 21-2

Diagnostic

Or.	Gr.	Gr.	Gr.	Re.	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.	• Install another lamp house in case the voltage on the “LAMP OUT” pins is 140 volt and you hear the SPG module 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 to high.	• Check if the LPS air inlet at the bottom side of 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 whole LPS module.

Or.	Gr.	Gr.	Gr.	Re.	Diagnostic	Action
LVPS OK	**PFC OK**	**LPS OK**	**LAMP OK**	**ERR**		
ON	OFF	OFF	OFF	Flashing fast	Error detected inside this LPS unit. In case the other LPS unit operates normally the LPS module as a whole works at 50%.	Replace the LPS module.
ON	OFF	OFF	OFF	Flashing slow	The LPS module operates normally but the LPS communication interface is probably malfunctioning. One or both LPS units where ordered to shutdown due to a malfunction somewhere else inside the projector. In most cases this happens after the projector is warmed up. Older LPS communication interfaces may have this problem in combination with some LPS units. Note that the diagnostic LEDs on the Fan & Motor Control board do not indicate a problem.	• Check the revision of the LPS communication interface. The module revision must be “10” or higher. In case the module revision is lower than “10” **replace the LPS communication interface**. • Check the error logged in the projector log file.

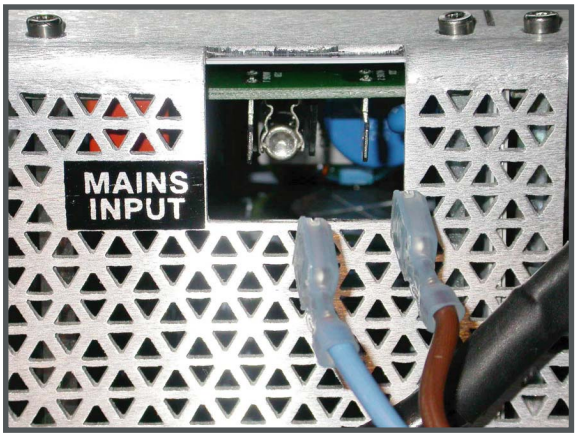
21.3 Removing the LPS module

Necessary tools

- 6 x 120 mm flat screw driver.
- 10 mm nut driver.

How to remove the LPS module?

1. Remove the back cover of the projector.
2. Disconnect the “MAINS INPUT” from both LPS units.



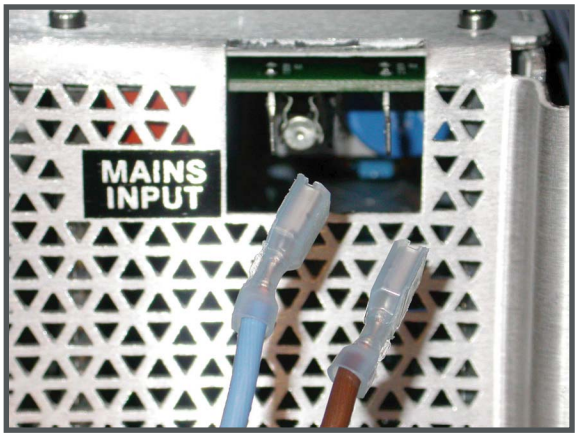


Image 21-3

3. Disconnect the grey wire unit from the “CTRL IN” socket.

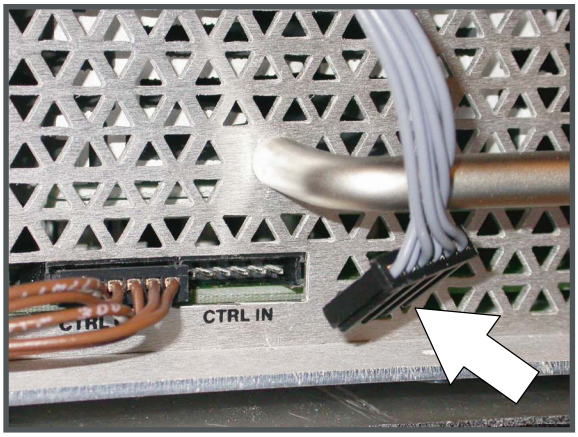


Image 21-4

4. Disconnect both “LAMP OUT” power cables at the left side from the LPS module. Use for that a 10 mm nut driver.
   Caution: *Do not loose the washers which fit between the fixation nuts and the cable eye.*

   Tip: *Place the washers and nuts back upon the output pins.*

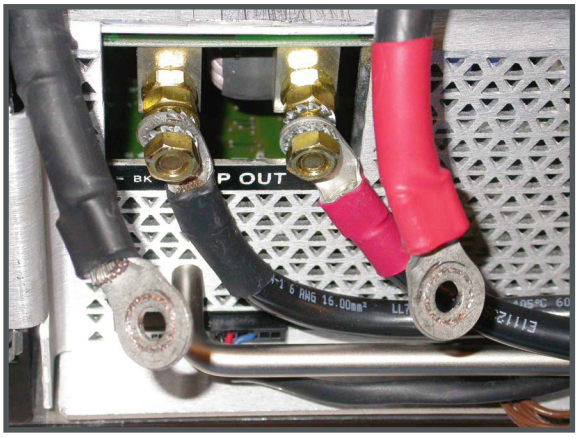


Image 21-5

5. Release the four captive screws which fasten the LPS module to the projector chassis. Use for that a flat screwdriver (6 x 10 mm).

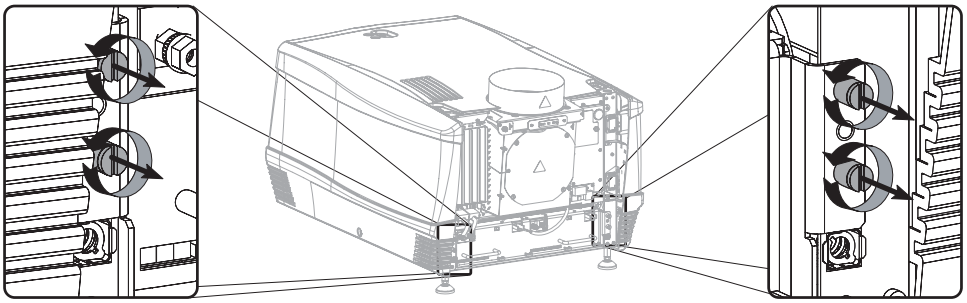


Image 21-6

6. Hold fast the LPS module by its handles pull the LPS module out of its compartment.

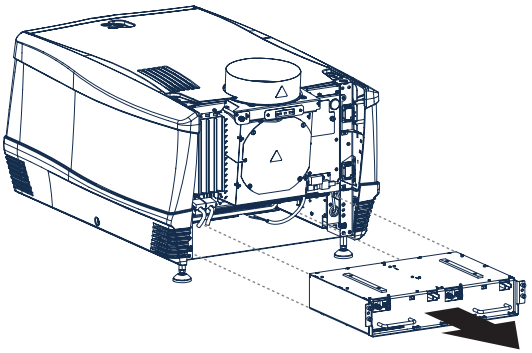


Image 21-7

21.4 Installation of the LPS module

Necessary tools

- 6 x 120 mm flat screwdriver.
- Torque wrench with a 10 mm hexagon socket.

How to install the LPS module?

1. Slide the LPS module into its compartment as illustrated.

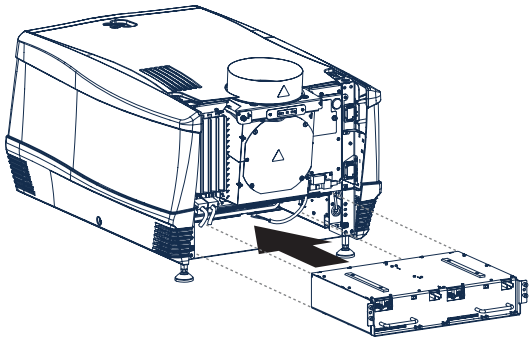


Image 21-8

2. Fasten the four captive screws of the LPS module.

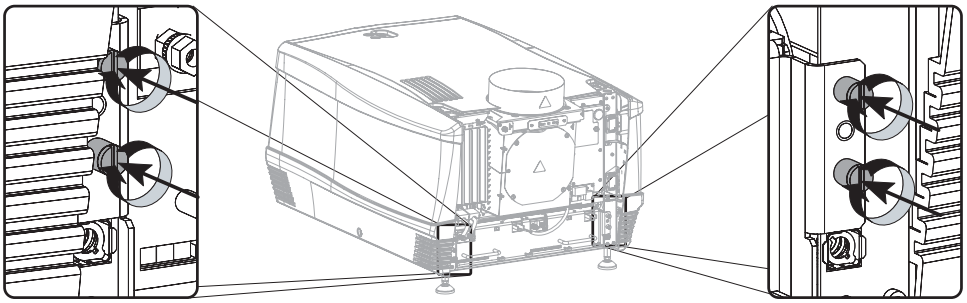


Image 21-9

3. Connect the power cables coming from the SPG module with the “LAMP OUT” sockets of the LPS module as illustrated. Fasten the nuts with a torque of **4Nm** (2.95 lbf*ft).
   Warning: *Make sure to place the washers and cable eyes in correct order upon the pin as illustrated. Always use a plain washer between the output pin and the cable eyes.*

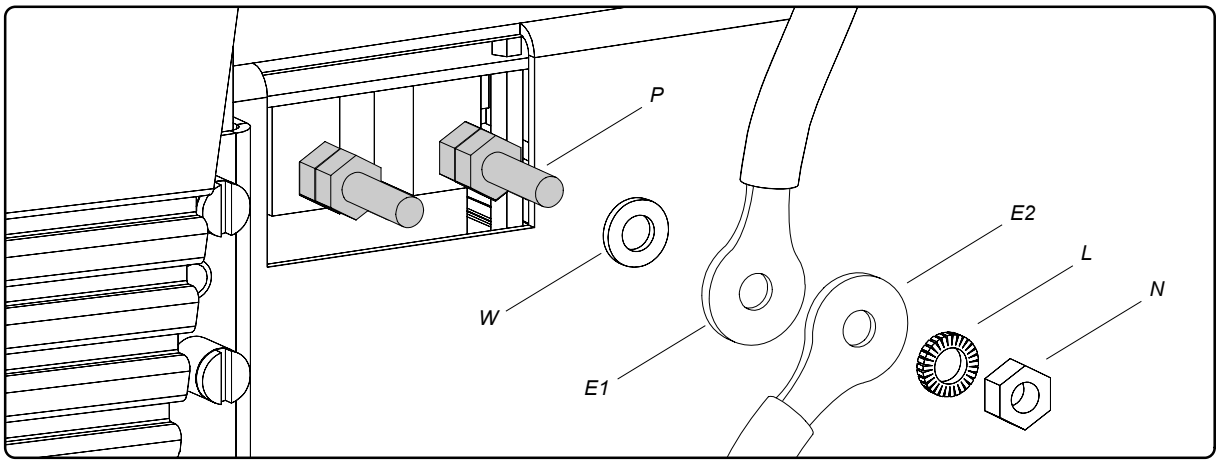


Image 21-10
P LPS output pin.
W Plain washer.
L Lock washer.
E1 Cable eye from SPG module.
E2 Cable eye from LPS unit.
N Nut.

Warning: *Respect the polarity of the socket and cables. Red marked cables with the “+” pin, black marked cables with the “-” pin.*

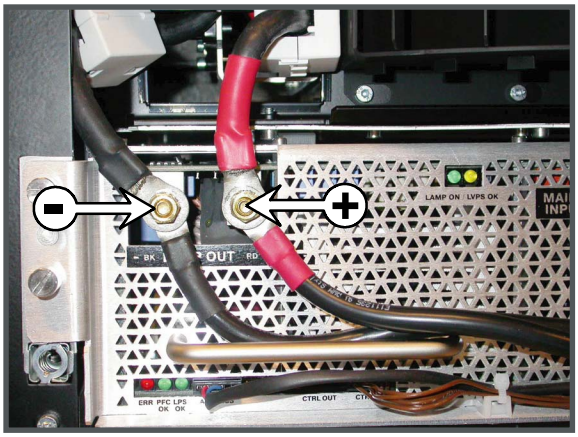


Image 21-11

4. Connect the wire unit from the LPS communication interface with the “CTRL IN” socket as illustrated.

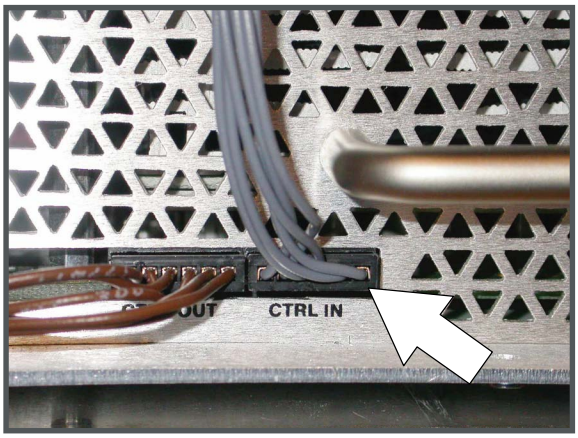
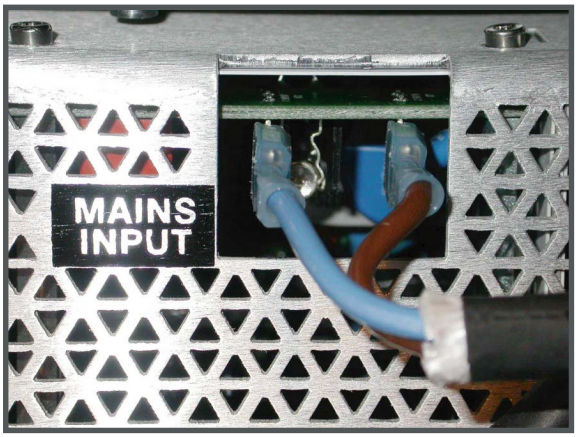


Image 21-12

5. Connect the mains input cables with the “MAINS INPUT” sockets of the LPS module as illustrated.



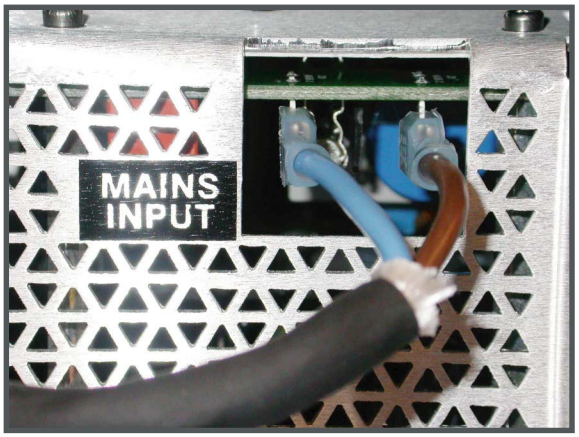


Image 21-13

6. Reinstall the back cover of the projector.

21.5 Replacement of the LPS communication interface

LPS communication interface

To exclude the influence of electrical interference on the communication line between the Barco Controller and the LPS module an optical separated RS232 communication is used. A network cable with RJ45 plugs connects the Power Backplane with the LPS communication interface. The LPS communication interface converts the RS232 signal into a I²C signal which is applied to the LPS module. Note that the Barco Controller has a board to board connection with the Power Backplane. The LPS communication interface is located at the rear side of the projector, just above the LPS compartement.

This procedure assumes that the rear cover of the projector is already removed.

Necessary tools

TX10 Torx screw driver.

How to replace the LPS communication interface?

1. Disconnect both wire units (reference A & B) from the LPS communication interface as illustrated.

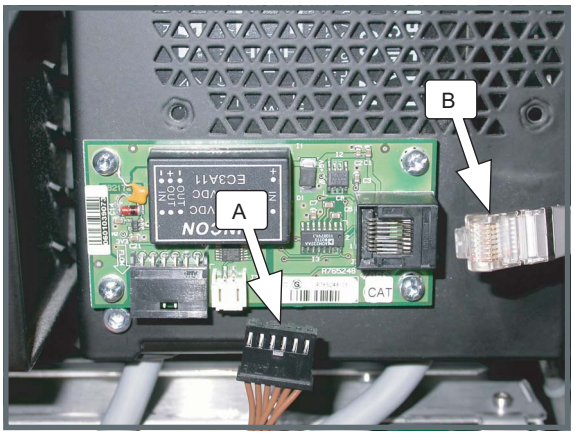


Image 21-14

2. Remove the LPS communication interface by releasing the four Torx screws as illustrated. Use a TX10 Torx screw driver.

