Deneb-PJ1

Machine Codes: Y041

Field Service Manual

26 December, 2013

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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4. Troubleshooting

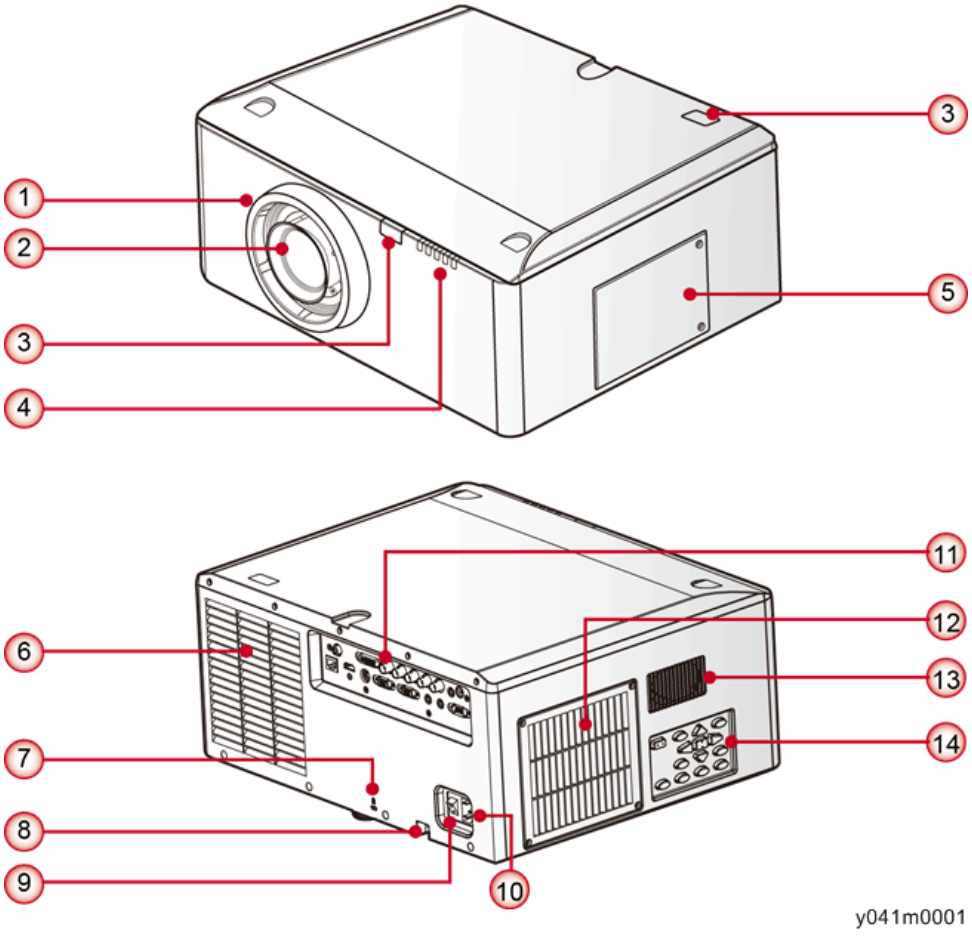
5. Test & Inspection

6. Firmware Update

1. Product Information

Overview

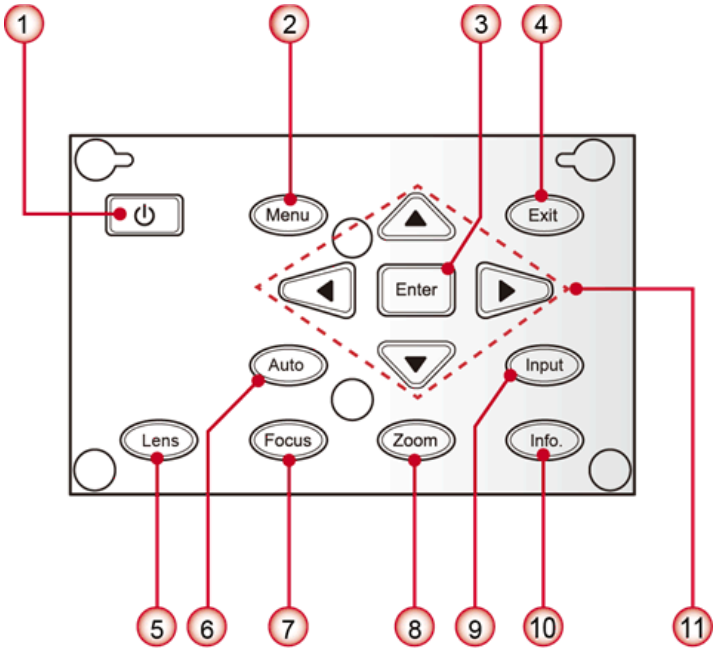
Main Unit



1. Lens ring
2. Zoom lens
3. IR receivers
4. LED indicators
5. Lamp door
6. Outlet vent

7. Kensington lock
8. Security bar
9. Power switch
10. Power connector
11. Connector panel
12. Inlet vent & filter
13. Audio vent
14. Keypad panel

Control Panel



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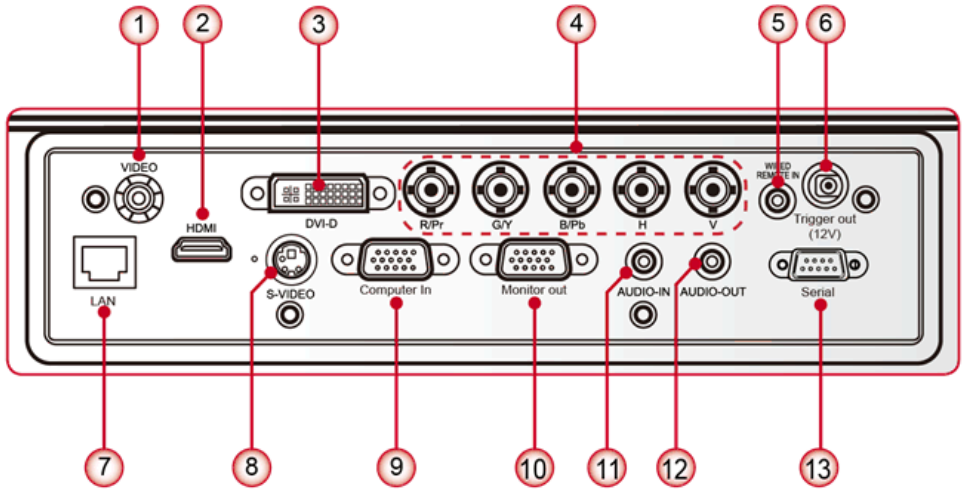
1. ⏻/ Power key
2. Menu key
3. Enter key
4. Exit key
5. Lens key
6. Auto key
7. Focus key

8. Zoom key
9. Input key
10. Info. key
11. Four directional select keys

Connection Ports



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1. Composite video input connector
2. HDMI connector
3. DVI-D connector
4. BNC connector
5. Wired remote input connector
6. 12V trigger relay connector
7. LAN connector
8. S-Video input connector
9. Computer In connector (VGA input)
10. Monitor out connector (VGA output)
11. Audio input connector
12. Audio output connector
13. RS232 connector (9-pin DIN type)

Specifications

General Specifications

No	Item	Description
1	Technology	"TI" DMD 12,0.7" XGA, type A, DC3
2	Dimension (W x D x H)	453 x 390 x 212 mm (without lens, with elevators)
3	Power supply	Auto-ranging: 100V ~ 240V ± 10%, 50-60Hz
4	Keystone correction	• V: +/- 20 degree • H: +/- 20 degree
5	Resolution	Native resolution: 1024x 768
6	Power consumption	• Normal Brightness mode: 500W maximum • ECO Brightness mode: 370W • Standby mode (LAN off) < 0.5W
7	Throw ratio	• 0.99-1.26 (Replacement Lens Type 5) • 1.26-1.58 (Standard Lens Type 2) • 1.58-3.00 (Replacement Lens Type 6)
8	Lamp life	• 1500 hours standard @370W, 50% survival rate (normal mode) • 2000 hours typical @280W, 50% survival rate (ECO mode)
9	Video compatibility	• NTSC: NTSC M 3.58MHz, 4.43MHz • PAL: PAL B/D/G/H/I/M/N, 4.43MHz • SECAM: SECAM B/D/G/K/K1/L, 4.25/4.4 MHz • SDTV: 480i/p, 576i/p • HDTV: 720p(50/60Hz), 1080i/p(50/60Hz), 1080p 24\25\30\50\60 Hz
10	Brightness	• Marketing: 6,000
11	Contrast ratio	• Marketing: 4,400:1 Maximum (Dynamic ON)

No	Item	Description
12	Uniformity	• Typical: 90%, Minimum: 80%(BMA standard) • Typical: +/-20%, Minimum: +/-35%(ANSI standard)
13	Color wheel	• 6 Segment—RGBCYW, 56mm • 2X, 7200RPM (120Hz) & 3X, 10800RPM (180Hz)
14	Lamp	370W
15	Projection lens	• Zoom range (ratio): LEN-008: 1.28X; LEN-009: 1.25X; LEN-010: 1.9X • Throw ratio: LEN-008: 0.99-1.26; LEN-009: 1.26-1.58; LEN-010: 1.58-3.00 • Throw distance: LEN-008:1.01~7.68m; LEN-009: 1.28~9.63m; LEN-010: 1.61~18.29m • Motorized lens shift: Horizontal: +/-15% (tolerance +/-4%) Vertical: +/-50% (tolerance +/-4%) (Dim corner larger than 50%) • Projection Image Size: 50~300
16	Temperature	• Operating: 5°C ~ 40 °C • Non-operation: -20°C ~ 60°C
17	Altitude	• Operating: for 0 ~ 2500 ft, 5 ~ 40°C for 2500 ~ 5000 ft, 5 ~ 30°C for 5000 ~ 10000 ft, 5 ~ 25°C • Non-operation: Sea Level to 40,000 feet

Compatible Mode

Computer compatibility for PC

Signal	Resolution	Frequency [KHz]	Refresh rate [Hz]	Video	Digital	Analog	Remark
NTSC	-	15.734	60	O	-	-	
PAL/ SECAM	-	15.625	50	O	-	-	

Signal	Resolution	Frequency [KHz]	Refresh rate [Hz]	Video	Digital	Analog	Remark
	640 x 350	31.5	70.1		O	O	70Hz
	640 x 400	37.9	85.1		O	O	85Hz
	720 x 400	31.5	70		O	O	
	720 x 400	37.9	85		O	O	
	720 x 576		50		O	O	
VGA	640 x 480	31.5	60		O	O	
VGA	640 x 480		67		O	O	
VGA	640 x 480	37.9	72.8		O	O	72Hz
VGA	640 x 480	37.5	75		O	O	
VGA	640 x 480	43.3	85		O	O	
SVGA	800 x 600	35.2	56.3		O	O	56Hz
SVGA	800 x 600	37.9	60.3		O	O	60Hz
SVGA	800 x 600	46.9	75		O	O	
SVGA	800 x 600	48.1	72.2		O	O	72Hz
SVGA	800 x 600	53.7	85.1		O	O	85Hz
	832 x 624		75		O	O	
XGA	1024 x 768	48.4	60		O	O	
XGA	1024 x 768	56.5	70.1		O	O	70Hz
XGA	1024 x 768	60	75		O	O	
XGA	1024 x 768	68.7	85		O	O	
	1152 x 864		75		O	O	
HD720	1280 x 720		50		O	O	
HD720	1280 x 720		60		O	O	

