Spica-PJ1

Machine Code: Y092

Field Service Manual

October, 2015

Important Safety Notices

Important Safety Notices

Prevention of physical injury

1. Before disassembling or assembling parts of the main machine and peripherals, make sure that the power cord of the main machine is unplugged.
2. The wall outlet should be near the machine and easily accessible.
3. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.

⚠WARNING

- To prevent a fire or explosion, keep the machine away from flammable liquids, gases, and aerosols.

Health safety conditions

- This machine, which uses a high voltage power source, can generate ozone gas. High ozone density is harmful to human health. Therefore, the machine must be installed in a well-ventilated room.

Observance of electrical safety standards

- This machine and its peripherals must be serviced by a customer service representative who has completed the training course on those models.

Safety and Ecological Notes for Disposal

- Dispose of replaced parts in accordance with local regulations.

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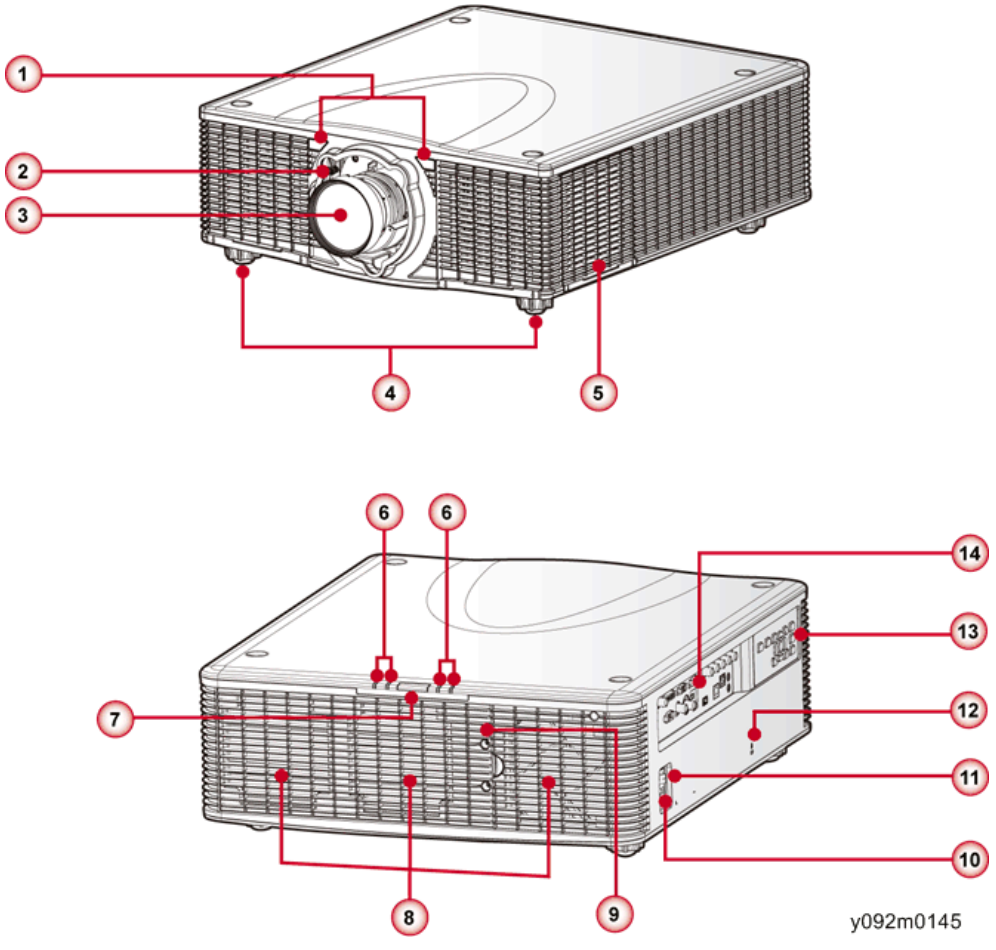
1. Product Information

Overview

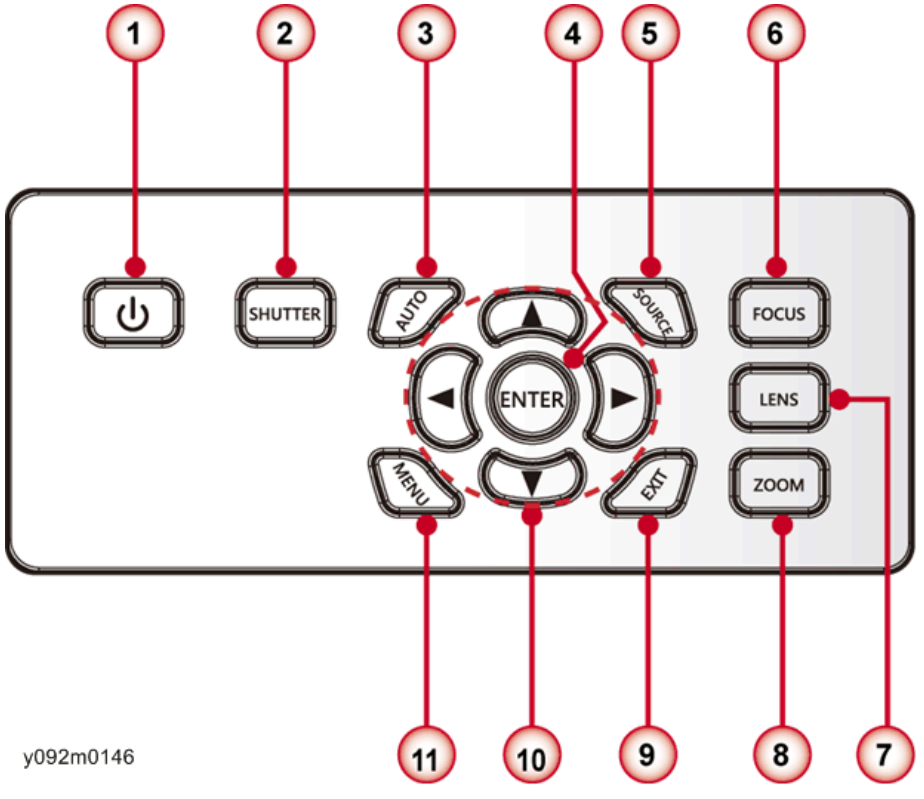
Main Unit



1. IR Receivers
2. Lens Release Button
3. Lens
4. Adjustable Feet
5. Inlet Vent
6. LED Status Indicators

7. IR Sensor
8. Outlet Vents
9. Lamp Door
10. Power Connector
11. Power Switch
12. Anti-Theft Lock Hole (Kensington™ Lock)
13. Keypad Panel
14. Connector Panel

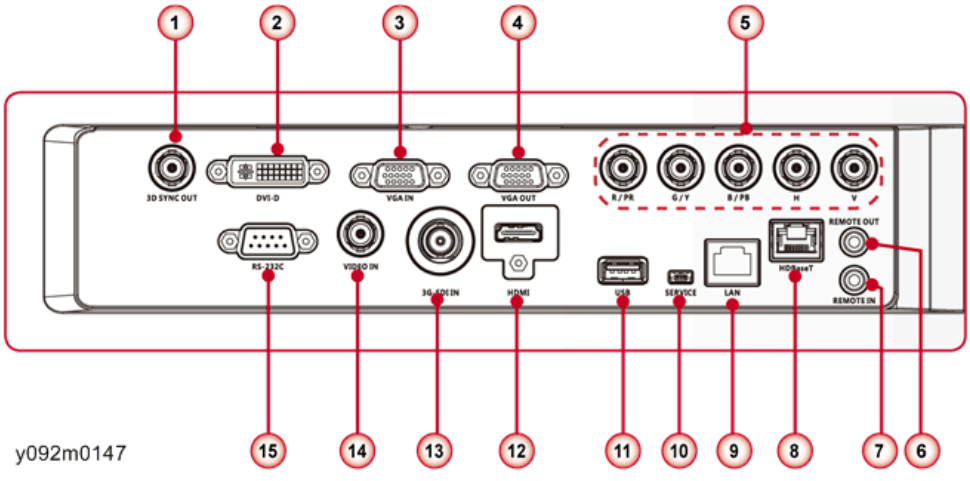
Control Panel



1. ⏻/ Power key
2. Shutter key
3. Auto key
4. Enter key
5. Source key

6. Focus key
7. Lens key
8. Zoom key
9. Exit key
10. Four directional selector keys
11. Menu key

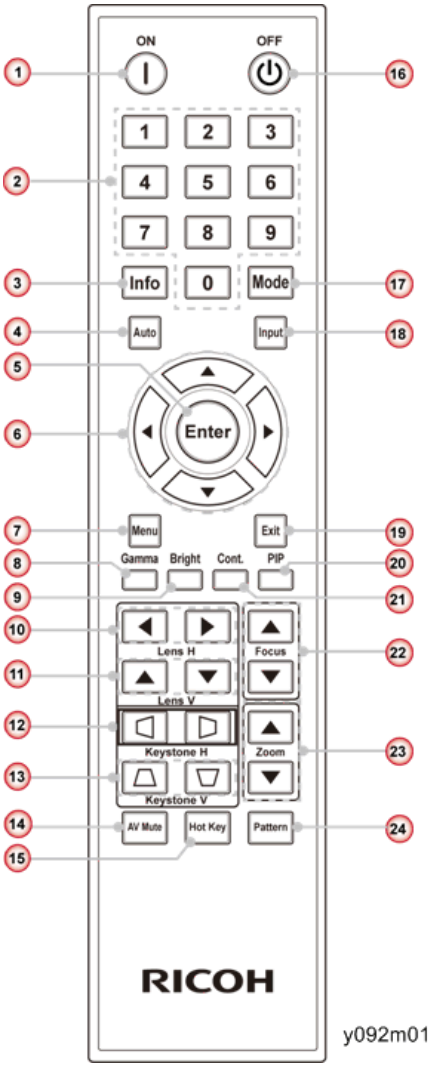
Connection Ports



1. 3D Sync OUT Connector
2. DVI-D Connector
3. VGA IN Connector
4. VGA OUT Connector
5. Component/RGBHV IN Connector
6. REMOTE OUT Connector
7. REMOTE IN Connector
8. HDBaseT Connector
9. LAN Connector
10. SERVICE Connector
11. USB Connector
12. HDMI Connector
13. 3G-SDI IN Connector
14. VIDEO IN Connector

15. RS-232C Connector

Remote Control



No.	Key Name	Description
1	Power ON	Power on the projector.
2	Numeric Keypad	
3	Information	Display the projector information.
4	Auto	Auto adjust projector with source.

No.	Key Name	Description
5	Enter	Confirm your item selection.
6	Four Directional Select Keys	Press up, down, left, right direction buttons to select items or make adjustments.
7	Menu	Launch the OSD main menu.
8	Gamma	Adjust mid-range levels.
9	Bright	Adjust the amount of light in the image.
10	Lens H	Adjust the position of the image horizontally.
11	Lens V	Adjust the position of the image vertically.
12	Keystone H	Adjust image distortion caused by tilting the projector horizontally.
13	Keystone V	Adjust image distortion caused by tilting the projector vertically.
14	AV Mute	Display or blank the video image.
15	Hot Key	Select your preset keys quickly.
16	OFF	Turn off the projector.
17	Mode	Select the preset display mode.
18	Input	Automatically scans for the connected source.
19	Exit	Exit a menu.
20	PIP	Turn PIP/PBP ON/OFF.
21	Cont.	Adjust the difference between dark and light.
22	Focus	Adjust the lens focus.
23	Zoom	Adjust the lens zoom function.
24	Pattern	Display a test pattern.

Specifications

Product Highlights

- High brightness, typical 11000 ANSI lm for WUXGA.
- 6 optional lenses, TR coverage from 0.84 : 1 to 7.2 : 1.
- Interchangeable color wheel, high brightness or superior rich-color.
- Power zoom, focus, lens shift (V: +/-60%, H: +/-25%).
- Embedded HDBaseT solution, supports HD video streaming through RJ45.
- Embedded warping design for geometry correction and curve blending.
- Built in Dynamic Aperture (contrast ratio up to 5000 : 1) and Mechanical Shutter.
- Supports 360 degrees operation and Portrait mode.

Technology and Platform

Item	Description
Technology	"TI" DMD, 0.96" WUXGA x1, Type A, DC3
ASIC	PW392C + Dual DDP4422
Native Resolution	• Native Resolution: WUXGA(1920 x 1200) • Maximum Resolution: Graphic up to WUXGA@60Hz (Reduced blanking)

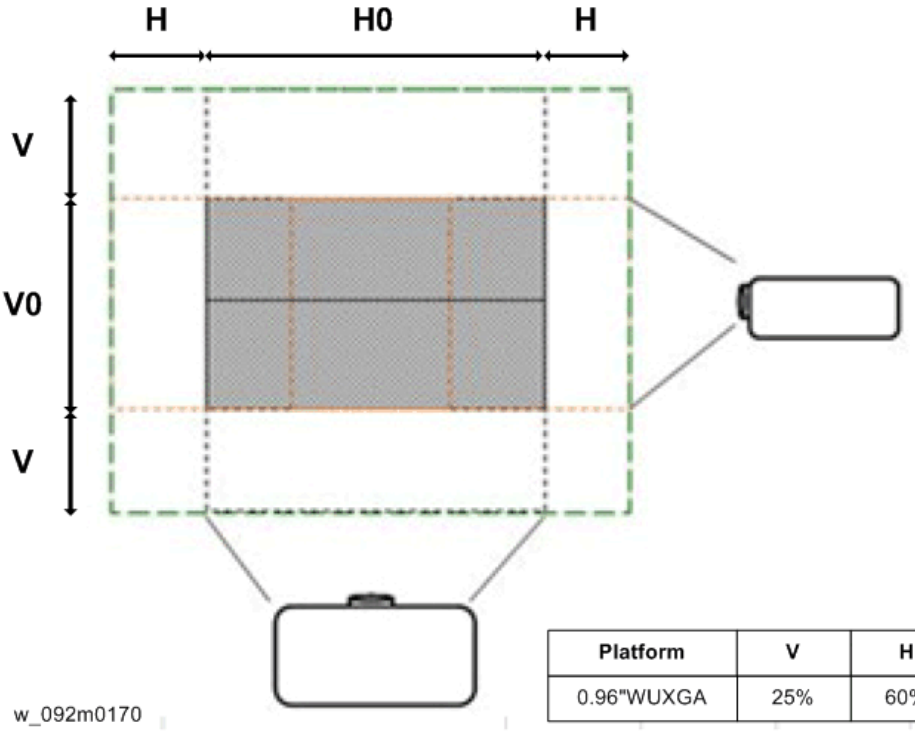
Optical Specifications

Color Primaries: ANSI 9-point measurement

C/W	Color	x & y
6S High Brightness color wheel	White	x=0.331+/- 0.02 y=0.397+/- 0.02
	Red	x=0.633+/- 0.02 y=0.356+/- 0.02
	Green	x=0.335+/- 0.025 y=0.542+/- 0.025
	Blue	x=0.140+/- 0.02 y=0.089+/- 0.02

C/W	Color	x & y
6S High Brightness color wheel (Option)	White	x=0.318+/- 0.02 y=0.395+/- 0.02
	Red	x=0.648+/- 0.02 y=0.317+/- 0.02
	Green	x=0.298+/- 0.025 y=0.644+/- 0.025
	Blue	x=0.144+/- 0.02 y=0.056+/- 0.02

Projection Lens



Platform	V	H
0.96"WUXGA	25%	60%

B1 / B2 / B3

Platform	RICOH PJ KU12000 (WUXGA1920 x 1200)					
DMD	0.96"					
Projection Lens	B1		B2		B3	
Lens Type	Wide Zoom		Wide Zoom		Wide Zoom	
Zoom Type	Wide	Tele	Wide	Tele	Wide	Tele
Throw Ratio	0.84	1.02	1.02	1.36	1.2	1.5
Focal Length(EFL) (mm)	21.5	28.7	21.5	28.7	25.5	31.8
Zoom Ratio	1.2X		1.33X		1.25X	

Projection Lens			B1		B2		B3	
Lens Type			Wide Zoom		Wide Zoom		Wide Zoom	
Zoom Type			Wide	Tele	Wide	Tele	Wide	Tele
Projection screen size			Projection distance (m)					
Diagonal (inch)	Height (m)	Width (m)	Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)
50	1.08	0.67	0.9	1.1	1.1	1.5	1.3	1.6
60	1.29	0.81	1.1	1.3	1.3	1.8	1.6	1.9
70	1.51	0.94	1.3	1.5	1.5	2.1	1.8	2.3
80	1.72	1.08	1.4	1.8	1.8	2.3	2.1	2.6
90	1.94	1.21	1.6	2.0	2.0	2.6	2.3	2.9
100	2.15	1.35	1.8	2.2	2.2	2.9	2.6	3.2
110	2.37	1.48	2.0	2.4	2.4	3.2	2.8	3.6
120	2.59	1.62	2.2	2.6	2.6	3.5	3.1	3.9
130	2.80	1.75	2.4	2.9	2.9	3.8	3.4	4.2
140	3.02	1.89	2.5	3.1	3.1	4.1	3.6	4.5
150	3.23	2.02	2.7	3.3	3.3	4.4	3.9	4.8
160	3.45	2.15	2.9	3.5	3.5	4.7	4.1	5.2
170	3.66	2.29	3.1	3.7	3.7	5.0	4.4	5.5
180	3.88	2.42	3.3	4.0	4.0	5.3	4.7	5.8
190	4.09	2.56	3.4	4.2	4.2	5.6	4.9	6.1
200	4.31	2.69	3.6	4.4	4.4	5.9	5.2	6.5
210	4.53	2.83	3.8	4.6	4.6	6.2	5.4	6.8
220	4.74	2.96	4.0	4.8	4.8	6.4	5.7	7.1
230	4.96	3.10	4.2	5.1	5.1	6.7	5.9	7.4
240	5.17	3.23	4.3	5.3	5.3	7.0	6.2	7.8

Projection Lens			B1		B2		B3	
Lens Type			Wide Zoom		Wide Zoom		Wide Zoom	
Zoom Type			Wide	Tele	Wide	Tele	Wide	Tele
Projection screen size			Projection distance (m)					
Diagonal (inch)	Height (m)	Width (m)	Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)
250	5.39	3.37	4.5	5.5	5.5	7.3	6.5	8.1
260	5.60	3.50	4.7	5.7	5.7	7.6	6.7	8.4
270	5.82	3.64	4.9	5.9	5.9	7.9	7.0	8.7
280	6.03	3.77	5.1	6.2	6.2	8.2	7.2	9.1
290	6.25	3.91	5.2	6.4	6.4	8.5	7.5	9.4
300	6.46	4.04	5.4	6.6	6.6	8.8	7.8	9.7
310	6.68	4.17	5.6	6.8	6.8	9.1	8.0	10.0
320	6.90	4.31	5.8	7.0	7.0	9.4	8.3	10.3
330	7.11	4.44	6.0	7.3	7.3	9.7	8.5	10.7
340	7.33	4.58	6.2	7.5	7.5	10.0	8.8	11.0
350	7.54	4.71	6.3	7.7	7.7	10.3	9.1	11.3
360	7.76	4.85	6.5	7.9	7.9	10.6	9.3	11.6
370	7.97	4.98	6.7	8.1	8.1	10.8	9.6	12.0
380	8.19	5.12	6.9	8.4	8.4	11.1	9.8	12.3
390	8.40	5.25	7.1	8.6	8.6	11.4	10.1	12.6
400	8.62	5.39	7.2	8.8	8.8	11.7	10.3	12.9
410	8.83	5.52	7.4	9.0	9.0	12.0	10.6	13.3
420	9.05	5.66	7.6	9.2	9.2	12.3	10.9	13.6
430	9.27	5.79	7.8	9.5	9.5	12.6	11.1	13.9
440	9.48	5.93	8.0	9.7	9.7	12.9	11.4	14.2

Projection Lens			B1		B2		B3	
Lens Type			Wide Zoom		Wide Zoom		Wide Zoom	
Zoom Type			Wide	Tele	Wide	Tele	Wide	Tele
Projection screen size			Projection distance (m)					
Diagonal (inch)	Height (m)	Width (m)	Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)
450	9.70	6.06	8.1	9.9	9.9	13.2	11.6	14.5
460	9.91	6.20	8.3	10.1	10.1	13.5	11.9	14.9
470	10.13	6.33	8.5	10.3	10.3	13.8	12.2	15.2
480	10.34	6.46	8.7	10.6	10.6	14.1	12.4	15.5
490	10.56	6.60	8.9	10.8	10.8	14.4	12.7	15.8
500	10.77	6.73	9.1	11.0	11.0	14.7	12.9	16.2

B4 / B5 / B6

Platform	RICOH PJ KU12000 (WUXGA1920 x 1200)					
DMD	0.96″					
Projection Lens	B4		B5		B6	
Lens Type	Standard		Long Zoom		Ultra-Long Zoom	
Zoom Type	Wide	Tele	Wide	Wide	Tele	Wide
Throw Ratio	1.5	2	2	1.5	2	2
Focal Length(EFL) (mm)	31.8	42.1	42.4	31.8	42.1	42.4
Zoom Ratio	1.33X		2X		1.8X	

Projection Lens			B4		B5		B6	
Lens Type			Standard		Long Zoom		Ultra-Long Zoom	
Zoom Type			Wide	Tele	Wide	Tele	Wide	Tele
Projection screen size			Projection distance (m)					
Diagonal (inch)	Height (m)	Width (m)	Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)
50	1.08	0.67	1.6	2.2	2.2	4.3	4.3	7.8
60	1.29	0.81	1.9	2.6	2.6	5.2	5.2	9.3
70	1.51	0.94	2.3	3.0	3.0	6.0	6.0	10.9
80	1.72	1.08	2.6	3.4	3.4	6.9	6.9	12.4
90	1.94	1.21	2.9	3.9	3.9	7.8	7.8	14.0
100	2.15	1.35	3.2	4.3	4.3	8.6	8.6	15.5
110	2.37	1.48	3.6	4.7	4.7	9.5	9.5	17.1
120	2.59	1.62	3.9	5.2	5.2	10.3	10.3	18.6
130	2.80	1.75	4.2	5.6	5.6	11.2	11.2	20.2
140	3.02	1.89	4.5	6.0	6.0	12.1	12.1	21.7
150	3.23	2.02	4.8	6.5	6.5	12.9	12.9	23.3
160	3.45	2.15	5.2	6.9	6.9	13.8	13.8	24.8
170	3.66	2.29	5.5	7.3	7.3	14.7	14.7	26.4
180	3.88	2.42	5.8	7.8	7.8	15.5	15.5	27.9
190	4.09	2.56	6.1	8.2	8.2	16.4	16.4	29.5
200	4.31	2.69	6.5	8.6	8.6	17.2	17.2	31.0
210	4.53	2.83	6.8	9.1	9.1	18.1	18.1	32.6
220	4.74	2.96	7.1	9.5	9.5	19.0	19.0	34.1
230	4.96	3.10	7.4	9.9	9.9	19.8	19.8	35.7

Projection Lens			B4		B5		B6	
Lens Type			Standard		Long Zoom		Ultra-Long Zoom	
Zoom Type			Wide	Tele	Wide	Tele	Wide	Tele
Projection screen size			Projection distance (m)					
Diagonal (inch)	Height (m)	Width (m)	Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)
240	5.17	3.23	7.8	10.3	10.3	20.7	20.7	37.2
250	5.39	3.37	8.1	10.8	10.8	21.5	21.5	38.8
260	5.60	3.50	8.4	11.2	11.2	22.4	22.4	40.3
270	5.82	3.64	8.7	11.6	11.6	23.3	23.3	41.9
280	6.03	3.77	9.1	12.1	12.1	24.1	24.1	43.4
290	6.25	3.91	9.4	12.5	12.5	25.0	25.0	45.0
300	6.46	4.04	9.7	12.9	12.9	25.9	25.9	46.5
310	6.68	4.17	10.0	13.4	13.4	26.7	26.7	48.1
320	6.90	4.31	10.3	13.8	13.8	27.6	27.6	49.6
330	7.11	4.44	10.7	14.2	14.2	28.4	28.4	51.2
340	7.33	4.58	11.0	14.7	14.7	29.3	29.3	52.8
350	7.54	4.71	11.3	15.1	15.1	30.2	30.2	54.3
360	7.76	4.85	11.6	15.5	15.5	31.0	31.0	55.9
370	7.97	4.98	12.0	15.9	15.9	31.9	31.9	57.4
380	8.19	5.12	12.3	16.4	16.4	32.8	32.8	59.0
390	8.40	5.25	12.6	16.8	16.8	33.6	33.6	60.5
400	8.62	5.39	12.9	17.2	17.2	34.5	34.5	62.1
410	8.83	5.52	13.3	17.7	17.7	35.3	35.3	63.6
420	9.05	5.66	13.6	18.1	18.1	36.2	36.2	65.2

Projection Lens			B4		B5		B6	
Lens Type			Standard		Long Zoom		Ultra-Long Zoom	
Zoom Type			Wide	Tele	Wide	Tele	Wide	Tele
Projection screen size			Projection distance (m)					
Diagonal (inch)	Height (m)	Width (m)	Min (m)	Max (m)	Min (m)	Max (m)	Min (m)	Max (m)
430	9.27	5.79	13.9	18.5	18.5	37.1	37.1	66.7
440	9.48	5.93	14.2	19.0	19.0	37.9	37.9	68.3
450	9.70	6.06	14.5	19.4	19.4	38.8	38.8	69.8
460	9.91	6.20	14.9	19.8	19.8	39.6	39.6	71.4
470	10.13	6.33	15.2	20.3	20.3	40.5	40.5	72.9
480	10.34	6.46	15.5	20.7	20.7	41.4	41.4	74.5
490	10.56	6.60	15.8	21.1	21.1	42.2	42.2	76.0
500	10.77	6.73	16.2	21.5	21.5	43.1	43.1	77.6

Lamp Information

Power	User selectable power from 465W Max Brightness mode to 370W ECO Mode in 10 steps (10.5W per step)
Lamp Mode	Single / Dual Lamps
465W Lamp rated lamp life to 50% brightness (2 hrs on, 15 min off duty cycle)	• 1500 hrs typical @ 465W • 2000 hrs typical @ 370W The lamp life is only guaranteed in ceiling mount and table top mode.
Warm-up time (to full output)	5 minutes max

Operating position	1. 360-degree tilt 2. Portrait mode (only keypad side up) 3. ±20 deg max tilt of lamp axis from horizontal

Image Quality

Blemishes	Per TI IQ 1912-xxx7 for 0.96" WUXGA spec.
Pixel Defects	Per TI IQ 1912-xxx7 for 0.96" WUXGA spec.
Flare	White Flare ≤ 2.5 pixels (including the pixel itself). Observable from 2m @ 150" screen
Light Leakage	< 0.8 lux. Evaluate on 150" screen
Distortion	<+/- 1.0% @ 100" screen size for all lenses.
Unbalance	<50cm @100" full range for all lenses.
Aperture Shadow	No shadows allowed for any orientation of the projector.

Thermal Specifications

Noise Level

Noise is measured based on ISO 7779. At bystander positions, the ISO 7779 test criterion is same as ISO 11203 [referencing Japanese Machine Standard 1999, using ISO 11203 (sound pressure)].

Note

- Tested under 2X color wheel speed, without dust filter and cable cover.

465 W dual lamps operation @ 23 C ambient	Typical : 39 dB(A), Max: 41 dB(A) A-weighted sound pressure level At the bystanders test positions Based on ISO 7779

370 W (ECO mode) dual lamps operation @ 23 C ambient	Typical : 36 dB(A), Max: 38 dB(A) A-weighted sound pressure level At the bystanders test positions Based on ISO 7779

Mechanical Specifications

Size

Maximum product dimensions (W x D x H)	520mm(W) x 591mm(D) x 208.3mm(H) (without lens, with elevators)

Adjustment

Product Alignment (Four adjustable feet)	45mm maximum for vertical adjustment, elevator could not be taken out.

Weight

Net weight (without lens)	26 kg
Weight with package	32kg

EE Specifications

Image Processor Performance

		Notes
Image Processor	Pixelworks PW392 C-30L	10 bit processing engine
Min input pixel rate	13.5 Mpix/s	NTSC / PAL / SECAM
Max input pixel rate	162 Mpix/s	1600x1200@60Hz

		Notes
Max input resolution	1600x1200@60Hz 1920x1200@60Hz, reduce blanking	162MHz (1600 x 1200) 154MHz (1920 x 1200)

Video Signal Connectors

Type	Connector	Description
HDMI In x 1	HDMI	HDMI, version 1.4b HDCP 1.3 compliance
Computer In x 1	DVI (Digital Only)	Signal link DVI, version 1.0
Computer In x 1	VESA (HD15) Blue, Female	Provides input for analog RGBHV/Component, HDTV input signal.
Monitor Out x 1	VESA (HD15) black, Female	Provides output loop thru to monitor.
CVBS In x 1	CVBS In (Composite Video) BNC connector , female	Provides composite video input signal.
BNC x 5	YPbPr In (Component Video) RGBHV In BNC Connector	Provides analog RGBHV/ Component, HDTV input signal.
USB x 1	Type A	USB 2.0 Host

Type	Connector	Description
RJ45 x2	RJ45-1 (HDBaseT input)	Transmits uncompressed high definition video by HDMI Tx interface , Ethernet 100BaseTx , control signals including RS-232 and Infrared through a single 100M Cat5e/6 LAN Cable. Presenter (an AP which is used to transfer Host PC/NB image to Projector). LAN control
	RJ45-2 (Network display)	Presenter (an AP which is used to transfer Host PC/NB image to Projector). LAN control

Control Signal and Power Connectors

Type	Connector	Description
AC Mains In x1	IEC/EN60320-C14 receptacle	Provides AC input
RS232 x 1	9-pin RS232 male (d-sub) x1	Provides serial connection for control systems
Wired Remote Connector	Wired Remote, 3.5mm stereo female x2 (in / out) Volts: 5V Amps: 300mA Max	Provides serial communications and power for wired remote
Ethernet x 2	RJ45-1* & RJ45-2	Ethernet interface for command, control and content. RJ45-1 (HDBaseT) can support 100M Cat5e/6 LAN Cable.

Wired / IR Remote Control

IR Receivers	38kHZ
IR Remote	Black IR remote with Key layout as shown earlier.
Wired Remote	Remote can be operated in wired mode where 5V power is provided by the projector and keys are communicated to the projector serially.