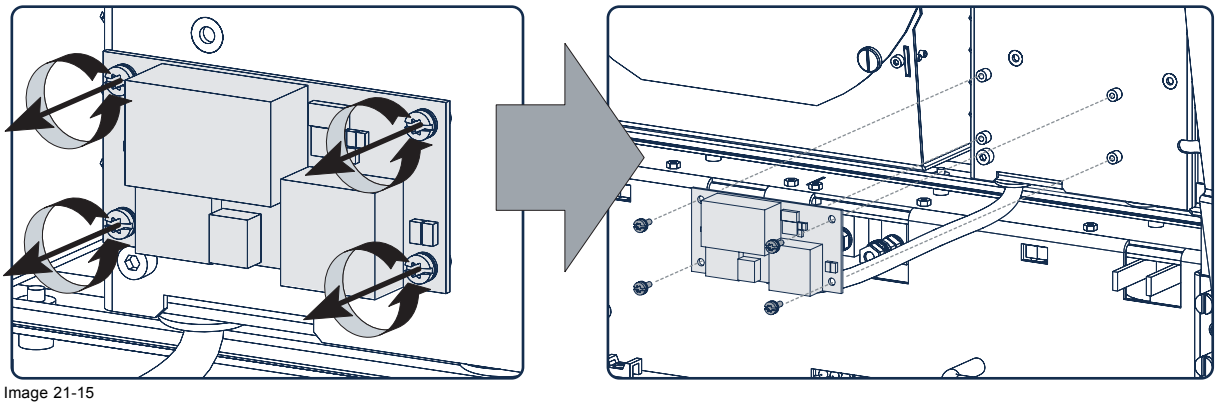


Image 21-15

3. Place a new LPS communication interface in its position and fasten with four Torx screws. Use a TX10 Torx screw driver.
4. Reconnect the wire units (reference A and B) with the LPS communication interface.

22. 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
- Troubleshooting
- Removal of the Start Pulse Generator
- Installation of the Start Pulse Generator

22.1 Introduction

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 start-up voltage of the lamp supplied by the Lamp Power Supply. 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

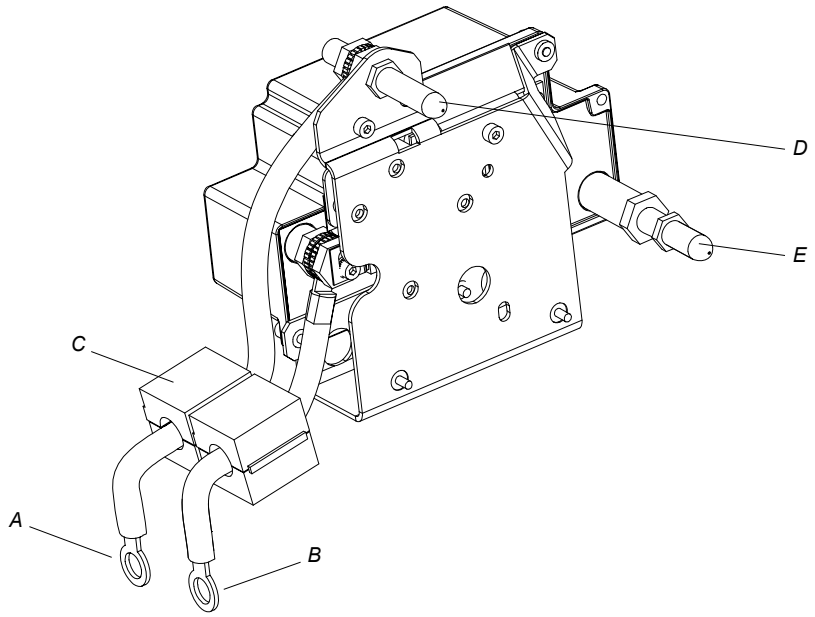


Image 22-1
A Black marked cable lug. Has to be connected with the negative “LAMP OUT” pin of the LPS module.
B Red marked cable lug. Has to be connected with the positive “LAMP OUT” pin of the LPS module.
C Ferrite block.
D Negative connection pin from SPG to lamp house.
E Positive connection pin from SPG to lamp house.

22.2 Troubleshooting

Lamp fails to ignite after you switched the projector from standby to operation

Situation	Solution
You can hear the SPG module three times clicking in an attempt to ignite the lamp. The voltage on the “LAMP OUT” pins of the LPS module is first 140 volt during the attempt to ignite and then drops to 0 volt. **Note**: The ambient noise must be low to hear the SPG clicking in an attempt to ignite the lamp.	• The LPS and SPG seem to work normally but the lamp is bad. Install another lamp house. • If the problem remains, replace the SPG module.
You can not hear the SPG module three times clicking in an attempt to ignite the lamp. The voltage on the “LAMP OUT” pins of the LPS module is first 140 volt during the attempt to ignite and then drops to 0 volt. **Note**: The ambient noise must be low to hear the SPG clicking in an attempt to ignite the lamp.	• Check the cabling of the SPG module. • Replace the SPG module.
You can not hear the SPG module three times clicking in an attempt to ignite the lamp. The voltage on the “LAMP OUT” pins of the LPS module is below 140 volt during the attempt to ignite. The diagnostic LED’s of the LPS module indicates a problem with the LPS module. **Note**: The ambient noise must be low to hear the SPG clicking in an attempt to ignite the lamp.	• Check the cabling of the LPS module. • Replace the LPS module.

22.3 Removal of the Start Pulse Generator

To remove or install the start pulse generator you have to remove the side cover, the back cover, the lamp cover and the lamp house first. This procedure assumes that these covers are already removed.

Necessary tools

- 10 mm nut driver.
- 3 mm Allen whrench.
- 6 x 120 mm flat screw driver.

How to remove the Start Pulse Generator?

1. Disconnect the SPG cables from the “LAMP OUT” pins of the LPS module. Use for that a 10 mm nut driver.
   Caution: *Do not loose the washers which fit between the fixation nuts and the cable eye.*

   Tip: *Place the washers and nuts back upon the output pins.*

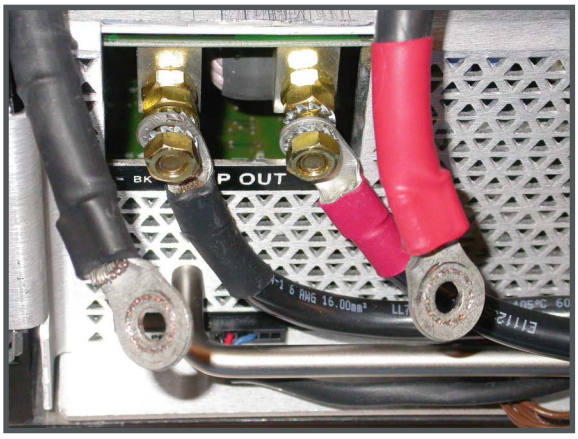


Image 22-2

2. Remove the cover of the Start Pulse Generator as illustrated. This cover is secured with 5 hexagon socket head cap screws. Use for that a 3 mm Allen wrench.

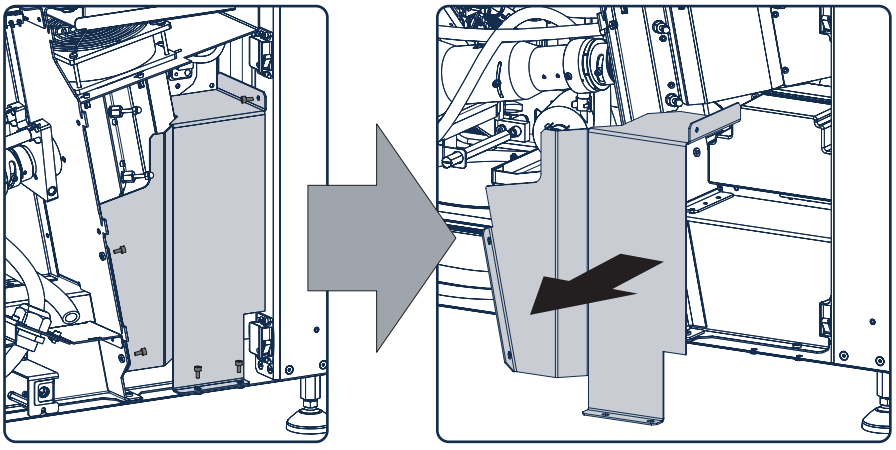


Image 22-3

3. Release the 3 captive screws (S) of the Start Pulse Generator as illustrated. Use for that a flat screw driver.

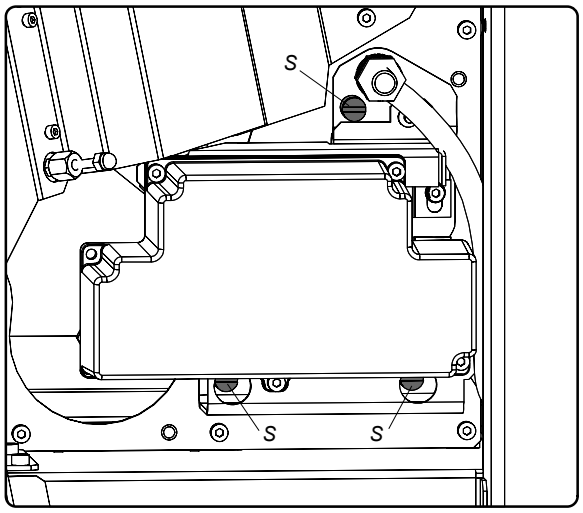


Image 22-4

4. Remove the Start Pulse Generator from the projector.
   Caution: *Do not damage the ferrite blocks while removing the SPG module.*

   Note: *The ferrite blocks have to be reused upon the SPG module which you want to install.*

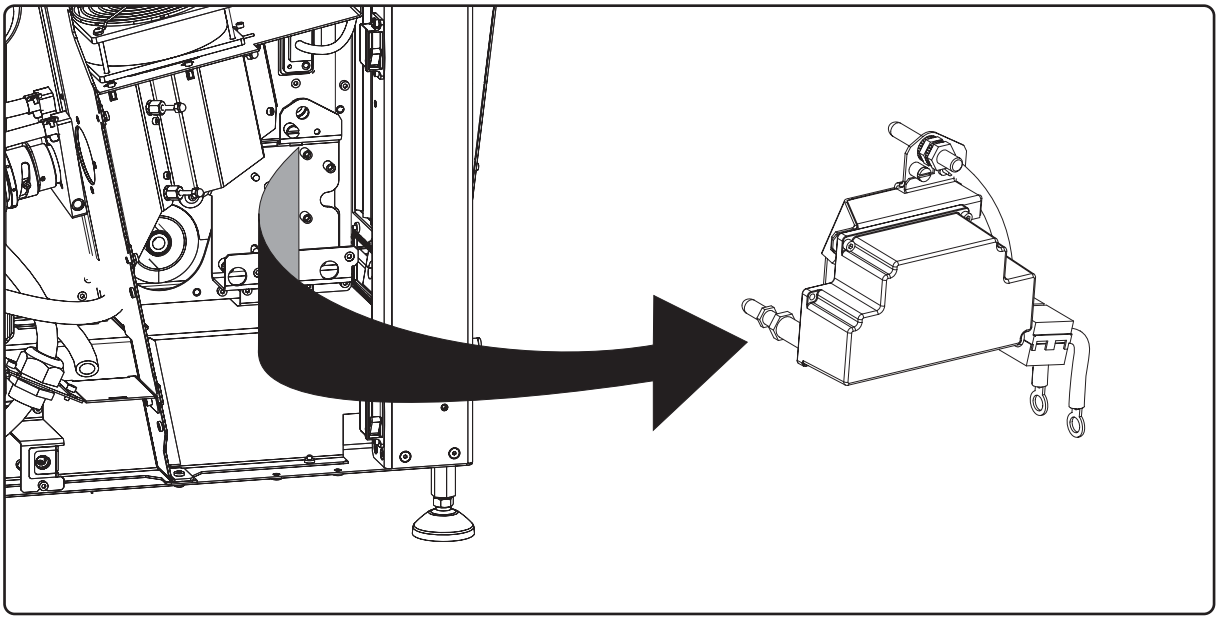


Image 22-5

22.4 Installation of the Start Pulse Generator

Necessary tools

- Torque wrench with a 10 mm hexagon socket.
- 3 mm Allen wrench.
- 6 x 120 mm flat screw driver.

How to install the Start Pulse Generator?

1. Place the Start Pulse Generator into its position inside the projector.
   Caution: *Gently guide the thick wires through the frame opening. Make sure that the lamp house is removed from the projector.*

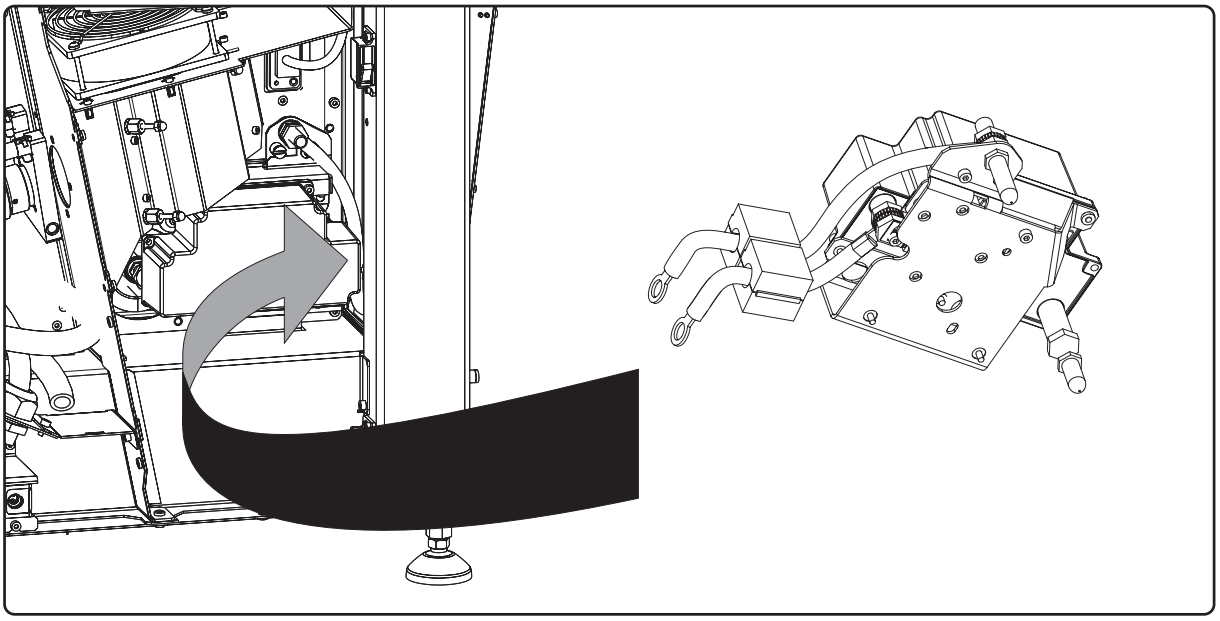


Image 22-6

2. Fasten the 3 captive screws (S) of the Start Pulse Generator as illustrated, using a flat screw driver.

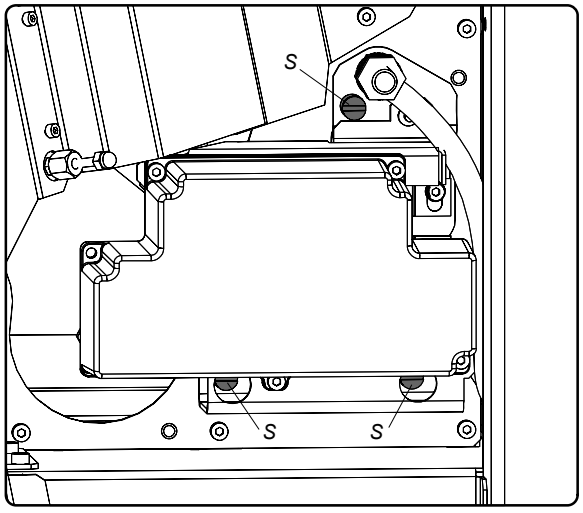


Image 22-7

3. Install the cover of the Start Pulse Generator as illustrated. The cover has to be fasten with 5 hexagon socket head cap screws. Use for that a 3 mm Allen wrench.

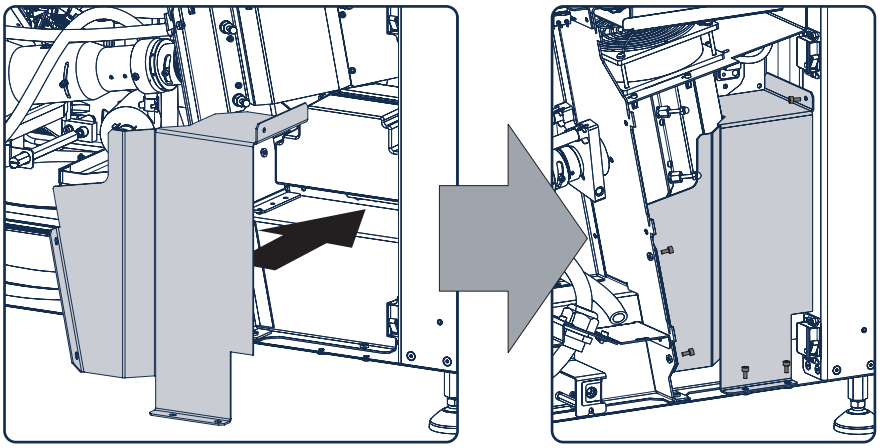


Image 22-8

4. Connect the power cables coming from the Start Pulse Generator with the “LAMP OUT” sockets of the LPS module as illustrated. Fasten the nuts with a torque of **4Nm** (2.95 lbf*ft).
   Warning: *Make sure to place the washers and cable eyes in correct order upon the pin as illustrated. Always use a plain washer between the output pin and the cable eyes.*

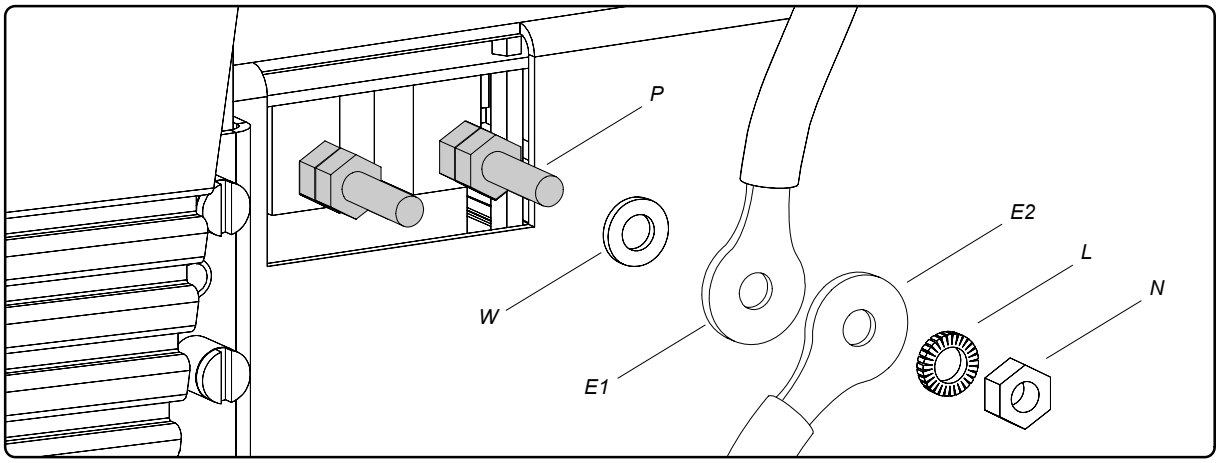


Image 22-9
P LPS output pin.
W Plain washer.
L Lock washer.
E1 Cable eye from SPG module.
E2 Cable eye from LPS unit.
N Nut.