Signal	Resolution	Frequency [KHz]	Refresh rate [Hz]	Video	Digital	Analog	Remark
WXGA	1280 x 768	47.4	60		O	O	
WXGA	1280 x 768		75		O	O	
WXGA	1280 x 768		85		O	O	
WXGA-800	1280 x 800		60		O	O	
SXGA	1280 x 1024	64	60		O	O	
SXGA	1280 x 1024	80	75		O	O	
SXGA	1280 x 1024	91.1	85		O	O	
SXGA+	1400 x 1050		60		O	-	
UXGA	1600 x1200	75	60		O	O	
HD1080	1920 x 1080		24		O	O	
HD1080	1920 x 1080		50		O	O	
HD1080	1920 x 1080		60		O	O	
WUXGA	1920 x 1200		60		O	O	Only support [RB] timing
HDTV	1920 x 1080	33.8	30	O	-	-	
	1920 x 1080	28.1	25	O	-	-	1920 x 1080
	1920 x 1080i		50	-	O	O	1920 x 1080i

Signal	Resolution	Frequency [KHz]	Refresh rate [Hz]	Video	Digital	Analog	Remark
	1920 x 1080i		60	-	O	O	1920 x 1080i
	1920 x 1080p		24	-	O	O	1920 x 1080p
	1920 x 1080p		25	-	O	O	1920 x 1080p
	1920 x 1080p		30	-	O	O	1920 x 1080p
	1920 x 1080p		50	-	O	O	1920 x 1080p
	1920 x 1080p		60	-	O	O	1920 x 1080p
	1280 x 720	45	60	O	-	-	1280 x 720
	1280 x 720p		50	-	O	O	1280 x 720p

Note

- "O" expressed support this type of signal and "-" expressed that does not support this type of signal.
- If the computer compatibility supportive signal is different from User's Manual, please refer to User's Manual.

Computer compatibility for MAC

Resolution	Hz	Mac book compatibility		Mac book Pro (Intel) compatibility		Power Mac G5 compatibility		Power Mac G4 compatibility	
		Digital	Analog	Digital	Analog	Digital	Analog	Digital	Analog
800x600	60	O	O	O	O	-	-	O	-
800x600	72	O	O	O	O	-	O	O	O

Resolution	Hz	Mac book compatibility		Mac book Pro (Intel) compatibility		Power Mac G5 compatibility		Power Mac G4 compatibility	
		Digital	Analog	Digital	Analog	Digital	Analog	Digital	Analog
800x600	75	O	O	O	O	-	O	O	O
800x600	85	O	O	-	O	-	O	O	O
1024x768	60	O	O	O	O	-	O	O	O
1024x768	70	O	O	O	O	-	O	O	O
1024x768	75	O	O	O	O	-	O	O	O
1024x768	85	O	O	O	O	-	O	O	O
1280x720	60	O	O	O	O	-	O	O	O
1280x768	60	O	O	O	O	-	-	-	O
1280x768	75	-	O	-	O	-	O	O	O
1280x768	85	-	O	-	O	-	-	-	O
1280x800	60	-	O	-	O	-	O	O	O
1280x1024	60	O	-	-	O	-	O	O	O
1280x1024	75	O	-	-	O	-	O	O	-
1920x1080	60	O	-	-	O	-	O	O	O
1920x1200(*1)	60	O	-	-	O	-	O	O	O

(*1) 1920 x 1200 @60Hz only support RB (reduced blanking)

Note

- **"O" expressed support this type of signal and "-" expressed that does not support this type of signal.**
- **If the computer compatibility supportive signal is different from User's Manual, please refer to User's Manual.**

GEO Board Limitation

	Blending	Keystone	4- Corner	Curve	Rotation	Pin Cushion/ Barrel
Blending		X	O	X	X	X
Keystone	X		X	X	X	O
4- Corner	O	X		X	X	X
Curve	X	X	X		X	X
Rotation	X	X	X	X		O
Pin Cushion/ Barrel	X	O	X	X	O	

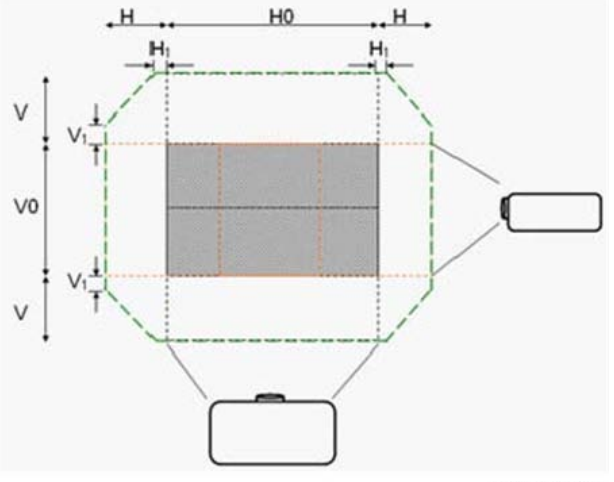
Lamp Information

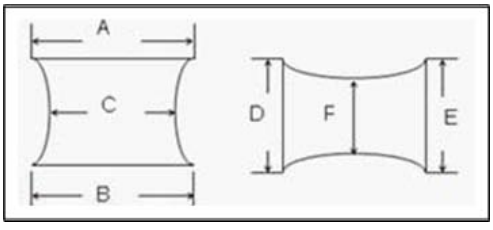
	Description
Type	370W
Lamp life	• Normal mode1500 Hours Standard @370W, 50% survival rate • ECO mode2000 hours typical @280W, 50% survival rate
	Above spec only claimed for table top and ceiling mount, CW @2X

	Description
Lamp power	• Normal mode: 370W+/-5% • ECO mode: 280W

Lens

Projection lens	Replacement Lens Type 5	Standard Lens Type 2	Replacement Lens Type 6
Focal length (f)	14.03-17.96	18.07-22.59	18.07-22.59
F number	2.30-2.57	2.00-2.32	2.30-3.39
Focus spec (MTF)	67 lp/mm	47 lp/mm	67 lp/mm
Zoom range (ratio)	1.28X	1.25X	1.9X
Zoom & focus adjustment	Motorized		
Throw ratio (XGA)	0.99-1.26	1.26-1.58	1.58-3.00
Throw distance (XGA)	1.01~7.68m	1.28~9.63m	1.61~18.29m
Projection image size		50~300"	

Projection lens	Replacement Lens Type 5	Standard Lens Type 2	Replacement Lens Type 6
Motorized lens shift	Horizontal: +/-15% (typical; tolerance +/-4%) Vertical: +/-50% (typical; tolerance +/-4%) (Dim corner larger than 50%) • Panel: 0.7" XGA • H: 15% • V: 50% • H1: 0% • V1: 20%  y041m0004 Lens shift accuracy: 0.5 pixel per step		
Keystone correction	V: +/- 20 degree H: +/- 20 degrees (optional warping board) OSD adjusting range will be +/-40 steps for H and V.		
Leakage	<=0.8 Lx @ screen size diagonal 83" outside of active area		

Projection lens	Replacement Lens Type 5	Standard Lens Type 2	Replacement Lens Type 6
Distortion	<+/- 1.0% @ 100" screen size (all lens shift area, all optional lens)  Horizontal distortion = (A-C)/C (up) and (B-C)C (down) Vertical distortion = (D + E - 2F)/2F		
Flare	1 pixel (core pixel) XGA=3.2mm @ 100" screen 2.Green flare<=2.0 pixels (Observable from 1.5m) 3.Blue/Red flare<=2.5 pixels (Observable from 1.5m)		
Unbalance	<50cm @100" full range for all lens.		
Thermal drift of focus	About 45cm @100" after 1 hr. burn-in		

2. Installation

Installation Requirements

Environment/Power Requirements

Operating temperature

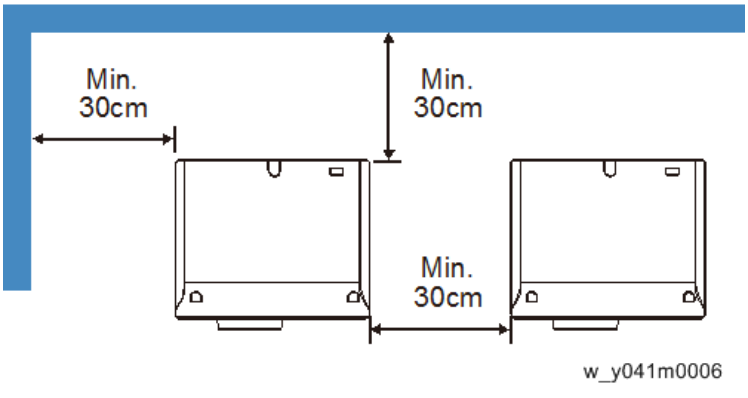
5ºC to +40ºC / 41°F~104°F

Power supply

100~240VAC ± 10%, 50~60Hz (Auto-ranging and power factor correction)

Machine Space Requirements

Do not block projector in/out air vents and keep 30 cm clearance around vents for air flow.



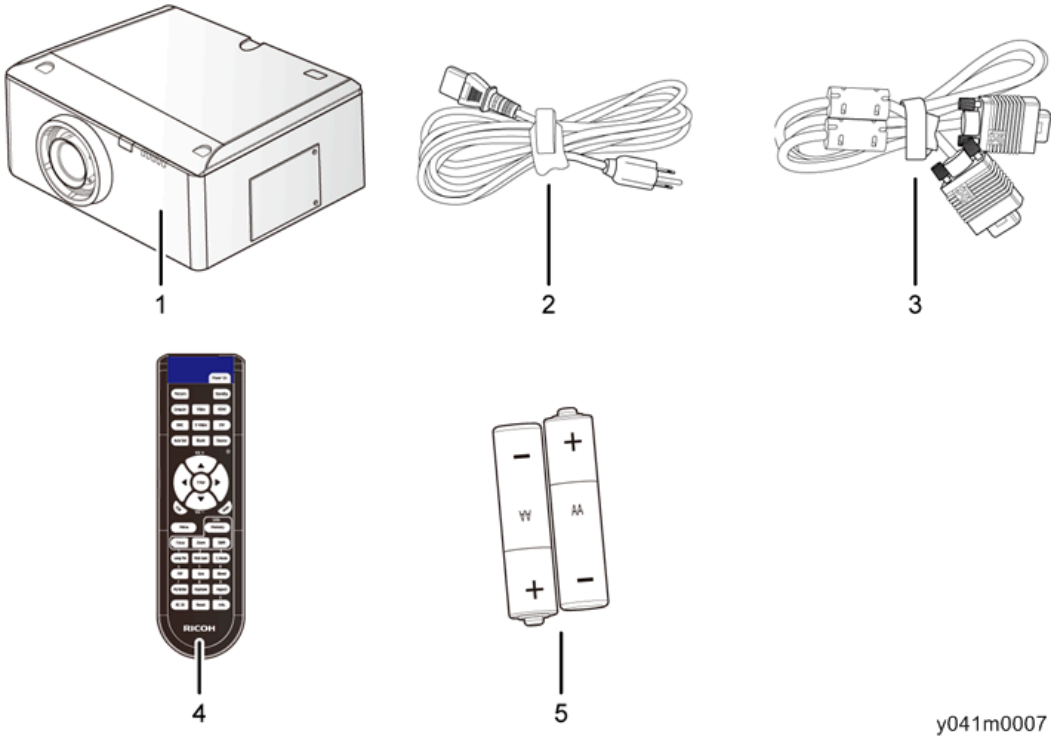
Machine Dimensions

453 mm (W) x 390 mm (D) x 212 mm (H) (without lens, with elevators)

Main Machine Installation

The user must set this projector up.