Remote range of operation using IR

Description	Criteria	Working Distance
Remote control functional range – front	In front of projector/IR receiver (0º)	10M
Remote control functional range at extremes of horizontal angle – front	Angle measured from normal to projection lens ± 40º	7M
Remote control functional range at extremes of vertical angle – front	Angle measured from normal to projection lens ± 15º	7M

PIP Compatibility

PIP/POP Matrix	VGA	BNC	DVI	3G-SDI	CVBS	HDMI	HDBase T	Network Display
VGA					V	V	V	V
BNC					V	V	V	V
DVI					V	V	V	V
3G-SDI					V	V	V	V
CVBS	V	V	V	V				
HDMI	V	V	V	V				
HDBase T	V	V	V	V				

PIP/POP Matrix	VGA	BNC	DVI	3G-SDI	CVBS	HDMI	HDBase T	Network Display
Network Display	V	V	V	V				

Power Consumption

Rated Voltage	100 VAC – 120 VAC, with 20A fuse. (For low voltage regions, such as Japan, North America)
	200 VAC – 240 VAC, with 10A fuse. (For high voltage regions, such as China, Europe)
Rated Current (465W lamp Mode)	100-120V~ 50/60 Hz, 12A
	200-240V~ 50/60 Hz, 5A
Line frequency	50/60 Hz
Type of connector	IEC/EN60320-C14 receptacle
Line Cord	Cable, power cord, 3M US
Surge Current	65Amps max.
Maximum Power Consumption	
465W (Max. Brightness Mode)	1150W +/-10% @110V
	1080W +/-10% @220V
370W (ECO Mode)	920W +/-10% @110V
	870W +/-10% @220V

F/W Specifications

OSD Languages

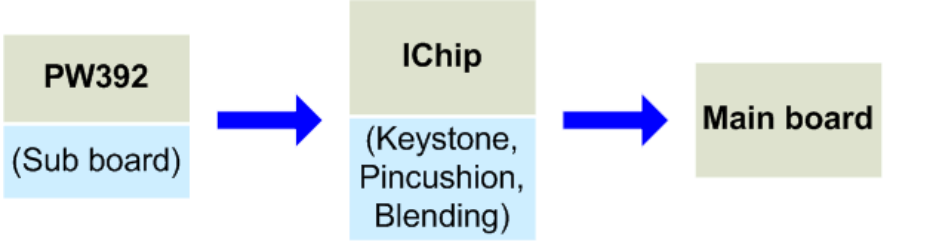
English, Chinese (simplified), Chinese (traditional), French, German, Italian, Japanese, Korean, Russian, Spanish, Portuguese, Dutch, Indonesian

LAN Function

LAN support Telnet, Crestron (Flash UI/RoomView/Control system), PJ-Link (Support v1.0, w/o authentication), AMX (Device discovery only, certification by customer).

Blending & Warping Features

The PW392 will change all types of video sources to WUXGA (for 2D WUXGA models) or 720P (for 3D timing), before sending the signal to the iChip. Therefore the limit of adjustment range for all functions will only be specified for WUXGA or 720P (for 3D timing).



Features:

- Image Blending with smooth gray scale at overlap area.
- Support warping/ keystone (V: +/- 20 degrees, H: +/- 20 degrees) / barrel / pincushion (via Grid adjusting: Max to 17 points X 17 points)
- Adjustable Black Level Polygon (area) interface locates anywhere
- Color compensation: Point- area at Grid adjustment interface

Video Signal Input Specifications

Based on standard input timing table as below

PC

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
640x480	60	DMT0660	V	V	V	V		V	
	72	DMT0672	V	V	V	V		V	
	75	DMT0675	V	V	V	V		V	
	85	DMT0685	V	V	V	V		V	

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
720x400	60	SMT0760H	V	V	V	V		V	
800x600	60	DMT0860	V	V	V	V		V	
	72		V	V	V	V		V	
	75	DMT0875	V	V	V	V		V	
	85	DMT0885	V	V	V	V		V	
	120	CVR0812	V		V	V		V	
848x480	50	CVT0850H			V	V		V	
	60	CVT0860H			V	V		V	
	75	CVT0875H			V	V		V	
	85	CVT0885H			V	V		V	
1024x768	60	DMT1060	V	V	V	V		V	
	75	DMT1075	V	V	V	V		V	
	85	DMT1085	V	V	V	V		V	
	120	CVR1012	V		V	V		V	
1152x720	50	CVT1150D			V	V		V	
	60	CVT1160D			V	V		V	
	75	CVT1175D			V	V		V	
	85	CVT1185D			V	V		V	
1152x864	60	CVT1160	V	V	V	V		V	
	70	DMT1170	V	V	V	V		V	
	75	DMT1175	V	V	V	V		V	
	85	DMT1185	V	V	V	V		V	

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
1280x720	50				V	V		V	
	60		V	V	V	V		V	
	75	CVT1275H	V	V	V	V		V	
	85	CVT1285H	V	V	V	V		V	
	120		V		V	V		V	
1280x768	60	CVT1260E	V	V	V	V		V	
	75	CVT1275E	V	V	V	V		V	
	85	CVT1285E	V	V	V	V		V	
1280x800	50	CVT1250_	V	V	V	V		V	
	60	DMT1260D	V	V	V	V		V	
	75	CVT1275_	V	V	V	V		V	
	85	CVT1285_	V	V	V	V		V	
1280x960	50	CVT1250			V	V		V	
	60	CVT1260	V	V	V	V		V	
	75	CVT1275	V	V	V	V		V	
	85	CVT1285	V	V	V	V		V	
1280x1024	50	CVT1250G			V	V		V	
	60	DMT1260G	V	V	V	V		V	
	75	DMT1275G	V	V	V	V		V	
	85	DMT1285G	V	V	V	V		V	

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
1360x768	50	CVT1350H			V	V		V	
	60	DMT1360H			V	V		V	
	75	CVT1375H			V	V		V	
	85	CVT1385H			V	V		V	
1366x768	60	DMR1360H	V	V	V	V		V	
1400x1050	50	CVT1450			V	V		V	
	60	CVT1460	V	V	V	V		V	
	75	CVT1475	V	V	V	V		V	
1440x900	60	CVT1460D	V	V	V	V		V	
	75	CVT1475D			V	V		V	
1600x900	60	DMR1660H			V	V		V	
1600x1200	60	DMT1660	V	V	V	V		V	
1680x1050	60	CVT1660D	V	V	V	V		V	
1920X1080	50	CVT1950H			V	V		V	
	60	CVR1960H	V	V	V	V		V	
1920X1200RB	60	CVR1960D							
	50	CVT1950D							

NTSC

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
NTSC (M, 4.43)	60								V

PAL

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
PAL (B,G,H,I)	50								V
PAL (N)	50								V
PAL (M)	60								V

SECAM

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
SECAM (M)	50								V

SDTV

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
480p	60		V	V	V	V		V	
576p	50		V	V	V	V		V	

EDTV

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
480p	60		V	V	V	V		V	
576p	50		V	V	V	V		V	

HDTV

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
1080i	25		V	V	V	V		V	
	29		V	V	V	V		V	
	30		V	V	V	V		V	
720p	50		V	V	V	V		V	
	59		V	V	V	V		V	
	60		V	V	V	V		V	
1080p	23		V	V	V	V		V	
	24		V	V	V	V		V	
	25		V	V	V	V		V	
	29		V	V	V	V		V	
	30		V	V	V	V		V	
	50		V	V	V	V		V	
	59		V	V	V	V		V	
	60		V	V	V	V		V	

Mandatory 3D

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
Frame Packing 1080p	24				V			V	
Frame Packing 720p	50				V			V	
	60				V			V	

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
Side by Side 1080i	50				V			V	
	60				V			V	
Top and Bottom 720p	50				V			V	
	60				V			V	
Top and Bottom 1080p	24				V			V	

Frame sequential 3D

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
800x600	120				V			V	
1024x768	120				V			V	
1280x720	120				V			V	

SD-SDI

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
480i YcbCr422 10bit	59.94						V		
576i YcbCr422 10bit	50						V		

HD-SDI

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
720p YcbCr422 10bit	50						V		
	59.94						V		
	60						V		
1080i YcbCr422 10bit	50						V		
	59.94						V		
	60						V		
1080p YcbCr422 10bit	23.98						V		
	24						V		
	25						V		
	29.97						V		
	30						V		
1080sF YcbCr422 10bit	25						V		
	29.97						V		
	30						V		

3GA-SDI

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
1080p YcbCr422 10bit	50						V		
	59.94						V		
	60						V		

3GB-SDI

Resolution	Frame rate (Hz)	H.Frequency	VGA	BNC	HDMI	DVI	3G-SDI	HDBaseT	CVBS
1080p YcbCr422 10bit With 352M Payload ID	50						V		
	59.94						V		
	60						V		

Environmental Conditions

Temperature/Humidity/Altitude

Operating temperature range	Operating: 0°C ~ 40°C 0 to 40 degrees C (0~2500 ft) 0 to 35 degrees C (2500~5000 ft) 0 to 30 degrees C (5000~10000 ft)
Storage temperature range	Storage: -10°C ~ 60°C
Humidity range	Operating: 10~85%RH, non-condensing Storage: 5~90%RH, non-condensing
Operating Altitude	10,000 ft maximum

2. Installation

Installation Requirements

Environment/Power Requirements

Operating temperature

0°C to 40°C

Power supply

100~240VAC, 50~60Hz

Machine Dimensions

520mm(W) x 591mm(D) x 208.3mm(H) (without lens, with elevators)

(20.47"(W) x 20.47"(D) x 8.20"(H))

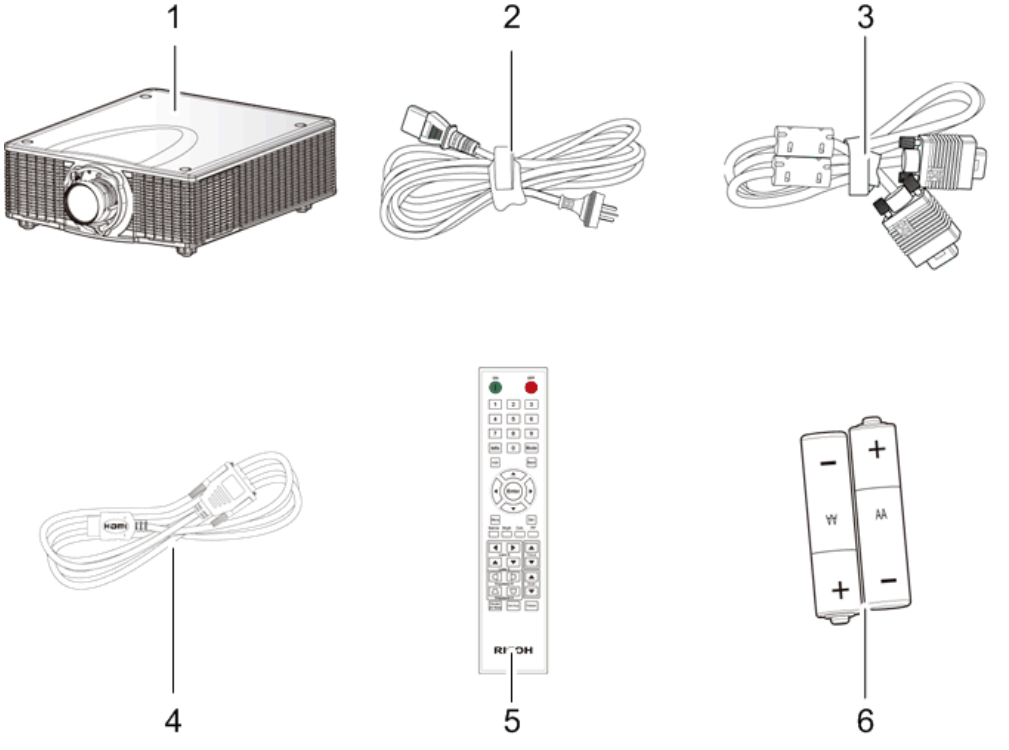
Main Machine Installation

The user must set this projector up.

Important

- **About the handling of this machine, follow the contents of the Safety Information section of the user manual.**

Accessory Check



y092m0148

No	Description	Q'ty
1	Projector without lens cover	1
2	Power cord	1
3	VGA cable	1
4	DVI-HDMI adapter	1

No	Description	Q'ty
5	Remote controller	1
6	AAA Batteries (for the remote controller)	2
-	Documentation: User's Manual (CD)	1
-	Documentation: Quick Start Guide	1

Note

- Due to different applications in each country, some regions may have different accessories.

Precautions

Please follow all warnings, precautions and maintenance as recommended in this manual.

⚠WARNING

- Do not look into the projector's lens when the lamp is on. The bright light may hurt your eyes.
- To reduce the risk of fire or electric shock, do not expose this projector to rain or moisture.
- When switching the projector off, please ensure the cooling cycle has been completed before disconnecting power. Allow 60 seconds for the projector to cool down.
- Do not use the lens cap when the projector is in operation.
- Do not look into or point the laser pointer on your remote controller into your or someone's eyes. Laser pointers can cause permanent damage to eyesight.
- Do not transport the projector with any lens installed.

Do

- Turn off and unplug the power plug from the AC outlet before cleaning the product.
- Use a soft dry cloth with mild detergent to clean the display housing.
- Disconnect the power plug from the AC outlet if the product is not being used for a long period of time.

Do not

- Block the slots and openings on the unit provided for ventilation.
- Use abrasive cleaners, waxes or solvents to clean the unit.

- Use under the following conditions:
  - In extremely hot, cold or humid environments.
    - Ensure that the ambient room temperature is within 0°C ~ 40°C
    - Relative humidity is 10% ~ 85%
  - In areas susceptible to excessive dust and dirt.
  - Near any appliance generating a strong magnetic field.
  - In direct sunlight.

3. Replacement and Adjustment

Special Tools

Make sure that engineers are equipped with the following tools, which will be necessary in order to update the firmware, and to perform adjustments that are necessary after replacing the optical engine (page 83 "DA, Photo Sensor Board, Lamp Housing, Optical Engine") or main board (page 52 "Main Board, Sub Board, LAN/USB Board").

1. RS-232C cable (female/cross)
2. Laptop
3. LAN Cable

Equipment Needed

- Screw bit (+): 105
- Screw bit (+): 107
- Hex sleeves 2.0 mm
- Hex sleeves 5.0 mm
- Hex sleeves 14.0 mm
- Projector

y092m0023

Parts List

Service Parts List

1. Outlet vent cover
2. Filter cover (rear) x2
3. Fan 1 / Fan 2
4. Fan docking board
5. Lamp cover
6. Top cover
7. Lamp 1 / Lamp 2
8. Color wheel
9. Top cover
10. Main board
11. Sub board
12. LAN/USB board
13. I/O cover
14. Front cover
15. Filter cover (front) x2
16. Filter sensor (front) x2
17. IR sensor board x2
18. LED board
19. Rear cover connector board
20. Interlock switch
21. Rear cover
22. Fan 3
23. Right Cover
24. Filter cover (right)
25. Right cover relay board x2
26. Filter sensor (right)
27. Left Cover
28. Keypad board
29. Keypad panel

30. Keypad cover
31. Ballast 1 / Ballast 2
32. Cooling pad (for Ballast 1)
33. Cooling pad (for Ballast 2)
34. Standoff x4
35. Fan driver board
36. Fan 4
37. AC Inlet
38. Fuse
39. Thermal switch
40. Fan 5 / Fan 6 / Fan 8
41. DA module
42. Photo sensor board
43. Lamp housing
44. Lamp cables x2
45. Optical Engine
46. Color wheel docking board
47. Light sensor board
48. Shutter
49. PSU
50. Cooling pad (for PSU)
51. Fan 7 / Fan 10
52. Adjustable foot x3
53. Nut (for Adjustable foot) x3

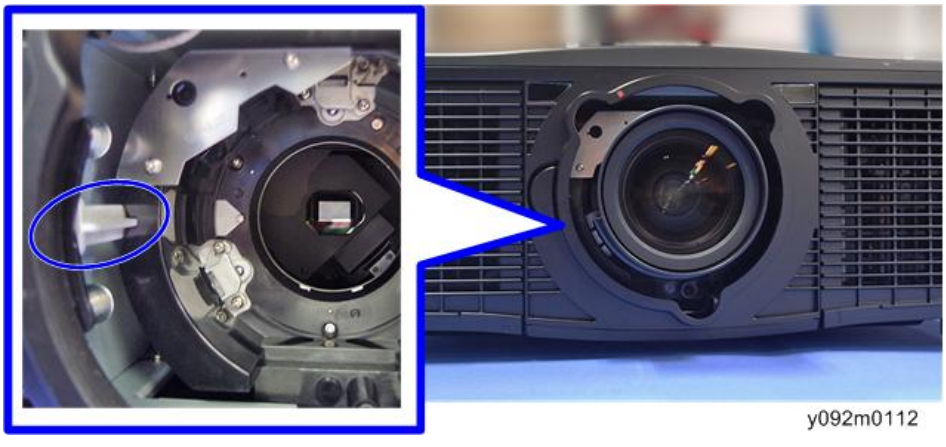
Part Replacement

Important

- This process is protective level II. Operators should wear electrostatic chains.
- When removing or disassembling the optical engine, please note that specific environmental conditions (clean room) are required.

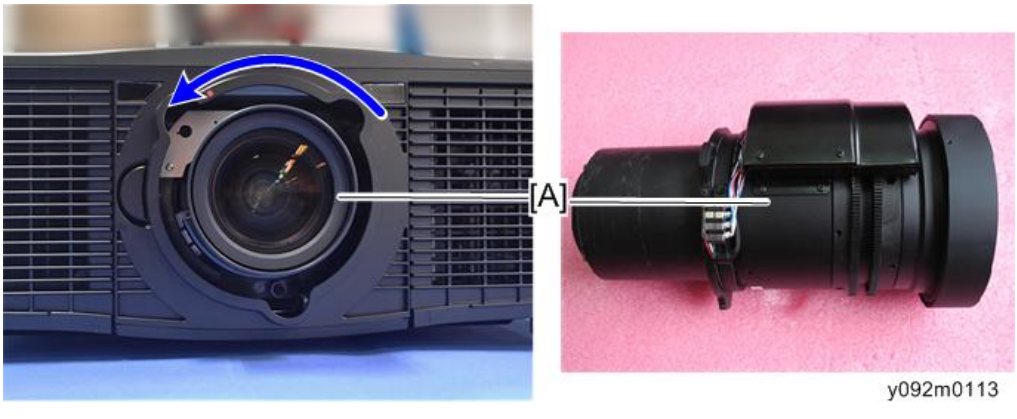
Projector Lens

1. Press and hold down the lens bar.



y092m0112

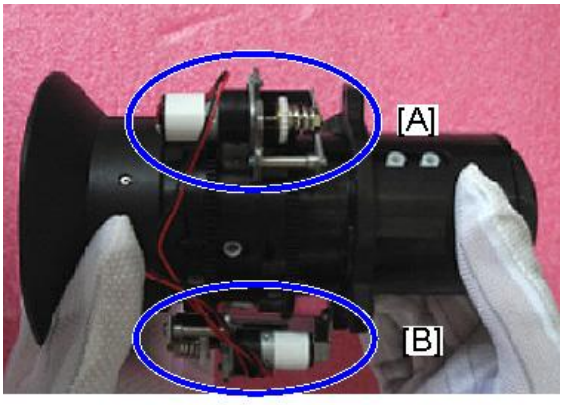
2. Remove the projector lens [A] by rotating it counter-clockwise.



y092m0113

Note

- Be careful not to make the glass of the projector lens dirty.
- Be careful not to touch the motor [A] [B] of the projector lens.



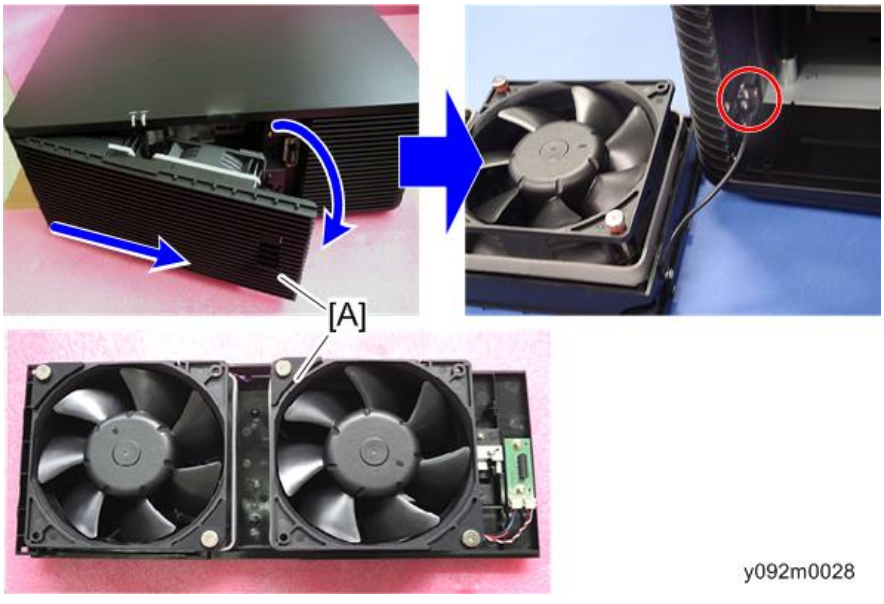
y041m1003

Outlet Vent Cover, Fan 1 / Fan 2, Fan Docking Board, Lamp Cover

1. Loosen two screws to open the lamp cover [A].

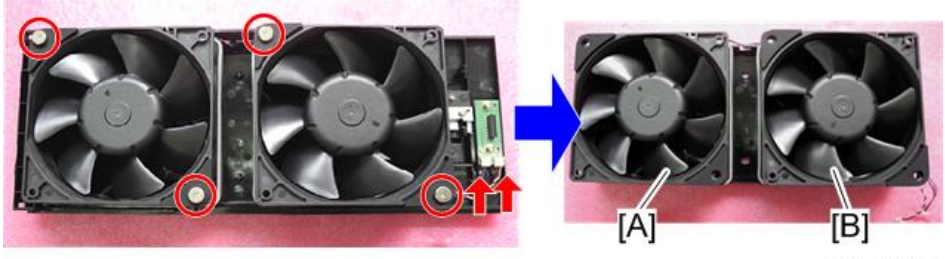
y092m0027

2. Open the cover, and then remove one screw to remove the lamp cover module [A].



y092m0028

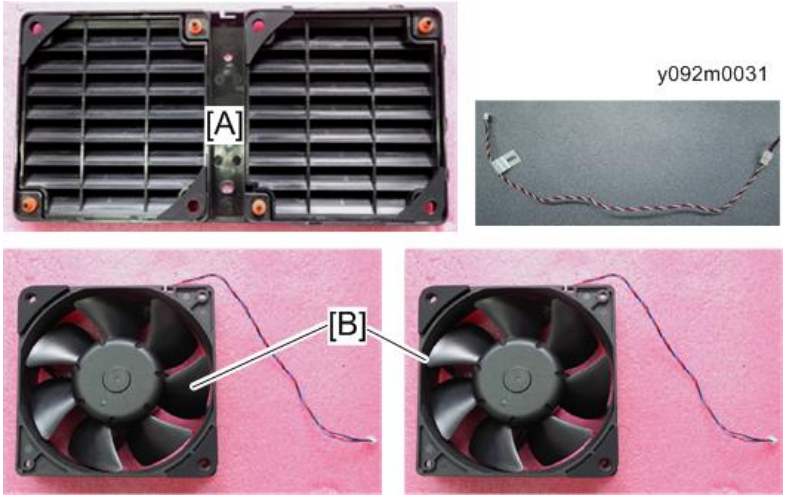
3. Remove four screws and two connectors to remove fan 1 [A] and fan 2 [B].



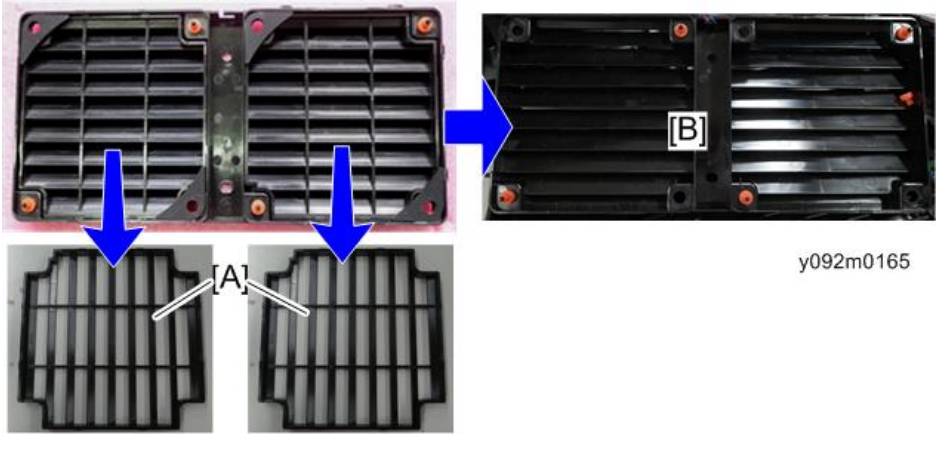
y092m0029

4. Disconnect the wire extension, then separate the outlet vent cover [A] and fan [B].

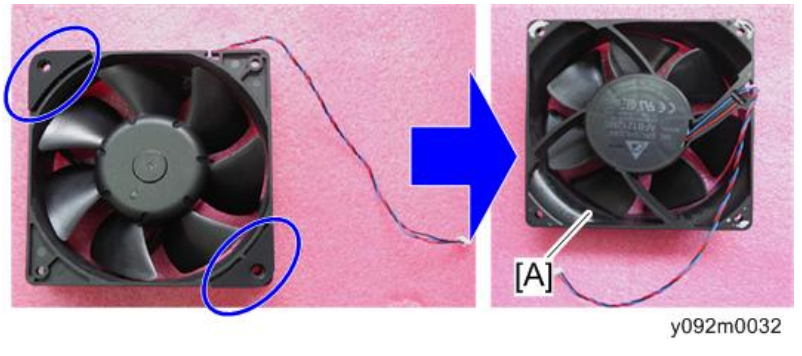
y092m0030



5. **Remove the filter cover [A] from the outlet vent cover [B].**



6. **Tear off the two rubbers from fan 1 and fan 2 [A].**



Note

- Fan 1 and Fan 2 are the same.

7. Remove two screws to remove the fan docking board [A] from the lamp cover [B].

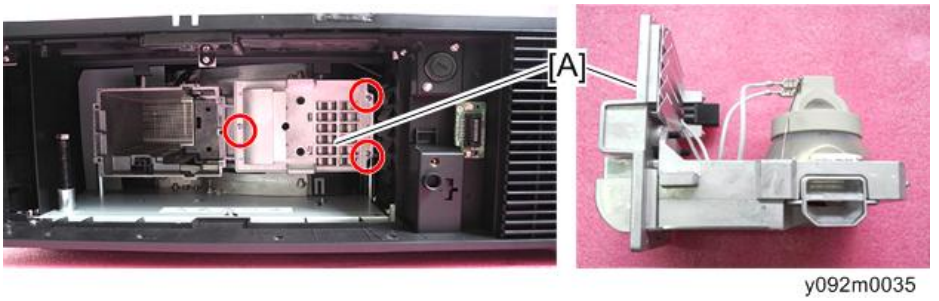
y092m0033

Lamp Unit

1. Loosen three screws to remove lamp 1 [A].

y092m0034

2. Loosen three screws to remove lamp 2 [A].



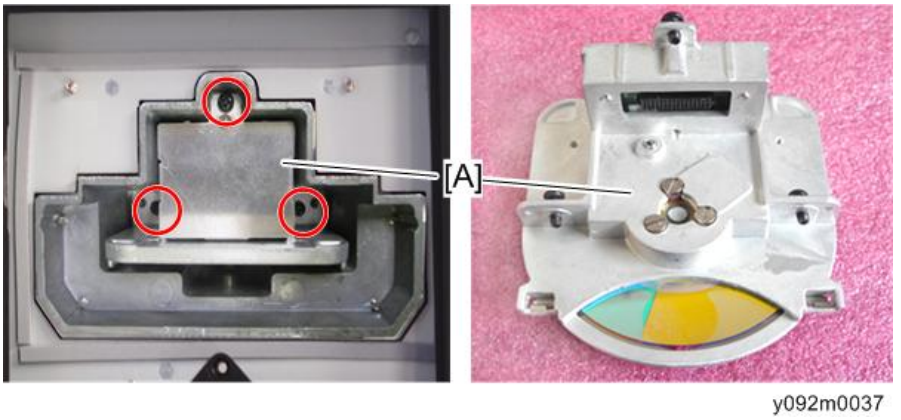
y092m0035

Color Wheel

1. Remove one screw to open the color wheel cover [A].

y092m0036

2. Loosen three screws to take out the color wheel [A].



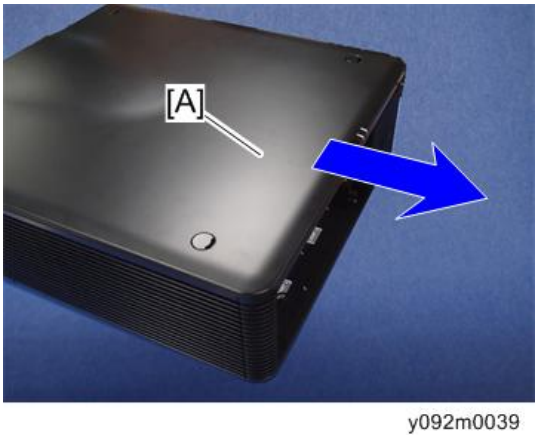
y092m0037

Top Cover and Main Board Shielding

1. Remove the lamp unit. (page 49 "Lamp Unit")
2. Loosen three screws and remove one screw (blue circle).

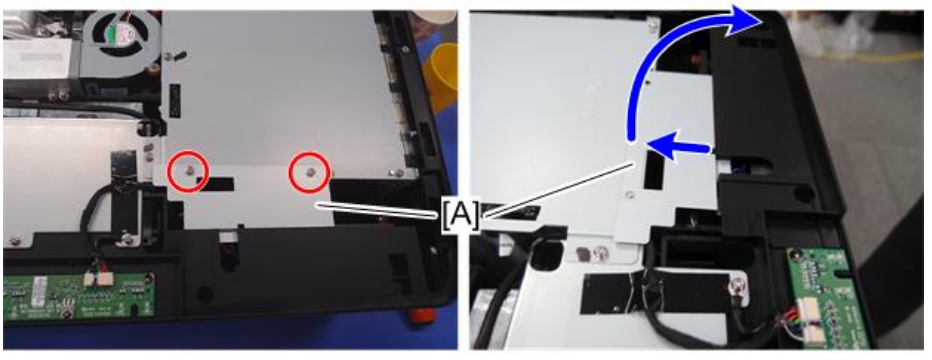
y092m0038

3. Pull the top cover [A] and remove it.



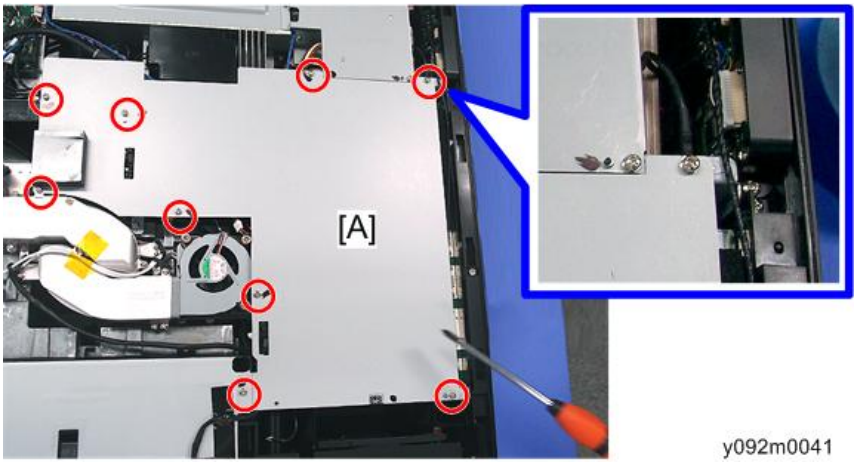
y092m0039

4. Remove 2 screws to remove the shield [A].



y092m0040

5. Remove nine screws to remove the main board shielding [A].



y092m0041

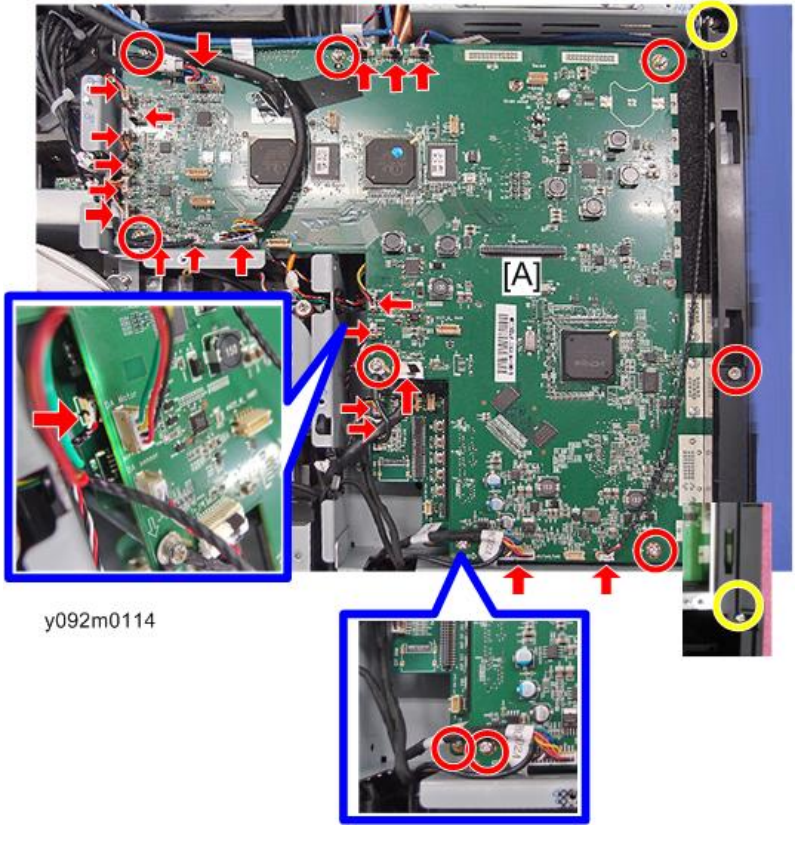
Main Board, Sub Board, LAN/USB Board

1. Remove the top cover and main board shielding. (page 60 "Main Board Bottom Shielding and Front Shielding")

2. Remove nine hex screws (red circles) and one hex screw (yellow circle).

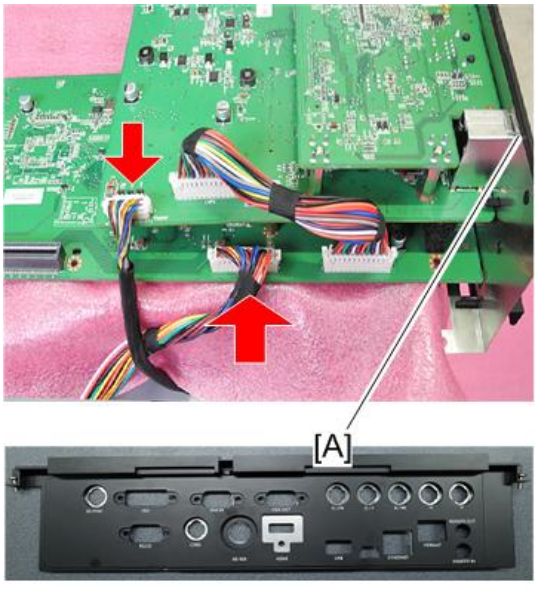
y092m0042

3. Remove nine screws (red circles) and loosen two screws (yellow circles) and disconnect 21 connectors.



y092m0114

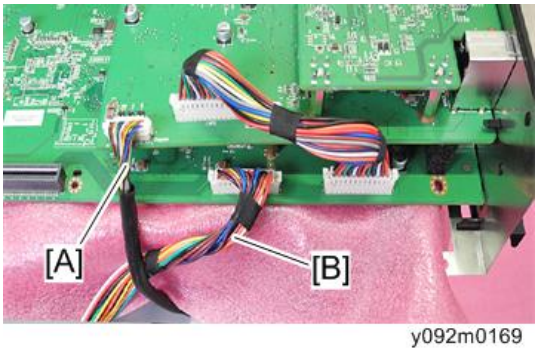
4. Disconnect two connectors, then separate the I/O cover [A].



y092m0115

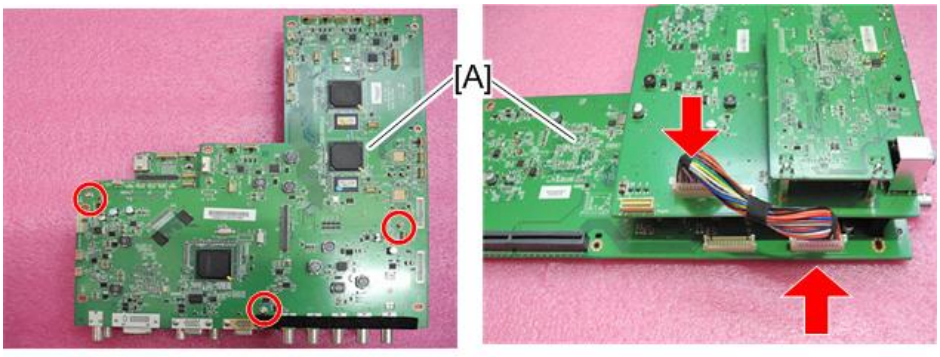
Note

- [A] is connected to the Keypad board.
- [B] is connected to the PSU.