Warning: *Respect the polarity of the socket and cables. Red marked cables with the “+” pin, black marked cables with the “-” pin.*

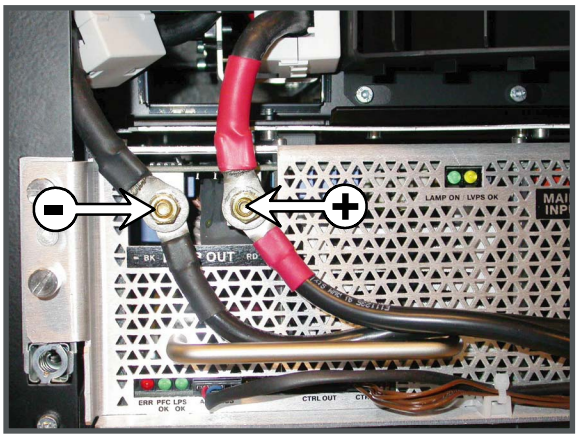


Image 22-10

Warning: *Make sure that both SPG cables are provided with ferrite blocks (C). Reuse the ferrite blocks of the removed SPG module in case no ferrite blocks are present upon the installed SPG module.*

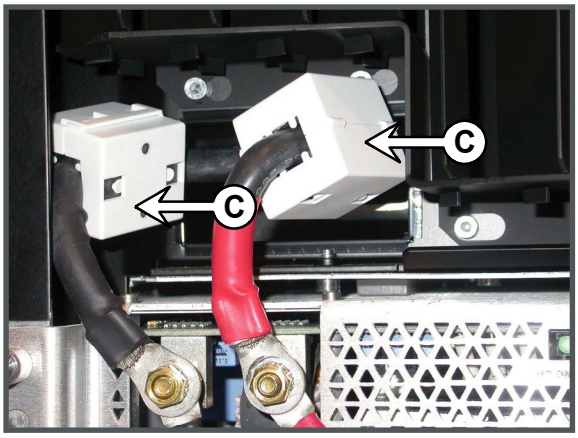


Image 22-11

5. Reinstall the lamp house and the covers of the projector.

23. FAN REPLACEMENT PROCEDURES

About this chapter

This chapter contains the replacement procedures of all fans in the projector. Except the fan of the Lamp Power Supply (LPS) unit. This unit has to be replaced as a whole.

Overview

- Heat exchanger fan
- Cold mirror fan
- Light Processor fan
- Lamp cathode fan
- Lamp anode fan
- Lamp Info Module fan
- Power compartment left fan
- Power compartment right fan
- Input & Communication compartment fan

23.1 Heat exchanger fan

This procedure assumes that the left cover and the cover of the sealed compartment is already removed.

Necessary tools

- 2,5 mm Allen wrench.
- 3 mm Allen wrench.
- Pair of pliers.

Necessary parts

Cable tie.

How to replace the fan of the heat exchanger?

1. Disconnect the liquid cooling circuit from the heat exchanger.
   Tip: *Sometimes a little cooling liquid will be spilled. Wrap a small cloth around the valved fitting while uncoupling to absorb the spilled cooling liquid.*

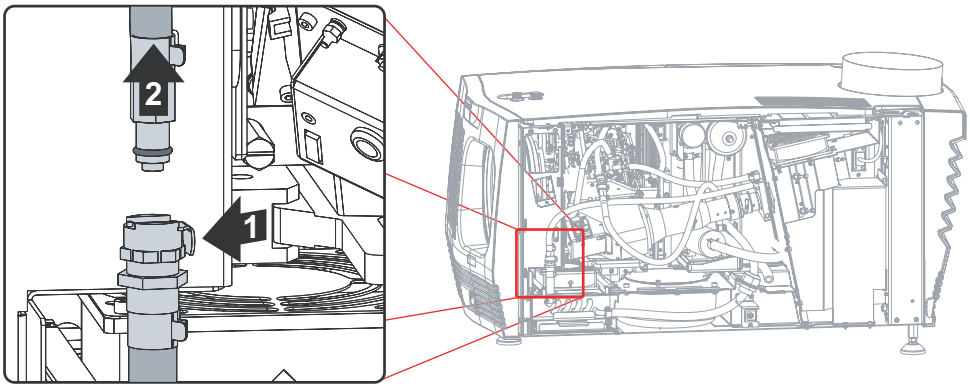


Image 23-1

2. Disconnect the fan (reference F) of the heat exchanger and the wire unit of the pump (reference P) as illustrated. Use a set of pliers to cut the cable tie which fasten the wire unit of the pump with the tubing.

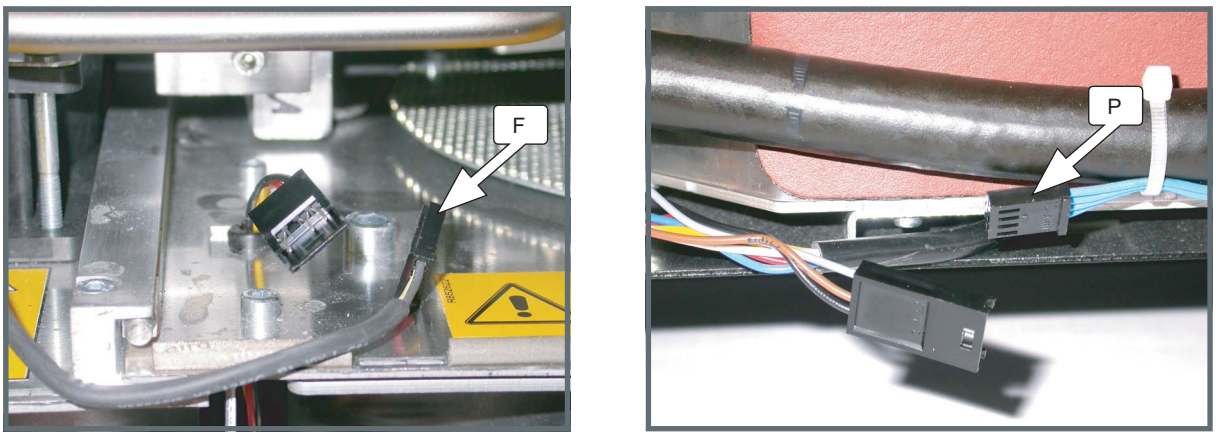


Image 23-2

3. Remove the two screws of the fixation plate for the tubing as illustrated. Use a 3 mm Allen wrench.

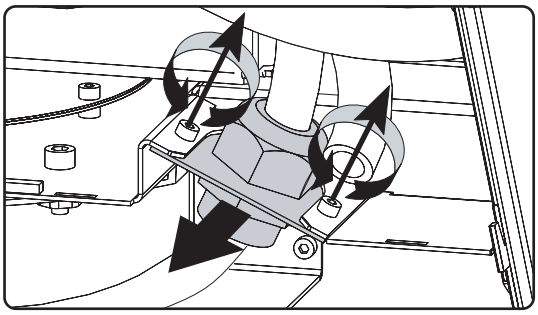


Image 23-3

4. Release the two fixation screws of the heat exchanger assembly and pull out the assembly. Use a 2,5 mm Allen wrench.

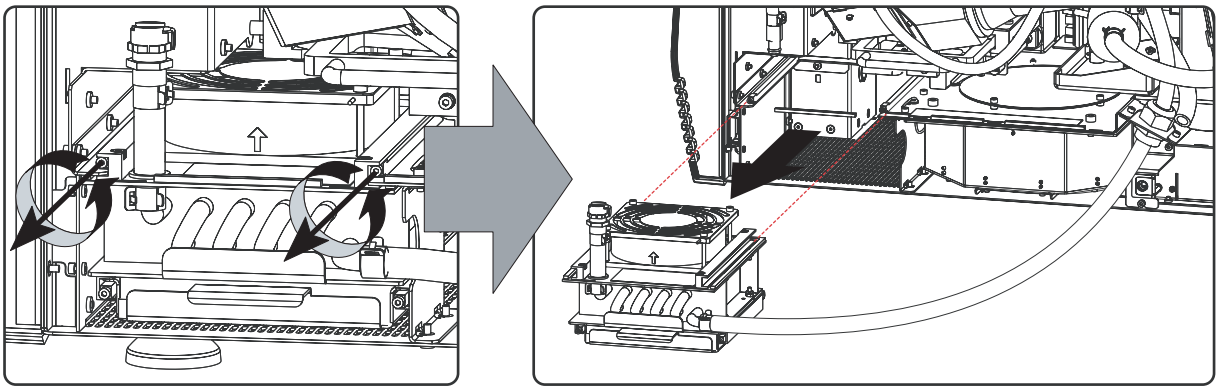


Image 23-4

5. Remove the fan (reference 3) from the heat exchanger assembly (reference 4) by releasing the four hexagon socket head cap screws (reference 1) as illustrated. Note that the on top of the fan a fan finger guard (reference 2) is mounted. Use a 3 mm Allen wrench.

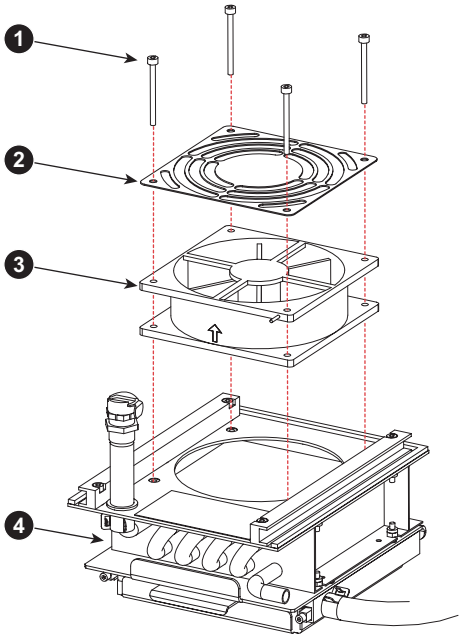


Image 23-5

6. Install a new fan upon the heat exchanger. Make sure that the air flow of the fan is upwards and the top of the fan is provided with an fan finger guard. Use a 3 mm Allen wrench to fasten the four hexagon socket head caps screws.
7. Slide the heat exchanger assembly in its place and fasten the two fixation screws. Use a 2,5 mm Allen wrench.

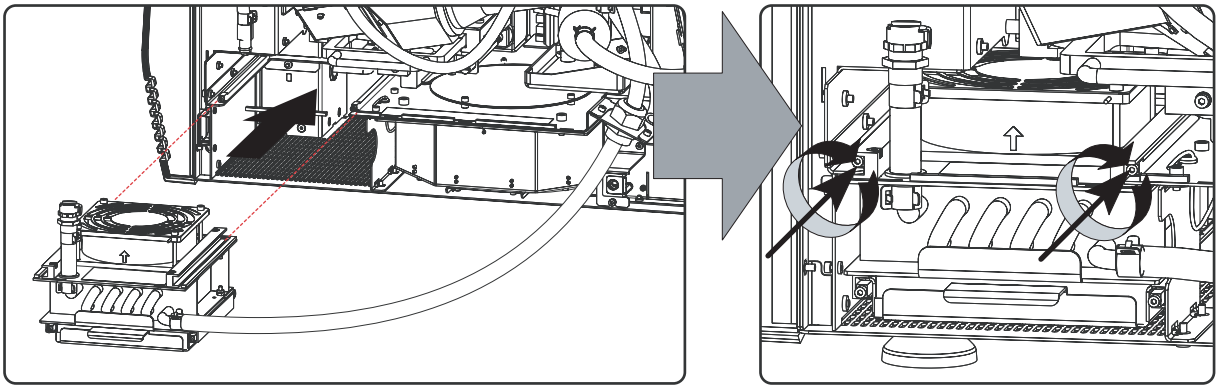


Image 23-6

8. Fasten the fixation plate for the tubing with two screws as illustrated. Use a 3 mm Allen wrench.

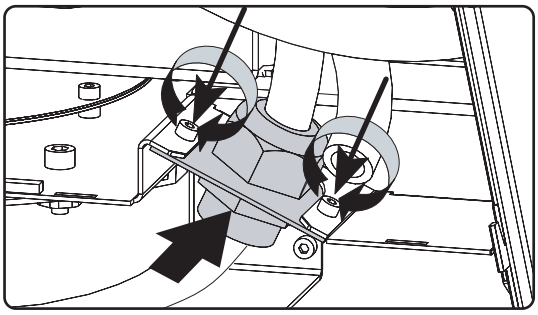


Image 23-7

9. Reconnect the wire unit of the fan (reference F) and the wire unit of the pump (reference P). Use a cable tie (reference T) to secure the wire unit of the pump with the tubing.

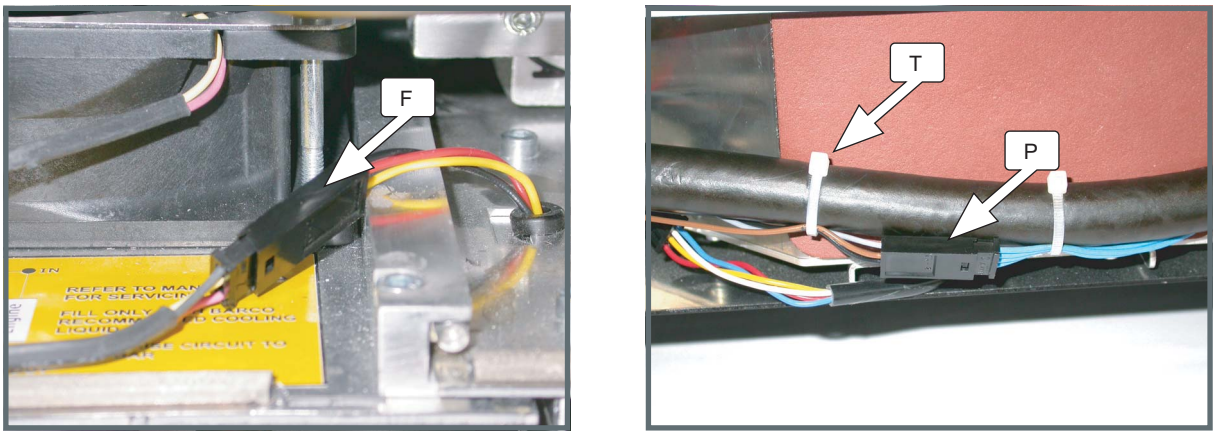


Image 23-8

10. Close up the liquid cooling circuit which you interrupted in step 1.

23.2 Cold mirror fan

The top cover of the projector has to be removed to replace the fan of the cold mirror without removing the cold mirror assembly from the projector. To remove the top cover all other covers has to be removed first. This procedure assumes that the front, rear, left, input and lamp cover are already removed.

Necessary tools

2,5 mm Allen wrench with ball head.

How to replace the fan of the cold mirror?