Accessory Check



No	Description	Q'ty
1	Projector with lens cover	1
2	Power cord	1
3	VGA cable	1
4	Remote control	1
5	AA batteries (for remote control)	2
-	Documentation: User's Manual (CD)	1
-	Documentation: Quick Start Card	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 lens cap when projector is in operation.
- Do not look into or point the laser pointer on your remote control into your or someone's eyes. Laser pointer 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 AC outlet if the product is not being used for a long period of time.

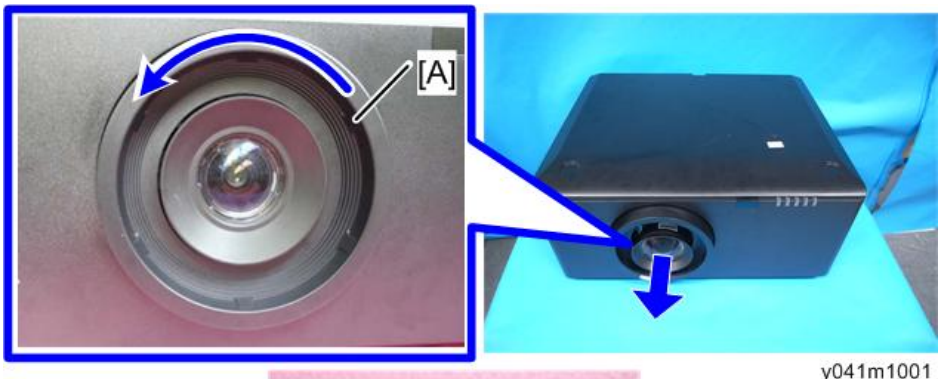
Do not

- 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 5°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.

GEO Board Installation

Installation Procedure

1. Rotate the lens ring cover [A].
2. Pull out the lens cover strap to remove the lens ring cover.



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3. Remove the 1 screw on the front cover.

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4. **Remove the 5 screws on the top cover.**

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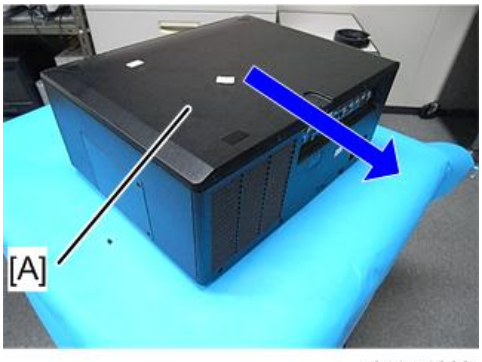
5. **Pull to remove the top cover [A].**



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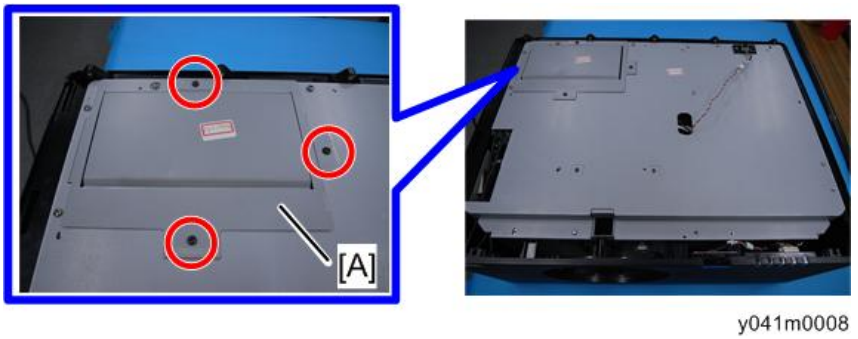
6. **Remove the 3 screws from the GEO cover and then remove the GEO cover [A].**



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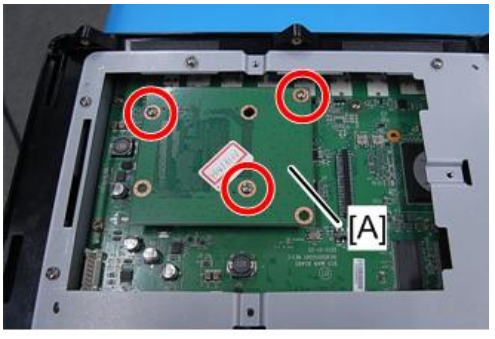
7. Remove the 3 screws and the dummy board [A].



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8. Install the GEO board.

3. Replacement and Adjustment

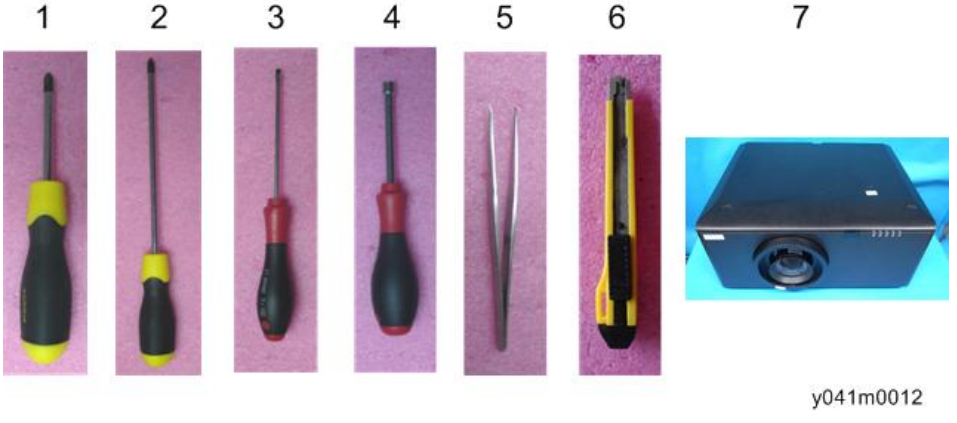
Special Tools

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 54 "Optical Engine") or main board(page 37 "Main Board, GEO Dummy Board, I/O Board, LAN Board").

1. RS-232C cable (cross)
2. Notebook PC
3. LAN Cable

Equipment Needed

1. Screw bit (+): 105 Screw driver (+): 107
2. Screw bit (+): 107
3. Screw bit (-): 107
4. Hex sleeves 5 mm
5. Tweezers
6. Utility knife
7. Projector



Parts List

Service Parts List

- Lens ring cover
- Lamp cover
- Lamp unit
- Top cover
- IR-T sensor
- Rear cover
- Main board
- I/O board
- LAN board
- Top blower
- TC blower
- Bottom blower
- System fan
- Thermal board
- LED board
- LED cover
- IR-F sensor
- IR-F cover
- Right cover
- Lamp cover
- Left cover
- Vent cover
- Filter vent cover
- Optical engine
- Bottom cover
- AC inlet
- DMD fan
- LVPS
- Lamp driver

- Thermal switch
- DA module
- DA sensor board
- Color wheel
- Photo sensor board
- Left cover
- Keypad rubber
- Keypad board
- Speaker
- Interrupt switch

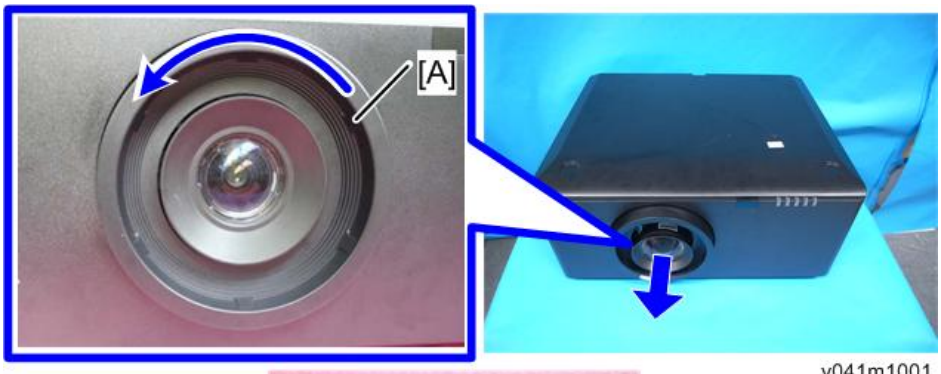
Part Replacement

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.