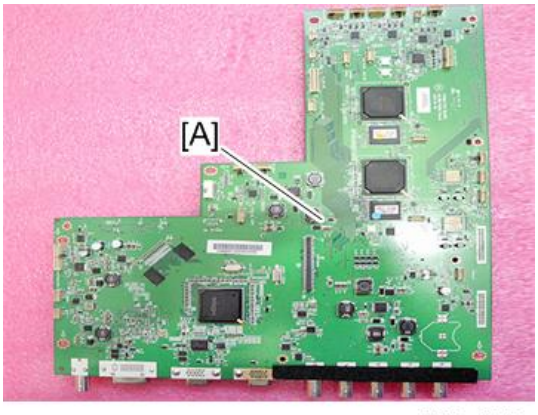


y092m0169

5. **Remove three screws and two connectors to remove the main board [A].**



y092m0116

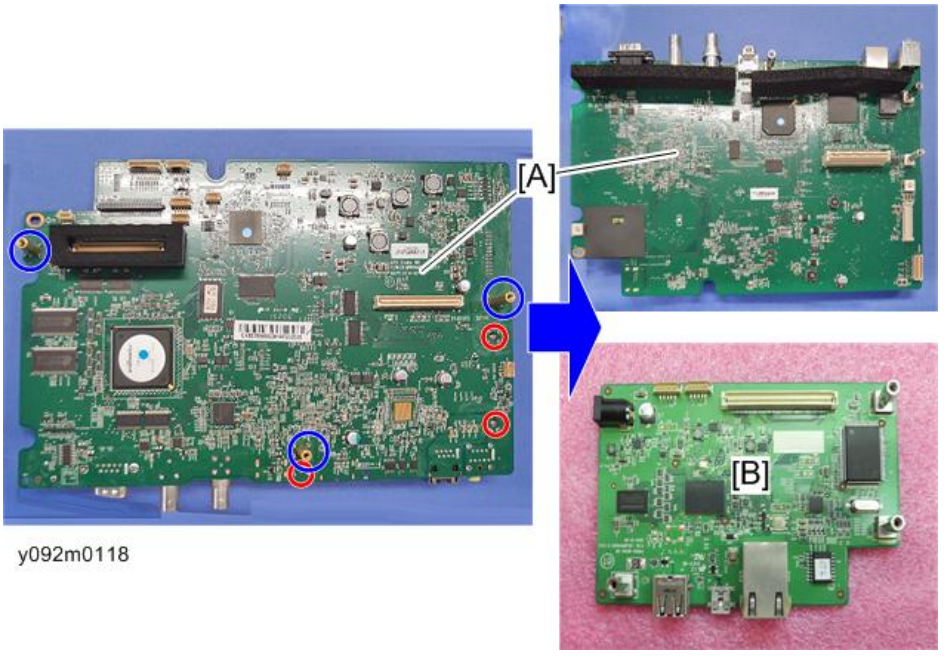


y092m0117

Note

- There are two connectors between main board and sub board.

6. **Remove three screws and three standoffs to separate the sub board [A] and the LAN/USB board [B].**

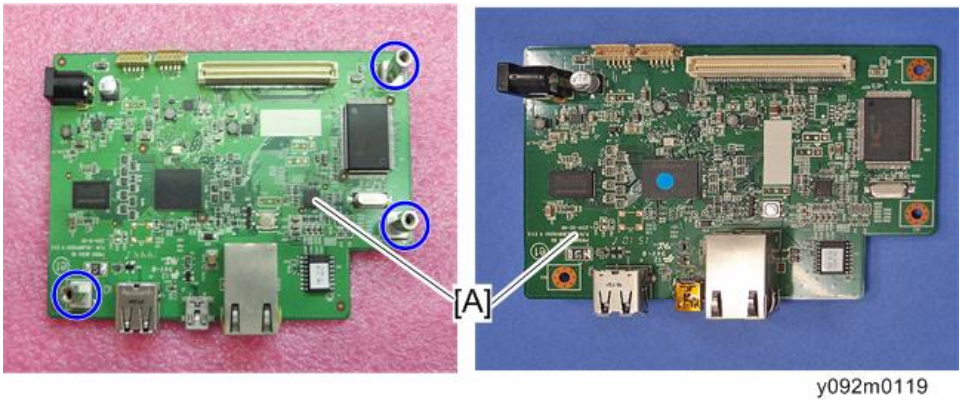


y092m0118

Note

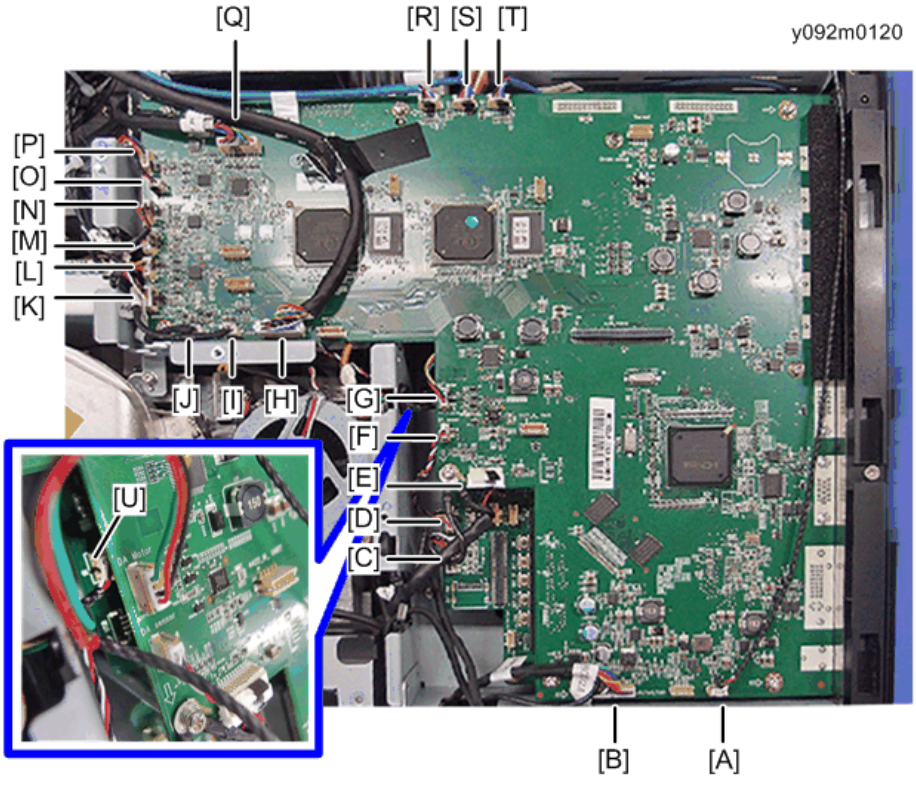
- There is one connector between LAN/USB board and sub board.

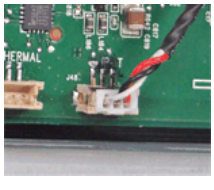
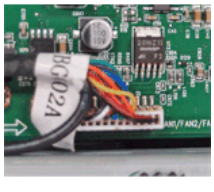
7. **Remove the three hex standoffs from the LAN/USB board [A].**

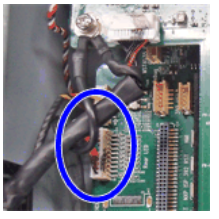
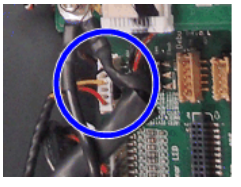
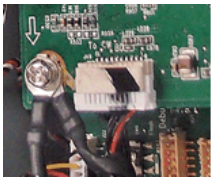
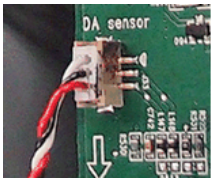
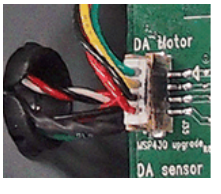
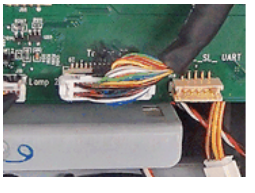


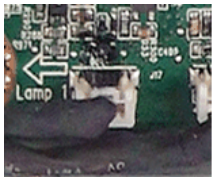
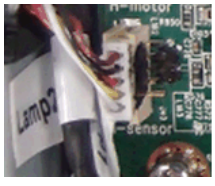
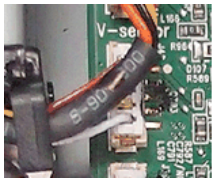
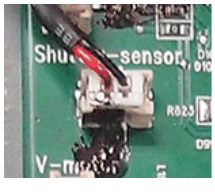
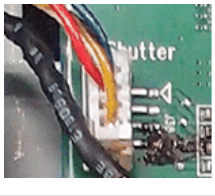
y092m0119

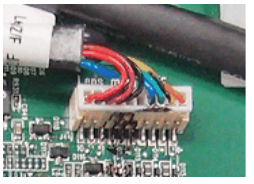
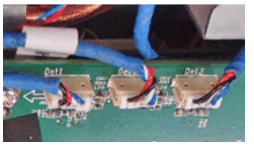
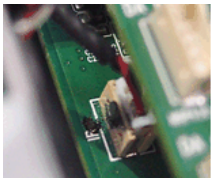
Connector list



Item	Name on board	Key feature	Figure
A	J48 IR-T	Red/white/black wire, white connector and black wire tube (3 pins)	
B	J67 FAN1/FAN2/ FAN3	White connector (12 pins)	

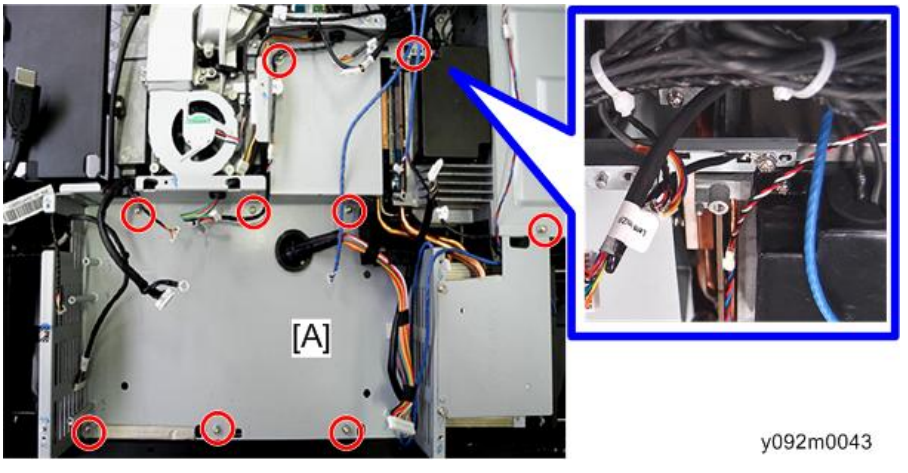
Item	Name on board	Key feature	Figure
C	J46 REAR LED	White connector (10 pins)	
D	J22 LIGHT SENSOR	Red/yellow/black wire, white connector and black wire tube (3 pins)	
E	J49 TO CW BD	White connector and black wire tube (20 pins)	
F	J33 DA SENSOR	Red/black/white wire, white connector (3 pins)	
G	J35 DA MOTOR	Red/black/yellow/green wire, white connector (4 pins)	
H	J53 TO FAN BD	White connector (30 pins)	
I	J18 LAMP2	White connector (5 pins)	

Item	Name on board	Key feature	Figure
J	J17 LAMP1	White connector (5 pins)	
K	J40 H-SENSOR	White/yellow/red/black/brown wire, white connector (5 pins)	
L	J39 H-MOTOR	Orange/brown/ black/ yellow wire, white connector (4 pins)	
M	J42 V-SENSOR	White/yellow/red/black/brown wire, white connector (5 pins)	
N	J41 V-MOTOR	Orange/brown/ black/yellow wire, white connector (4 pins)	
O	J65 SHUTTER SENSOR	Red/black wire, white connector and black wire tube (2 pins)	
P	J38 SHUTTER	Yellow/white/red/blue wire, white connector and black wire tube (4 pins	

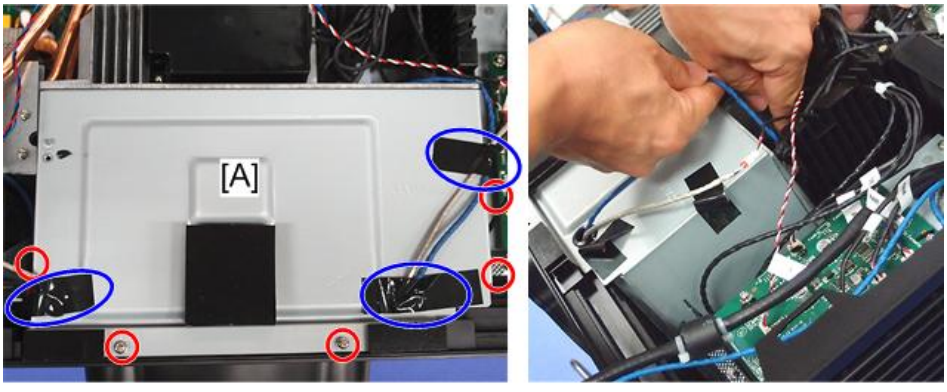
Item	Name on board	Key feature	Figure
Q	J44 LENS mem/Z/F	White connector and black wire tube (10 pins)	
R	J62 DET	Black/red/white/blue wire, white connector and blue wire tube (4 pins)	
S	J63 DET		
T	J64 DET		
U	J17 IR	Red/white/black wire, white connector and black wire tube (3 pins)	

Main Board Bottom Shielding and Front Shielding

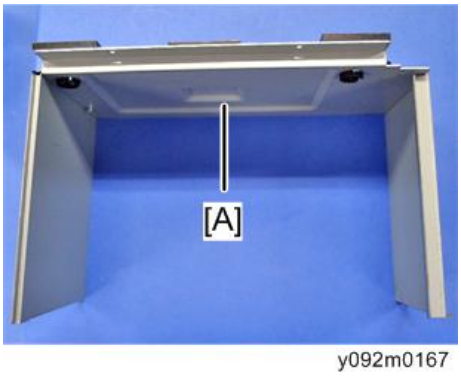
1. **Remove the main board unit. (page 52 "Main Board, Sub Board, LAN/USB Board")**
2. **Remove nine screws to remove the main board bottom shielding [A].**



3. Remove five screws and tear off three tapes, then remove the front shielding [A].



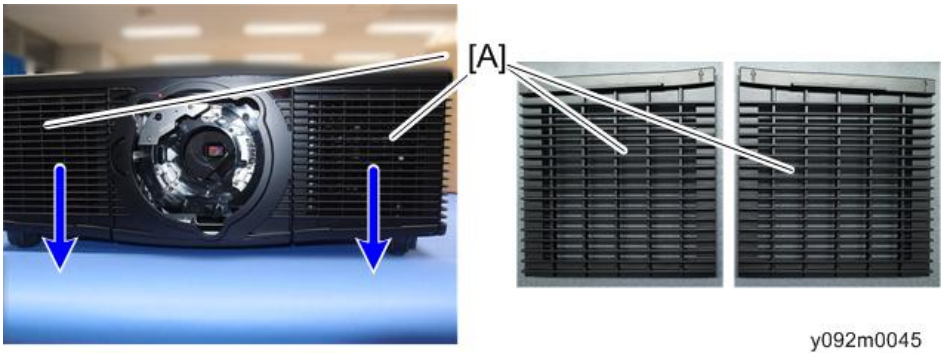
y092m0044



y092m0167

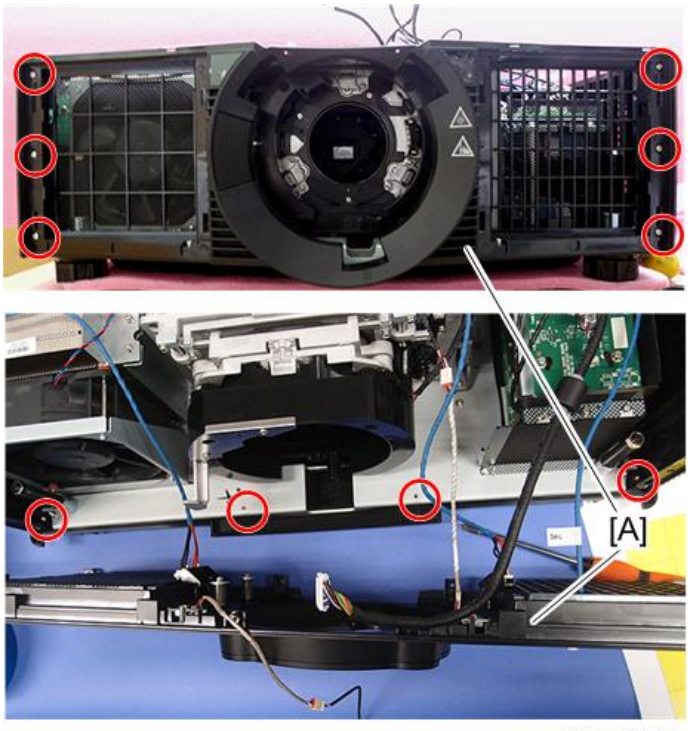
Front Cover, Filter Sensor, IR Sensor Board

1. Remove the main board bottom shielding and front shielding. (page 60 "Main Board Bottom Shielding and Front Shielding")
2. Pull down the filter cover [A] and then take out it.



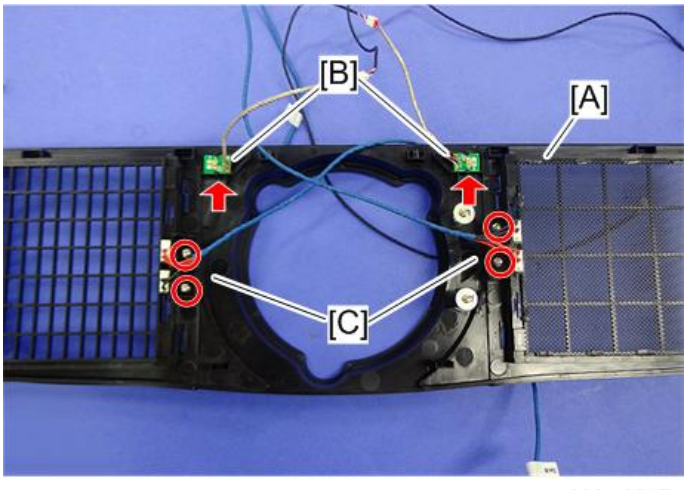
y092m0045

3. **Remove ten screws to remove the front cover [A].**

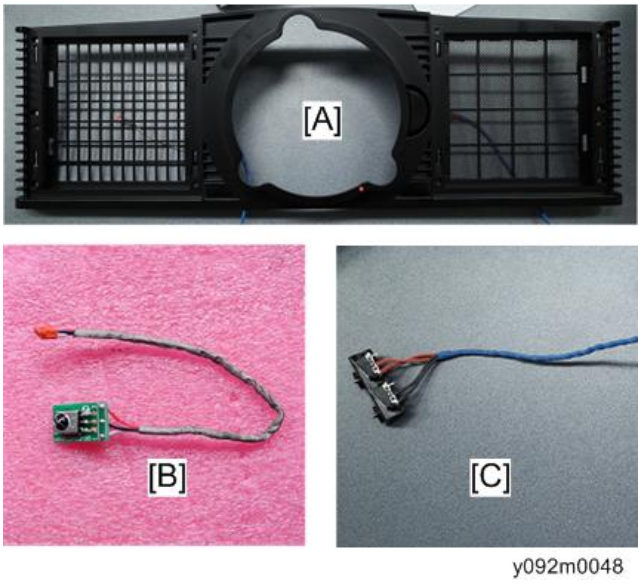


y092m0046

4. **Remove the four screws and then disassemble:**
   - Front cover [A],
   - IR sensor board [B],
   - Filter sensor [C].



y092m0047

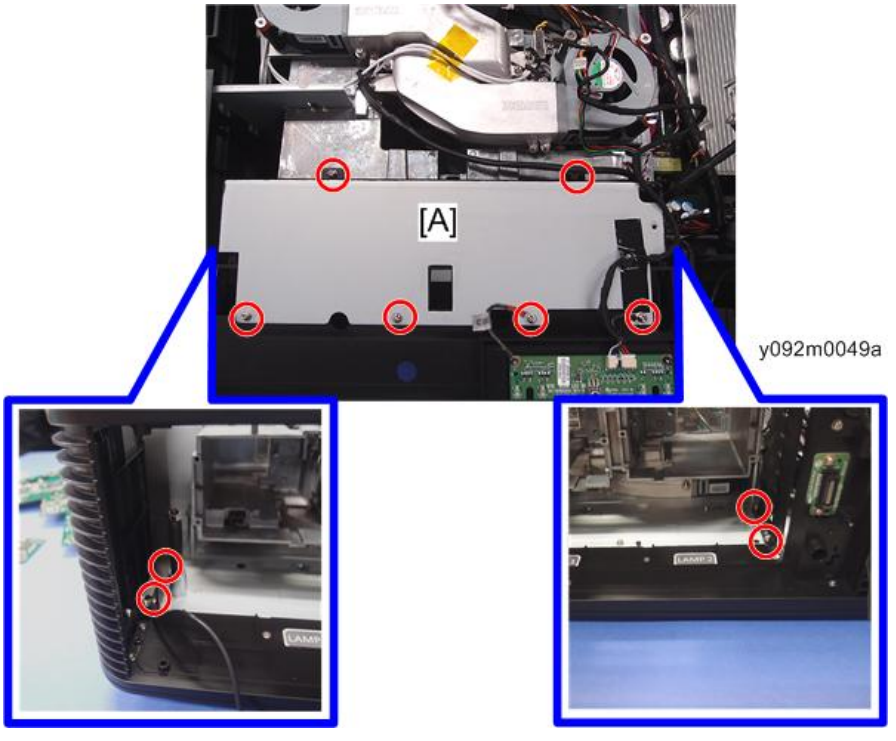


y092m0048

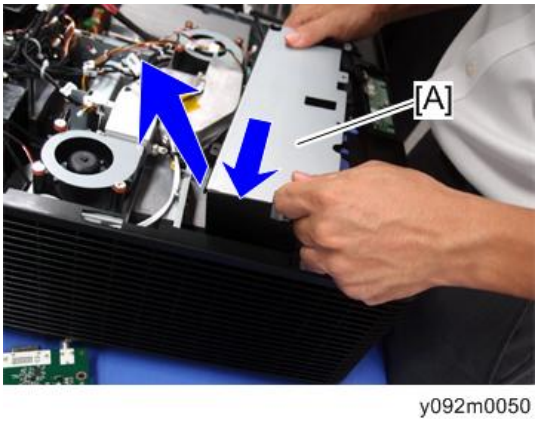
LED Board, Rear Cover Connector Board, Interlock Switch, Fan 3, Rear Cover

1. Remove the main board bottom shielding and front shielding. (page 60 "Main Board Bottom Shielding and Front Shielding")

2. **Remove ten screws to remove the back shielding [A].**



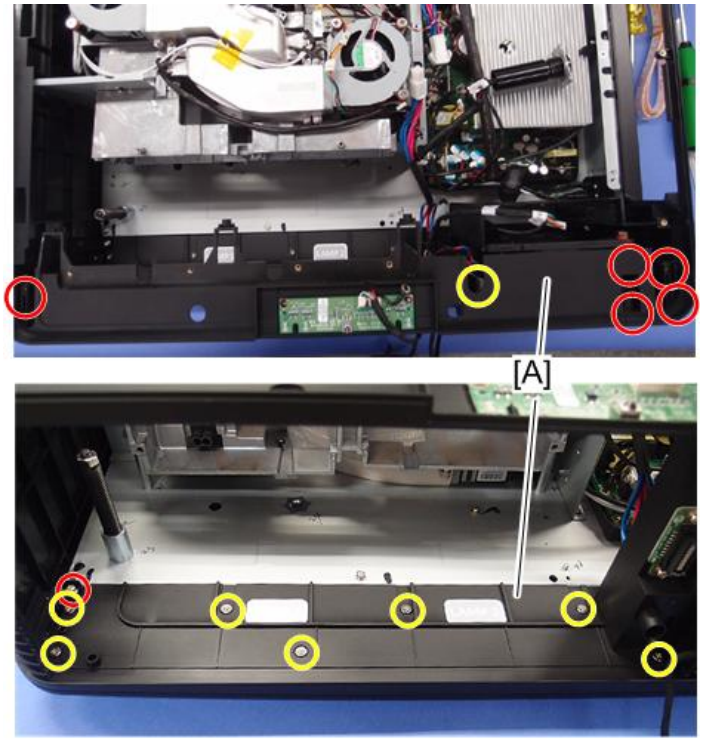
y092m0049a



y092m0050

3. **Remove 14 screws to remove the rear cover [A].**

   The screws in the yellow circles are flat-head.