1. Slide out the dust filter.

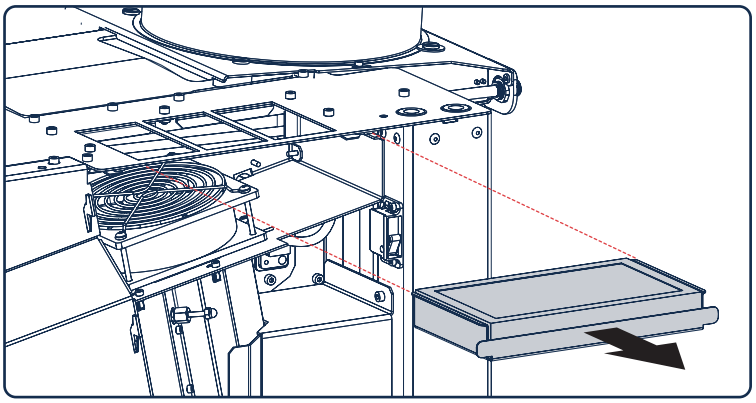


Image 23-9

2. Disconnect the wire unit (reference 1) of the fan.

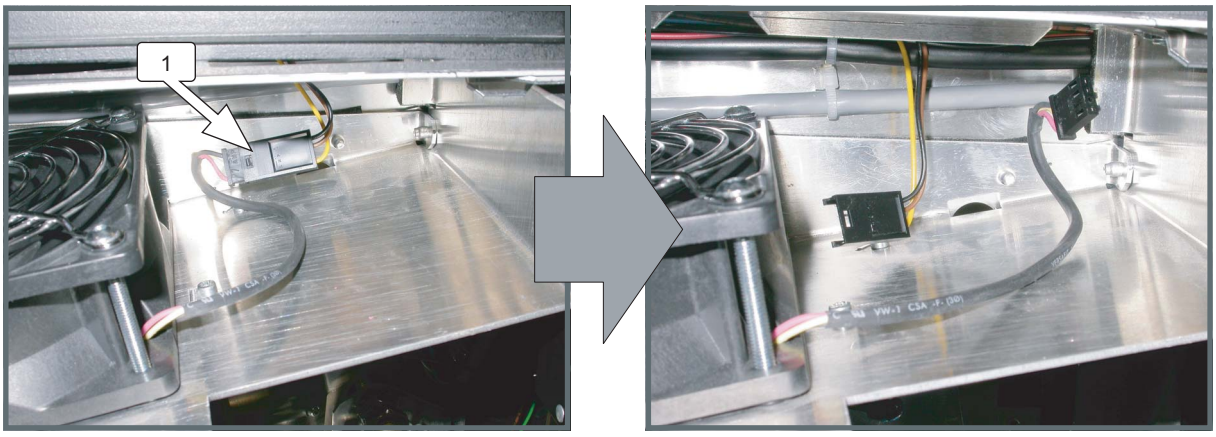


Image 23-10

3. Remove the four indicated screws (reference 2) with a 2,5 mm ball end Allen wrench.

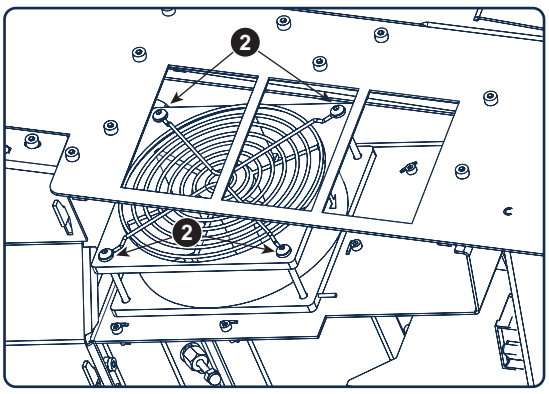


Image 23-11

4. Slide out the fan (reference 3) and fan finger guard (reference 4).
   Caution: *Be careful not to drop the rubber cushioning rings (reference 5) inside the projector.*

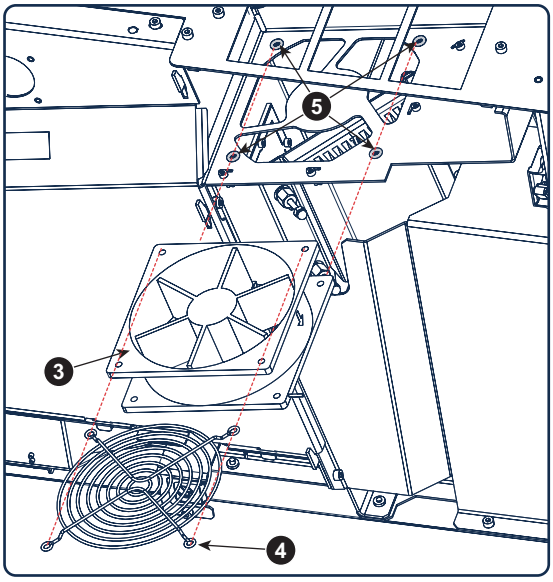


Image 23-12

5. Slide in a new fan and insert the four rubber cushioning rings between the fan and the fan plate. Make sure that the airflow of the fan is downwards.
6. Place the fan finger guard on top of the fan and secure with four screws using a ball end Allen wrench.
7. Reconnect the wire unit (reference 1) of the fan.

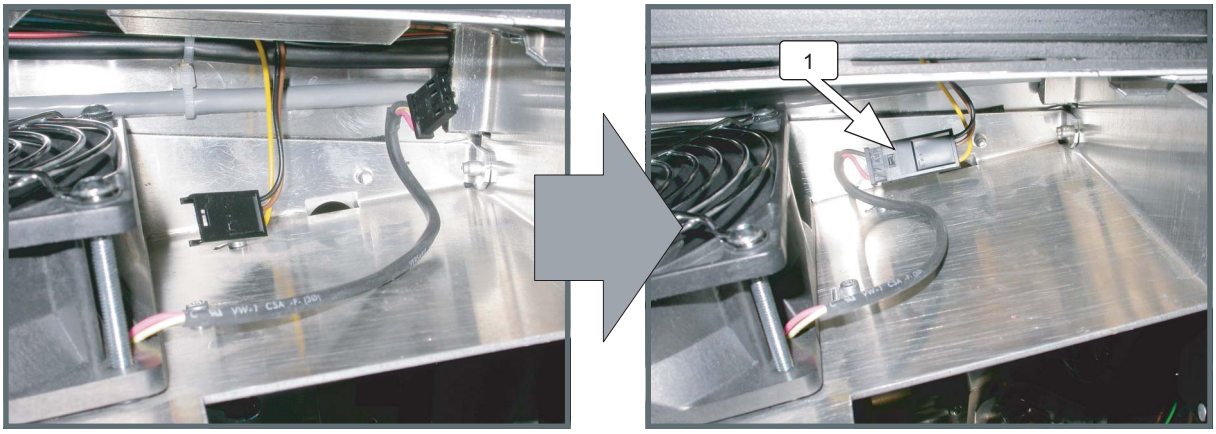


Image 23-13

8. Reinsert the dust filter. Make sure that the dust filter is correctly oriented.

23.3 Light Processor fan

To access the Light Processor fan the Input & Communication unit has to be removed. This procedure assumes that the Input & Communication unit is already removed.

Necessary tools

- 2,5 mm Allen wrench.
- 3 mm Allen wrench.

How to replace the fan of the Light Processor?

1. Remove the cover plate of the fan compartment. Use a 2,5 mm Allen wrench to release the four hexagon socket head cap screws (reference 1) which secure the cover plate.

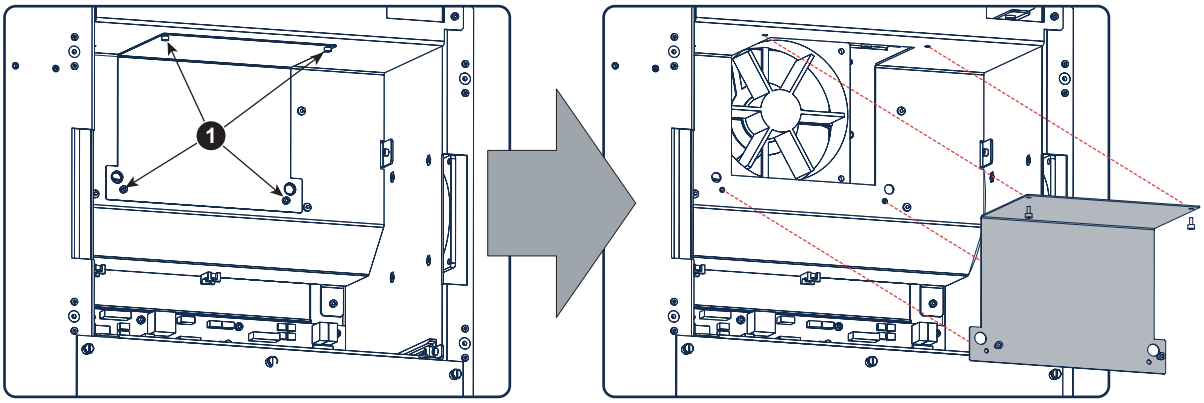


Image 23-14

2. Disconnect the wire unit (reference C) of the Light Processor fan (reference F3).

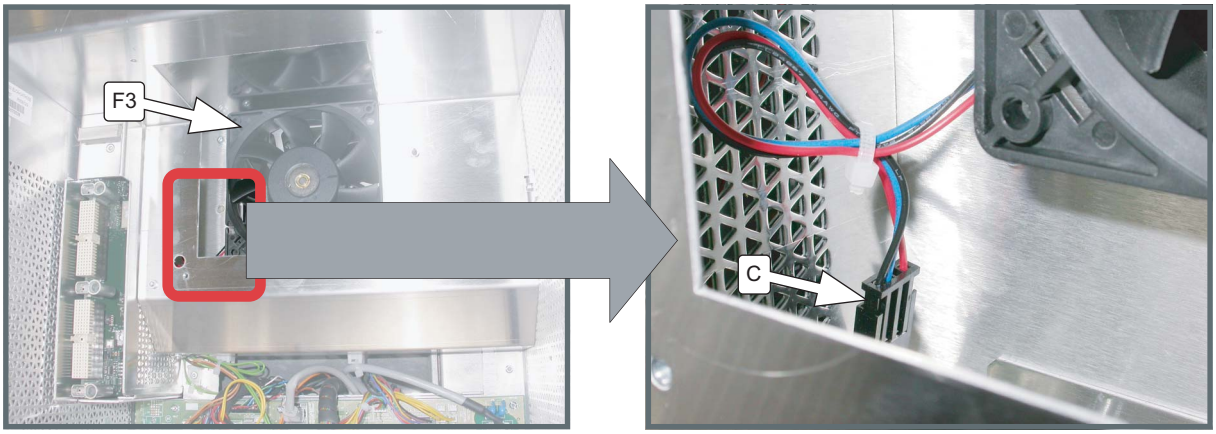


Image 23-15

3. Release the four hexagon socket head cap screws (reference 2) which secure the fan. Use a 3 mm Allen wrench.

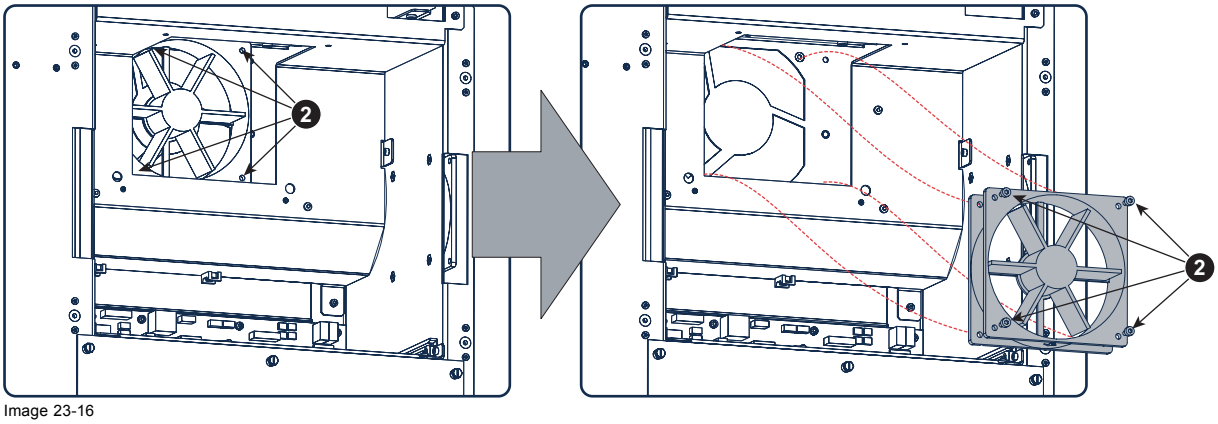


Image 23-16

4. Replace the fan. Make sure that the airflow of the fan is towards the Light Processor compartment.
5. Fasten the new fan with four hexagon socket head cap screws. Use a 3 mm Allen wrench.
6. Reconnect the wire unit of the fan.
7. Reinstall the cover plate of the fan compartment. Use a 2,5 mm Allen wrench.

23.4 Lamp cathode fan

To access the cathode fan the lamp house has to be removed. This procedure assumes that the lamp cover and lamp house are already removed.

Necessary tools

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

How to replace the fan of the lamp cathode?

1. Remove the left side panel of the lamp compartment by releasing the six indicated screws (reference 1). Use a 3 mm Allen wrench.

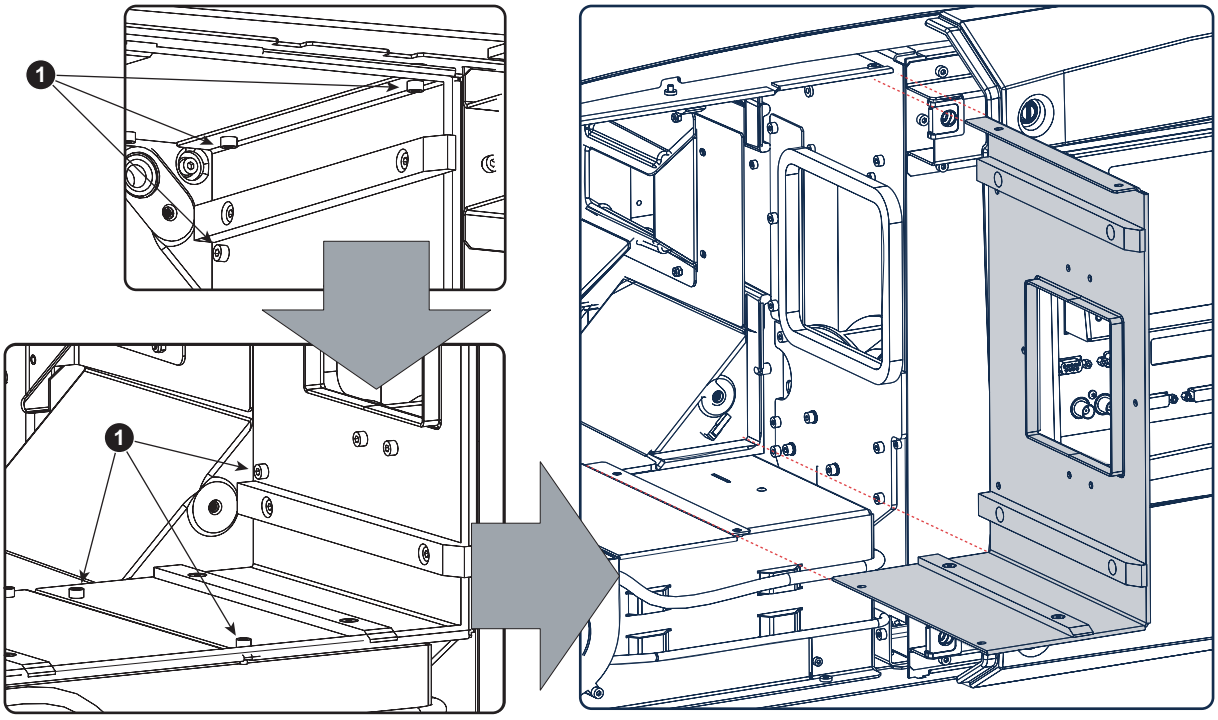


Image 23-17

2. Pull out the wire unit with connector from behind the plate and disconnect the cathode fan.

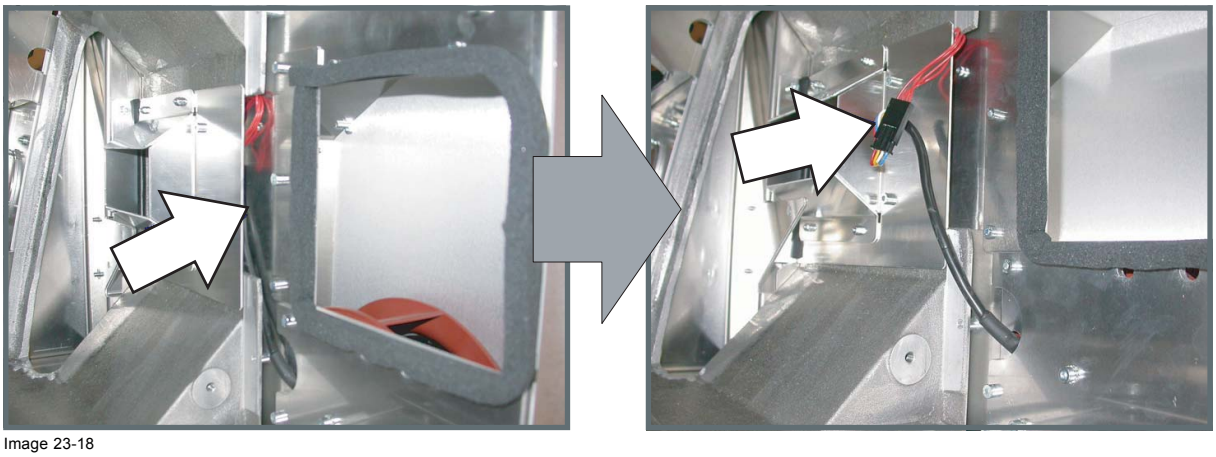


Image 23-18

3. Remove the small side plate of the air channel by releasing the three screws (reference 2). Use a 3 mm Allen wrench. Cut the foam rubber (reference 3) as it is stuck on the different plates.