Lens Ring Cover, Projector Lens

1. Rotate the lens ring cover [A].
2. Pull out the lens cover strap to remove the lens ring cover.



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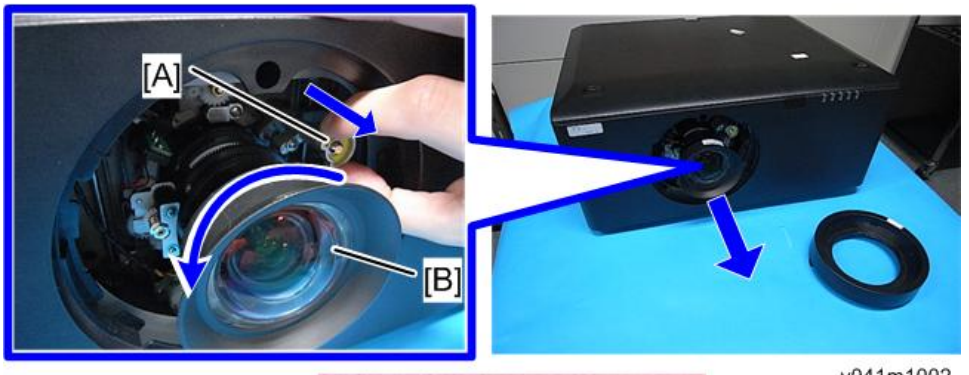
3. **Pull out the lens shift lock [A], and hold the projector lens [B], rotate it carefully. Then remove the projector lens carefully.**



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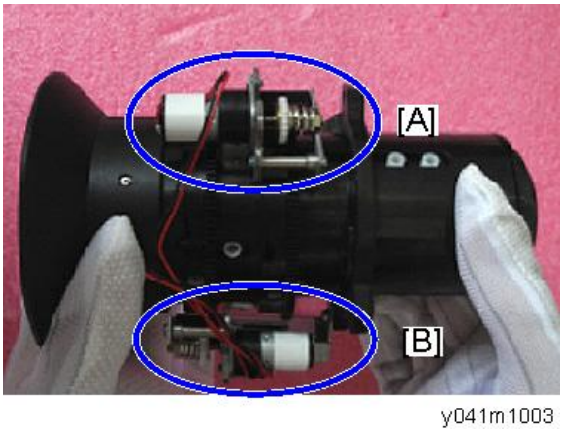
Note

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



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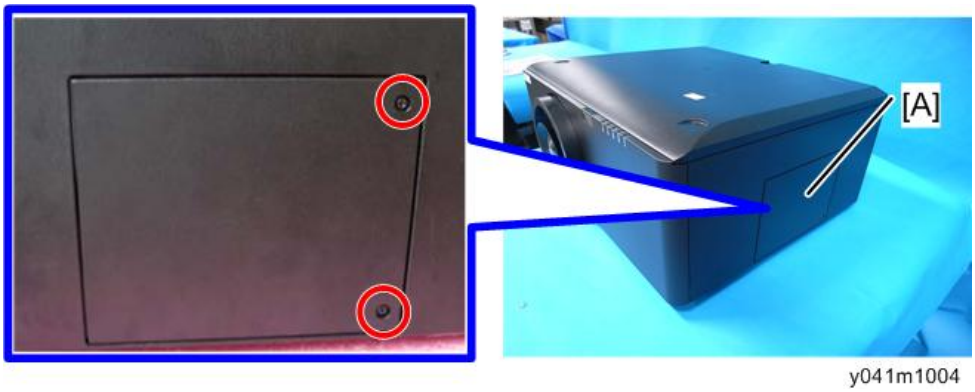
Lamp Cover, Lamp Unit

1. Loosen the 2 screws on the lamp cover [A].



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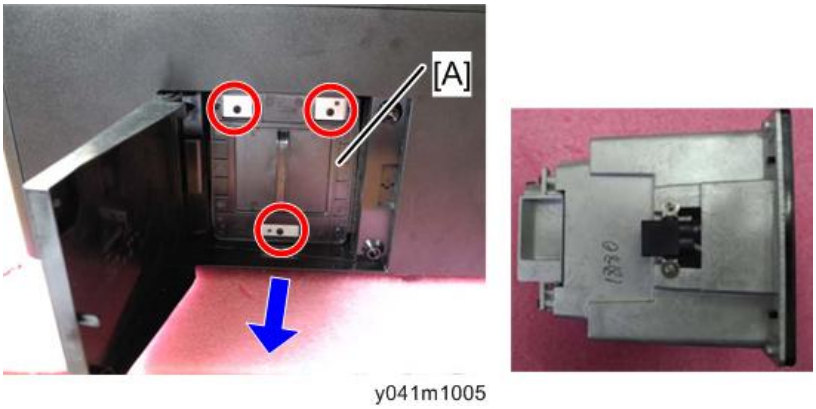
2. Remove the 3 screws, and then take out the lamp unit [A].



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Top Cover, IR-T Sensor

1. **Remove the 1 screw on the front cover.**

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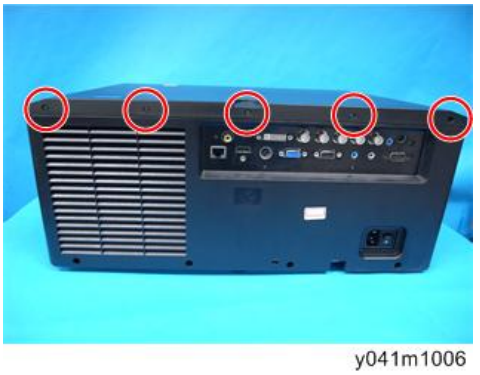
2. **Remove the 5 screws on the top cover.**



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3. **Pull to remove the top cover [A].**

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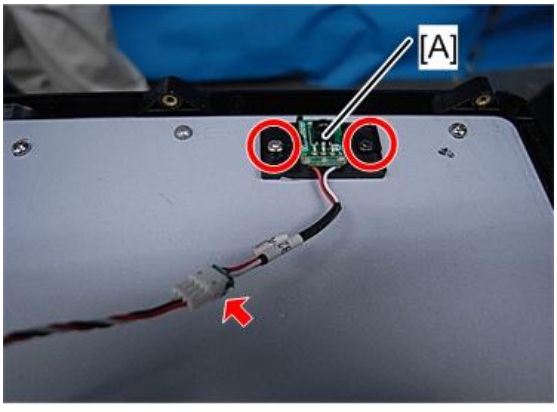
4. Remove the 2 screws and unplug the 1 connector for the IR-T sensor [A]



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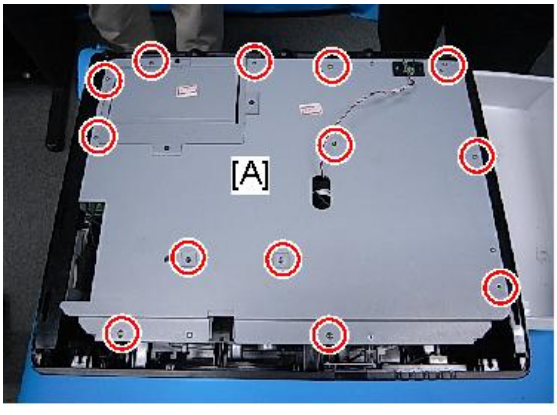
5. Remove the 13 screws to remove the top shielding [A].



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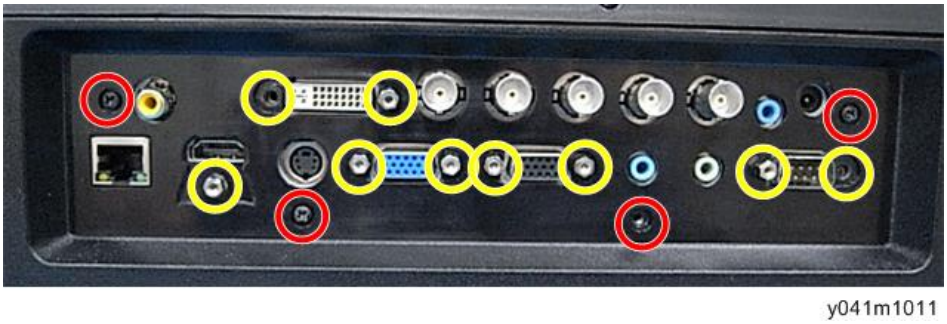
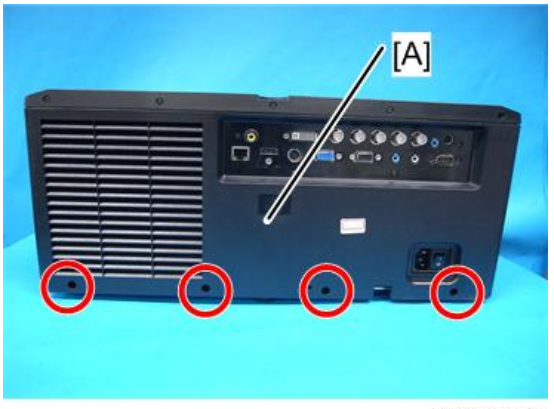
Rear Cover

1. Remove the 8 screws (red circle) and 9 hex screws (yellow circle) to remove the rear cover [A].



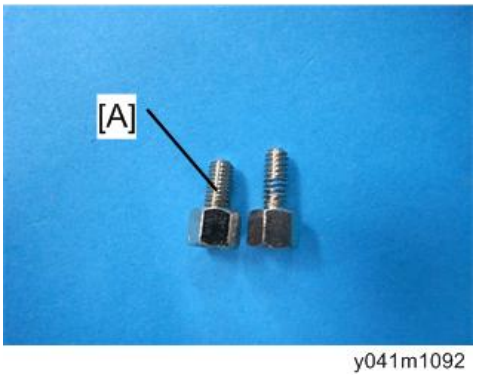
y041m1011



y041m1012

Note

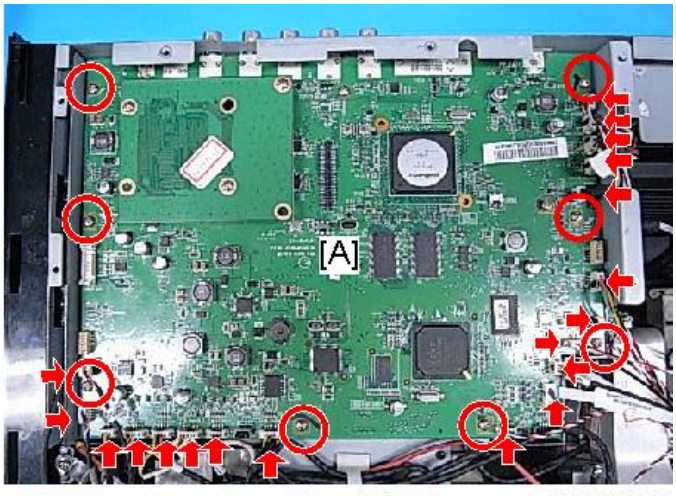
- Be sure to attach the shorter screw [A] under the HDMI port.



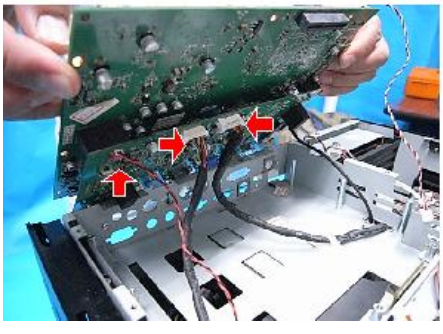
y041m1092

Main Board, GEO Dummy Board, I/O Board, LAN Board

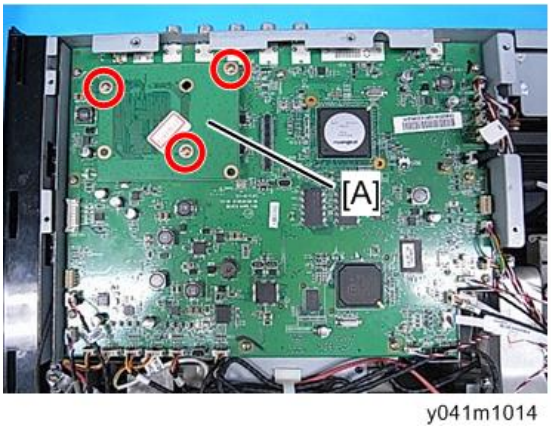
1. Remove the 8 screws and 19 connectors on the front and the 3 connectors on the back to remove the main board modules.