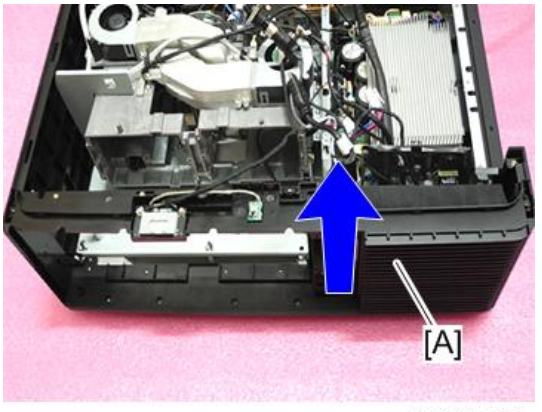


y092m0051

4. **Remove two screws and one connector.**

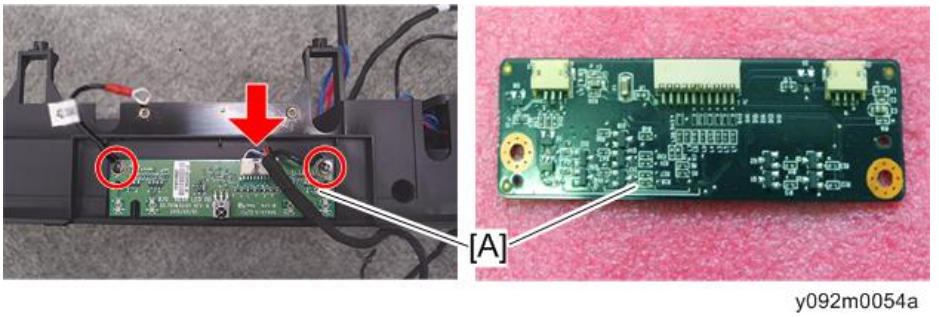
y092m0052

5. **Lift the rear cover [A] upward and remove it.**



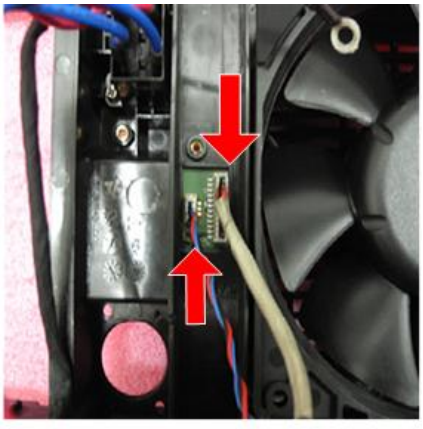
y092m0053

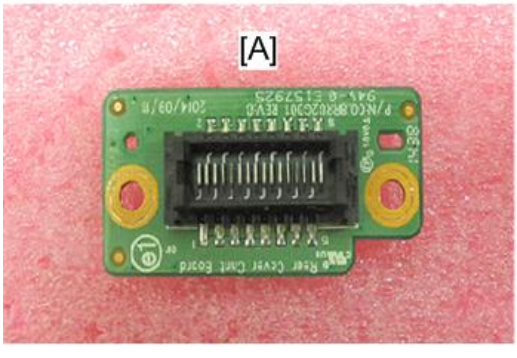
6. **Remove two screws and one connector to remove the LED board [A].**



y092m0054a

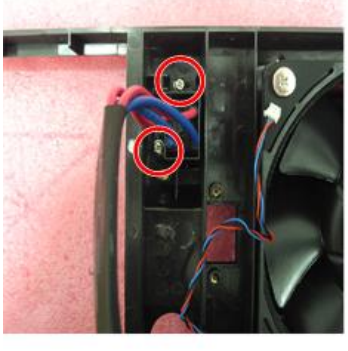
7. **Remove two screws and two connectors to remove the rear cover connector board [A].**

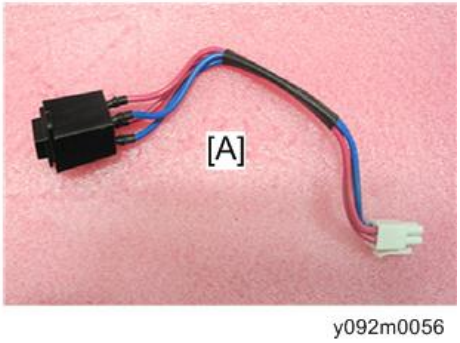




y092m0055

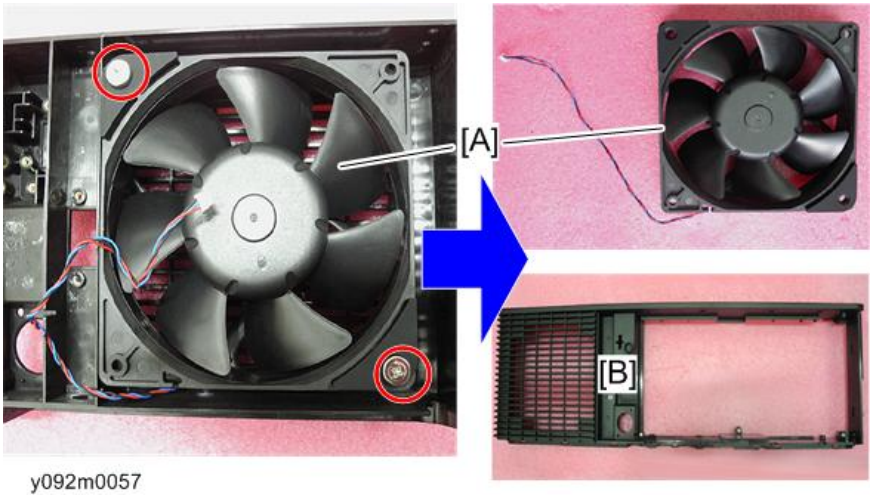
8. **Remove the two screws securing the interlock switch [A].**





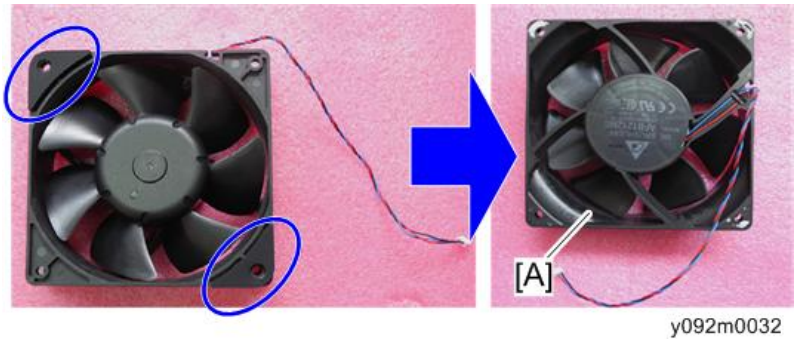
y092m0056

9. Remove two screws to separate fan 3 [A] from the rear cover [B].



y092m0057

10. Tear off the two rubbers to separate fan 3 [A].

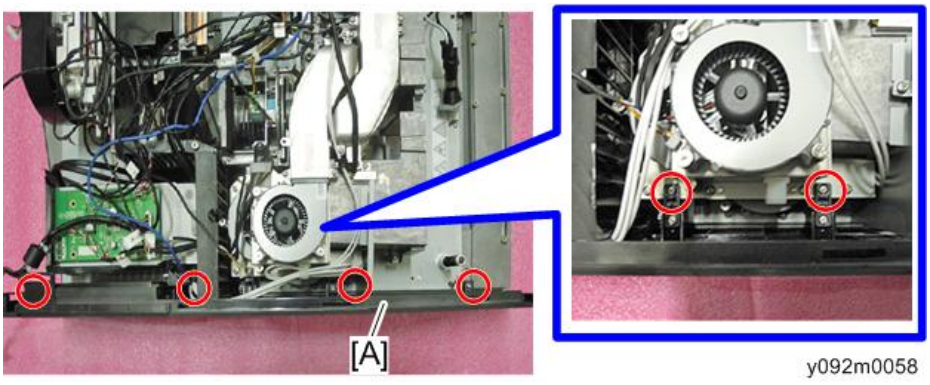


y092m0032

Right Cover, Right Cover Relay Board, Filter Sensor

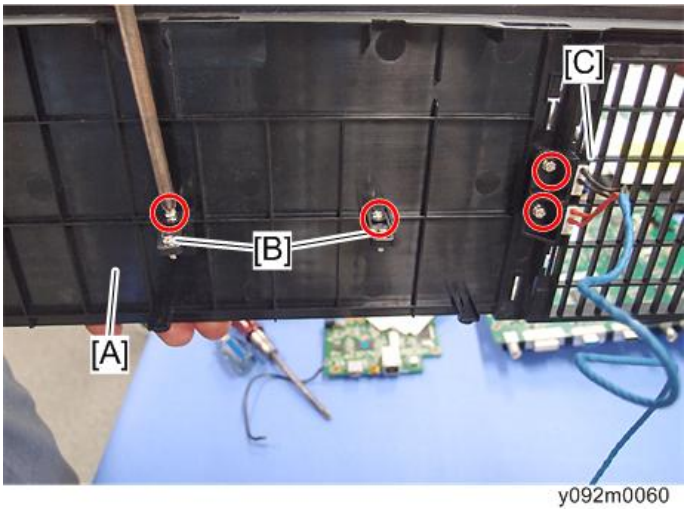
1. Remove the front cover. (page 61 "Front Cover, Filter Sensor, IR Sensor Board")
2. Remove the rear cover. (page 63 "LED Board, Rear Cover Connector Board, Interlock Switch, Fan 3, Rear Cover")

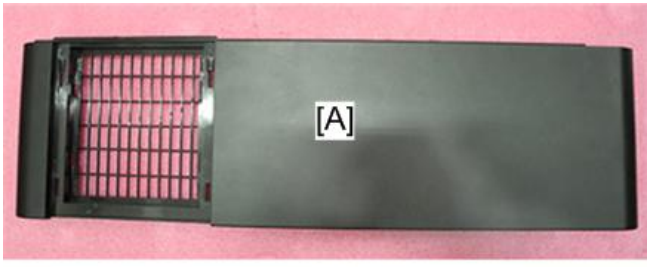
3. **Remove six screws to remove the right cover [A].**

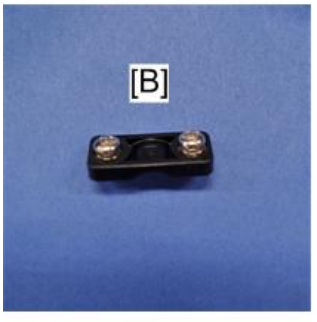


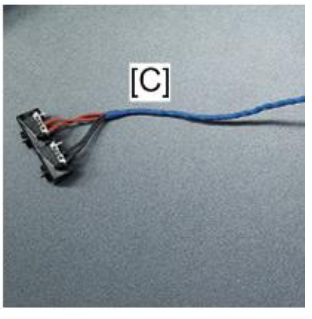
4. **Separate the filter cover [A] from the right cover.**

5. **Remove four screws and then disassemble:**
   - Right cover [A],
   - Right cover relay board [B],
   - Filter sensor [C].





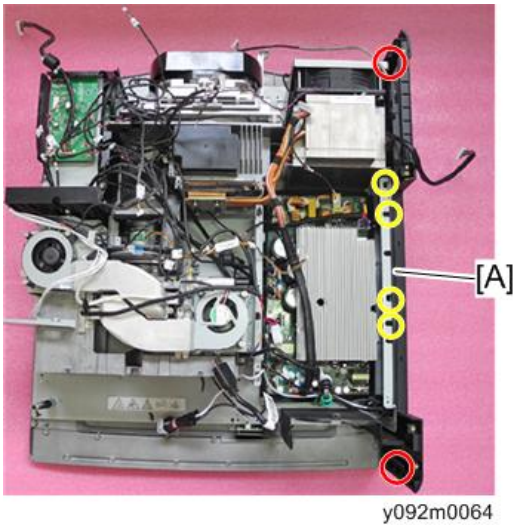




y092m0061

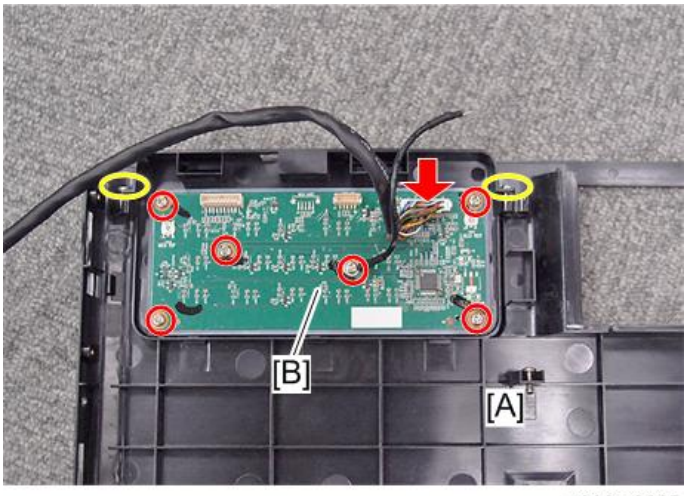
Left Cover, Keypad Board, Keypad Panel, Keypad Cover

1. Remove the front cover. (page 61 "Front Cover, Filter Sensor, IR Sensor Board")
2. Remove the rear cover. (page 63 "LED Board, Rear Cover Connector Board, Interlock Switch, Fan 3, Rear Cover")
3. Remove two screws (red) and loosen four screws (yellow) to remove the left cover [A].

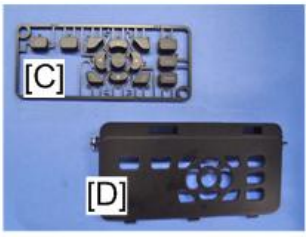


y092m0064

4. **Loosen two screws (yellow) and remove four screws (red) and one connector, and then disassemble:**
   - Left cover [A],
   - Keypad board [B],
   - Keypad panel [C],
   - Keypad cover [D].



y092m0065

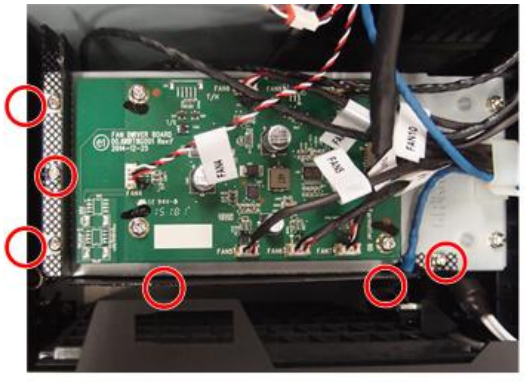


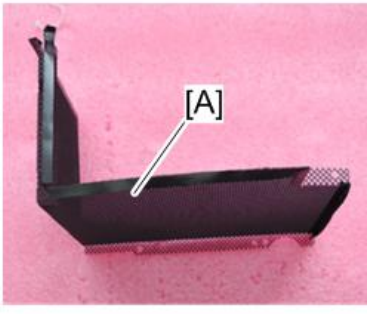
y092m0066

Ballast 1 / Ballast 2, Standoff

1. Remove the right cover. (page 68 "Right Cover, Right Cover Relay Board, Filter Sensor")

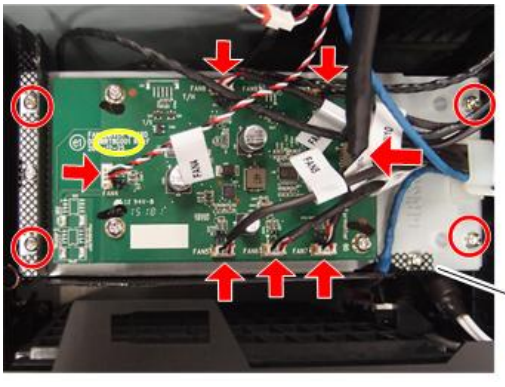
2. **Remove six screws to remove the fence [A].**

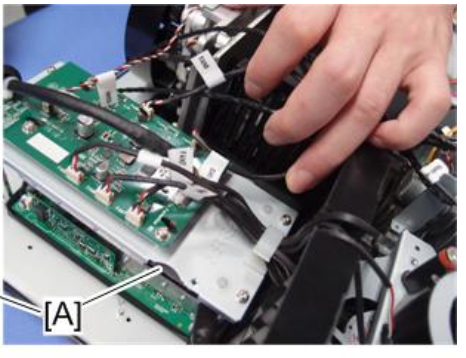




y092m0067

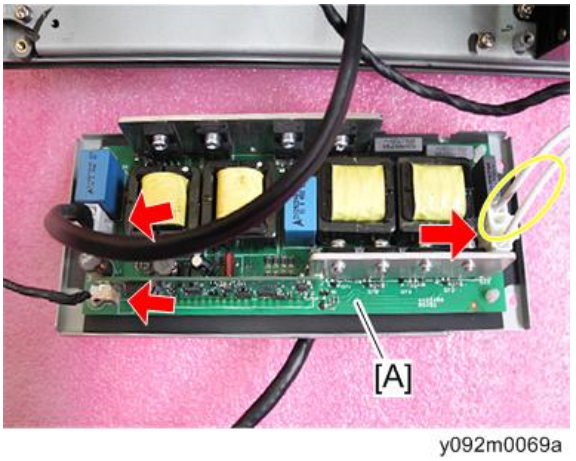
3. **Remove four screws and six connectors to remove the base [A].**





y092m0068

4. **Pull out the ballast 2 [A] then remove the three connectors.**

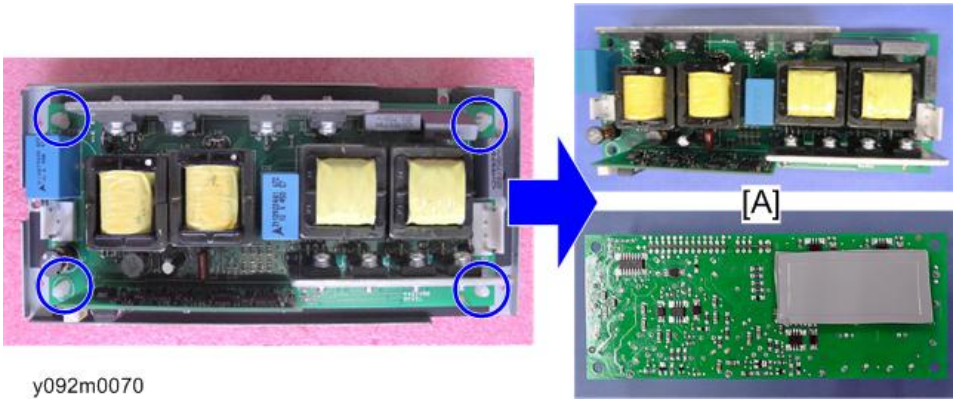


y092m0069a

Note

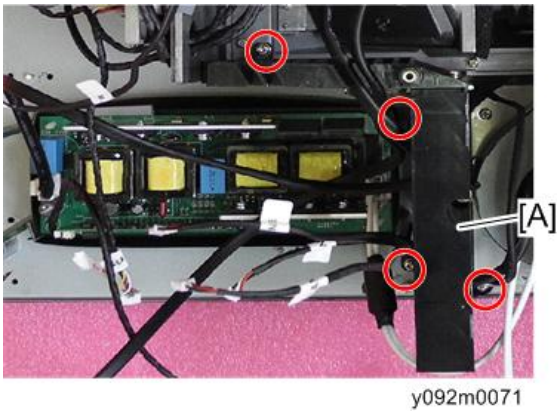
- The cable in the yellow circle is connected to the Lamp 2.

5. Separate the ballast 2 and cooling pad [A] from the ballast shielding (hook ×4).



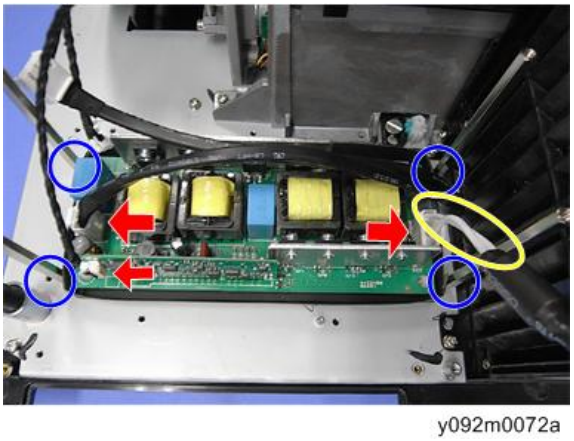
y092m0070

6. Remove four screws to remove the light shielding [A].



y092m0071

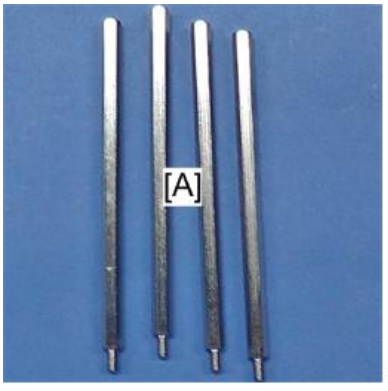
7. Remove the four standoffs [A] and the three connectors.



y092m0072a

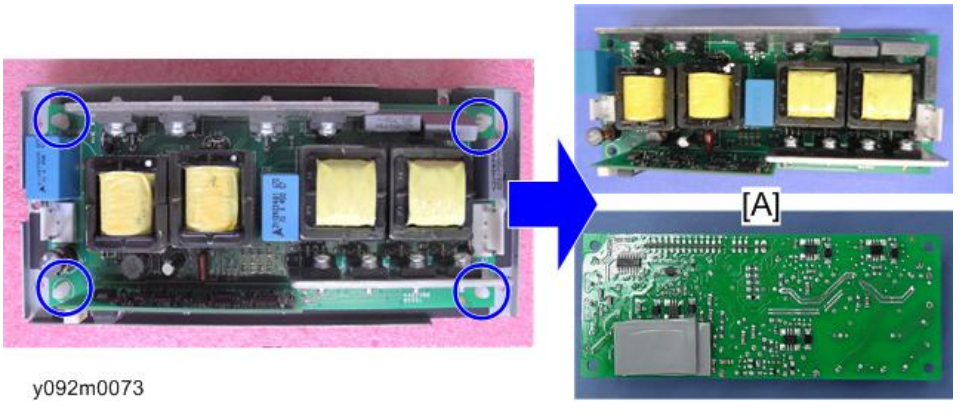
Note

- The cable in the yellow circle is connected to the Lamp 1..



y092m0074

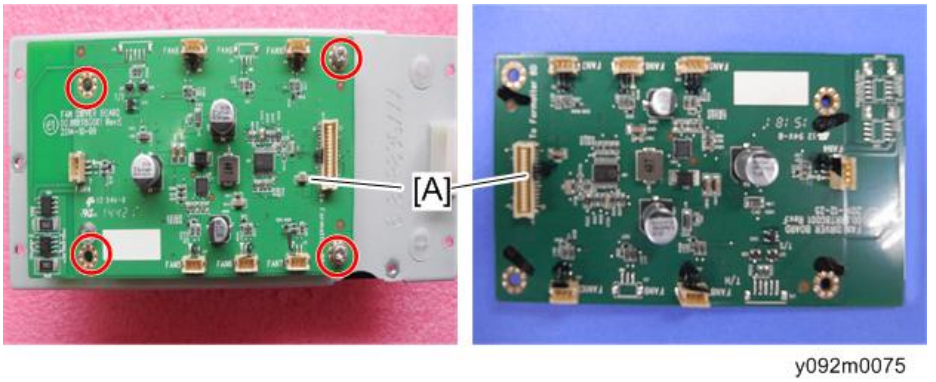
8. Separate the ballast 1 and cooling pad [A] from the ballast shielding (hook ×4).



y092m0073

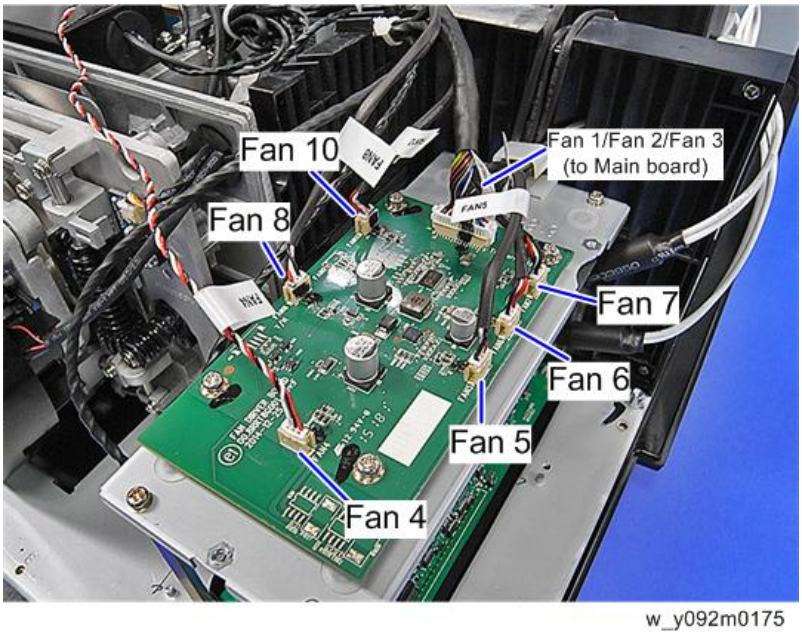
Fan Driver Board

1. Remove the ballast 2 (page 71 "Ballast 1 / Ballast 2, Standoff")
2. Remove the four screws to remove the fan driver board [A].



y092m0075

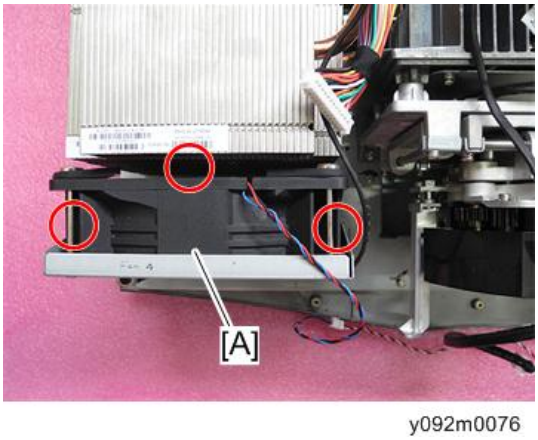
Fan connectors



w_y092m0175

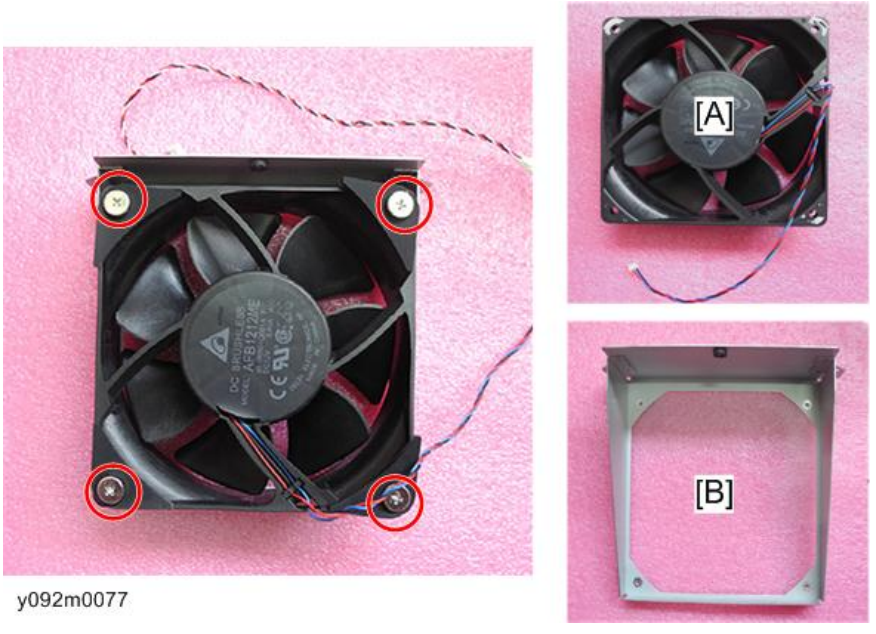
Fan 4

1. Remove the front cover. **(page 61 "Front Cover, Filter Sensor, IR Sensor Board")**
2. Remove three screws to remove fan 4 [A].



y092m0076

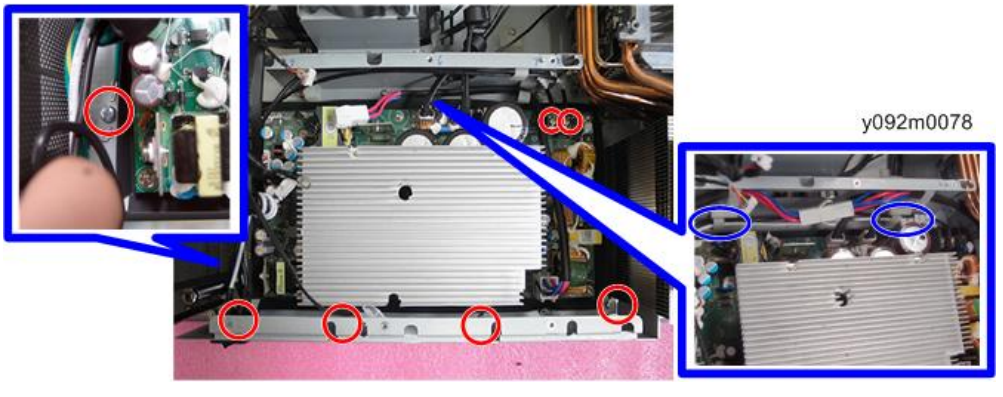
3. **Remove the four screws to separate fan 4 [A] and bracket [B].**



y092m0077

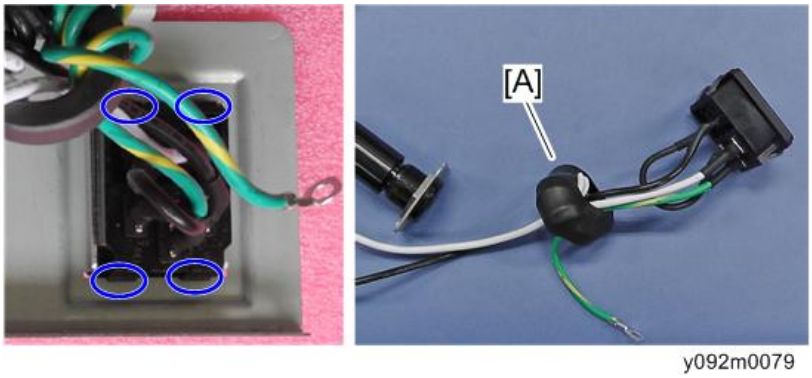
AC Inlet

1. **Remove the rear cover. (page 63 "LED Board, Rear Cover Connector Board, Interlock Switch, Fan 3, Rear Cover")**
2. **Remove seven screws and take out the cable from wire mount, and then remove the bracket and AC inlet.**



y092m0078

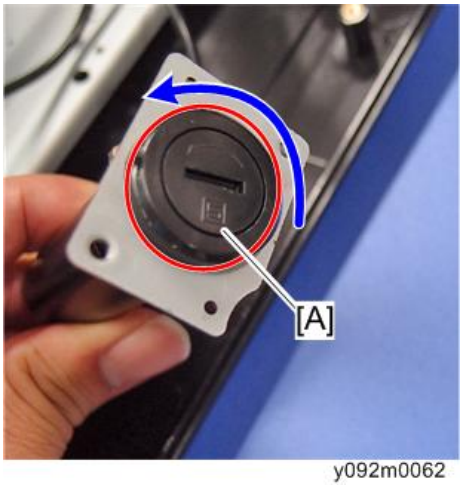
3. Remove the AC inlet [A] from the bracket.



y092m0079

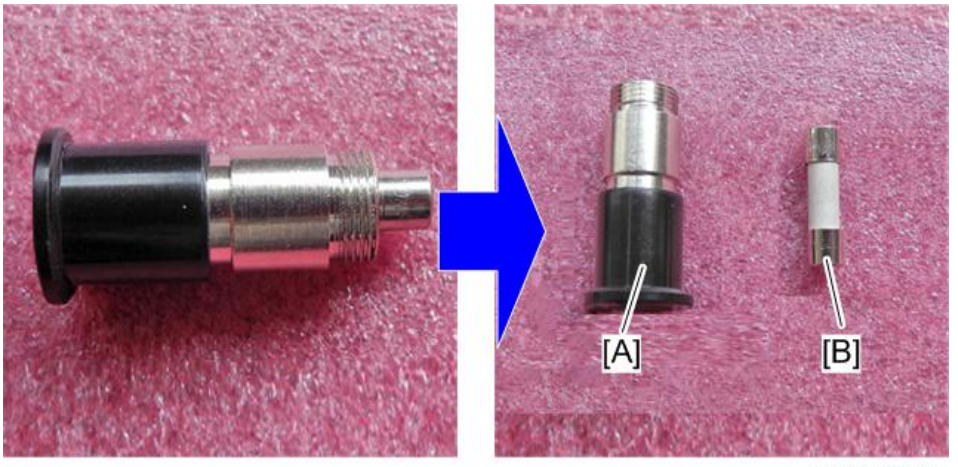
Fuse

1. Remove the lamp cover. (page 46 "Outlet Vent Cover, Fan 1 / Fan 2, Fan Docking Board, Lamp Cover")
2. Remove the fuse holder [A] by rotating it counter-clockwise.