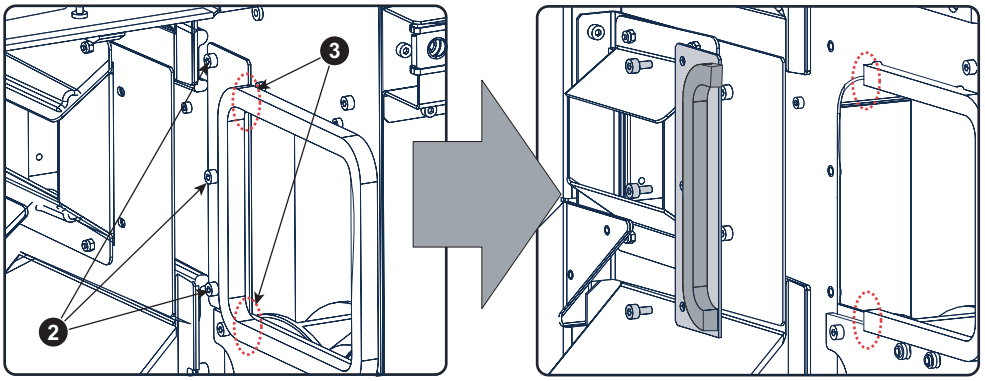


Image 23-19

4. Remove the cathode fan assembly out of its compartment by releasing the five indicated screws (reference 4). Us a 3 mm Allen wrench. Cut the foam rubber (reference 5) as it is stuck on the different plates.
   Tip: *Lift up and slightly turn the fan assembly to remove.*

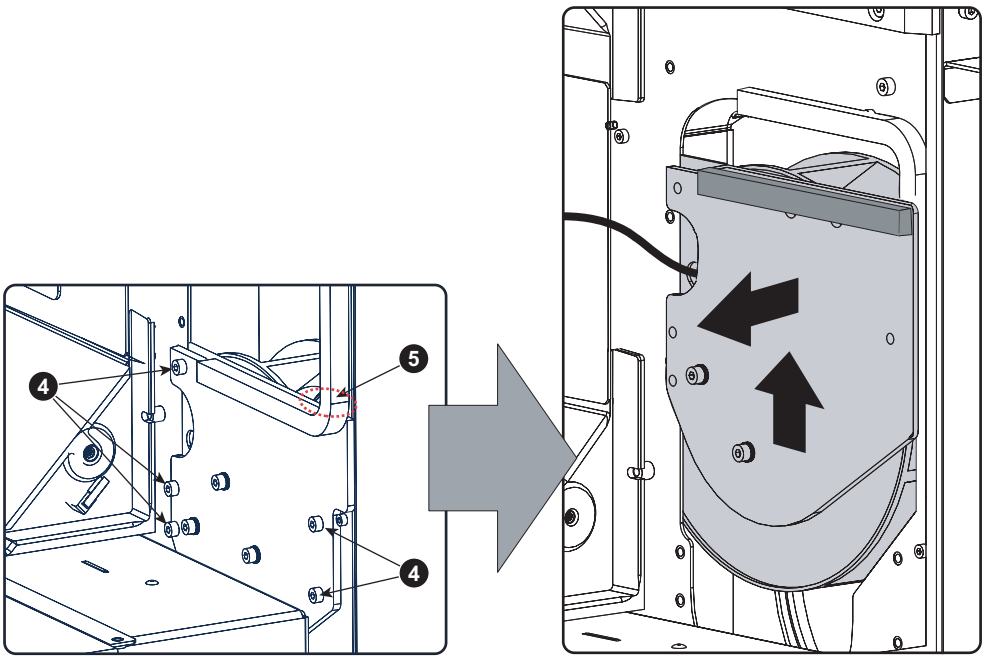


Image 23-20

5. Disassemble the cathode fan assembly by releasing the five indicated screws (reference 6). Use 3 mm Allen wrench.

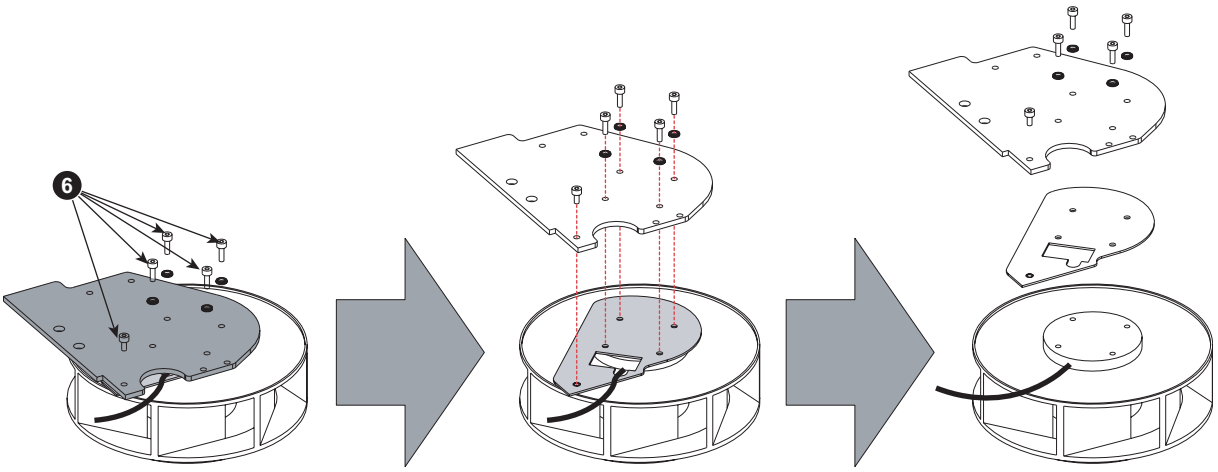


Image 23-21

6. Fasten the two plates upon the new cathode fan with five screws (reference 6). Provide the four screws in the center with a washer (reference 7). Use a 3 mm Allen wrench. Note that the wire unit of the fan must be guided trough the hole of the lower plate.

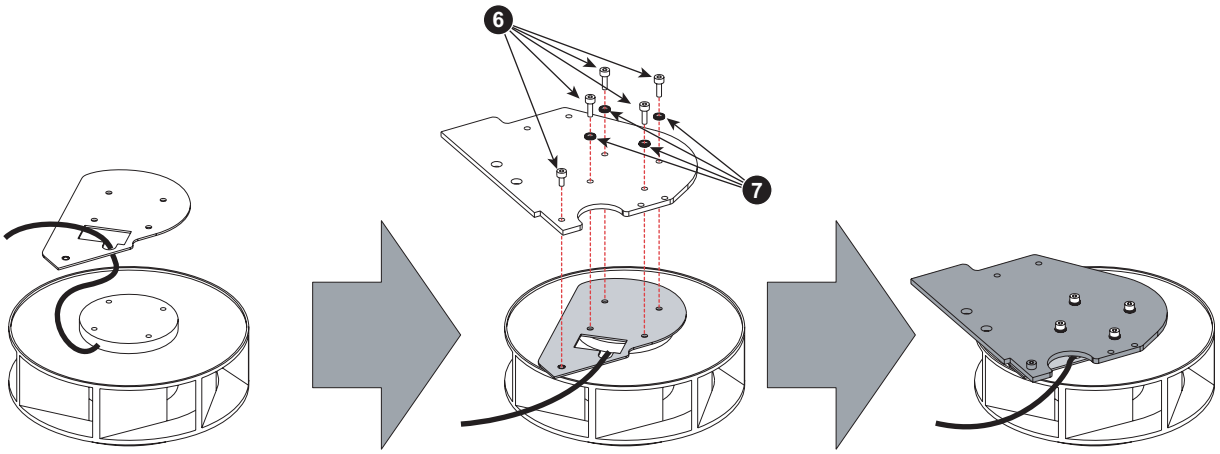


Image 23-22

7. Install the fan assembly back in its compartment with five screws (reference 8). Use a 3 mm Allen wrench.
   Caution: *Make sure that the wire unit of the fan does not get jammed.*

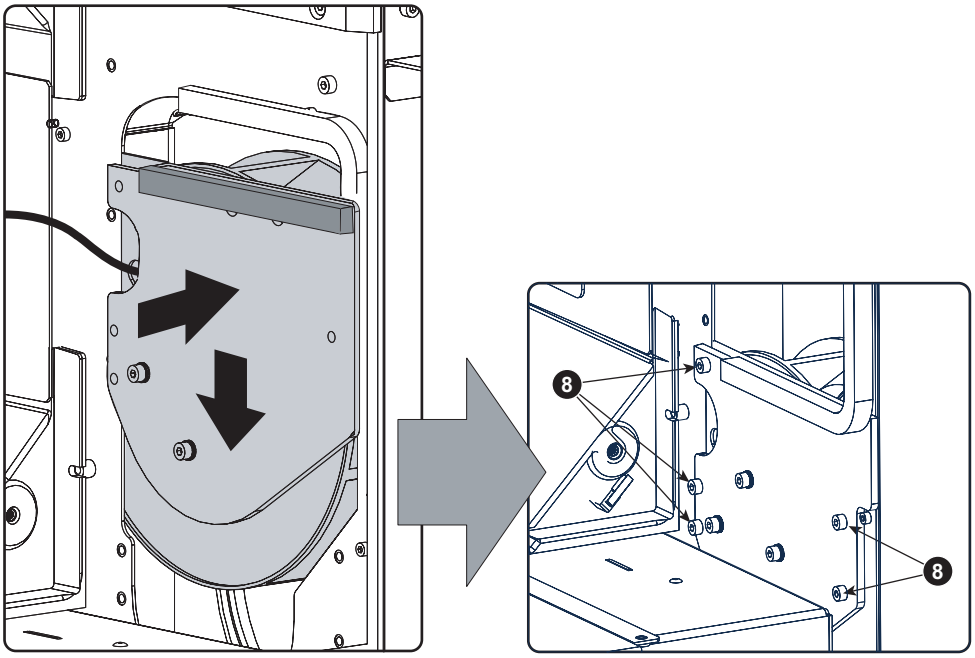


Image 23-23

8. Install the small side plate of the air channel with three screws (reference 9). Use a 3 mm Allen wrench.

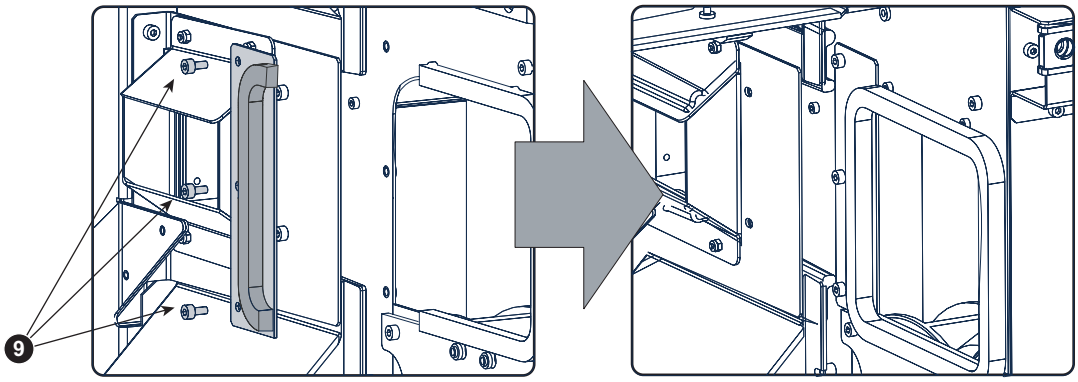


Image 23-24

9. Reconnect the wire unit of the cathode fan and hide the connector behind the plate.

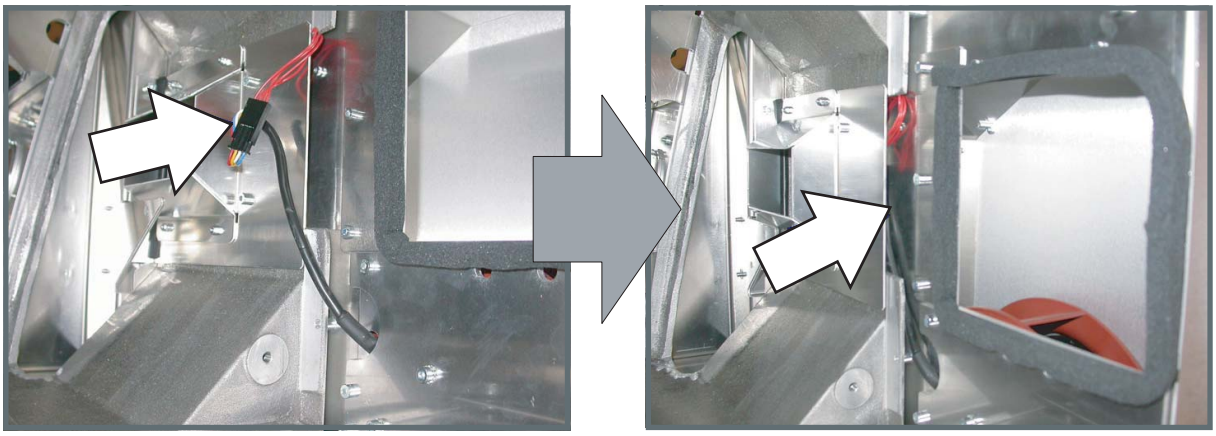


Image 23-25

10. Reinstall the left side panel of the lamp compartment with six screws (reference 10). Use a 3 mm Allen wrench.

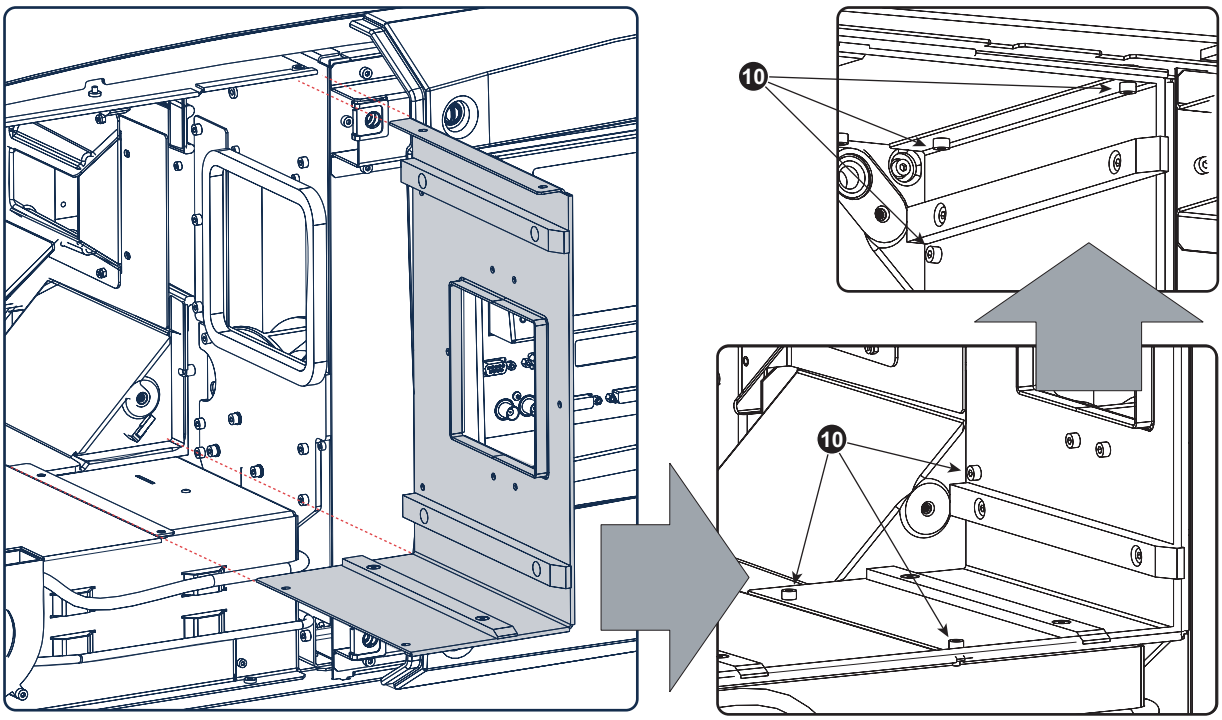


Image 23-26

23.5 Lamp anode fan

To access the anode fan the light processor has to be removed. This procedure assumes that the light processor is already removed.

Necessary tools

- 2,5 mm Allen wrench.
- 3 mm Allen wrench.
- 5 mm Allen wrench.
- Pair of pliers.
- Universal pliers.
- 7 mm open-end wrench.

How to replace the fan of the lamp anode?

1. Disconnect the anode fan (reference B), the fan (reference A) of the heat exchanger and the wire unit of the pump (reference C) as illustrated. Use a set of pliers to cut the cable tie (reference D) which fasten the wire unit of the pump with the tubing.