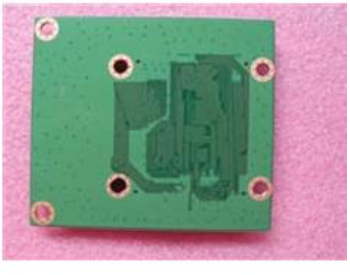


y041m1013



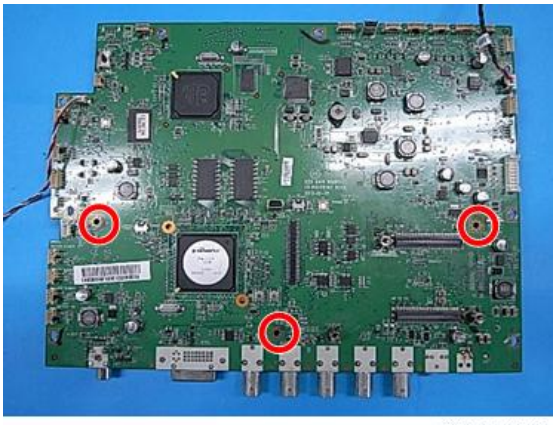
2. Remove the 3 screws to remove the GEO dummy board [A].



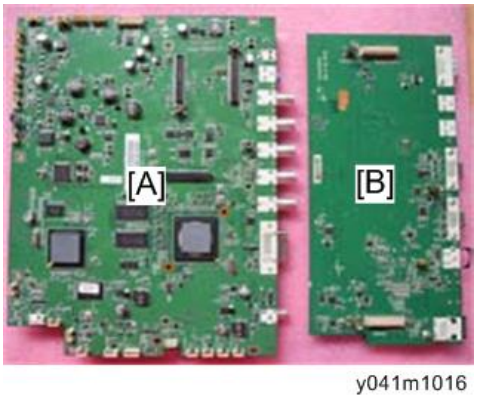


y041m1014

3. **Remove the 3 screws to separate the main board [A] and the I/O board [B].**



y041m1015

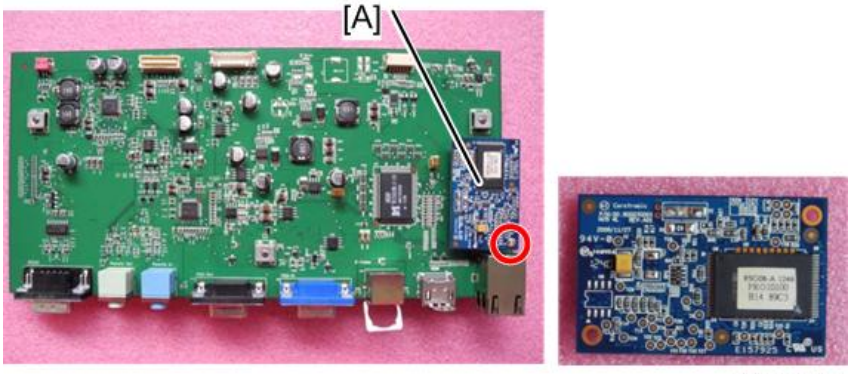


y041m1016

4. **Remove the 3 hex screws.**

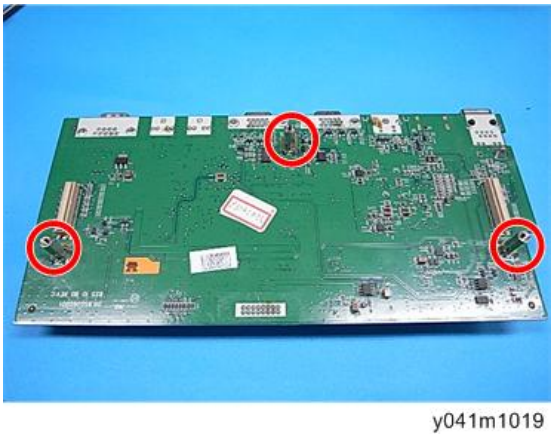
y041m1017

5. Remove the 1 screw to remove the LAN board [A].



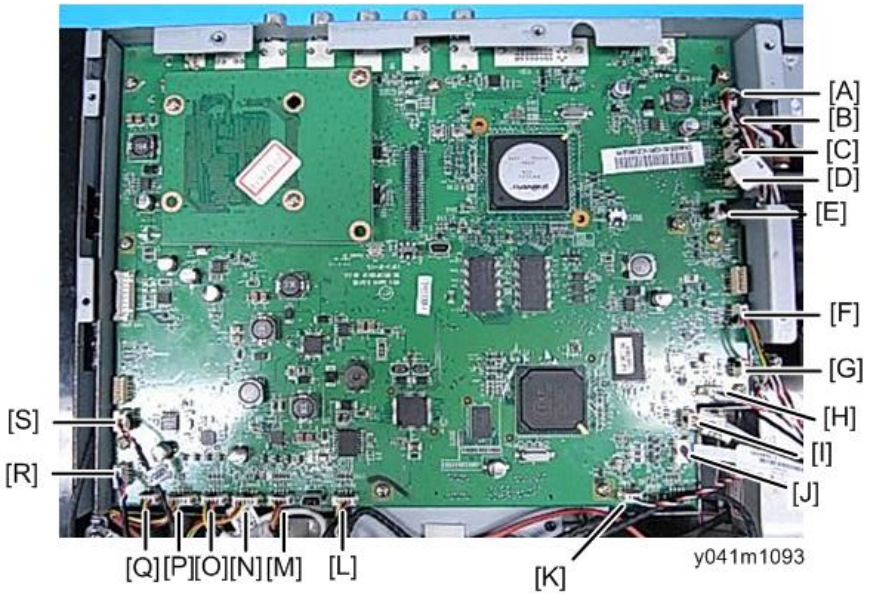
y041m1018

6. Remove the 3 hex screws.



y041m1019

Connector list



Item	Name on board	Key feature	Figure
A	SYSTEM FAN	Red/white/black wire, white connector (3 pin) The system fan [A], top blower [B], TC blower [C], and bottom blower [D] each have a three-pin connector of the same color. Be sure to identify the harness of each unit before connecting its connector to the board.	
B	TOP BLOWR		
C	TC BLOWER		
D	BOTTOM BLOWER		
E	LAMP DRIVER	White/red/white/black /brown wire, white connector (5 pin)	
F	DA MOTOR	Green/yellow/black/orange wire, white connector (4 pin)	

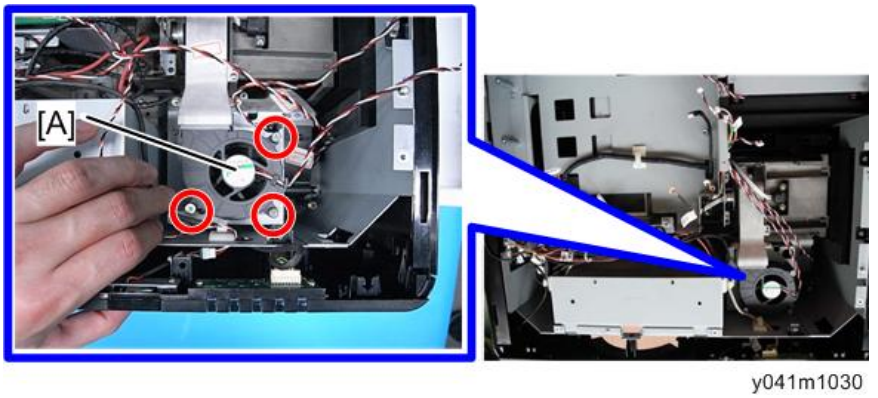
Item	Name on board	Key feature	Figure
G	DA SENSOR	Yellow/black/red wire, white connector (3 pin) DA sensor [G] and C/W sensor [I] each have a three-pin connector of the same color. Be sure to identify the harness of each unit before connecting its connector to the board.	
I	C/W SENSOR		
H	IR-T	White/black/red wire, white connector (3 pin)	
J	C/W DRIVER	-	
K	IR-F	Red/black/white wire, white connector (3 pin)	
L	ZOOM/FOCUS	Yellow/black/red/white wire, white connector and black wire tube (4 pin)	
M	MOTOR-H	Yellow/black/brown/orange wire, white connector and black wire tube (4 pin) The harness is wired on the left of the lens unit.	
N	SENSOR-H	Yellow/black/red/white Wire, white connector and white wire tube (4 pin) The harness is wired on the left of the lens unit.	
O	MOTOR-V	Yellow/black/brown/orange wire, white connector and black wire tube (4 pin) The harness is wired on the right of the lens unit.	

Item	Name on board	Key feature	Figure
P	SENSOR-V	Yellow/black/red/white wire, white connector and red wire tube (4 pin) The harness is wired on the right of the lens unit.	
Q	DMD fan	Red/yellow/black wire, white connector and black wire tube (3 pin)	
R	THERMAL	Red/black/white/blue wire, white connector and black wire tube (4 pin)	
S	FILTER SENSOR	Red/black wire, white connector (2 pin)	