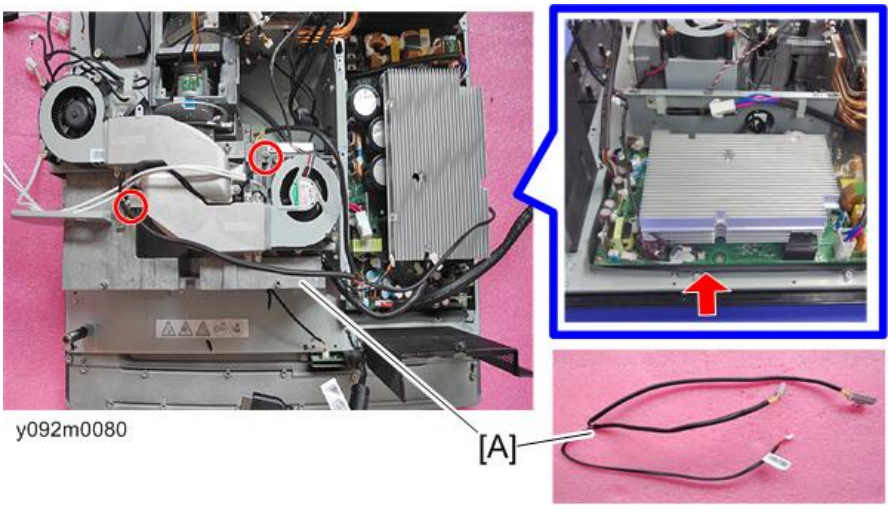
y092m0062

3. Separate the holder [A] and fuse [B].



Thermal Switch

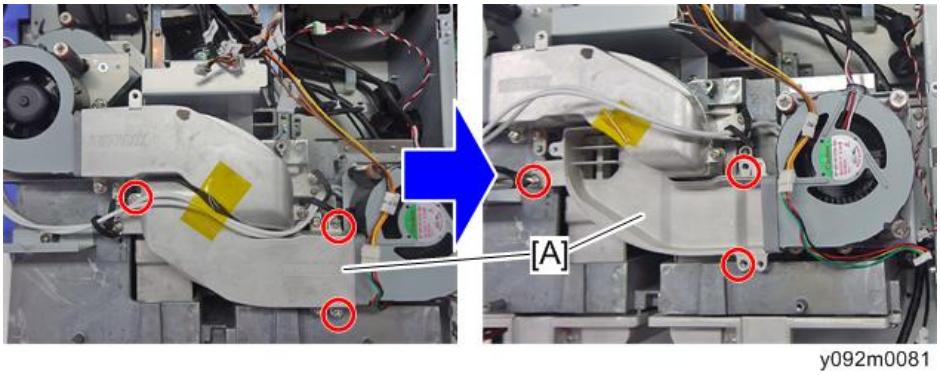
1. Remove the main board bottom shielding. (page 60 "Main Board Bottom Shielding and Front Shielding")
2. Remove two screws and one connector to remove the thermal switch [A].



Fan 5 / Fan 6 / Fan 8

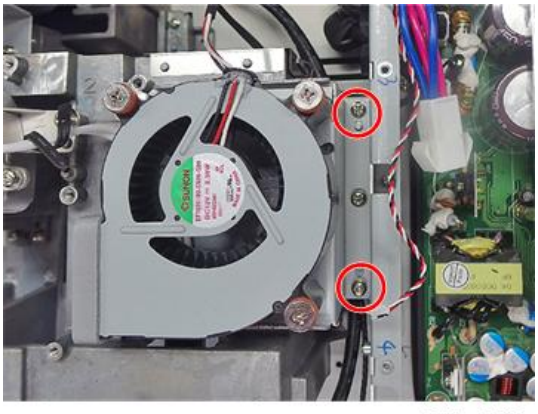
1. Remove the right cover. (page 68 "Right Cover, Right Cover Relay Board, Filter Sensor")
2. Remove the thermal switch. (page 78 "Thermal Switch")

3. To remove the duct [A], remove three screws on the upper side and then remove three screws on the lower side.



y092m0081

4. Remove two screws to remove fan 8 and the bracket.

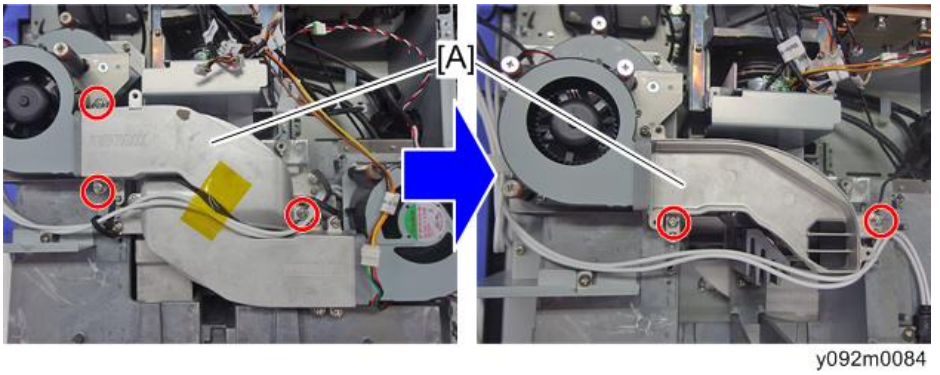


y092m0082

5. **Remove the three screws to separate fan 8 [A] and the bracket [B].**

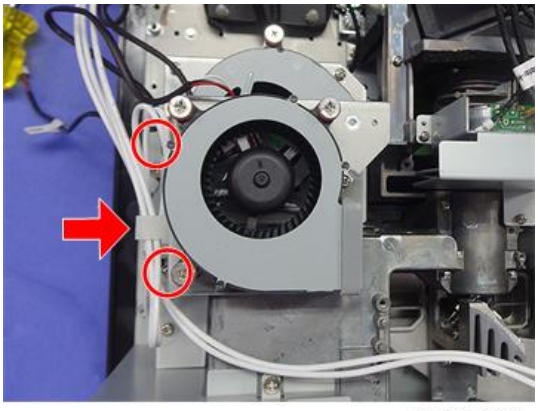
y092m0083

6. **To remove the duct [A], remove three screws on the upper side and then remove two screws on the lower side.**



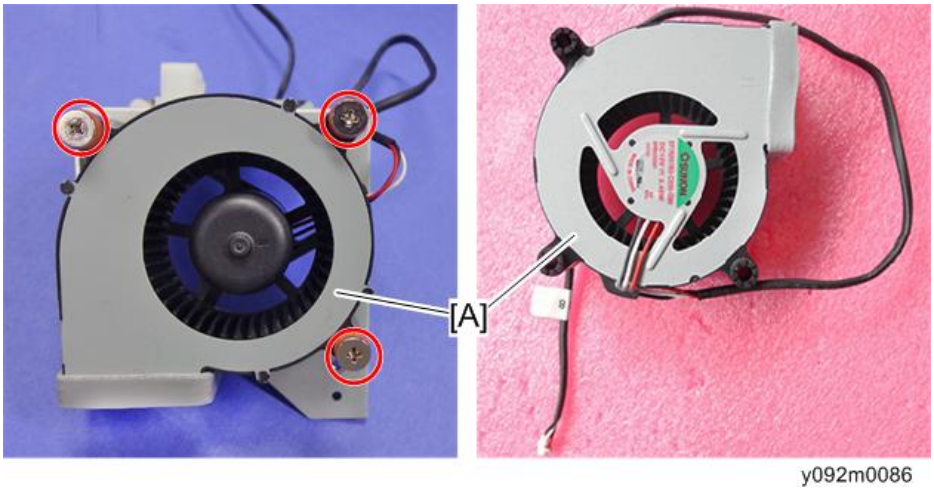
y092m0084

7. Take out the cable from the wire mount, and remove two screws to remove fan 5 and the bracket.



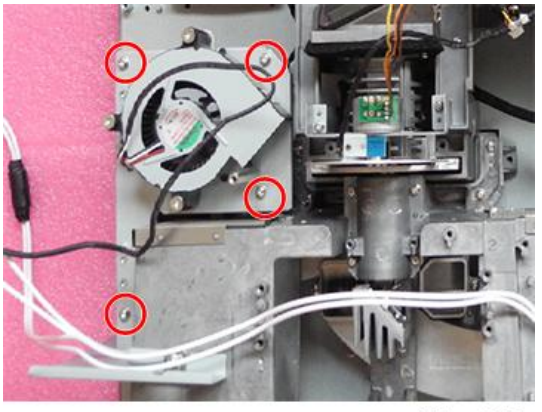
y092m0085

8. Remove three screws to separate fan 5 [A] and the bracket.



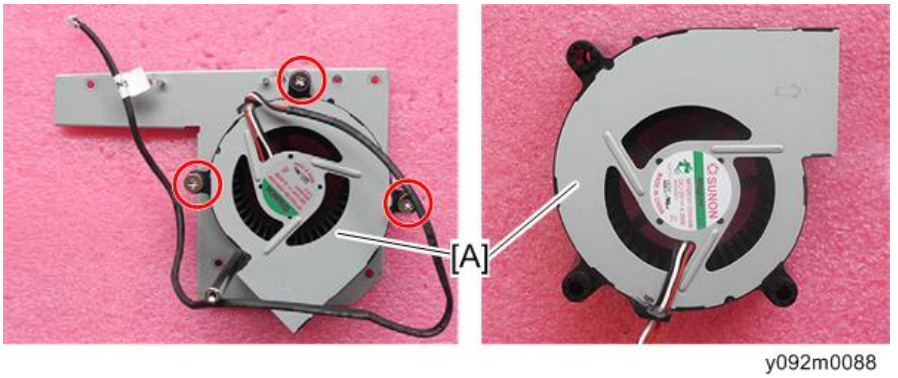
y092m0086

9. **Remove four screws to remove fan 6 and the bracket.**



y092m0087

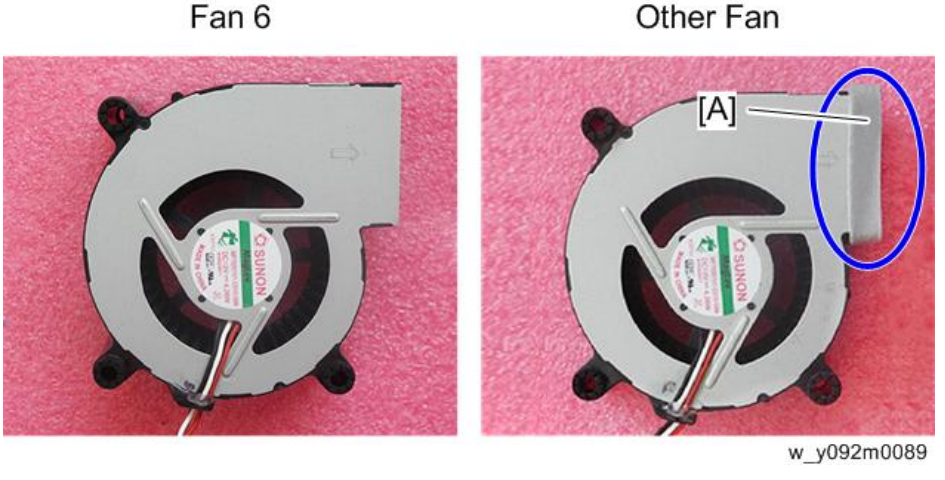
10. **Remove three screws to separate fan 6 [A] and the bracket.**



y092m0088

Note

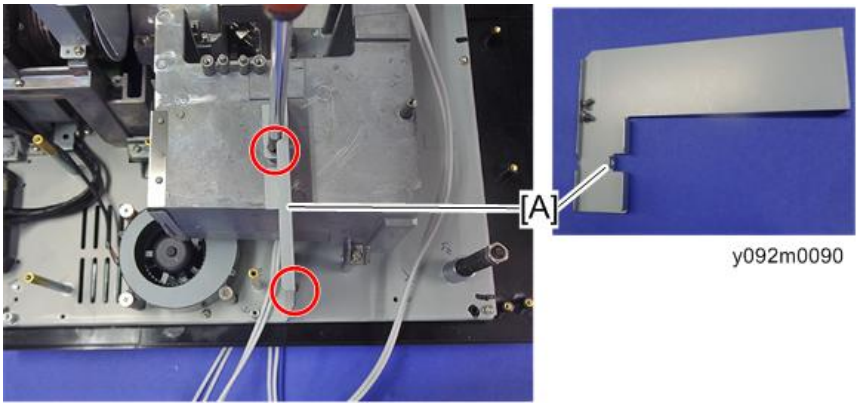
- Fan 6 does not have the sponge [A].



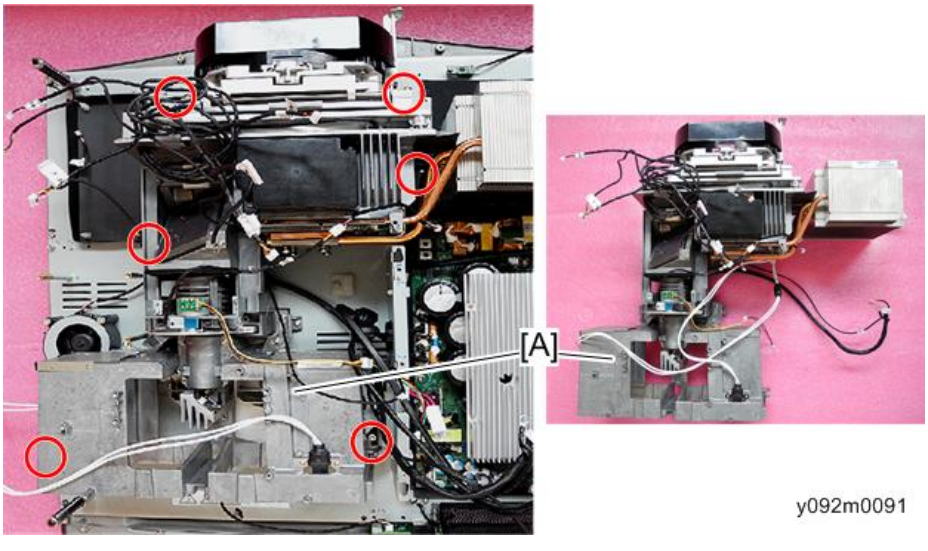
w_y092m0089

Optical Engine Assembly

1. Remove fan 5, fan 6, and fan 8. (page 78 "Fan 5 / Fan 6 / Fan 8")
2. Remove two screws to remove the shield [A].



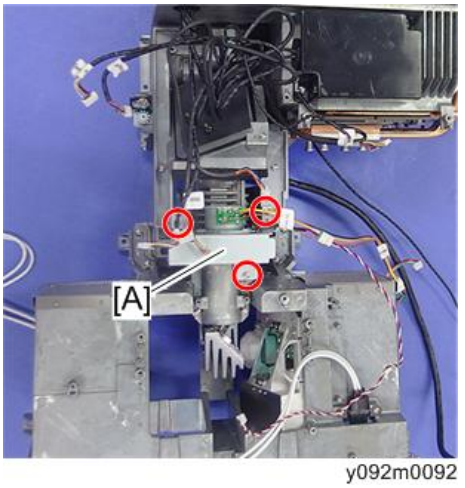
3. Remove six screws to remove the optical engine assembly [A].



DA, Photo Sensor Board, Lamp Housing, Optical Engine

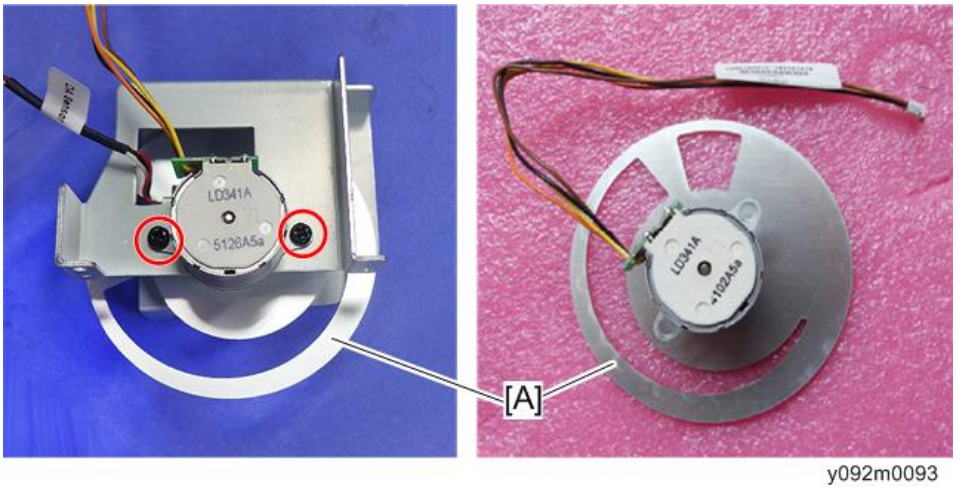
1. Remove the optical engine assembly. (page 83 "Optical Engine Assembly")

2. **Remove three screws to remove the DA module [A].**



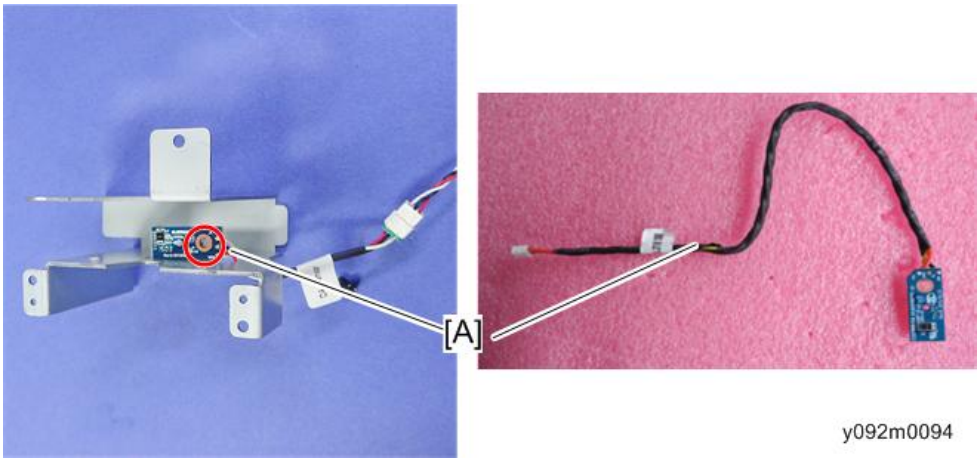
y092m0092

3. **Remove two screws to remove the DA [A] from the bracket.**



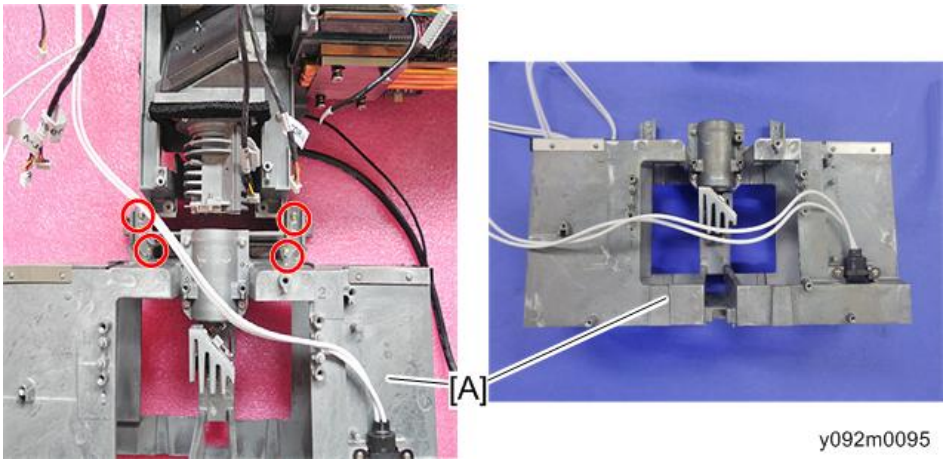
y092m0093

4. Remove one screw securing the photo sensor board [A].

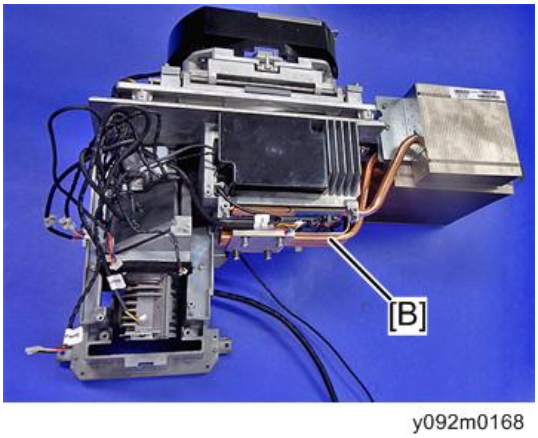


y092m0094

5. Remove four screws to detach the lamp housing [A] from the optical engine [B].

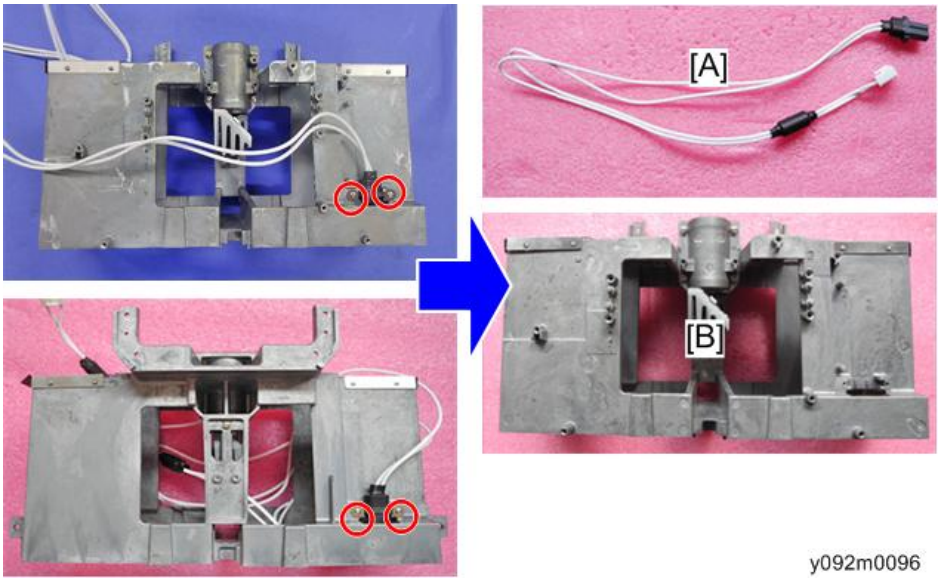


y092m0095



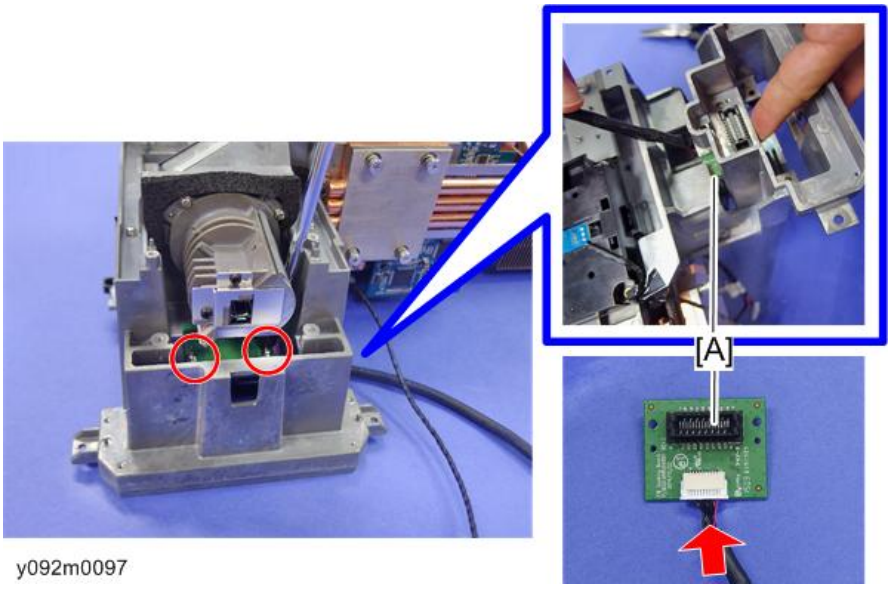
y092m0168

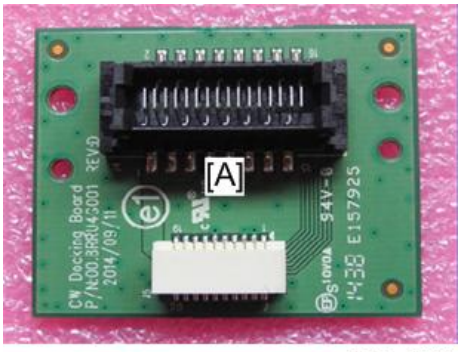
6. Remove four screws to remove the two lamp cables [A] from the lamp housing [B].



Color Wheel Docking Board, Light Sensor Board, Shutter

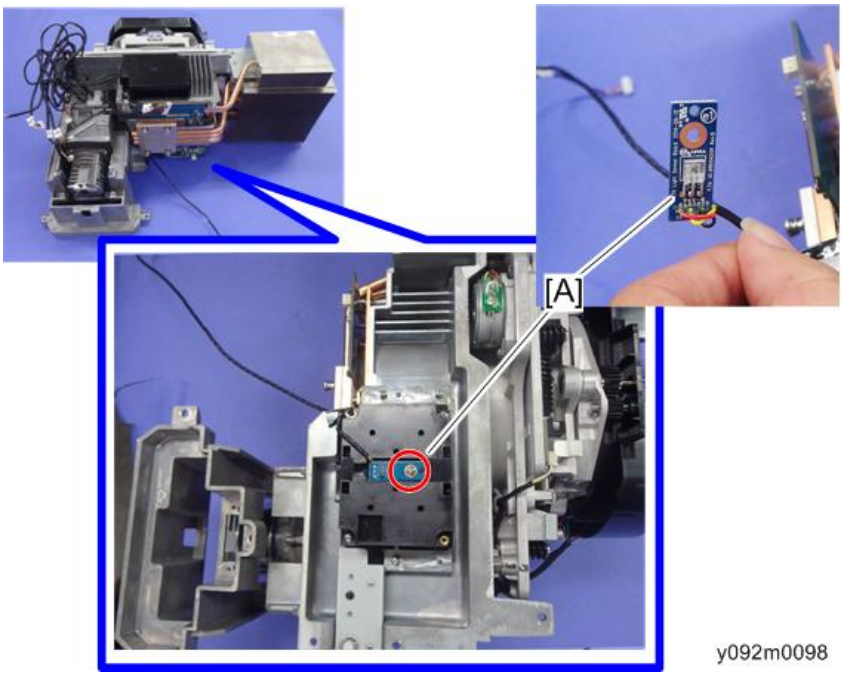
1. Remove the DA, lamp housing. (page 83 "DA, Photo Sensor Board, Lamp Housing, Optical Engine")
2. Remove two screws and one connector to remove the color wheel docking board [A].





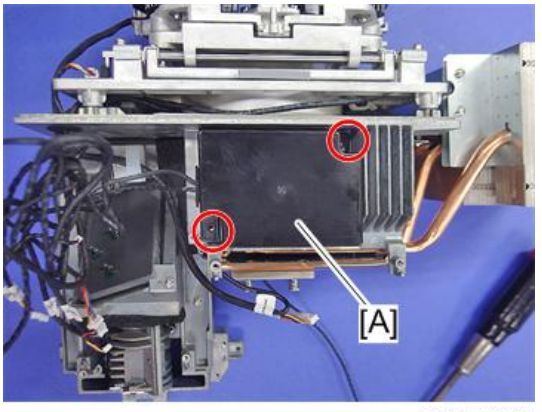
y092m0144

3. **Remove one screw to remove the light sensor board [A].**



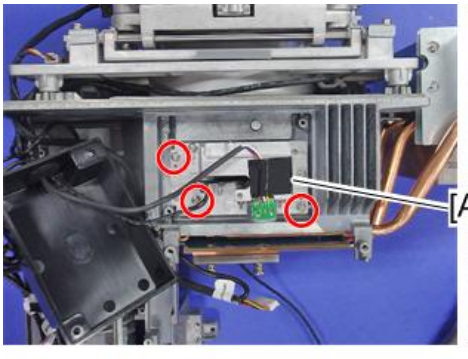
y092m0098

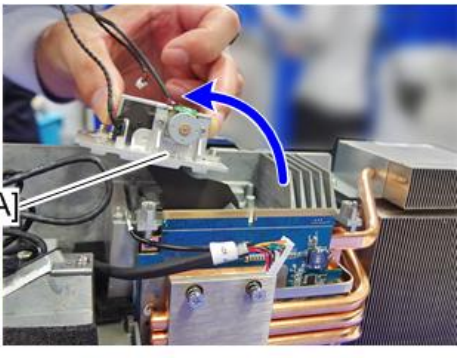
4. Remove two screws to remove the shutter cover [A].