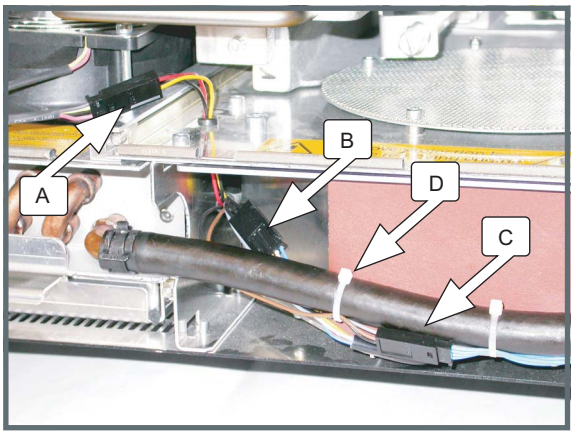


Image 23-27

2. Remove the two screws of the fixation plate for the tubing as illustrated. Use a 3 mm Allen wrench.

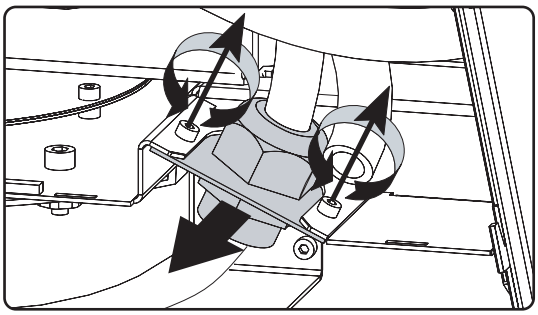


Image 23-28

3. Release the two fixation screws of the heat exchanger assembly and pull out the assembly.

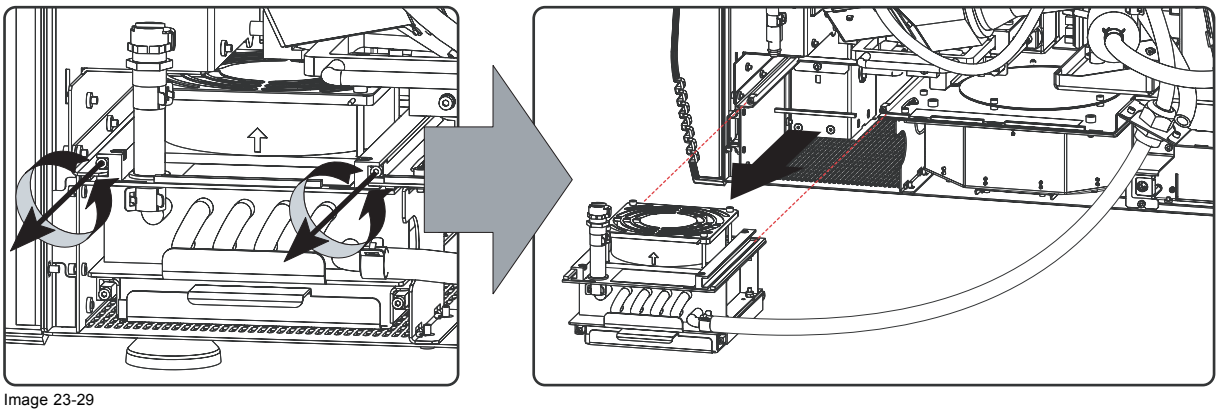


Image 23-29

4. Remove the anode fan security guard and fan bezel by releasing the four hexagon socket head cap screws (reference 1). Use a 3 mm Allen wrench.

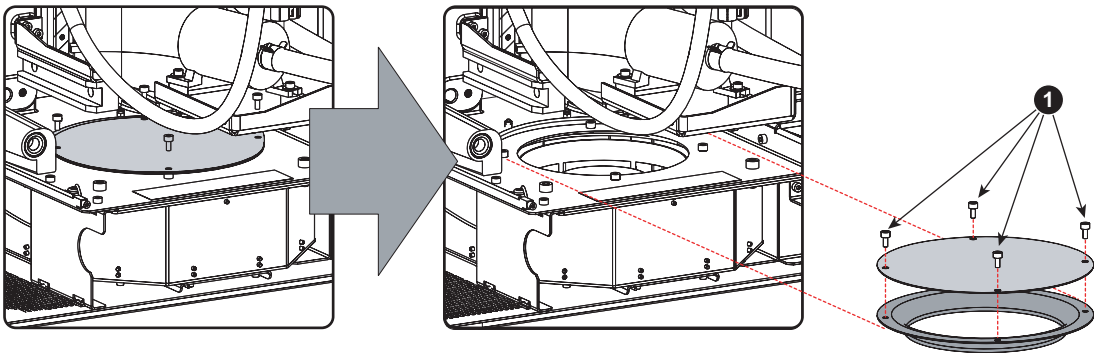


Image 23-30

5. Release the three indicated hexagon socket head cap screws (reference 2) and slide out the anode fan assembly. Use a 5 mm Allen wrench.

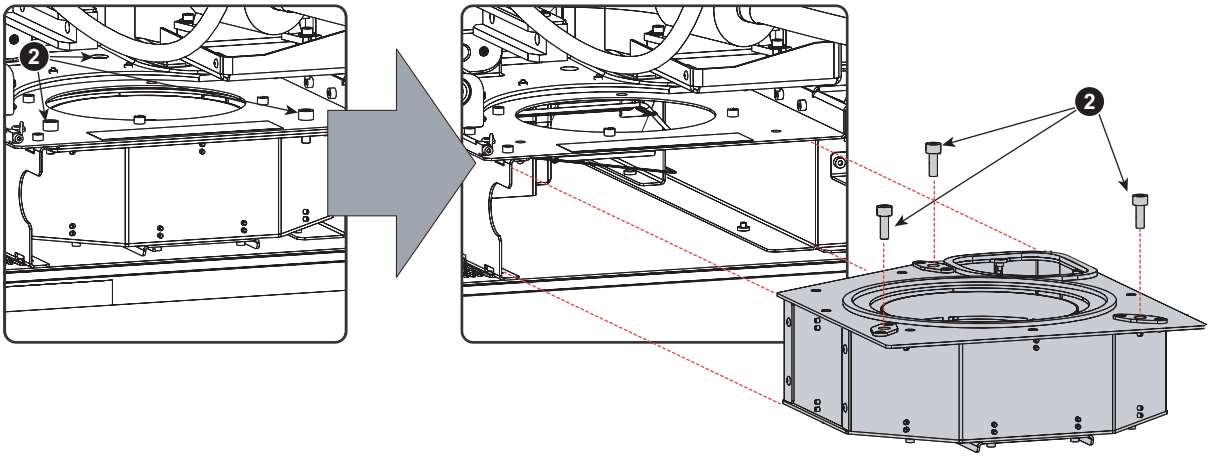


Image 23-31

6. Remove the fan from the fan house by releasing first the 11 small screws at the edge (reference 3) and then the 4 big screws in the middle (reference 4) as illustrated. Use a 2,5 mm and a 3 mm Allen wrench.

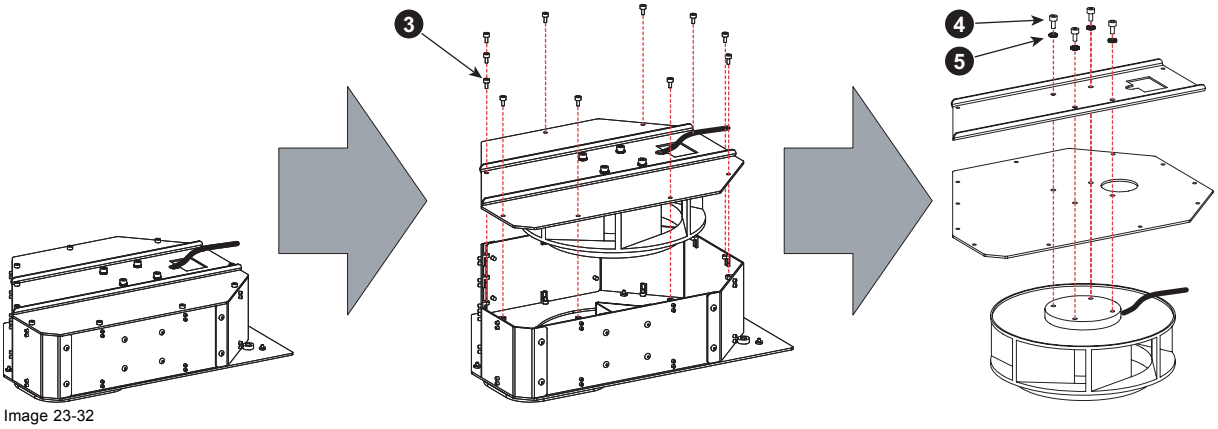


Image 23-32

7. Install a new anode fan inside the fan house as follows:
   a) Guide the wire unit of the anode fan through the holes in mounting plates.
   b) Fasten the two mounting plates upon the fan with four hexagon socket head cap screws (reference 6) as illustrated. Provide each screw with a washer (reference 7).
   c) Close the anode fan house with 11 screws (reference 8).

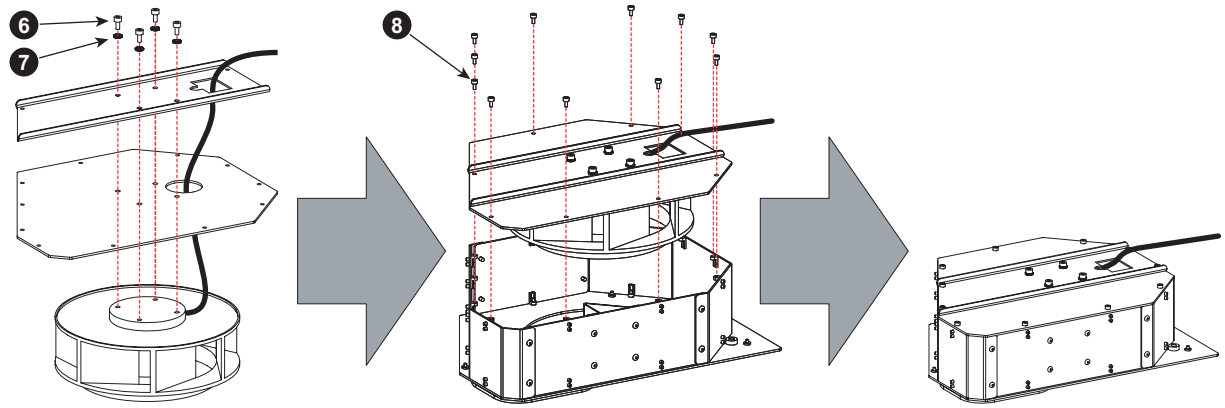


Image 23-33

8. Slide the anode fan assembly back in its compartment and secure with 3 big hexagon screws (reference 9). Use a 5 mm Allen wrench.

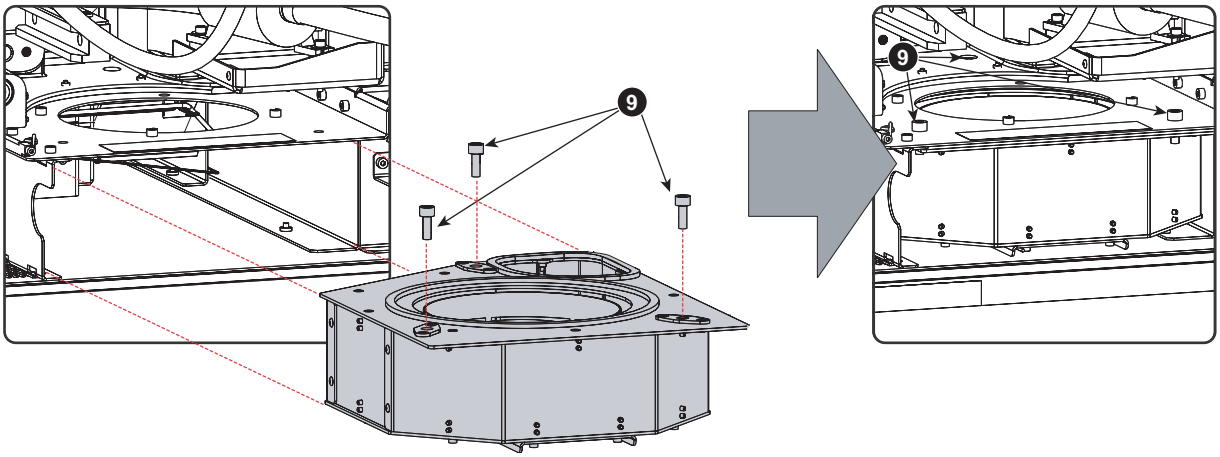


Image 23-34

9. Reinstall the anode fan bezel and security guard. Use a 3 mm Allen wrench to secure the four hexagon socket head cap screws (reference 10).

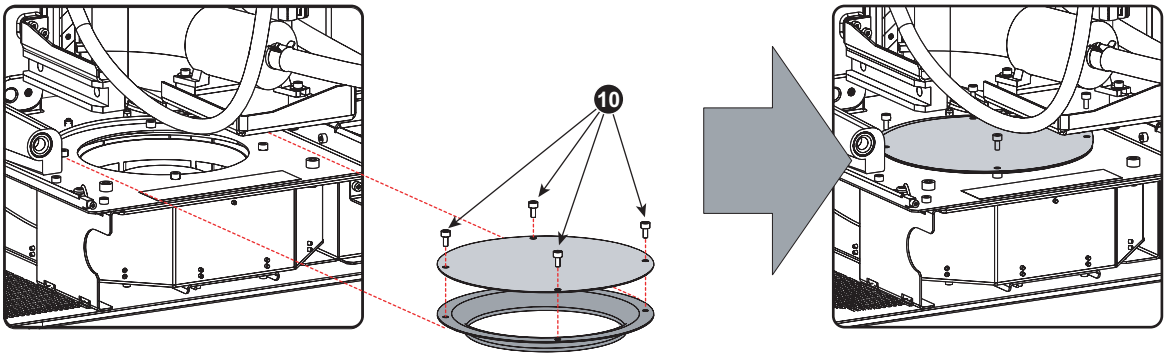


Image 23-35

10. Slide the heat exchanger assembly in its place and fasten the two fixation screws. Use a 2,5 mm Allen wrench.

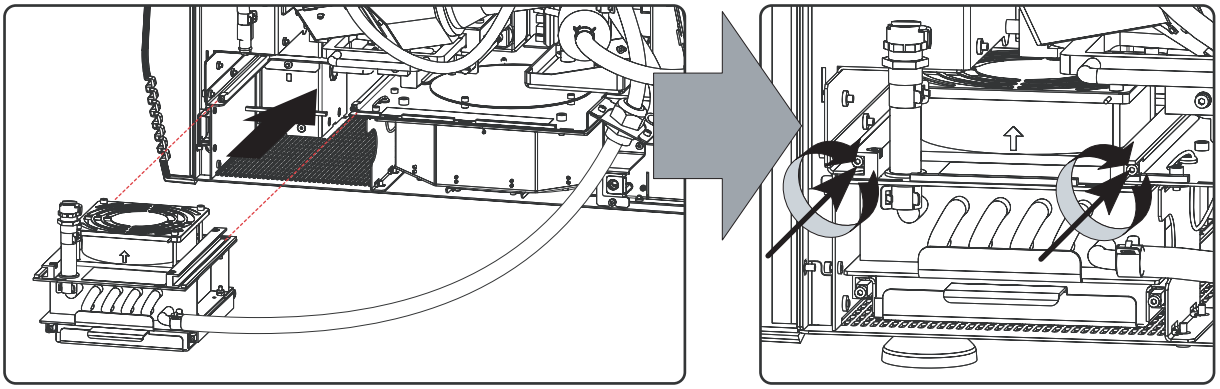


Image 23-36

11. Fasten the fixation plate for the tubing with two screws as illustrated. Use a 3 mm Allen wrench.

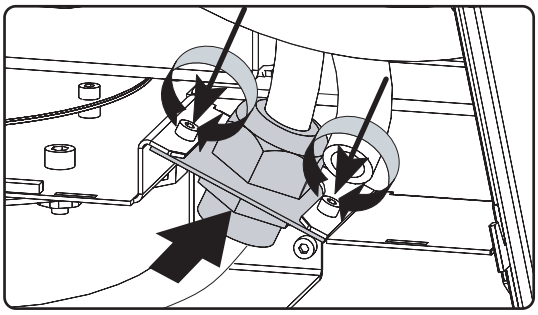


Image 23-37

12. Reconnect the wire unit of the anode fan (reference B), the wire unit of the heat exchanger fan (reference A) and the wire unit of the pump (reference C). Use a cable tie (reference D) to secure the wire unit of the pump with the tubing.

23.6 Lamp Info Module fan

To access the Lamp Info Module fan the lamp cover has to be removed. This procedure assumes that the lamp cover is already removed.

Necessary tools

3 mm Allen wrench.

How to replace the fan of the Lamp Info module?