Blower Module

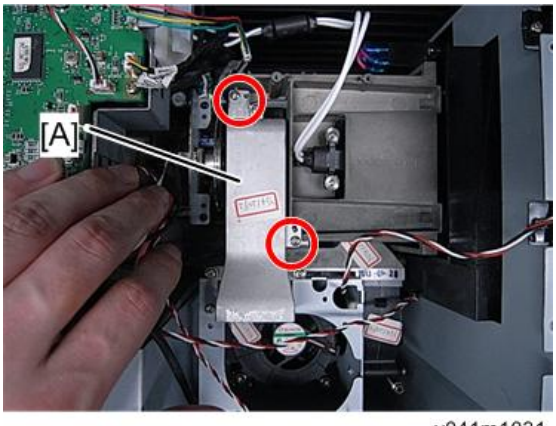
Top blower and duct

1. **Remove the 3 screws to remove the top blower [A].**



y041m1030

2. Remove the 2 screws to remove the top blower duct [A].

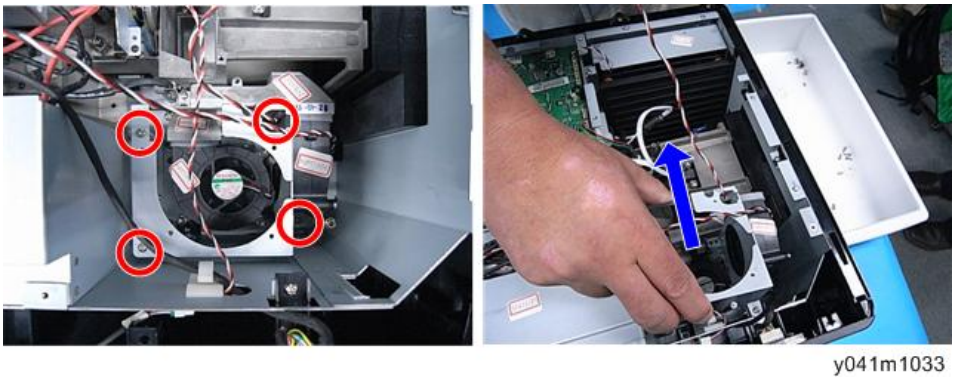


y041m1031

y041m1032

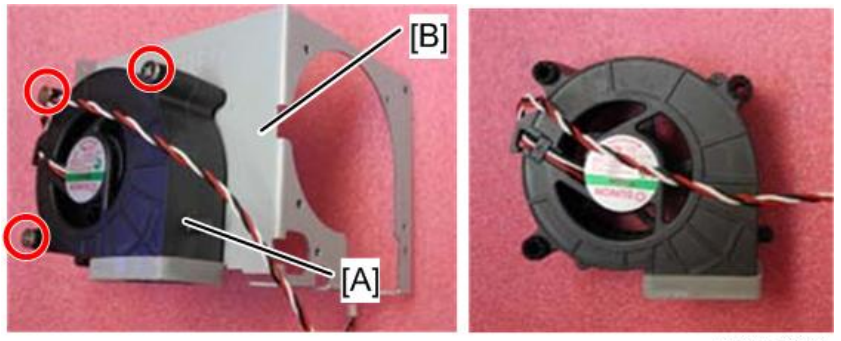
TC blower

1. Remove the top blower (page 42 "Top blower and duct")
2. Remove the 4 screws to remove the TC blower module.



y041m1033

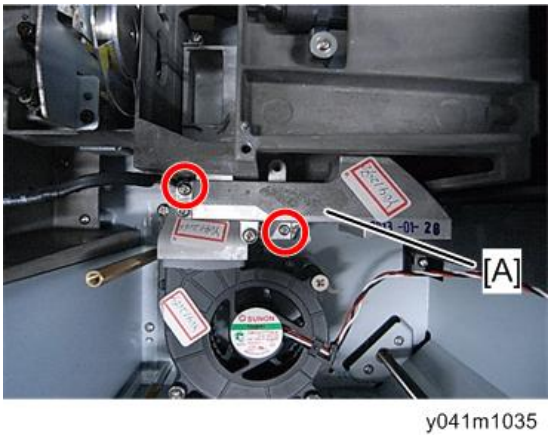
3. Unscrew 3 screws to separate TC blower [A] and bracket [B]



y041m1034

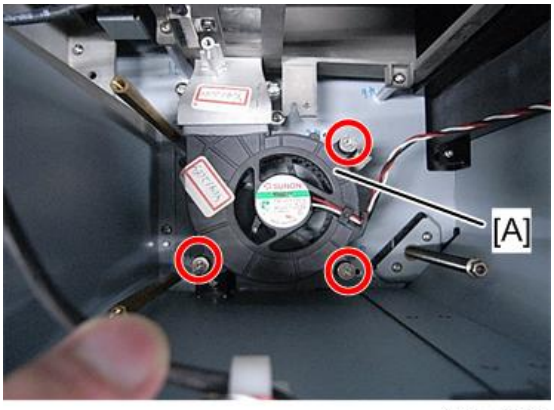
Bottom blower and duct

1. Remove the top blower. (page 42 "Top blower and duct")
2. Remove the TC blower. (page 43 "TC blower")
3. Remove the 2 screws to remove the blower duct [A].

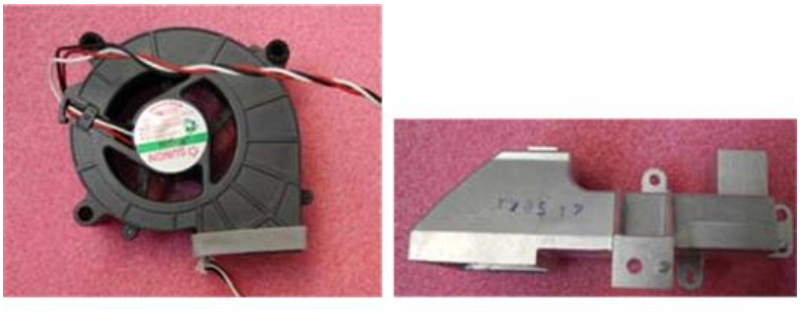


y041m1035

4. Remove the 3 screws to remove the bottom blower [A].



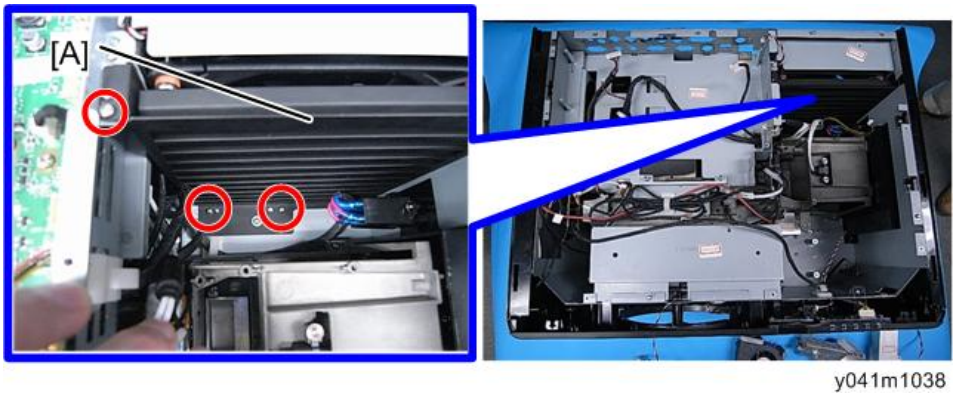
y041m1036



y041m1037

System Fan

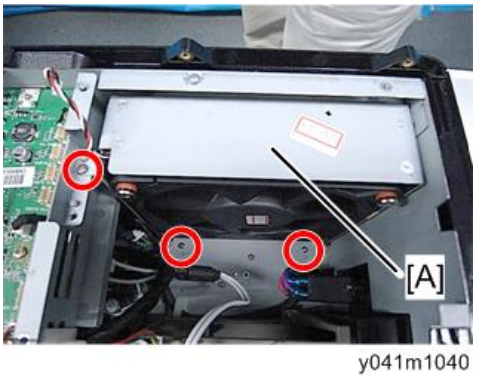
1. Remove the 3 screws to remove the outlet vent [A].



y041m1038

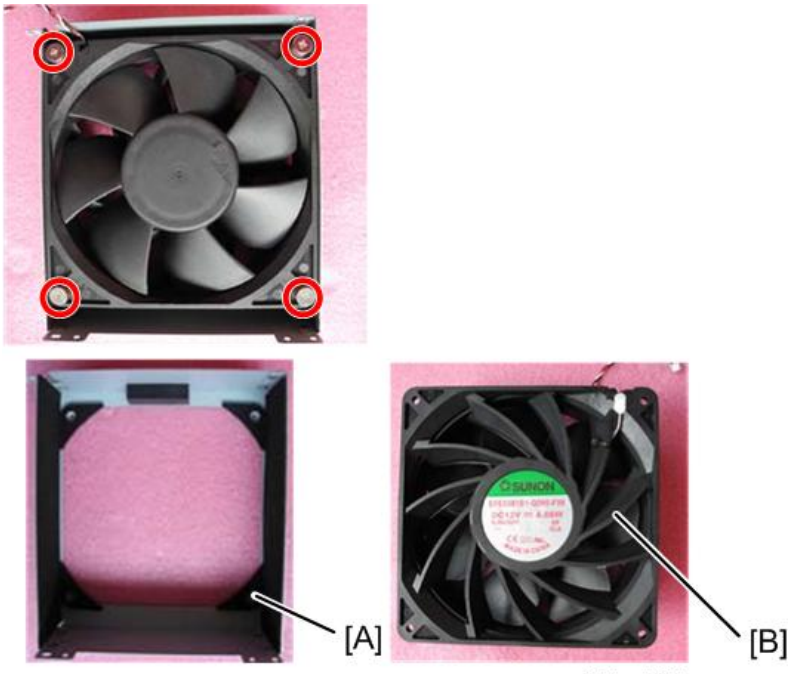
y041m1039

2. **Remove the 3 screws to remove the system fan module [A].**



y041m1040

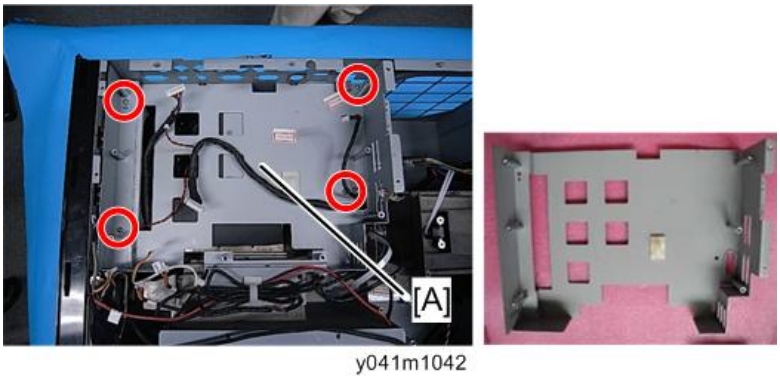
3. Remove the 4 screws to separate bracket [A] and fan [B].



y041m1041

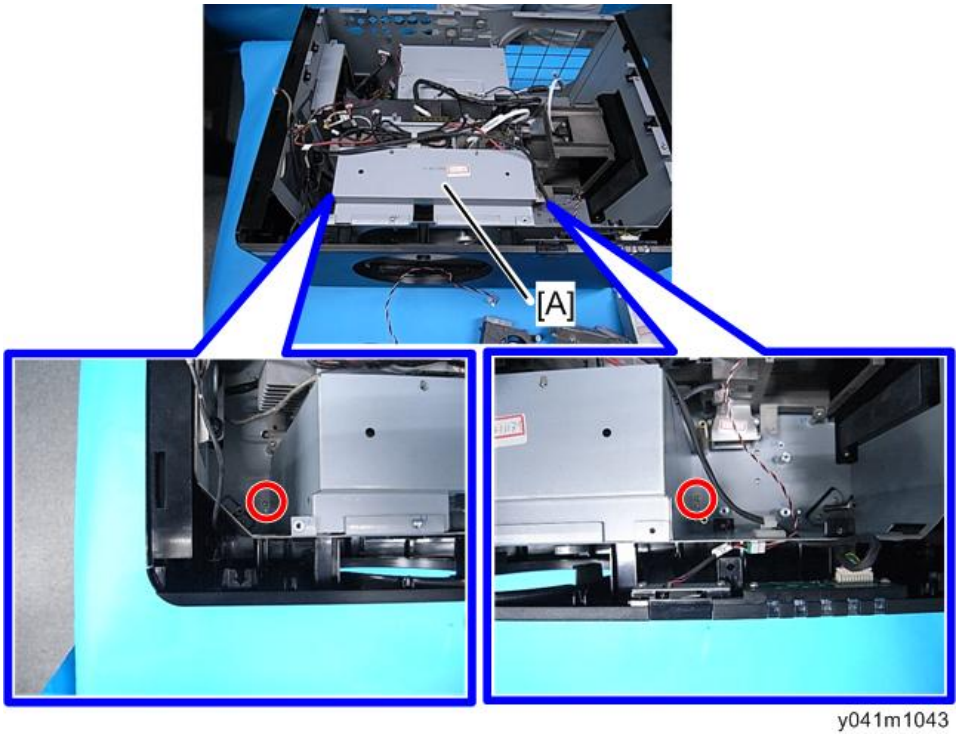
Main Board Shielding and Front Shielding