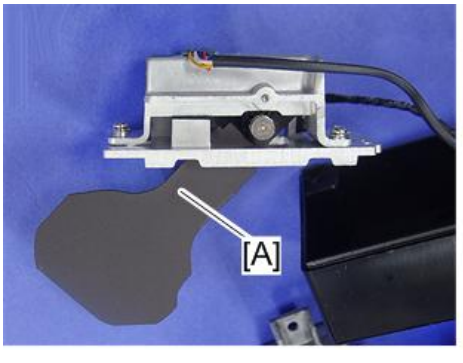
y092m0099

5. Remove three screws to remove the shutter [A].





y092m0100

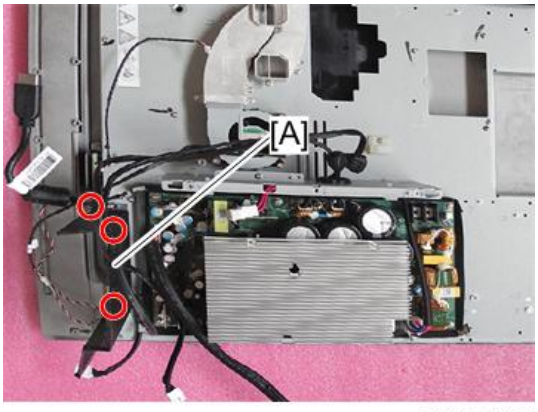


y092m0101

PSU

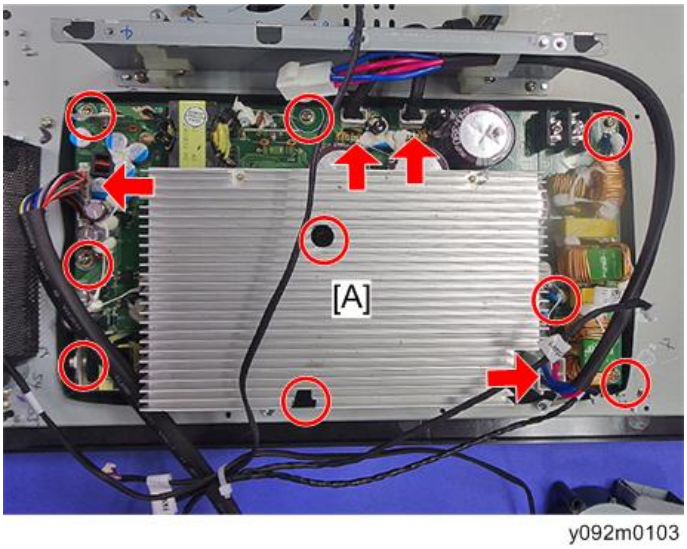
1. Remove the optical engine assembly. (page 83 "Optical Engine Assembly")

2. Remove three screws to remove the fence [A].

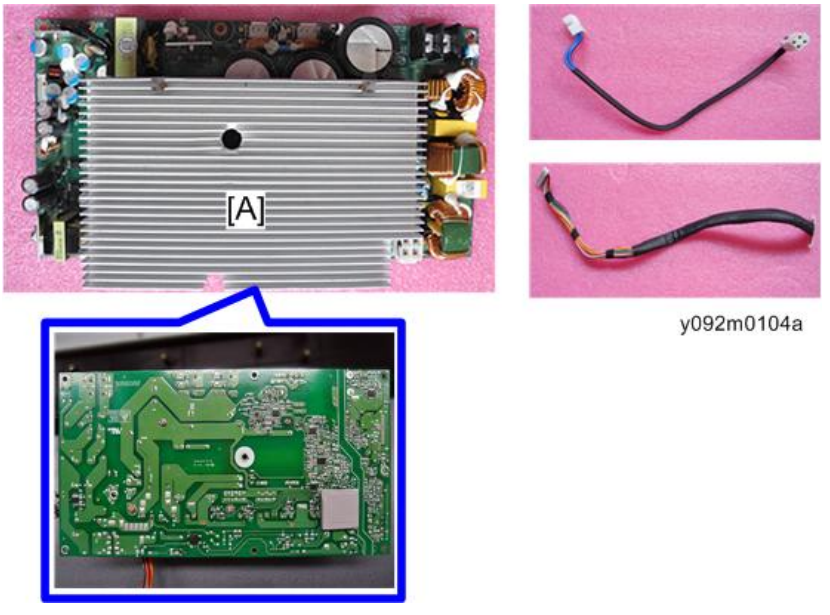


y092m0102

3. Remove nine screws and four connectors to remove the PSU and cooling pad [A].

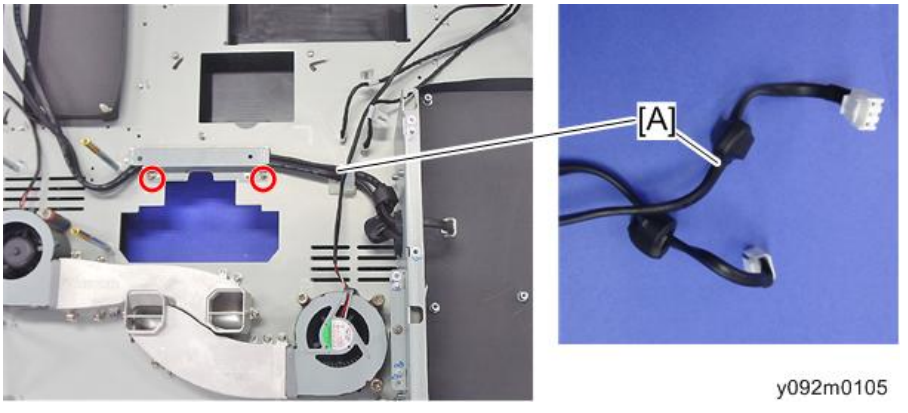


y092m0103



y092m0104a

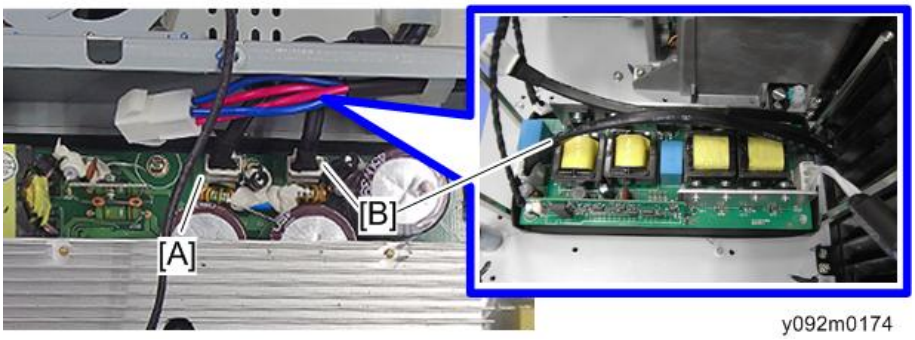
4. **Remove two screws to remove the two cables [A].**



y092m0105

Note

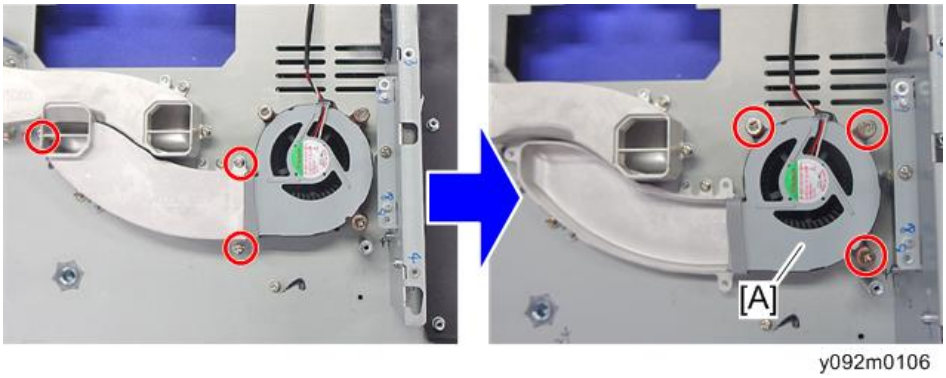
- [A] is connected to the Ballast 2.
- [B] is connected to the Ballast 1.



y092m0174

Fan 7 / Fan 10

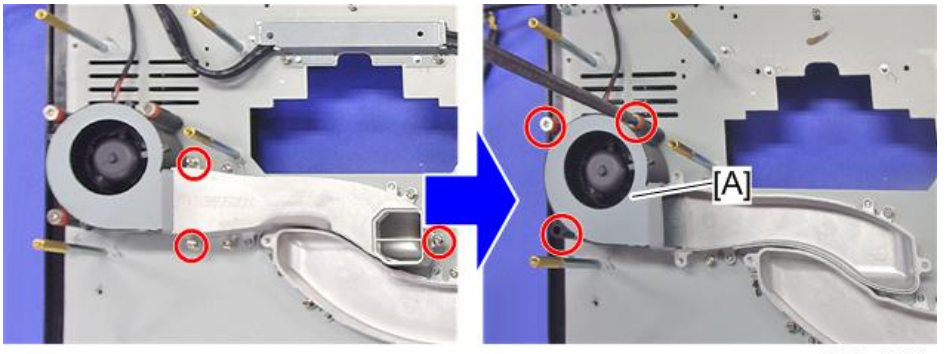
1. Remove the optical engine assembly. (page 83 "Optical Engine Assembly")
2. Remove three screws on the upper side of the duct, and then remove the three screws for fan 10 [A].



y092m0106

y092m0108

3. Remove three screws on the upper side of the duct, and then remove the three screws for fan 7 [A].



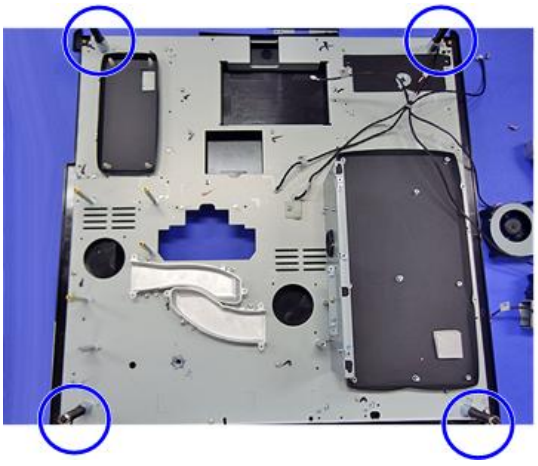
y092m0107

y092m0108

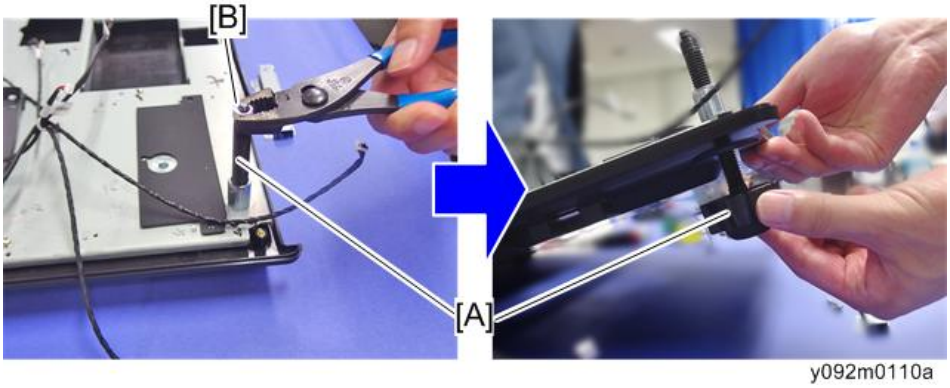
Adjustable Foot

1. Remove the PSU. (page 88 "PSU")

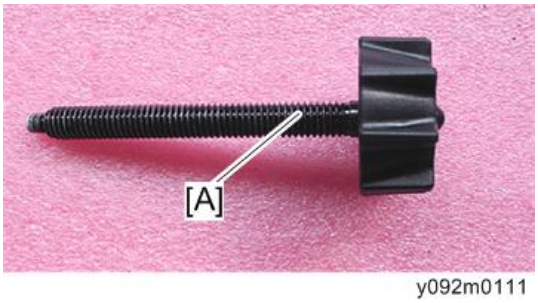
2. **Remove the four adjustable feet [A] and nuts [B].**



y092m0109



y092m0110a



y092m0111

Required Action after Replacing Parts

After replacing parts, please execute the related items shown in the table below.

Action after repair	After changed parts								After update	Description page
	Main board	Sub board	LAN-USB board	Color wheel	DA	Optical engine	Fan	Lamp	Firmware	
System firmware update	v	v								page 137
Color wheel index	v			v					v	page 129
Reset lamp hours	v							v	v	page 127
DA calibration	v				v				v	page 125
Factory reset	v								v (*)	page 131
Fan calibration		v					v			page 124
Lens calibration	v					v				page 124
Network test		v	v							page 133

(*) This action is not always required. Perform it only if the situation demands it.

After parts replacement or repair, check that the projector works properly.

Project images on the screen and check that they are not faulty.

Note

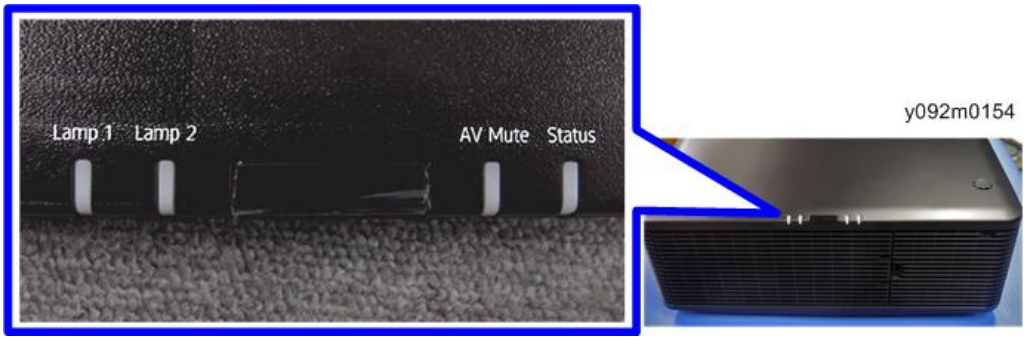
- If the color appears abnormal after changing the Main Board Module, enter the Factory Mode Menu and perform a color wheel index adjustment.
- After changing an F-type Fan (FAN5, FAN6, FAN7, FAN8, FAN10), perform a Fan calibration.

4. Troubleshooting

Equipment Needed

- Projector
- PC (Personal Computer)
- DVD Player
- Screw drivers
- VGA cable, power cord, component cable, audio cable, HDMI cable, LAN cable, RS232 cable
- Voltage test meter

LED Indicators



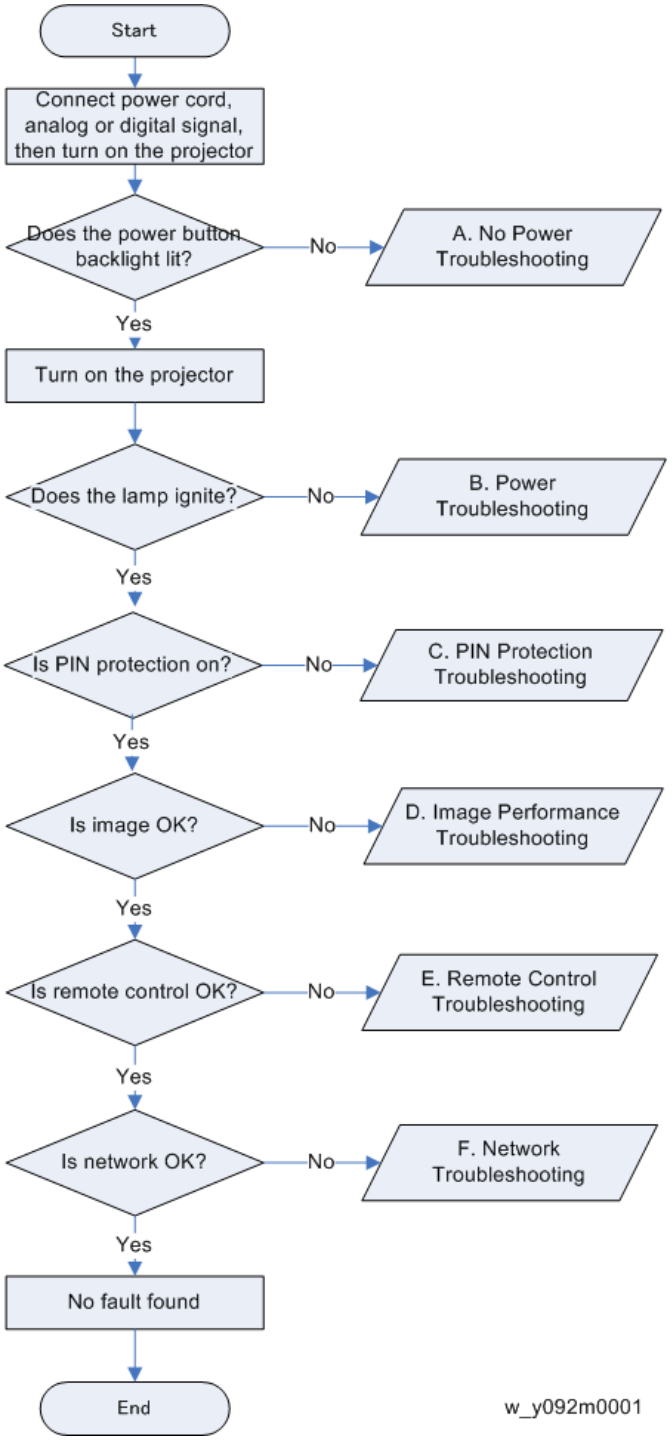
4

LED status and meanings

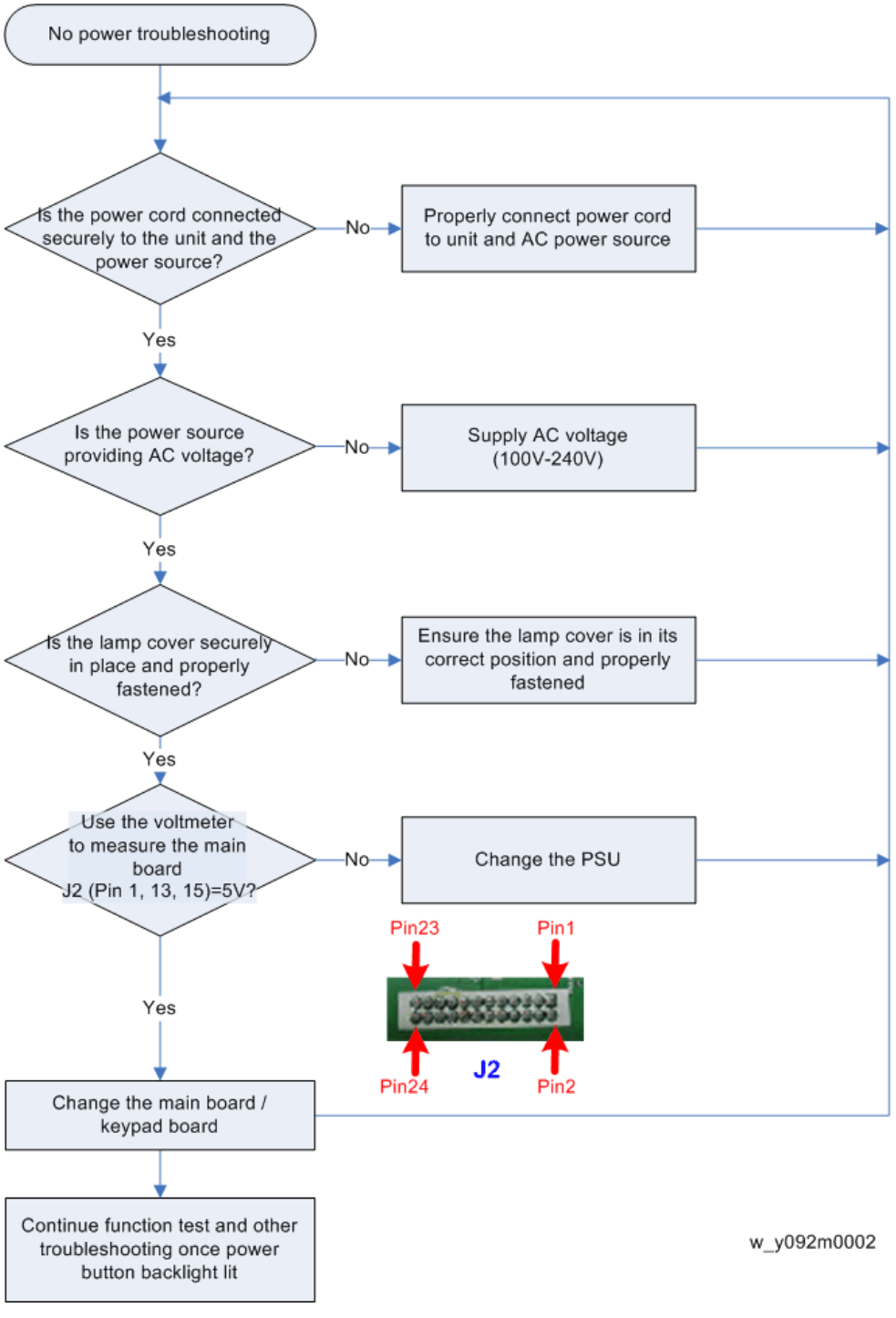
LED	Status	Projector State
Lamp 1, Lamp 2	Off	Lamps are off
	Solid Orange	Lamp time has expired and lamp should be replaced
	Solid Green	Lamp is on and operating correctly
	Flashing Green	Lamp is switching on
	Flashing Red	Failed to strike lamp after 5 attempts (strike attempts will stop)
		Lamp has unexpectedly shut down (system goes into cooling down state)
AV Mute	Off	Picture mute is off and Shutter is open – image is displayed
	Flashing Green	Picture mute is on and Shutter is closed – image is black

LED	Status	Projector State
Status	Off	AC power is off (without AC plug in)
		AC has been applied, projector is in standby mode
	Solid Green	Projector is powered up and operating normally
	Flashing Orange	Projector is in cooling down mode or startup mode
	Flashing (alternating) Green/Orange	Projector is in flash update state
	Solid Orange	Need to clean/change dust filter
	Solid Red	Temperature is too high
	Flashing Red	Fan failure
Shutter	Off	Picture mute is off and Shutter is open – image is displayed
	Flashing Green	Picture mute is on and Shutter is closed – image is black

Main Procedures



A. No Power Troubleshooting

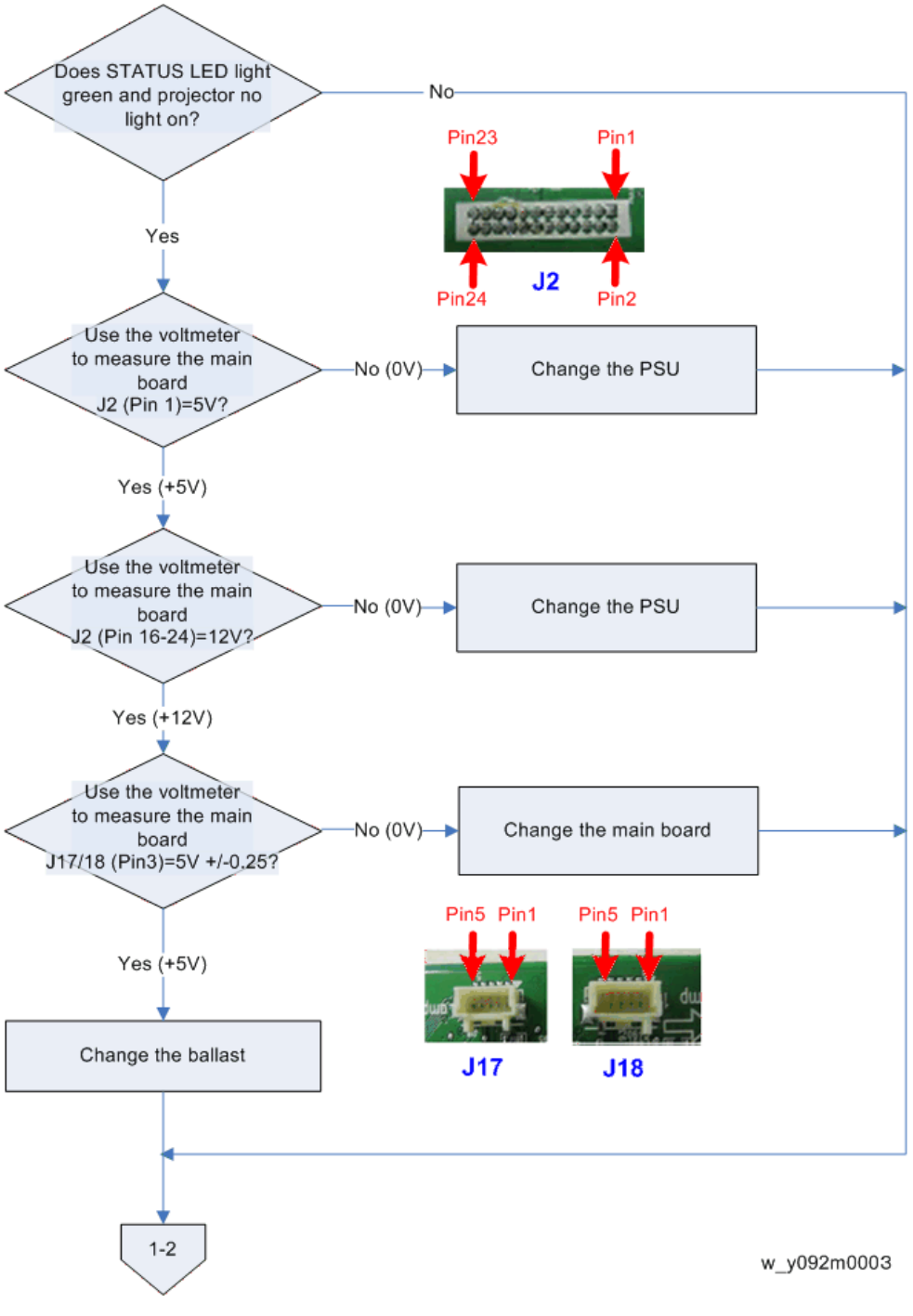


B. Power Troubleshooting

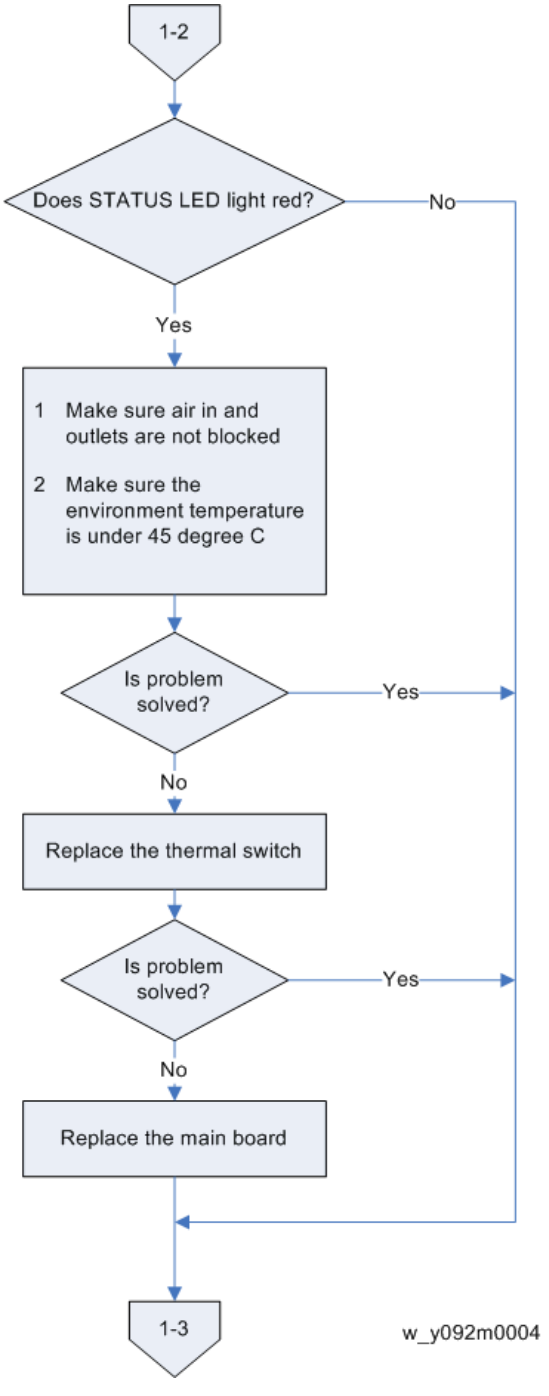
Make sure all connectors are connected properly.

Check the LED indicators.

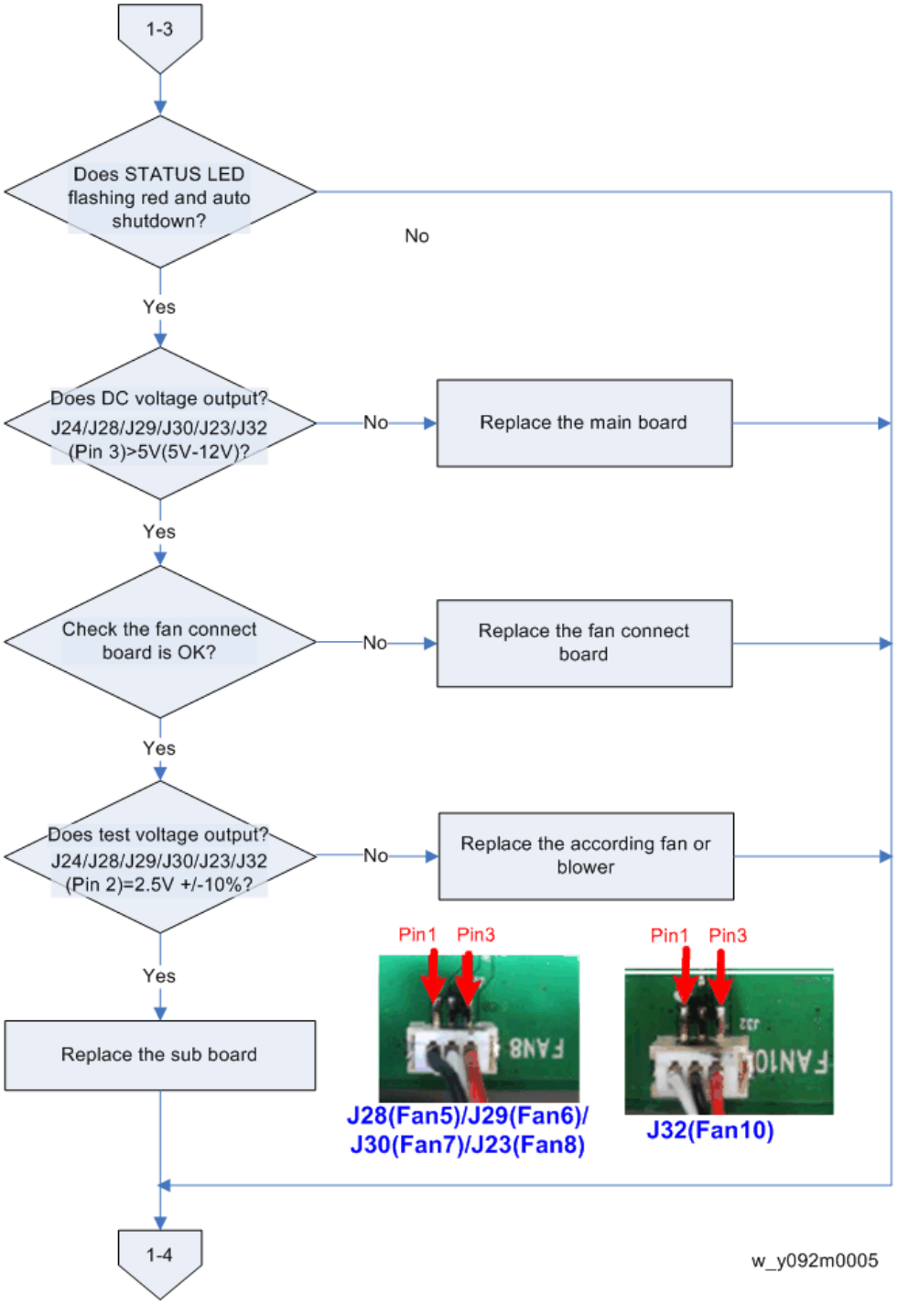
1-1 Does STATUS LED Light blue and projector no light on?



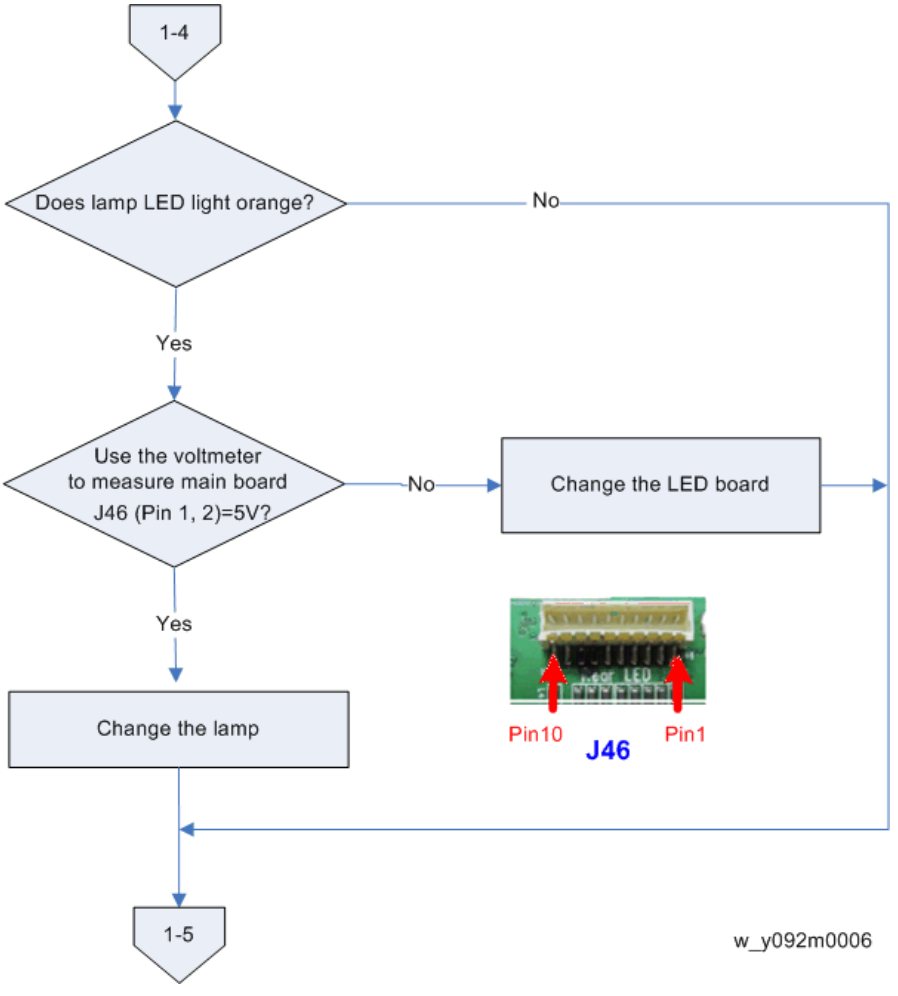
1-2 Does STATUS LED light red?