1. Disconnect the wire unit (reference C) of the fan (reference FL).

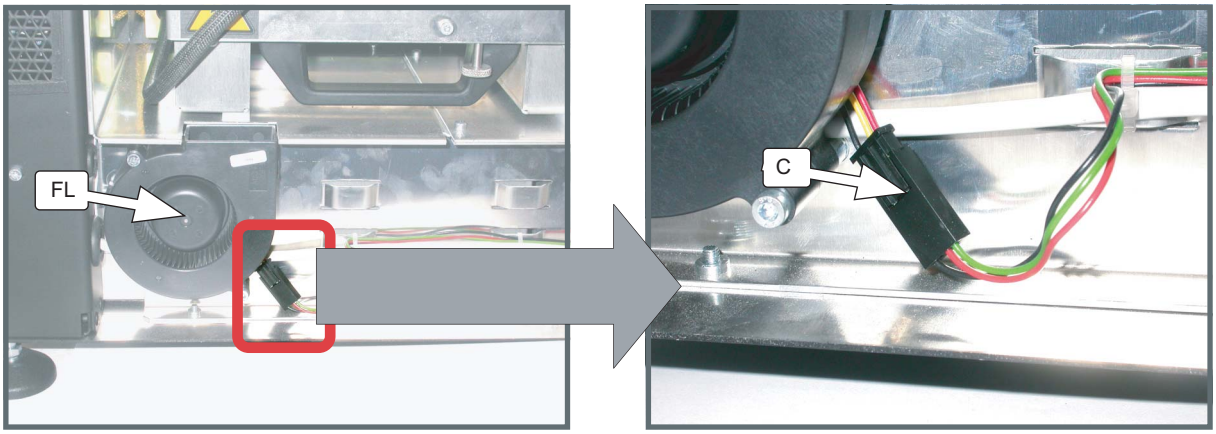


Image 23-38

2. Remove the fan from the projector by releasing the two hexagon socket head cap screws (reference 1). Use a 3 mm Allen wrench.

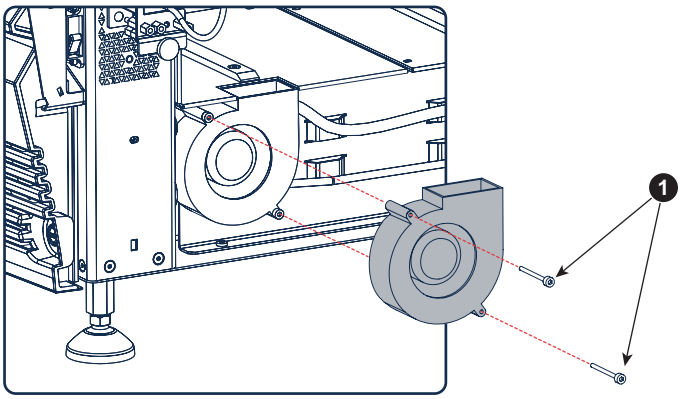


Image 23-39

3. Install a new fan as illustrated in image 23-39. Use a 3 mm Allen wrench to fasten the two hexagon socket head cap screws.
4. Reconnect the wire unit of the fan.

23.7 Power compartment left fan

The two fans of the power compartment are located behind the front filter of the projector. The lens, front cover, input cover, top cover and front filter has to be removed to access the fixation screws of the left fan. This procedure assumes that the lens, front cover, input cover, top cover and front filter are already removed.

Necessary tools

3 mm Allen wrench.

How to replace the left fan of the power compartment?

1. Remove the big vertical leaf spring by releasing the two screws (reference 1). Use a 3 mm Allen wrench.

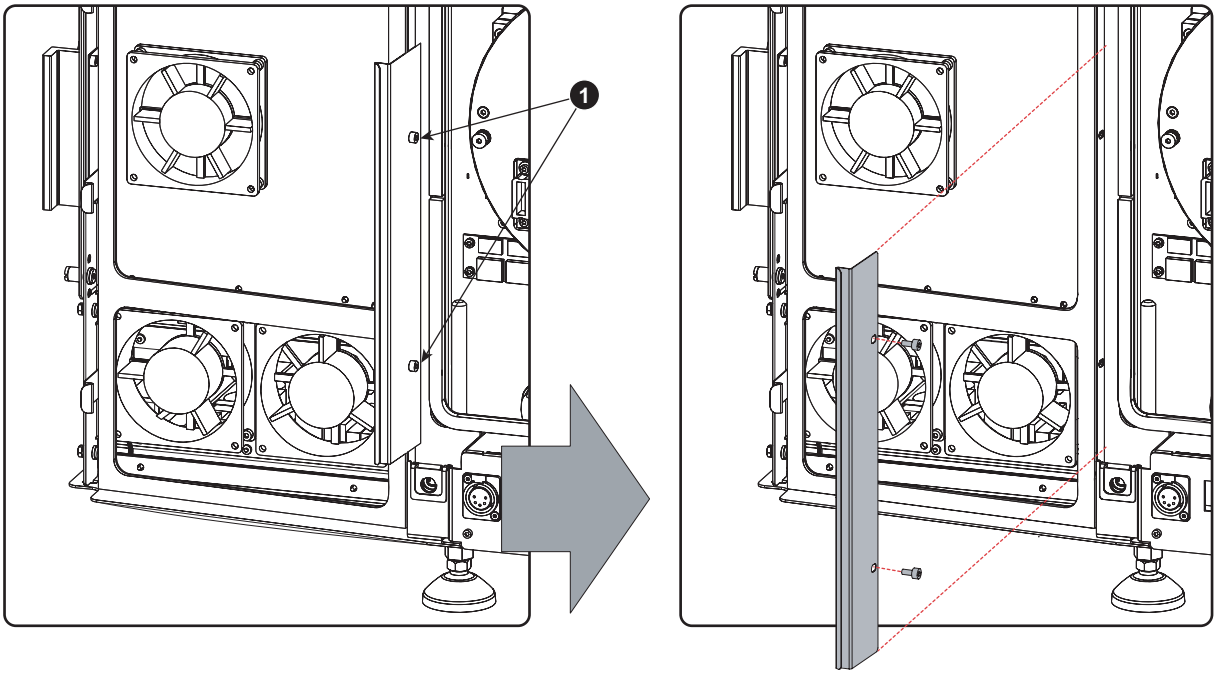


Image 23-40

2. Remove the metal frame as illustrated. Use a 3 mm Allen wrench to release the two screws (reference 2) at the top and the two screws (reference 3) at the bottom of the metal frame. This frame has to be removed because the two screws at the left side of the left power fan are hidden behind this frame.

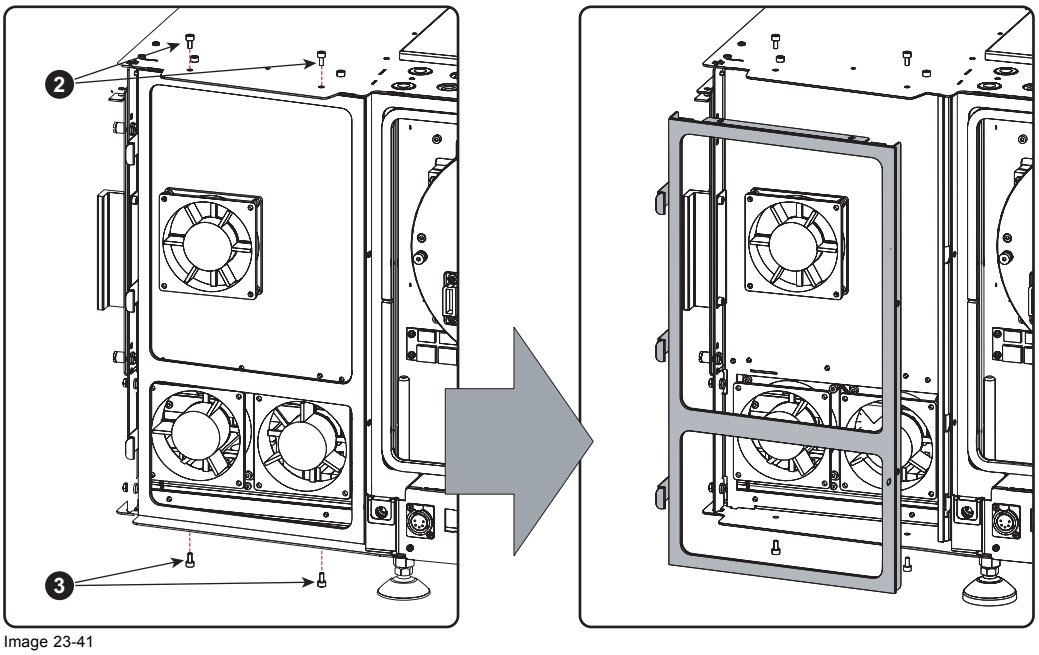


Image 23-41

3. Disconnect the wire unit (FC) of the left fan.

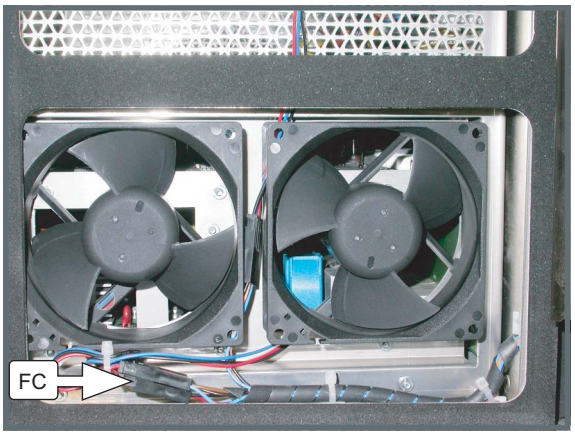


Image 23-42

4. Remove the fan from the projector. Use a 3 mm Allen wrench to release the four screws (reference 4) which fasten the fan.

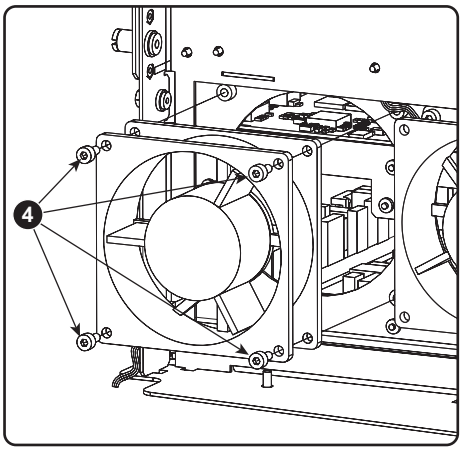


Image 23-43

5. Install a new fan and secure with four screws (see image 23-43).
6. Connect the wire unit of the left fan (see image 23-42).
7. Reinstall the metal frame as illustrated. Use a 3 mm Allen wrench to fasten the two screws at the top (reference 5) and the two screws at the bottom (reference 6) of the metal frame.

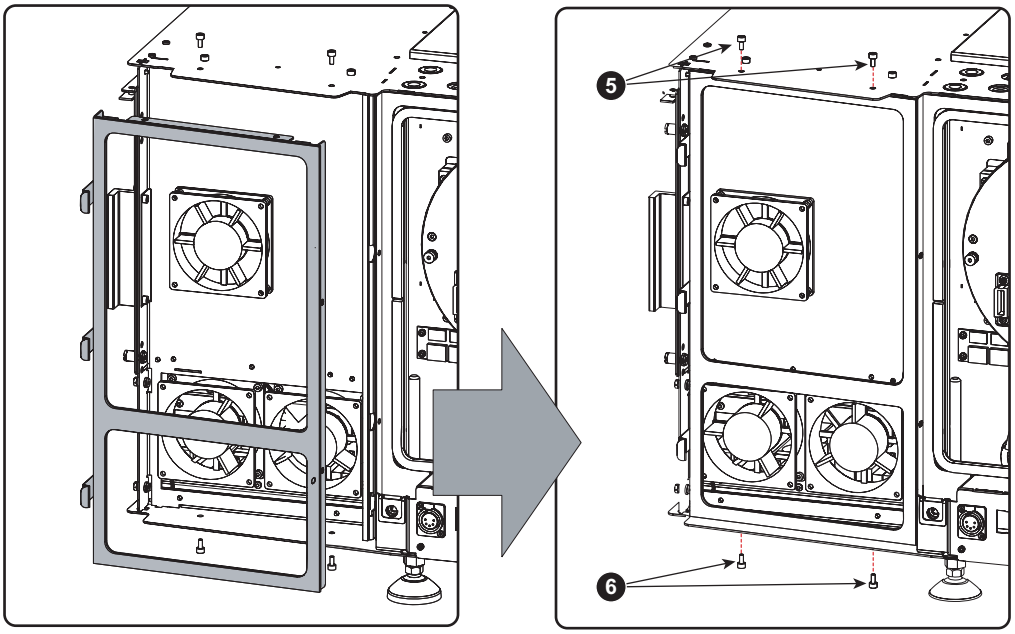


Image 23-44

8. Reinstall the big vertical leaf spring. Use a 3 mm Allen wrench to fasten the two screws (reference 7).

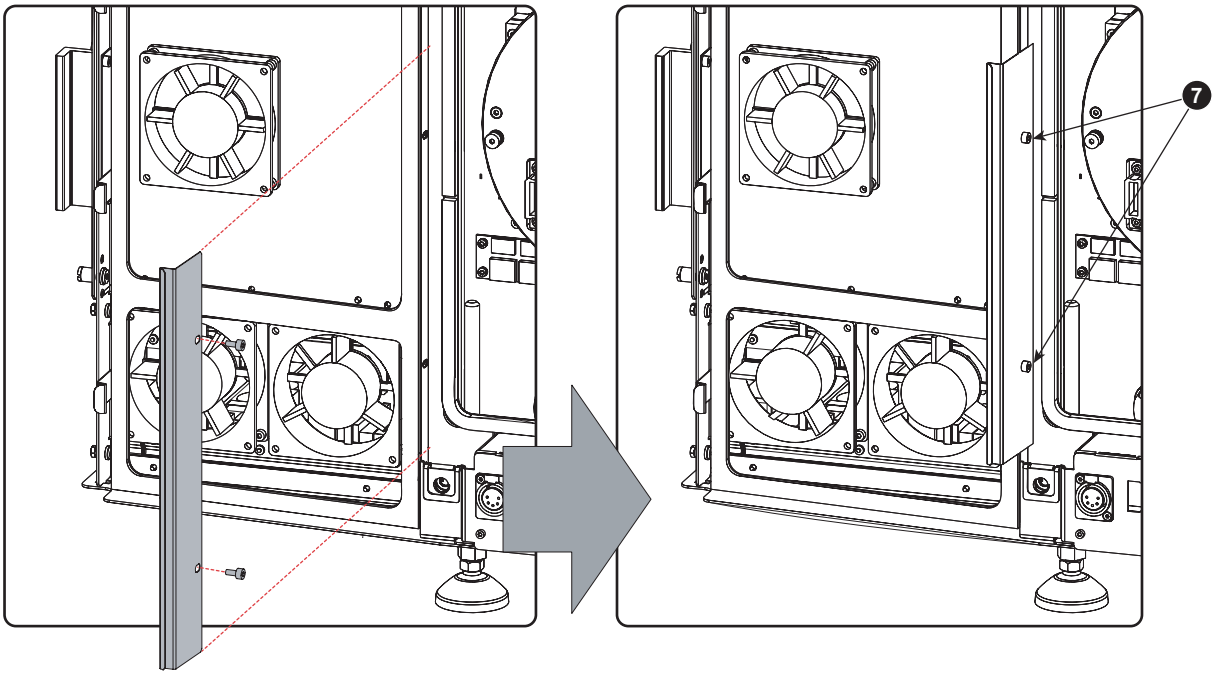


Image 23-45

23.8 Power compartment right fan

The two fans of the power compartment are located behind the front filter of the projector. The lens, input cover, front cover and front filter has to be removed to access the fixation screws of the right fan. This procedure assumes that the lens, input cover, front cover, and front filter are already removed.

Necessary tools

3 mm Allen wrench.

How to replace the right fan of the power compartment?

1. Disconnect the wire unit (reference FC) of the right fan.

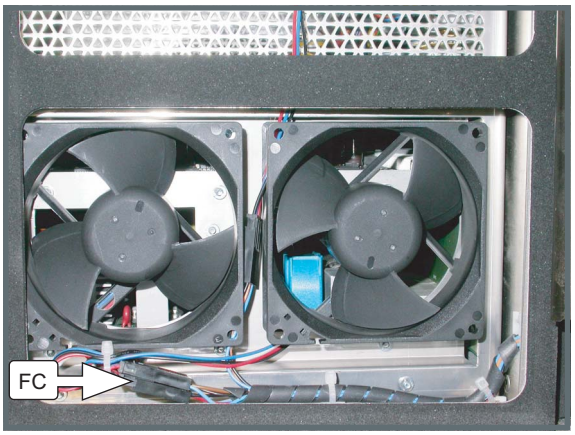


Image 23-46

2. Remove the right fan from the projector. Use a 3 mm Allen wrench to release the four screws (reference 1) which fasten the right fan.

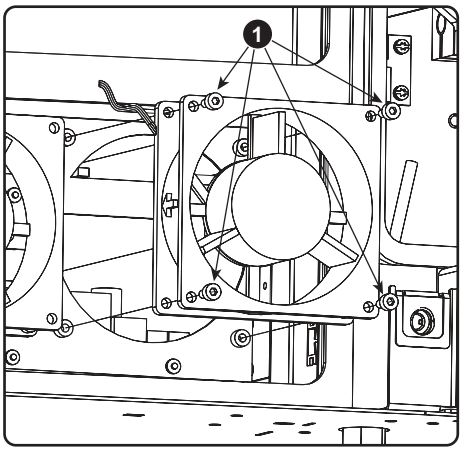


Image 23-47

3. Install a new fan and secure with four screws.
4. Connect the wire unit of the right fan.

23.9 Input & Communication compartment fan

The two fan of the Input & Communication compartment is located behind the front filter of the projector. The lens, input cover, front cover and front filter has to be removed to access the fixation screws of the this fan. This procedure assumes that the lens, input cover, front cover, and front filter are already removed.