1. Remove the 4 screws to remove the main board shielding [A].



y041m1042

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

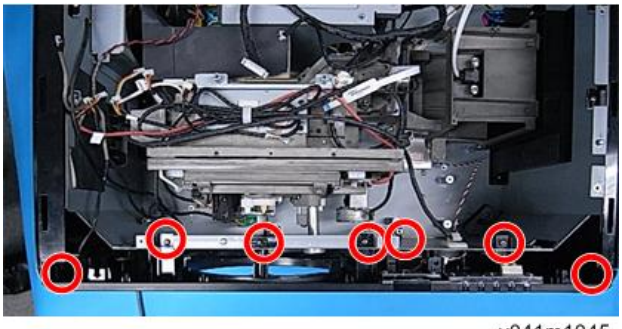


y041m1043

y041m1044

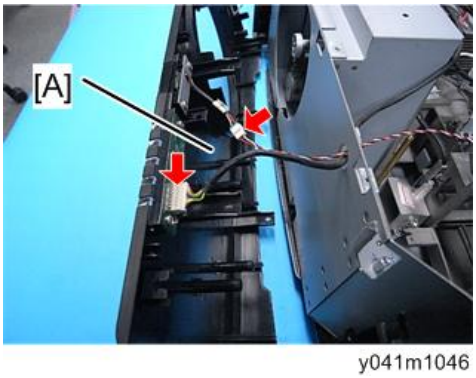
Front Cover, LED Board, LED Cover, Thermal Board, IR Cover

1. **Remove the 7 screws.**



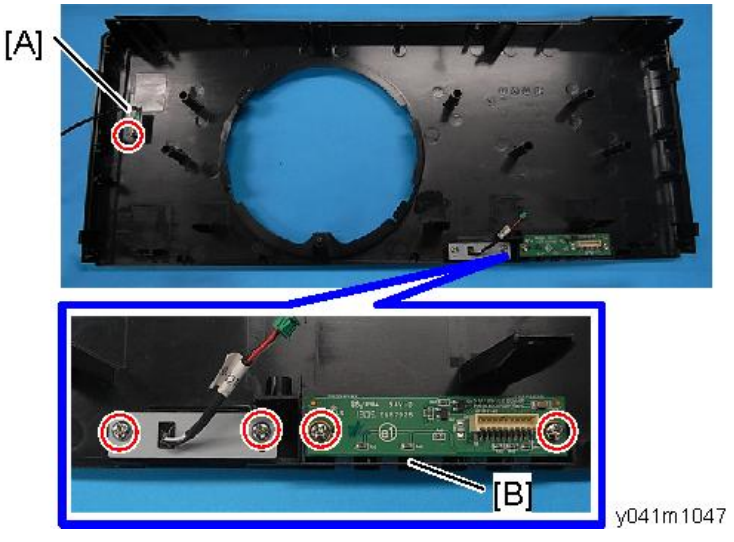
y041m1045

2. **Unplug the 2 connectors to remove the front cover [A].**

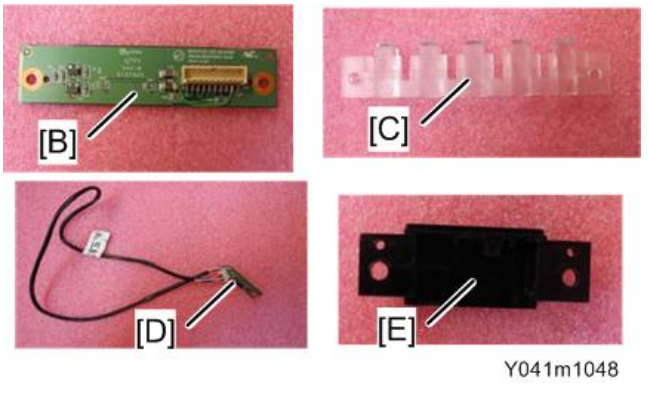


y041m1046

3. **Remove the 5 screws to disassemble:**
   - Thermal board [A],
   - LED board [B],
   - LED cover [C],
   - IR-F sensor [D],
   - IR-F cover [E].



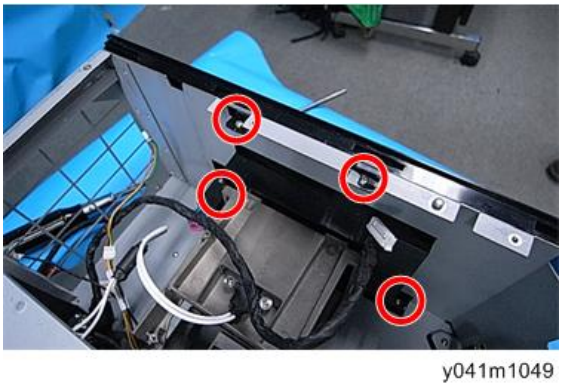
y041m1047



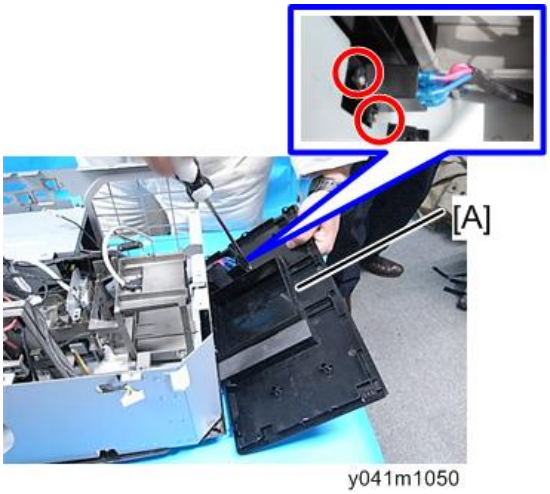
Y041m1048

Right Cover, Lamp Cover

1. **Remove the 6 screws to remove the right cover [A].**

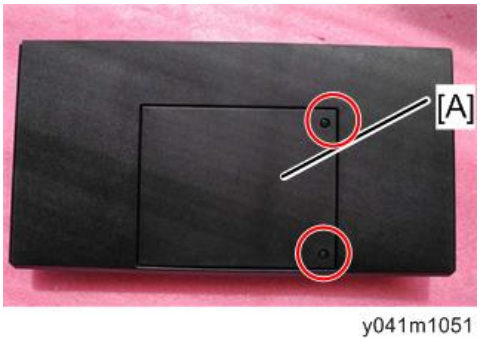


y041m1049



y041m1050

2. Remove the 2 screws to remove the lamp cover [A].



y041m1051

Left Cover, Keypad Rubber, Keypad Board, Speaker, Interrupt switch

1. Remove the 5 screws and unplug the 3 connectors to remove the left cover [A].

y041m1052

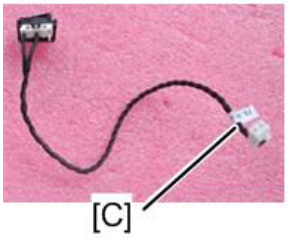
y041m1053

2. **Remove the 9 screws to remove keypad board [A], the keypad rubber [B], interrupt switch module [C], speaker [D], and speaker holder [E].**

y041m1054

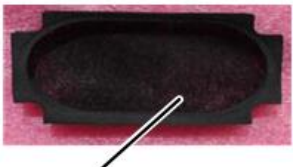
[A]

[B]



[C]

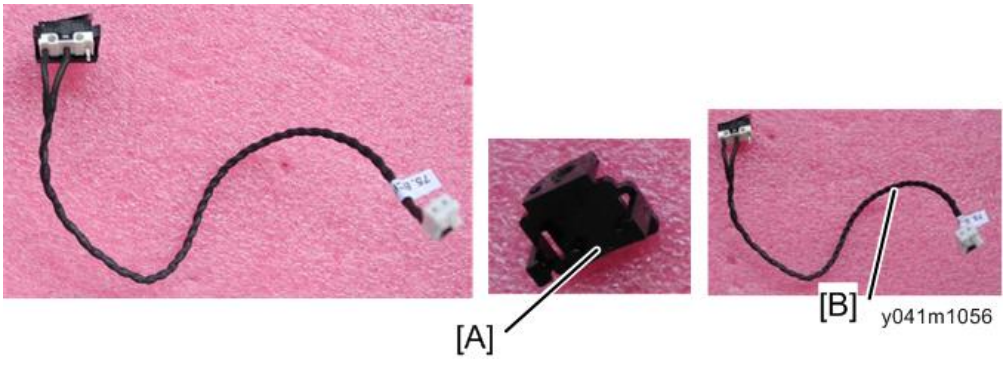
[D]



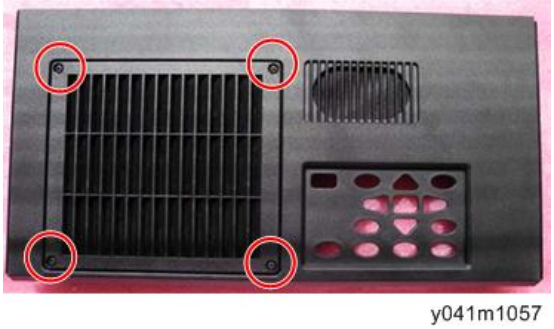
[E]

y041m1055

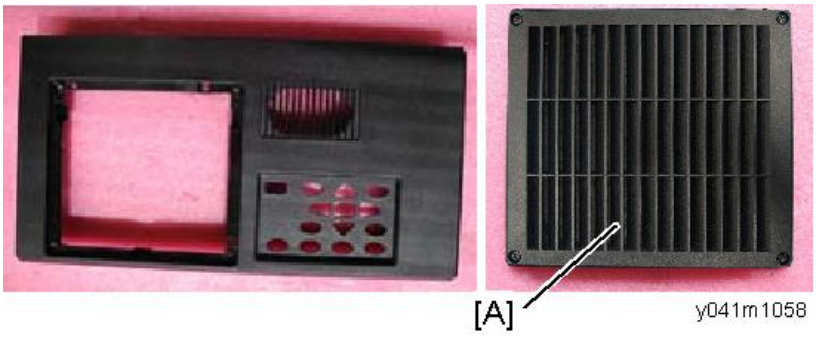
3. Separate the switch holder [A] and interrupt switch [B].