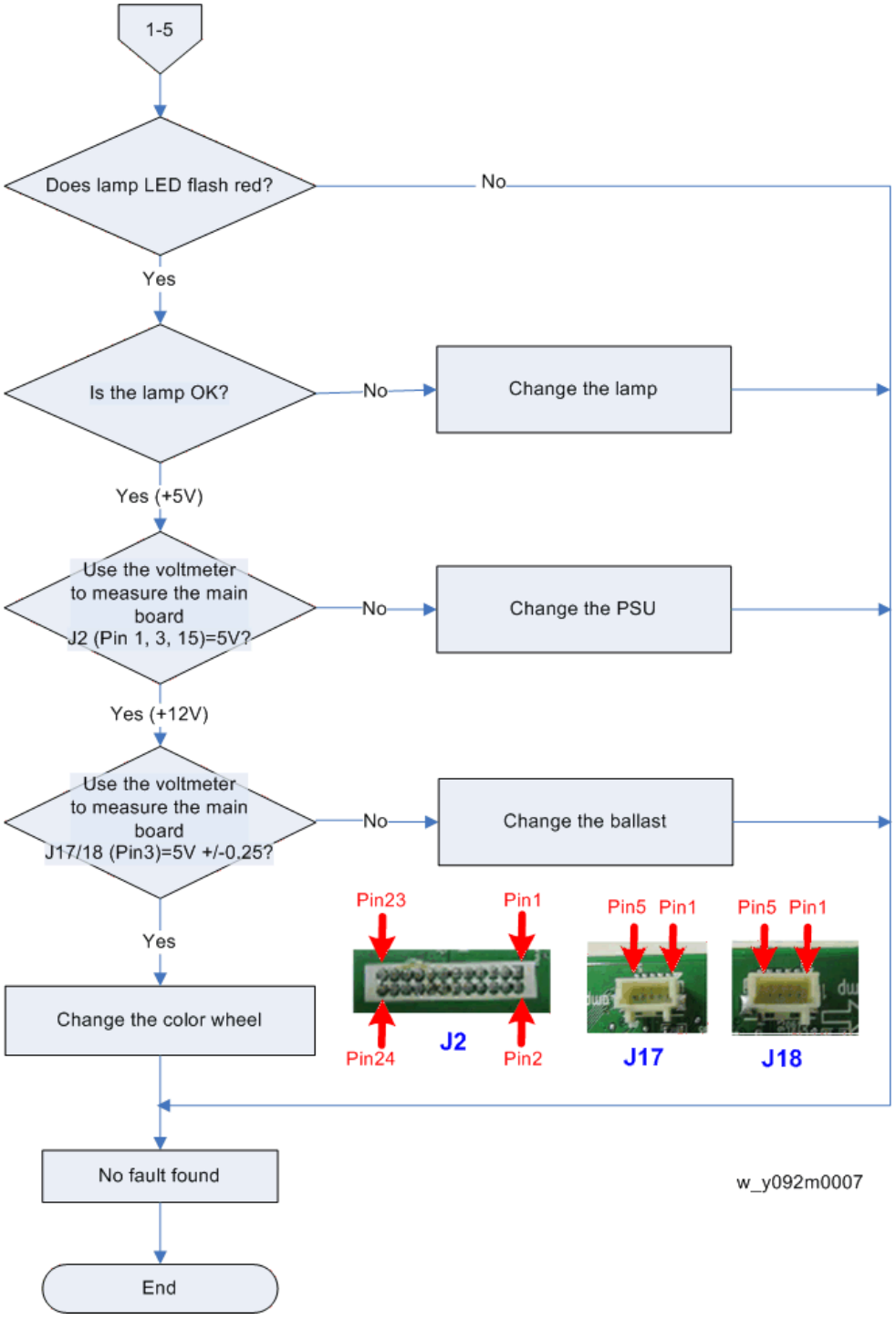
1-3 Does STATUS LED flashing red and auto shutdown?



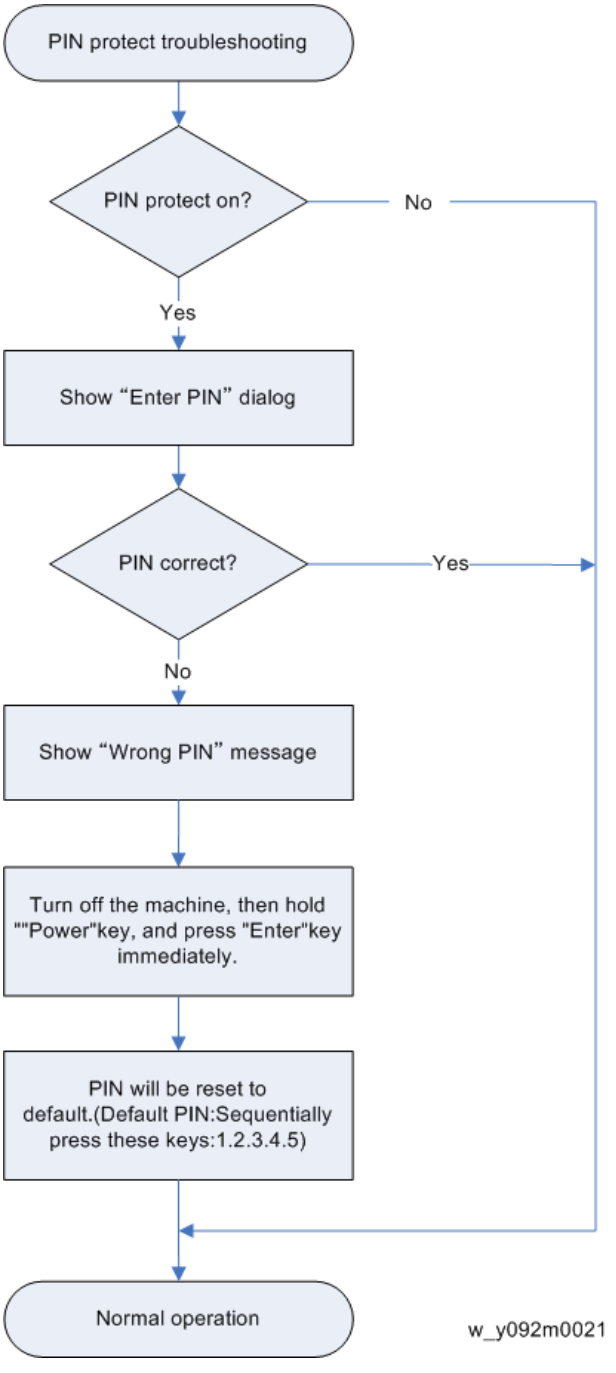
1-4 Does lamp LED light yellow?



1-5 Does lamp LED flash red?

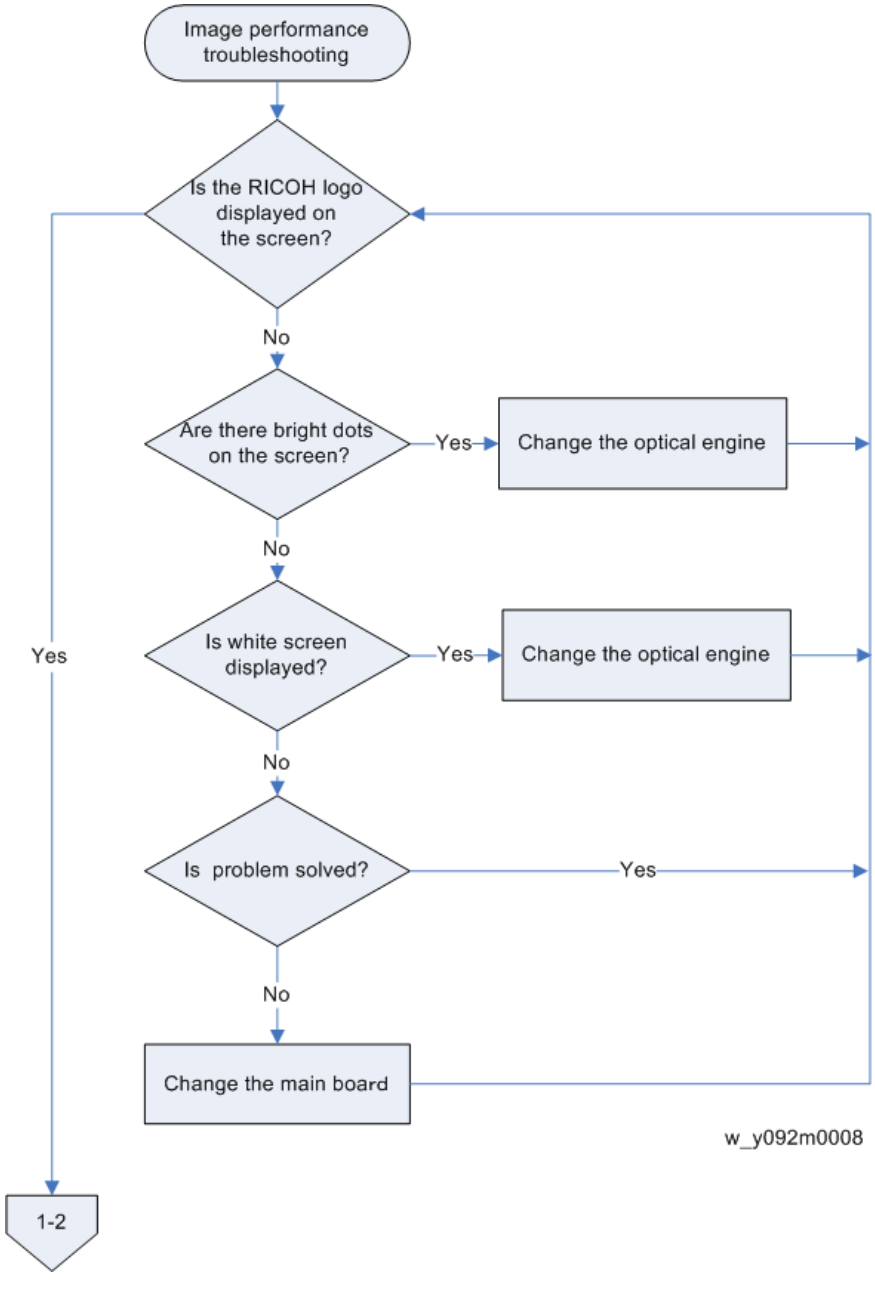


C. PIN Protect Troubleshooting

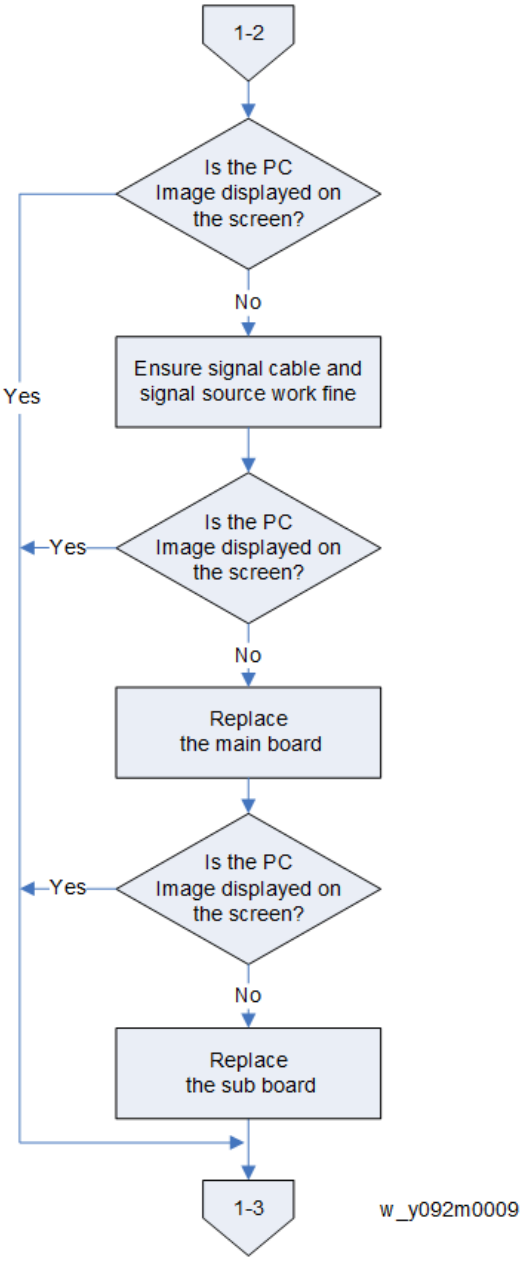


D. Image Performance Troubleshooting

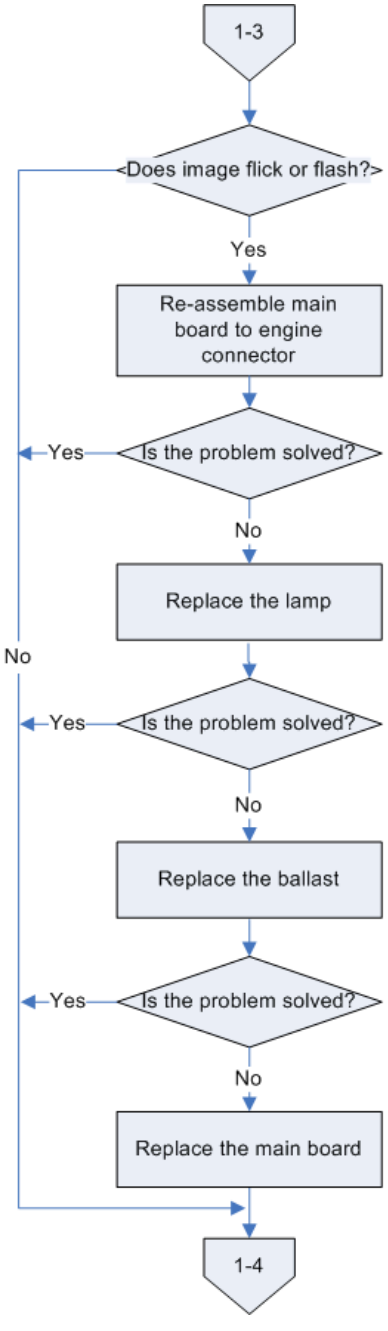
1-1 (Is the RICOH logo displayed on the screen?)



1-2 (Is the PC image displayed on the screen?)

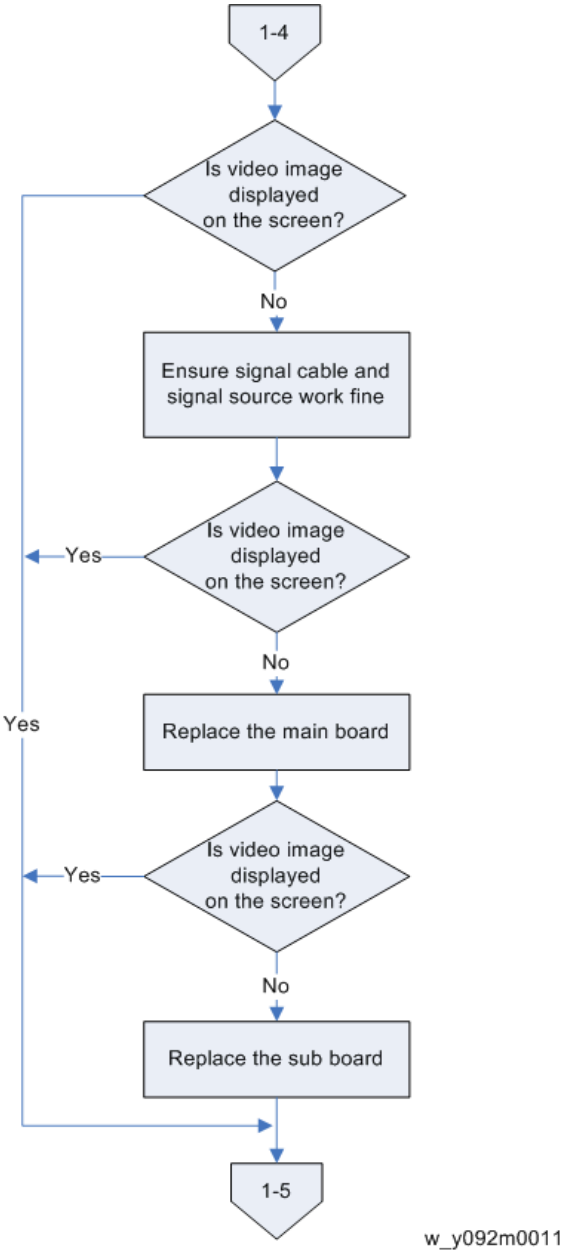


1-3 (Does image flick or flash?)



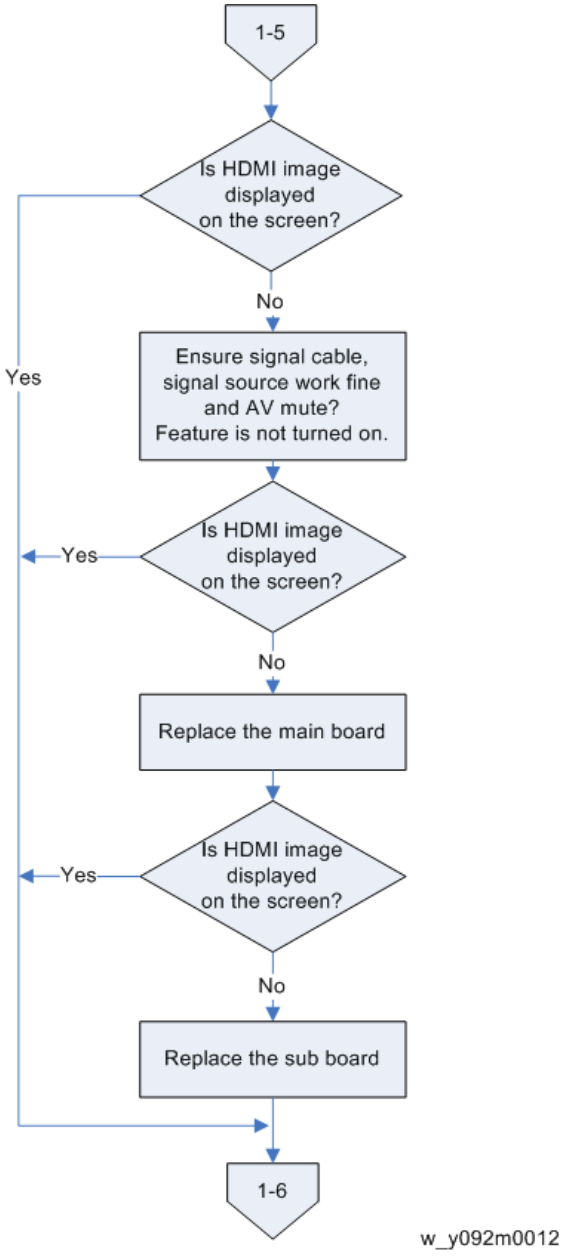
w_y092m0010

1-4 (Is video image displayed on the screen?)



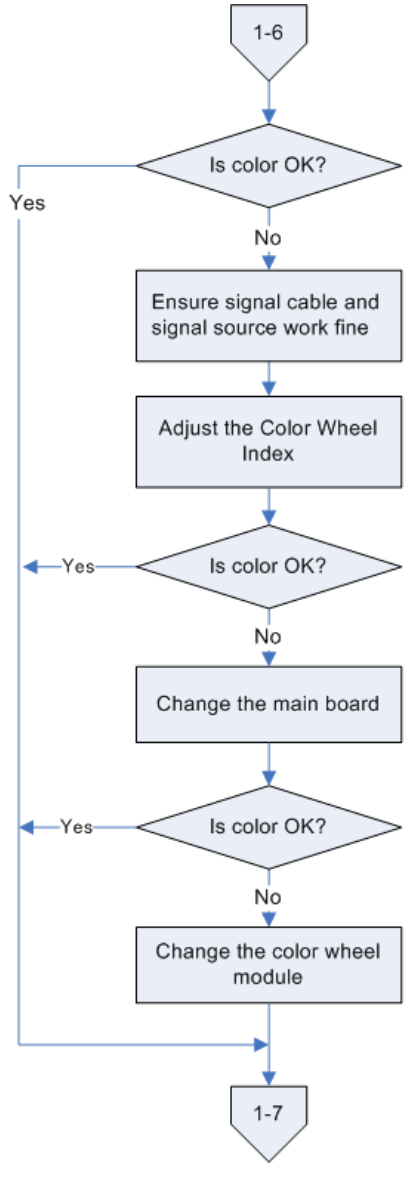
w_y092m0011

1-5 (Is HDMI image displayed on the screen?)



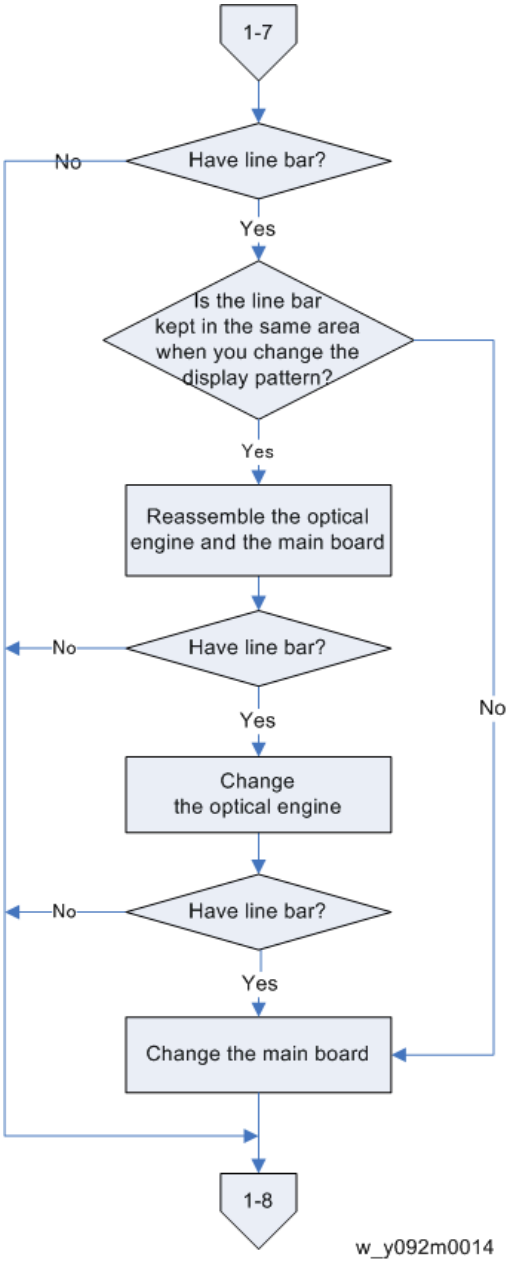
w_y092m0012

1-6 (Is color ok?)

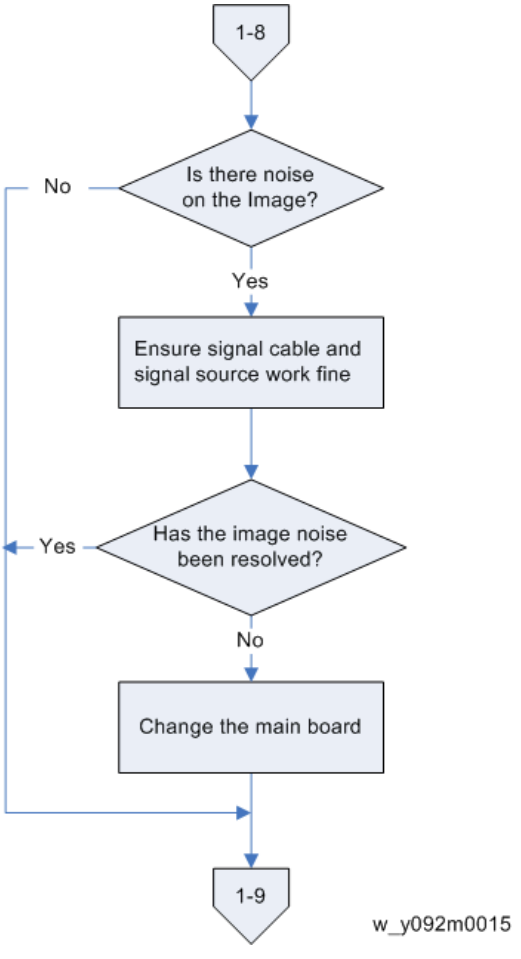


w_y092m0013

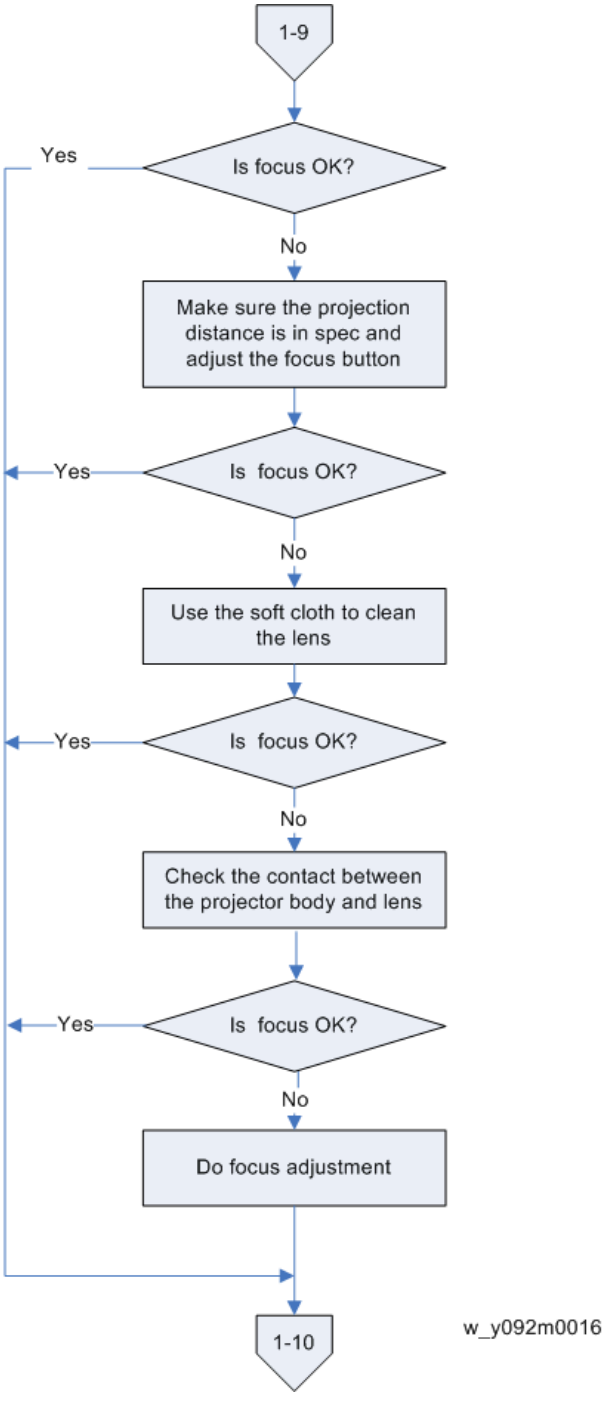
1-7 (Have line bar?)



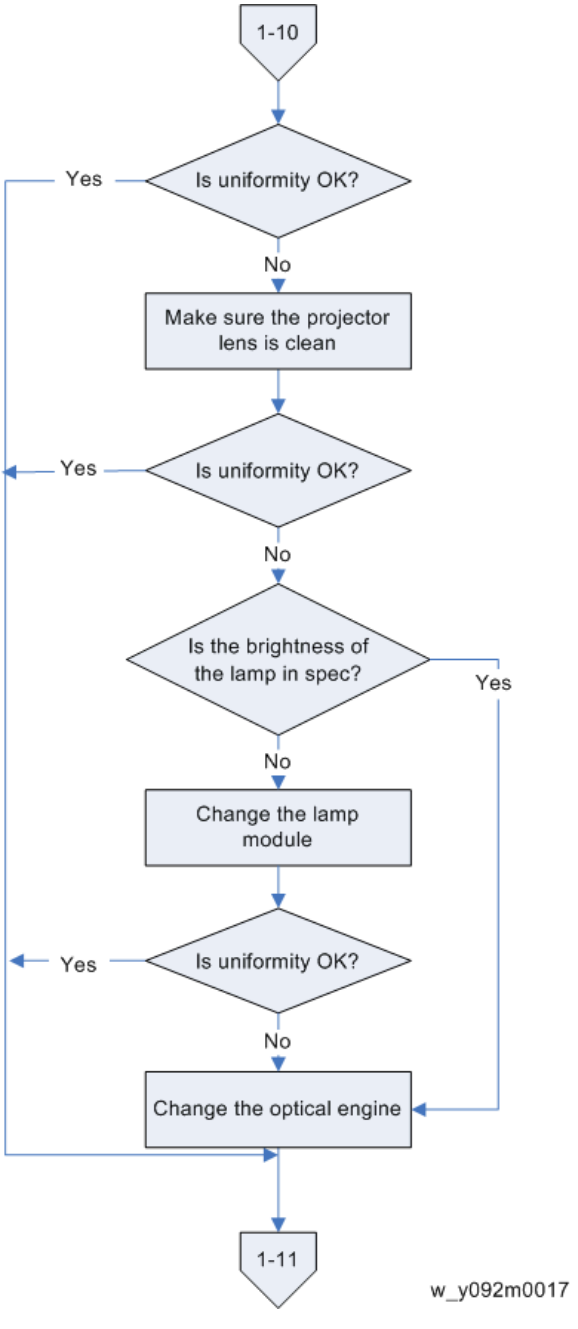
1-8 (Is there noise on the image?)



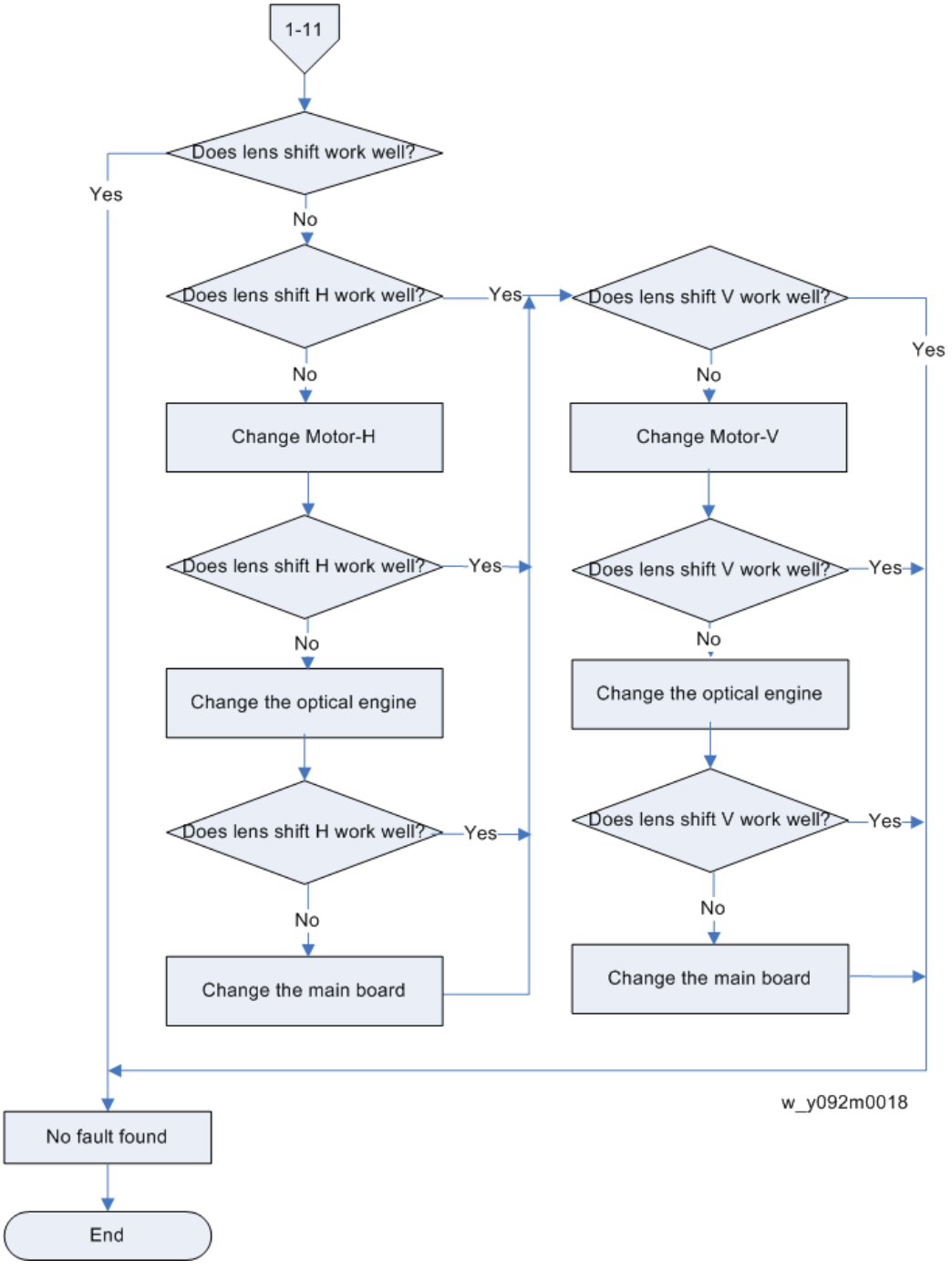
1-9 (Is focus ok?)