Necessary tools

3 mm Allen wrench.

How to replace the fan of the Input & Communication compartment?

1. Disconnect the wire unit (reference C) of the fan (reference F2).

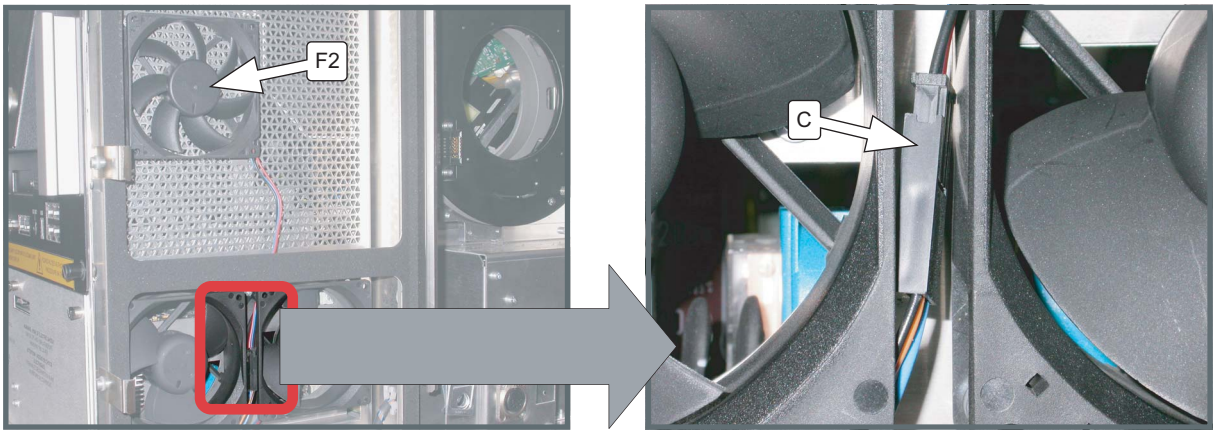


Image 23-48

2. Remove the fan from the projector. Use a 3 mm Allen wrench to release the four screws (reference 1) which fasten the fan.

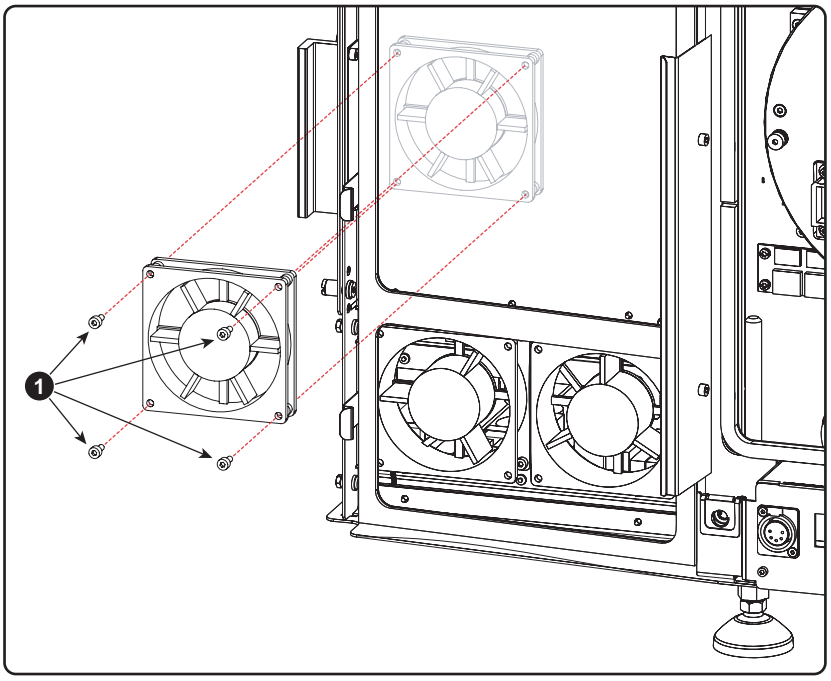


Image 23-49

3. Install a new fan and secure with four screws.
4. Reconnect the wire unit of the fan.

24. MAINTENANCE PROCEDURES

About this chapter

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

Overview

- Cleaning the exterior of the projector
- Replacement of the dust filter on the front side
- Replacement of the dust filter on the bottom side
- Replacement of the dust filter on the top side

24.1 Cleaning the exterior of the projector

How to clean the exterior of the projector ?

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.

24.2 Replacement of the dust filter on the front side

The front filter of the projector can be removed from the lamp side of the projector in case there is insufficient place at the front of the projector or in case you want to avoid the removal of the lens. This procedure describes how to access the front filter from the side of the projector.

Necessary parts

New dust filter for the front side.

How to replace the HEPA dust filter on the front side of the projector?

1. Remove the input cover of the projector.
2. Release the captive screw of the front cover and pull the left side of the front cover 5 centimeters away from the projector. No need to remove the front cover.
3. Turn the three latches of the front filter compartment 90° counterclockwise.

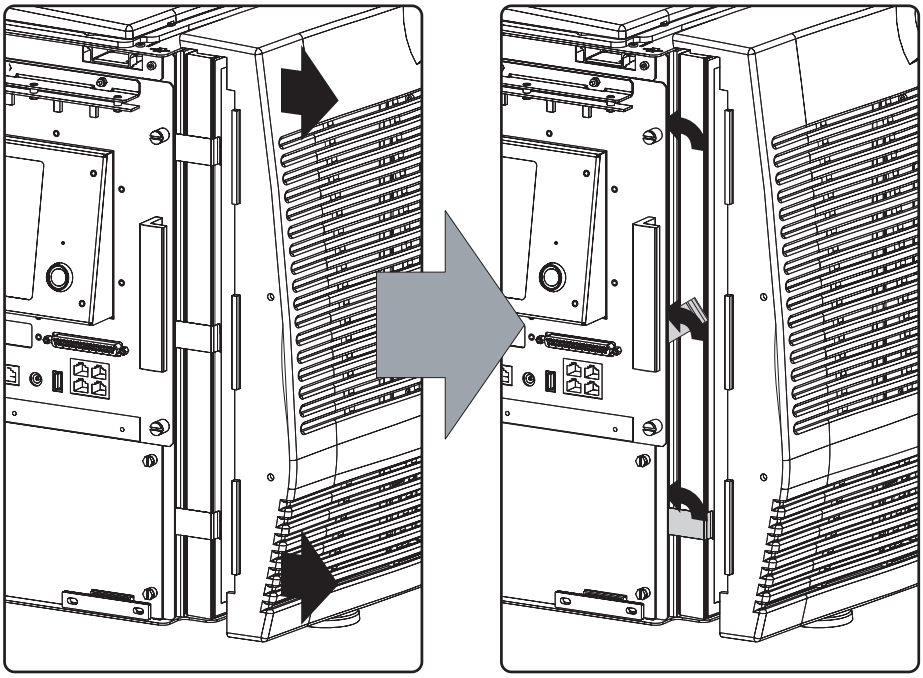


Image 24-1

4. Pull out the front dust filter as illustrated.

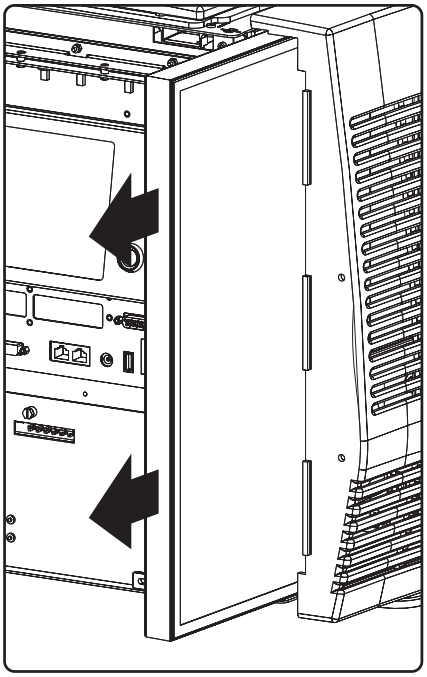


Image 24-2

5. Insert a new filter.
6. Rotate the three latches back into the original position.
7. Fasten the front cover and reinstall the input cover of the projector.

CAUTION: Never install a used HEPA filter. Always install a new HEPA filter.

24.3 Replacement of the dust filter on the bottom side

Necessary parts

- New HEPA dust filter for the bottom side.
- 2.5 mm Allen key.

How to replace the HEPA dust filter on the bottom side of the projector ?

1. Remove the side cover of the projector.
2. Release (not remove) the two wedge lock screws (A) using a 2.5 mm Allen key as illustrated.

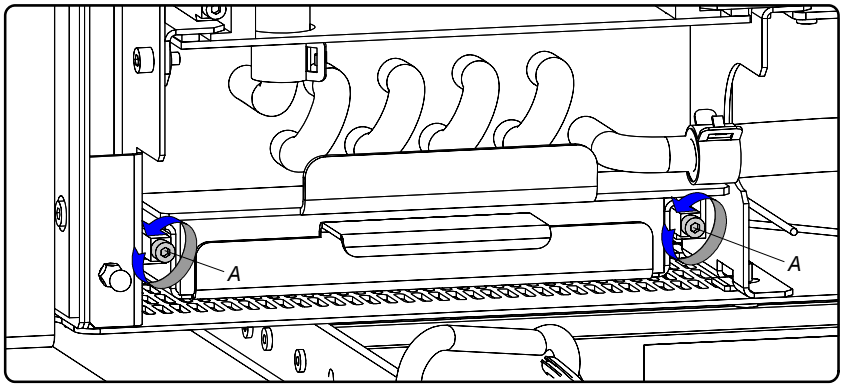


Image 24-3

3. Remove the filter (F) on the bottom side by pulling out the filter holder (H) as illustrated.

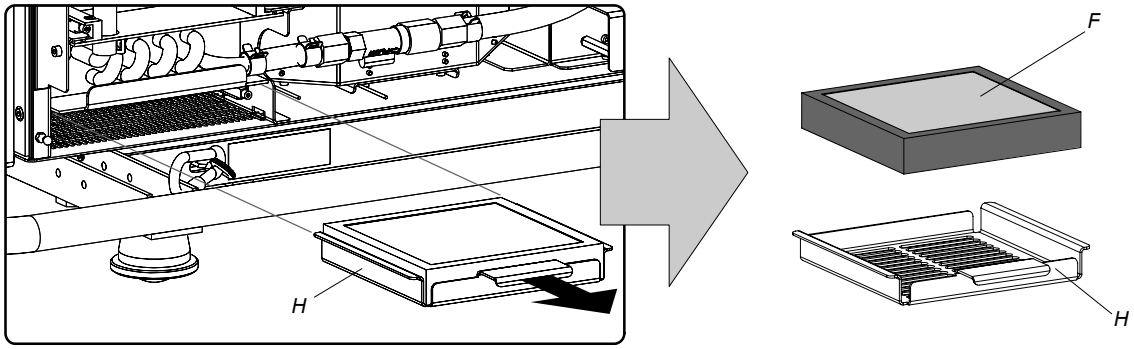


Image 24-4

4. Place a new HEPA dust filter in the filter holder.
5. Reinstall the filter holder containing the new HEPA filter.
6. Fasten the two wedge lock screws (A) using a 2.5 mm Allen key as illustrated.

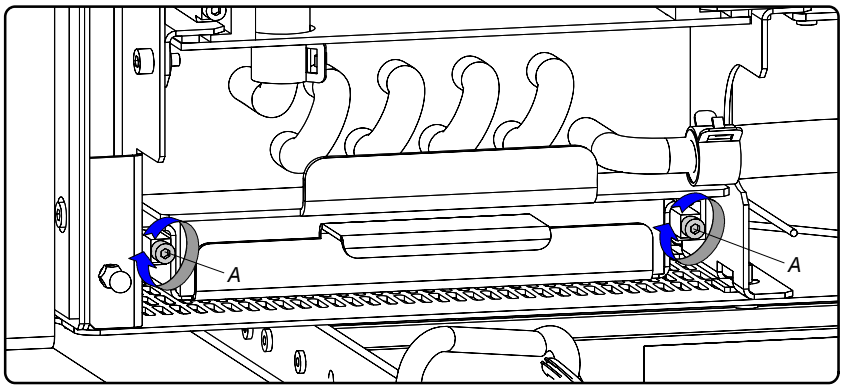


Image 24-5

7. Reinstall the side cover of the projector.

CAUTION: Never install a used HEPA filter. Always install a new HEPA filter.

24.4 Replacement of the dust filter on the top side

Necessary parts

New HEPA dust filter for the top side.

How to replace the HEPA dust filter on the top side of the projector ?

1. Remove the side cover of the projector.
2. Remove the filter (F) on the bottom side by pulling out the filter holder (H) as illustrated.

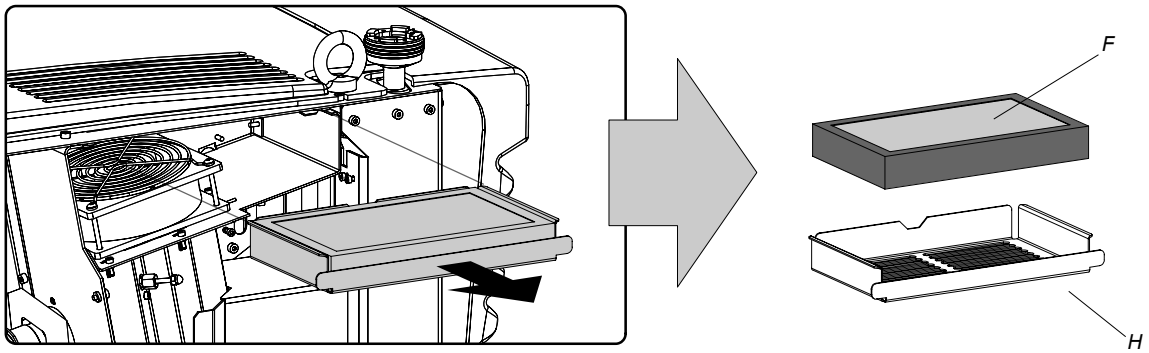


Image 24-6

3. Place a new HEPA dust filter in the filter holder.
4. Reinstall the filter holder containing the new HEPA filter.
5. Reinstall the side cover of the projector.

CAUTION: Never install a used HEPA filter. Always install a new HEPA filter.

A. PIN CONFIGURATIONS

About this chapter

This chapter contains the pin configurations of the communication ports of the Input and Communication unit.

Overview

- Pin configurations of the communication ports
- Pin configurations of the inputs

A.1 Pin configurations of the communication ports

RS232IN

RS232/422 IN			
1RTSE+	Request To Send (RTS)	6 RXE+	Data Set Ready (DSR)
2 RXE-	Receive Data (RD or RX or RXD)	7 RTSE-	Request To Send (RTS)
3 TXE-	Transmitted Data (TD or TX or TXD)	8 CTSE-	Clear To Send (CTS)
4TXE+	Data Terminal Ready (DTR)	9 CTSE+	Clear To Send (CTS)
5 GND	Signal Ground (GND)	-	-

General Purpose IN/OUT

General Purpose In/Out			
1	GPIN 1 P	20	GPIN 1 N
2	GPIN 2 P	21	GPIN 2 N
3	GPIN 3 P	22	GPIN 3 N
4	GPIN 4 P	23	GPIN 4 N
5	GPIN 5 P	24	GPIN 5 N
6	GPIN 6 P	25	GPIN 6 N
7	GPIN 7 P	26	GPIN 7 N
8	GPIN 8 P	27	GPIN 8 N
9	GPOUT 1 P	28	GPOUT 1 N
10	GPOUT 2 P	29	GPOUT 2 N
11	GPOUT 3 P	30	GPOUT 3 N
12	GPOUT 4 P	31	GPOUT 4 N
13	GPOUT 5 P	32	GPOUT 5 N
14	GPOUT 6 P	33	GPOUT 6 N
15	GPOUT 7 P	34	GPOUT 7 N
16	Projector Good P	35	Projector Good N
17	reserved	36	reserved
18	reserved	37	reserved
19	reserved		

Ethernet port

Ethernet 10/100 base T Port			
1	TXD+	5	++2.5VA
2	TXD-	6	RXD-
3	RXD+	7	RXD-
4	++2.5VA	8	GNDM

A.2 Pin configurations of the inputs

DVI-D

DVI IN A & B							
1	RX2-	7	DDC Data	13	nc	19	RX0 Shield
2	RX2+	8	nc	14	+5V	20	nc
3	RX2 Shield	9	RX1-	15	GND	21	nc
4	nc	10	RX1+	16	Hot Plug Detect	22	TMDS Clock Shield
5	nc	11	RX1 Shield	17	RX0-	23	TMDS RXC+
6	DDC Clock	12	nc	18	RX0+	24	TMDS RXC-

GLOSSARY

DVI

Digital Visual Interface is a display interface developed in response to the proliferation of digital flat panel displays.

The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video. This standard uses TMDS (Transition Minimized Differential Signal) from Silicon Image and DDC (Display Data Channel) from VESA (Video Electronics Standards Association).

DVI can be single or dual link.

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.

SMPTE

Society of Motion Picture and Television Engineers - A global organization, based in the United States, that sets standards for baseband visual communications. This includes film as well as video standards.

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Numerics/Symbols

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