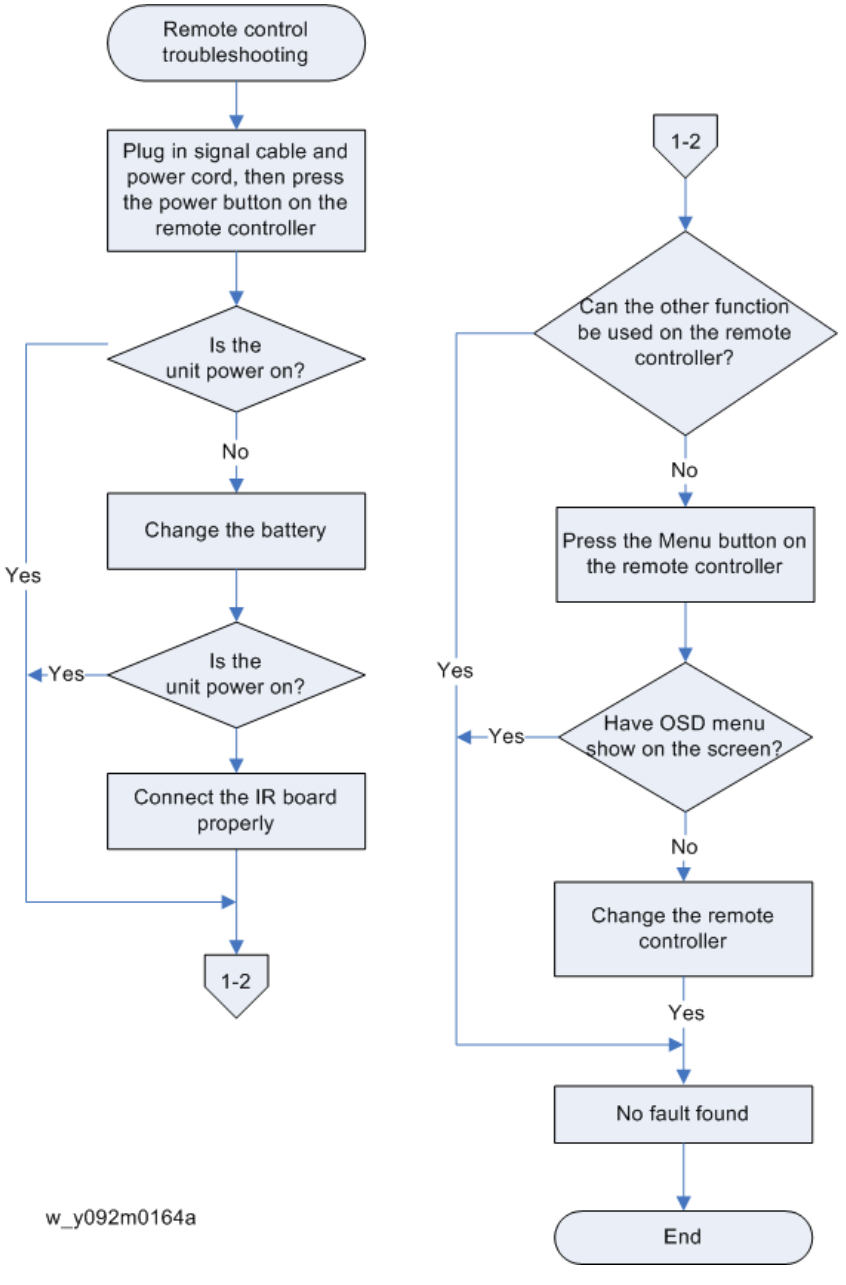
1-10 (Is uniformity ok?)



1-11 (Does lens shift work well?)

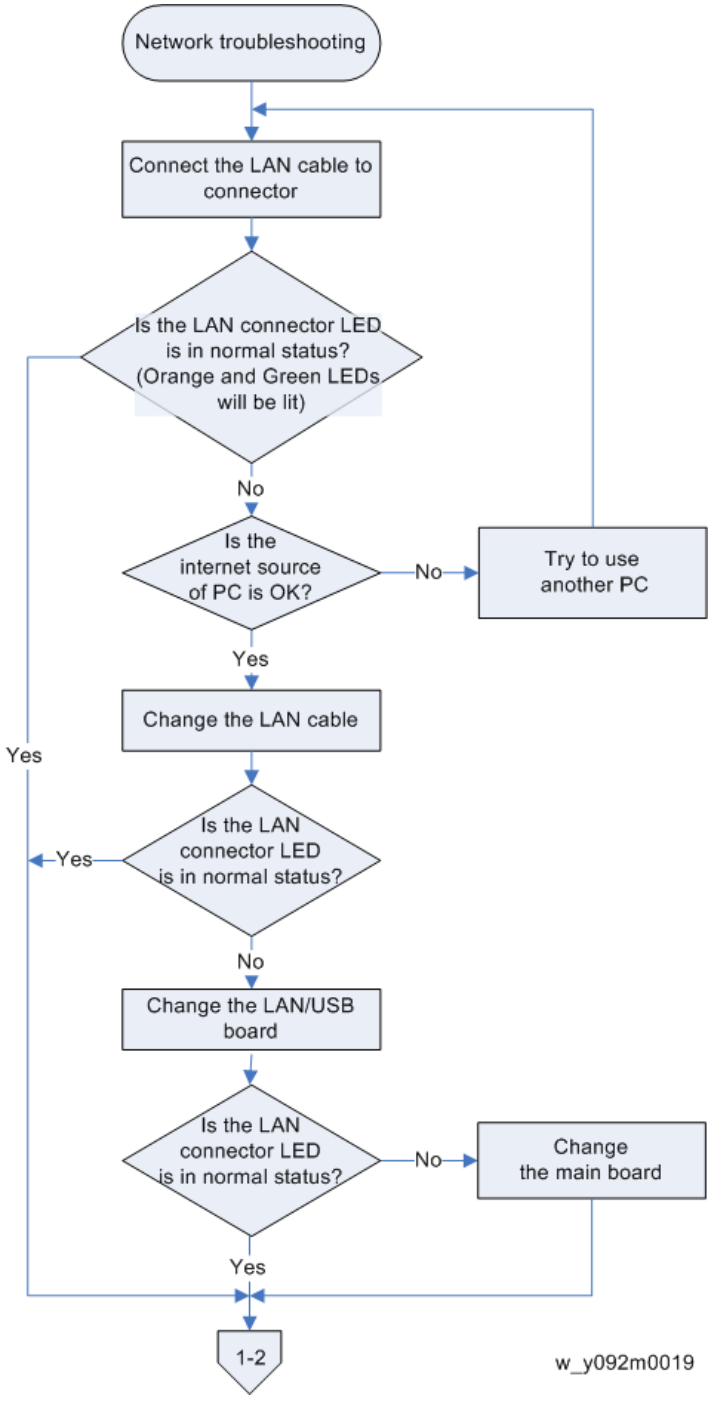


E. Remote Control Troubleshooting

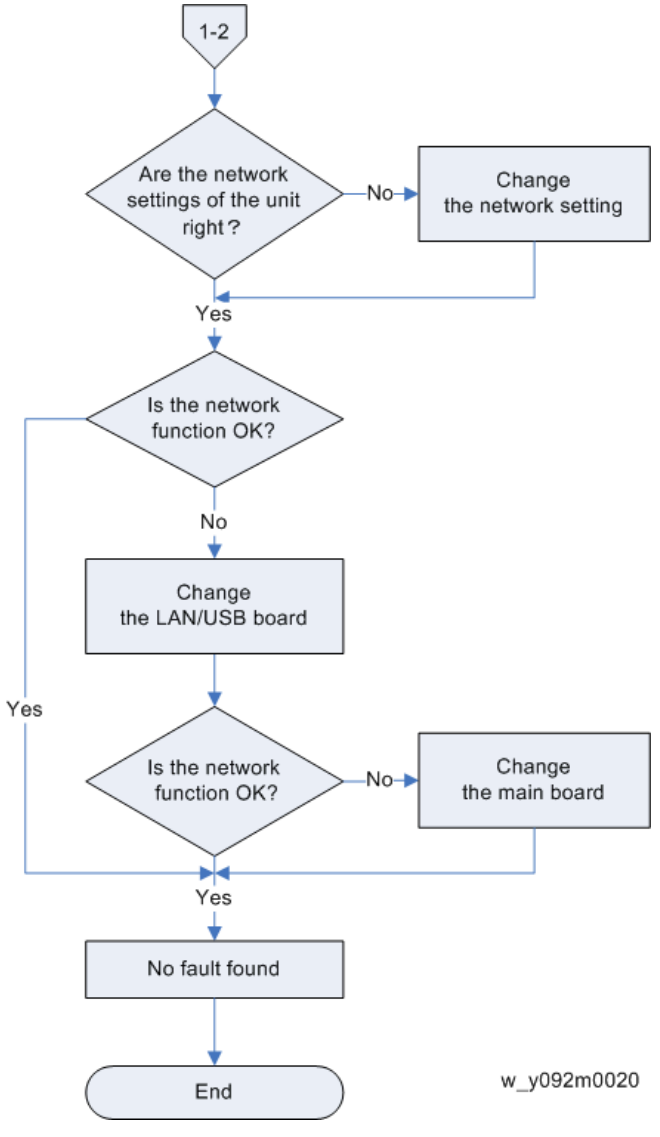


F. Network Troubleshooting

1-1 Is the LAN connector LED in normal status?



1-2 Are the network settings of the unit right?



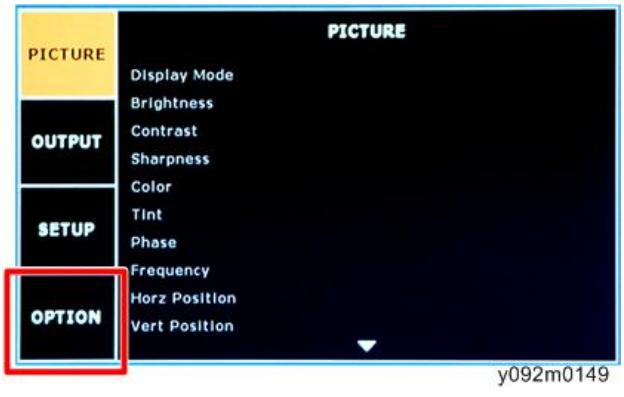
5. Test & Inspection

Service Mode

Service Mode

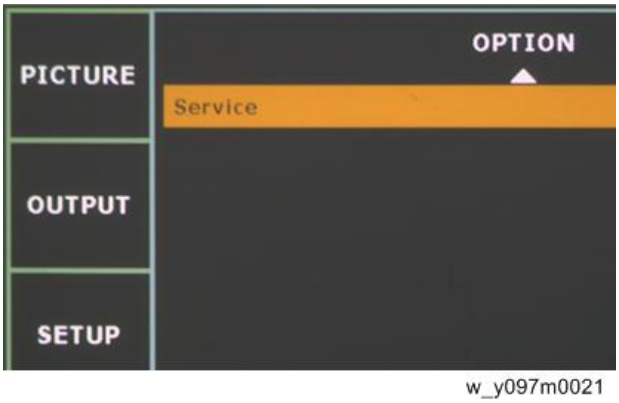
How to enter the Service Mode

1. Turn on the projector.
2. Press the “Menu” key to display the OSD menu.
3. Select “OPTION” with the [▼] key and press the “Enter” key



y092m0149

4. Select “Service” and press the “Enter” key.



w_y097m0021

“Enter Service Code” appears.

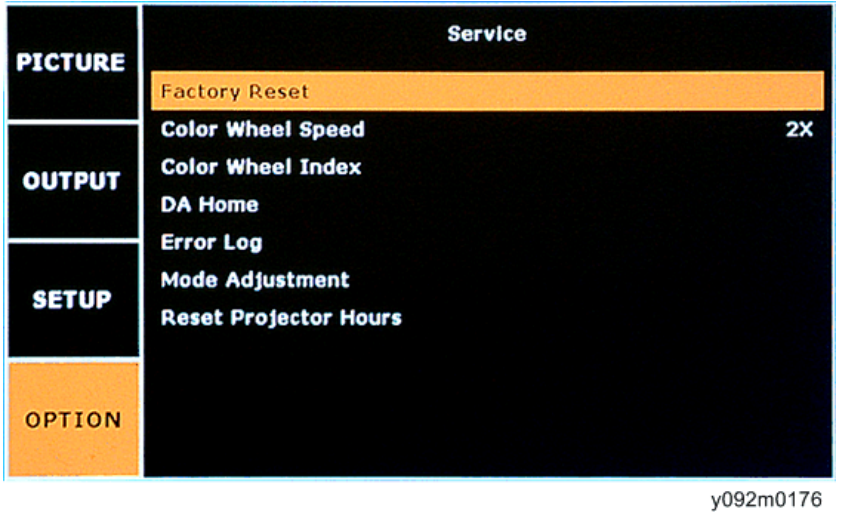
w_y097m0065

5. **Press the “Left [1]”, “Down [2]”, “Right [3]”, and “Up [4]” keys sequentially, then press the “Enter” key.**

y092m0172

To switch to the service mode with the remote controller, enter “1590” using the number keys when you enter the service code.

6. **The service mode menu appears.**



y092m0176

Note

- To exit from the service mode or return to the previous menu, press the "Exit" key.

Service Mode settings

Note

- Here is a summary of common terms.

Term	What It Means
DFU	Denotes "Design/Factory Use". Do not change this value.

Menu

Setting Item	Description
Factory Reset	Use this to reset all the settings in the OSD menu. (page 131 "OSD Reset")
Color Wheel Speed	DFU
Color Wheel Index	Use this to adjust the R/G/B value to improve the image when the color reproduction is not correct. (page 129 "Color Wheel Index")
DA Home	Use this to calibrate the DA of the projector. (page 125 "DA Calibration")
Error Log	Records the times when power for the projector failed to turn on, such as due to excessive temperature, lamp failure or fan lock.
Mode Adjustment	DFU
Reset Projector Hours	DFU

Calibration

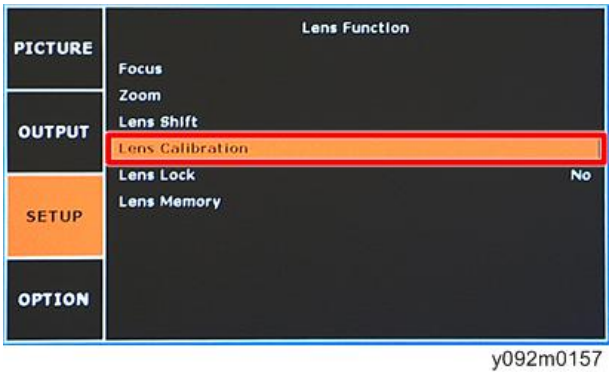
Lens Calibration

Note

- Always perform a Lens Calibration after repairing the projector or replacing the optical engine.

Inspection Item	Check if the lens shift module is moving smoothly.
Criteria	If the lens shift module does not move smoothly or sounds noisy, check whether the motor is working properly. If the motor is working properly, replace the optical engine.

1. **Put the projector on a horizontal surface.**
2. **Press the "Menu" key to display the OSD menu.**
3. **Select "SETUP" with the [▼] key and press the "Enter" key.**
4. **Select "Lens Calibration", and then press the "Enter" key.**



y092m0157

Fan Calibration and Auto Waveform

Note

- Always perform a Fan Calibration after replacing an F-type fan (Fan 5, Fan 6, Fan 7, Fan 8, Fan 10).

Criteria	If the fan calibration fails, change the corresponding fan.

1. **Plug in the power cord and turn the AC power on.**
2. **Hold "Down" then press the "Power" key.**

3. **Release the "Power" key when the power LED is flashing blue.**
4. **Press the "Power" key when the power LED is flashing red.**

   The projector will auto run and finish fan calibration and auto waveform.

   After several minutes, the projector will auto-power on and the Fan Information will appear on the screen, then the fan calibration and auto waveform is finished.

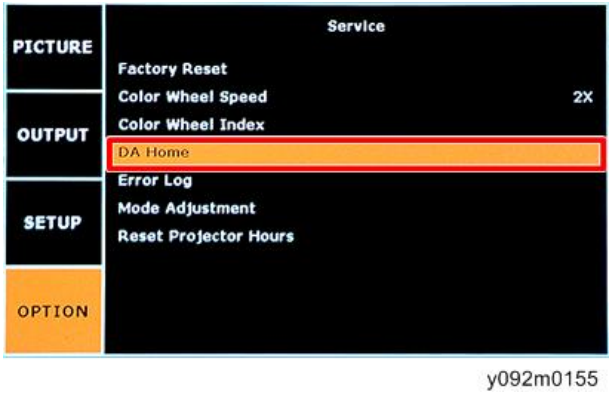
DA Calibration

Note

- Always perform a DA Calibration after replacing the DA module or the main board.

Inspection Item	Check if the brightness of the screen varies after executing the DA calibration.
Criteria	If the DA Module is not operating properly, change the DA module.

1. **Place the projector on a clean horizontal surface.**
2. **Get into Service Mode, see page 121 "How to enter the Service Mode".**
3. **Set DA to Open.**
4. **Select "DA Home", and then press the "Enter" key.**



y092m0155

5. **Press the right and left keys to display the following sequence: 17 > 18 > 19 > 20 (Right) > 19 > 18 > 17 (Left), to check whether DA is operating correctly.**

y092m0156

6. **Set DA Home position to the position of maximum brightness. The default value is Dual: 17.**

   Note

   - If the brightness value is very far from 17, it may indicate that the DA module is not operating smoothly and needs to be replaced.

7. **Select "DA".**
8. **Press Select, following Open > Close > Open to check whether DA is operating correctly.**

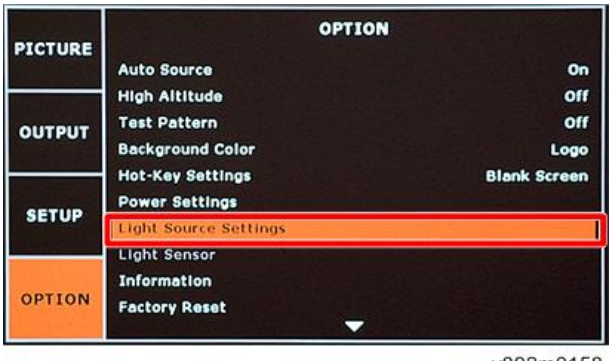
Lamp Hours

Reset Lamp Used Hours

After replacing the lamp module, we have to reset the lamp hours.

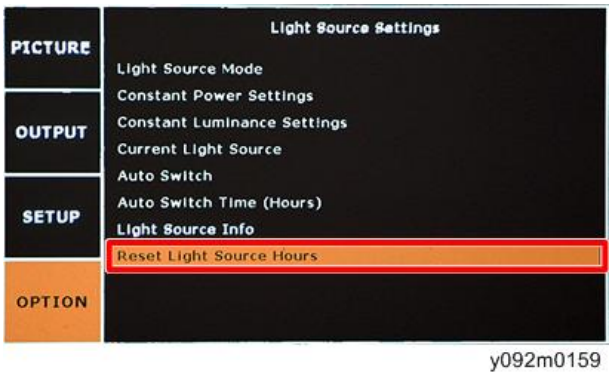
Use this procedure to reset the lamp hour history:

1. **Press the “Menu” key to display the OSD menu.**
2. **Select “OPTION with the [▼] key and press the “Enter” key.**
3. **Select “Light Source Settings” and press the “Enter” key.**



y092m0158

4. **Select "Reset Light Source Hours", and then press the “Enter” key.**



y092m0159

5. **Select “Lamp 1 Hours”, “Lamp 2 Hours” or “Both”, and then press it to reset the lamp hours.**

y092m0160

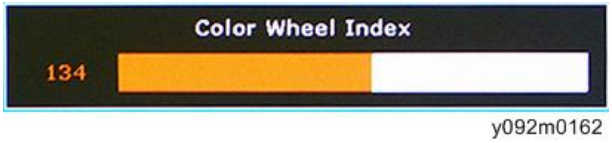
Color Wheel Index

After replacing the main board or color wheel, "Color Wheel Index" adjustment should be done.

1. Get into Service Mode. **(page 121 "How to enter the Service Mode")**
2. Select "Color Wheel Index", and then press the "Enter" key.

y092m0161

3. Press the "Left" or "Right" keys to adjust the color balance of the projected image.



y092m0162

Test Inspection Procedure

Function Inspection

General

All OSD functions must be checked for functionality. When the OSD menu is displayed, there shall be no visible peaking, ringing, streaking, or smearing artifacts on the screen.

Factory Default

The factory settings (with appropriate centering, size, geometry distortion, etc.) must be displayed when “Factory Reset” is selected. (page 131 "OSD Reset")

Display Size

All preset modes shall expand to full screen size using OSD Horizontal and Vertical Size controls.

Display Data Channel

The purpose of the DDC test is to verify the (DDC), DDC1/DDC2B operation of the projector and to verify Plug & Play function.

Acoustics

High pitch sound from cooling fan and color wheel is unacceptable.

Check points for exterior and print pattern

Check item	Check point
Text and Pattern	Missing letters and pattern or blurry prints are unacceptable.
Exterior	Dirt, scrapes, water ripples and uneven color are unacceptable.
Focus and Zoom	Focus and Zoom functioning well.
Logo	Missing logo, missing prints and blurred prints are unacceptable
Screw	All screws should be fixed and of the correct type.
Pedestal	Functioning well
Lamp cover	It should be locked in the correct place.

Check item	Check point
Plastic Parts	No plastic parts can be broken or damaged.
Safety or warning label	All safety and warning labels should be visible, including all contents.
Connector	All interface connectors should be complete and workable.

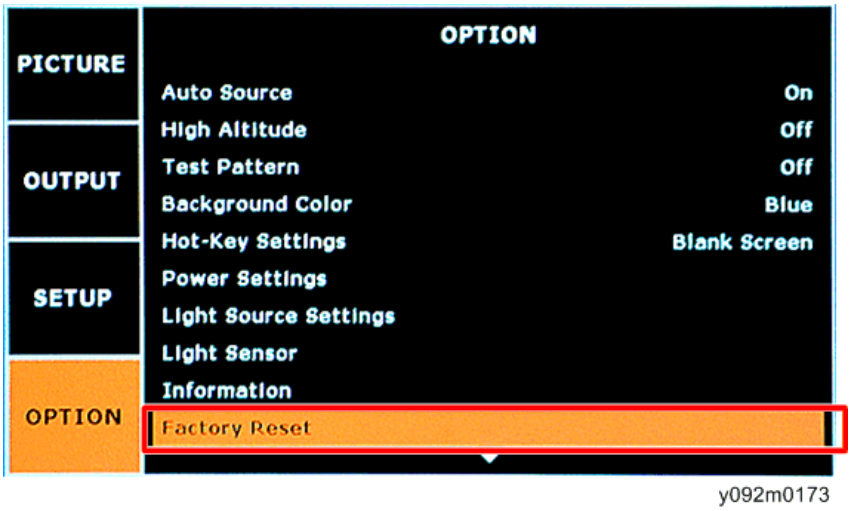
OSD Reset

There are two ways to do OSD Reset.

Use these procedures to erase all end-user settings and restore the default OSD settings.

Procedure A

1. Press the “Menu” key to enter the OSD menu.
2. Select “Option” -> “Factory Reset”, and then press the “Enter” key.



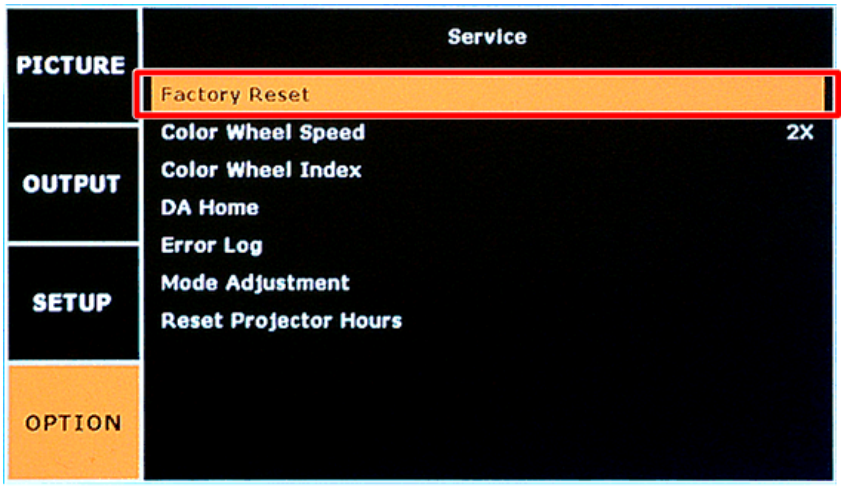
y092m0173

3. Select “Yes”, and then press the “Enter” key.

y092m0163

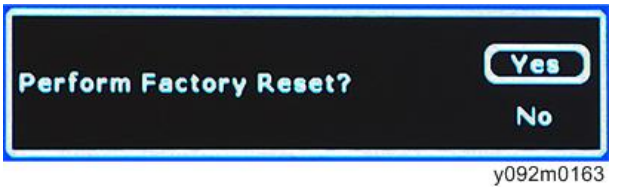
Procedure B

1. Get into Service Mode, see **page 121 "How to enter the Service Mode".**
2. Select "Factory Reset", and then press the “Enter” key.



y092m0151

3. Select "Yes", and then press the “Enter” key.



y092m0163

Network Test

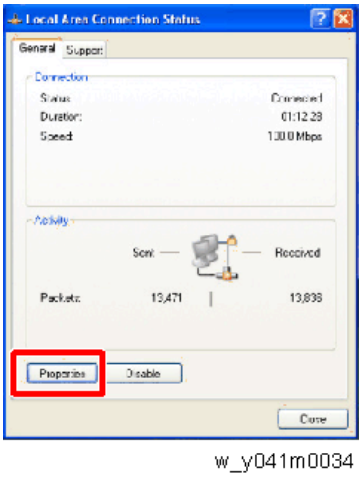
Network Function Test

Write Down Projector IP

1. Plug the power cord into the projector, and connect PC and projector with a LAN cable.
2. Turn on the projector.
3. Press the “Menu” key to display the OSD menu.
4. Select “SETUP” with the [▼] key and press the “Enter” key.
5. Select “Communications” > “LAN”.
6. Make sure DHCP is disabled.
7. Write down the following information:
    - IP address: 192.168.0.100 (default).
    - Subnet Mask: 255.255.255.0 (default).

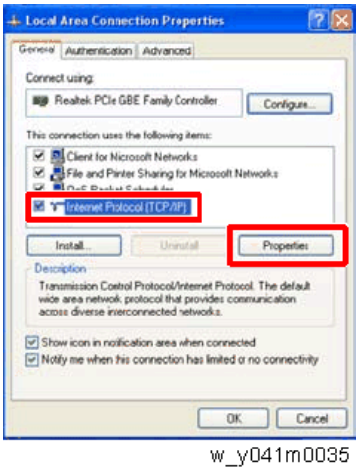
Network Setting

1. Double click “Local area connection”, and then choose “Properties”.



w_y041m0034

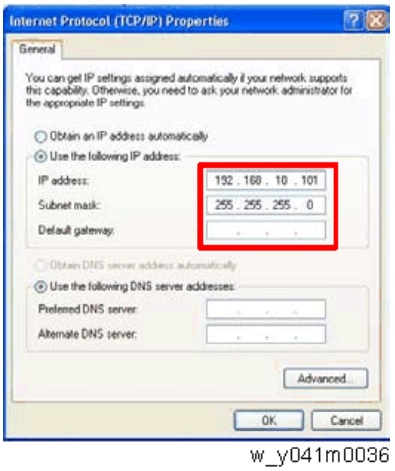
2. **Select “Internet protocol (TCP/IP)”, and then click “Properties”.**



w_y041m0035

5

3. **Modify the IP address to 192.168.0.240, and modify the subnet mask to 255.255.255.0.**



w_y041m0036

The subnet mask of the PC must be the same as the projector. The HOST ID or IP address (192.168.0.XXX) of the PC must be different from the projector IP address written down earlier.

4. **Click "OK".**
5. **Click "Close" to quit the setting screen.**

Read Projector information

Note

- Internet Explorer version 8 or higher is required.

1. **Connect the PC and the projector LAN Port with a LAN cable.**
2. **Use Internet Explorer to navigate to http://192.168.0.100.**

3. Select Administrator for the access type.
4. Enter the password admin.
5. Click “Login”.

6. Firmware Update

System Firmware Update

Equipment Needed

Equipment Needed	
Software	• OPFU: One Package Firmware Update
Hardware	1. Projector 2. Power cord 3. LAN cable (CAT-5e) 4. PC or Laptop with Windows 32-bit

1 2 3 4

y092m0022

Windows Setting

Note

- To update the firmware on your projector, you must first set up your PC.

1. **Disable Windows firewall.**
2. **Set the HDD sleep timer larger than two hours.**
3. **Run as an administrator in the case of Windows 7.**

Installation of the Firmware Update Utility

Note

- To update the firmware on your projector, you must install the Firmware Update Utility on your PC.

1. **Download the latest firmware program file from the website. Unzip the file to the desktop and open the folder created.**
2. **Execute Wizard OPFU.EXE**

Firmware Update Process

Note

- Examples shown in the instructions may have minor differences compared to the actual firmware update for your specific projector model. Where applicable, these instructions note important differences between models.

1. **Double-click the Firmware Update Wizard.**
2. **Click Run as admin and Close firewall.**
3. **Click "Next".**
4. **Connect the projector to the AC supply and turn on the power.**
5. **When the source message is displayed on the bottom left of the projected image, click "Next".**
6. **Connect the projector to the computer with a LAN cable.**
    1. Set the Default Gateway and Subnet Mask of the computer to match the projector.
    2. Set the IP address of the computer to match the first three numbers of the projector's IP address. (For projector 192.168.000.100, set computer to 192.168.000.xxx, where xxx is not 100.)
    3. Enter the projector's IP address.
    4. Click "Next".
7. **Click "Next".**

    If the firmware is corrupt, click the correct model name, and then click "Next".
8. **Choose the update items, and then click "Next".**

    Note

    - The firmware update procedure will run automatically and will take two hours to complete.
9. **When the firmware update is complete, verify the firmware version.**
10. **Click "Exit".**