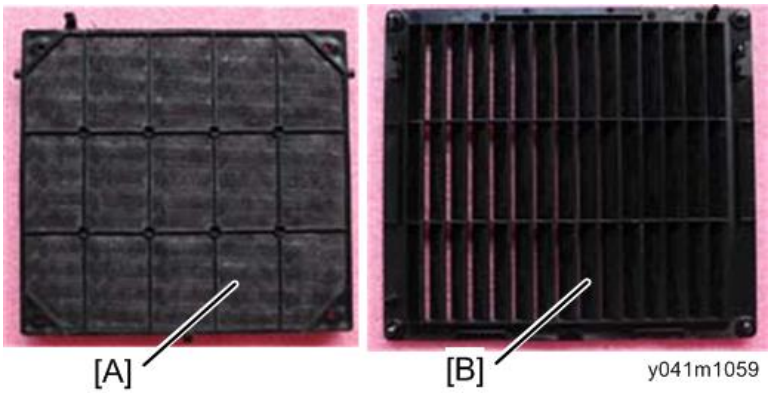
4. Remove the 4 screws to remove vent cover and filter vent cover [A].



y041m1057

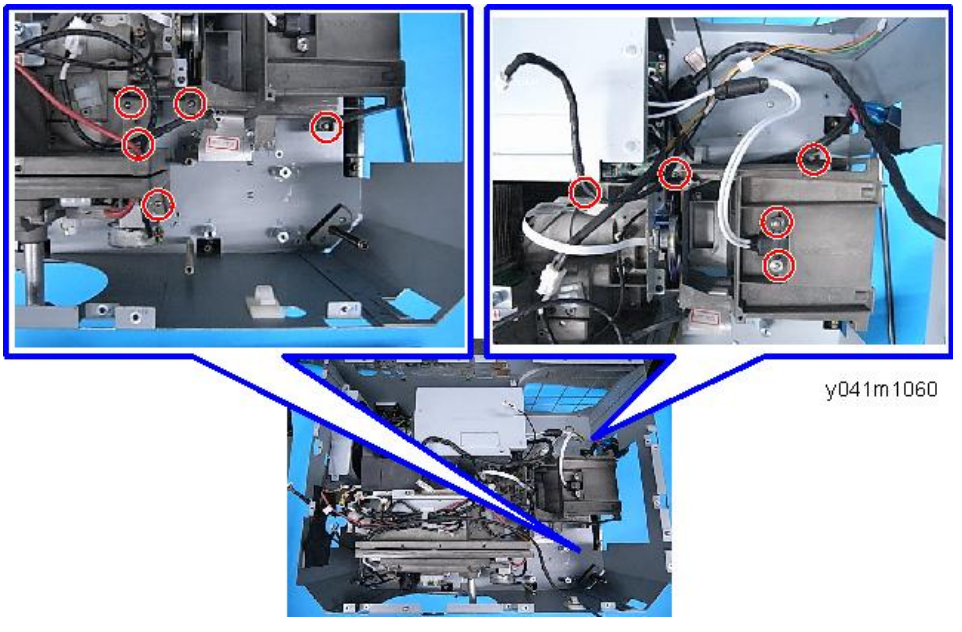


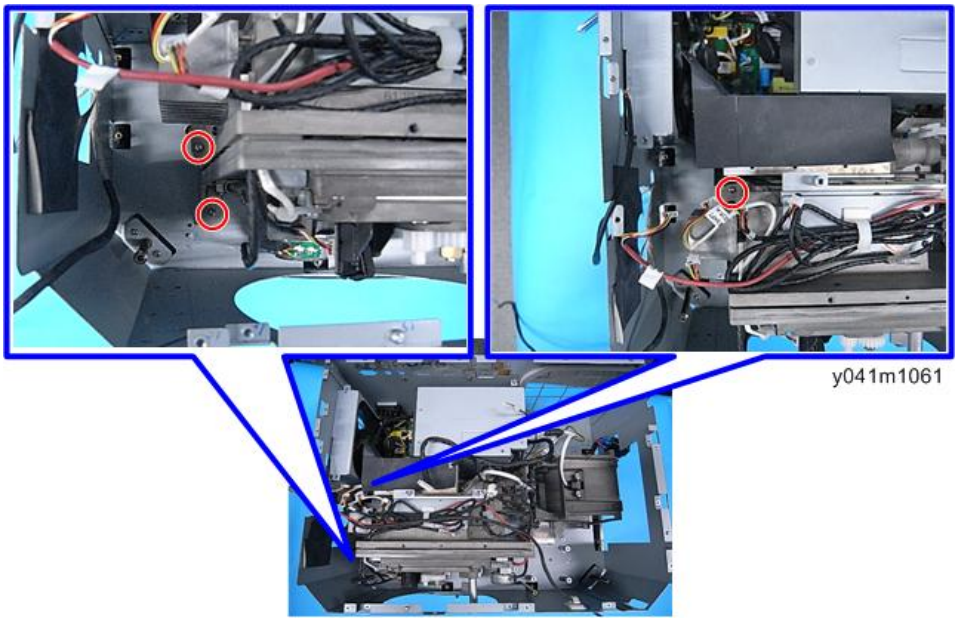
5. Separate the filter vent cover [A] and vent cover [B].



Optical Engine

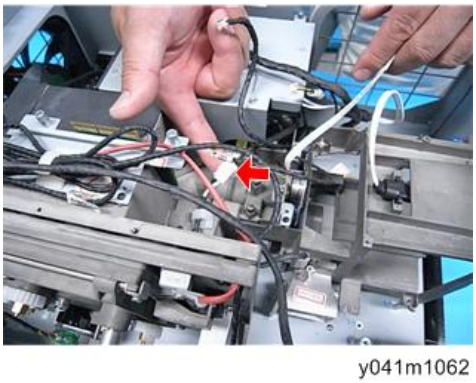
1. Remove the 13 screws.



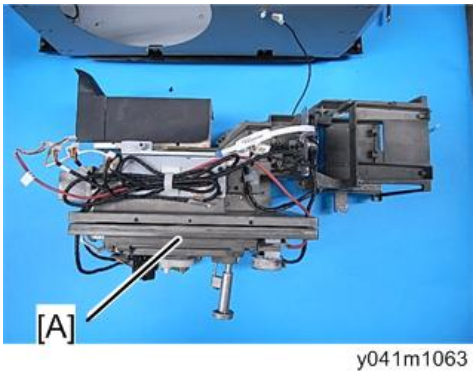


y041m1061

2. Unplug the 1 connector, and then remove the optical engine [A].



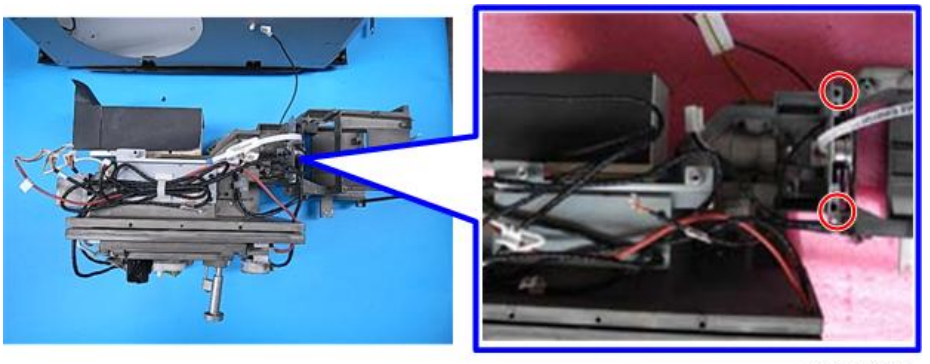
y041m1062



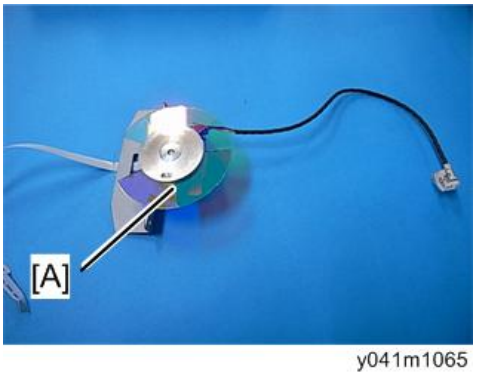
y041m1063

Color Wheel, Photo Sensor Board

1. Remove the optical engine. (page 54 "Optical Engine")
2. Remove the 2 screws to remove the color wheel [A].

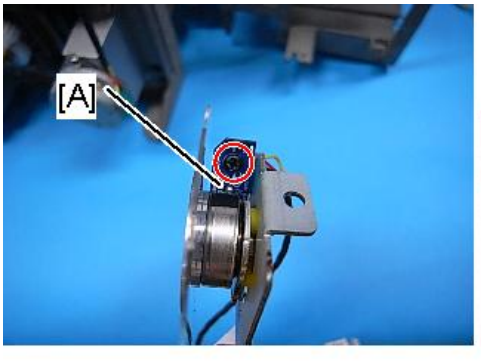


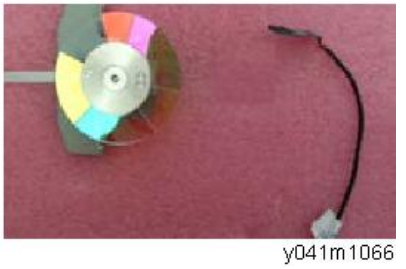
y041m1064



y041m1065

3. Remove the 1 screw to remove the photo sensor board [A].

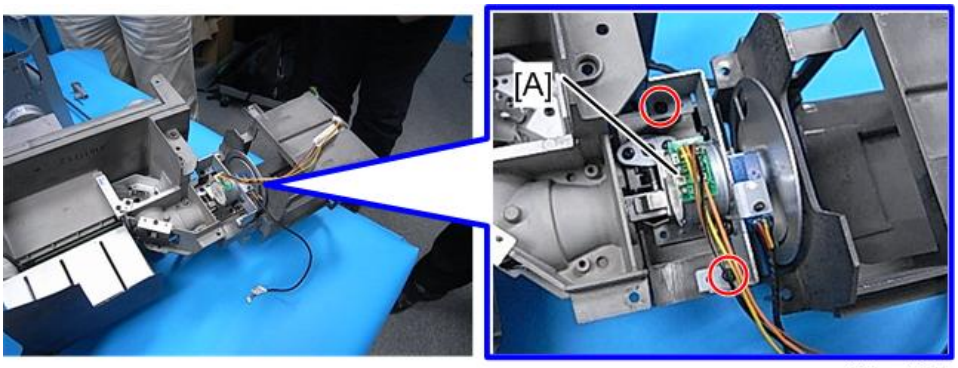




y041m1066

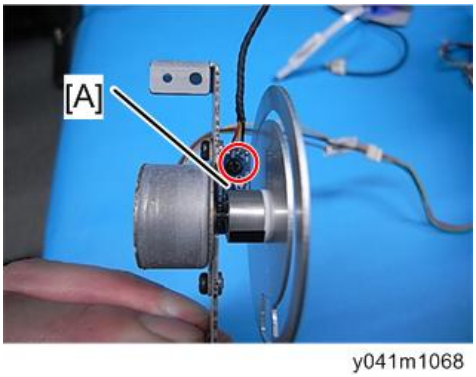
DA module, DA Sensor Board

1. Remove the optical engine. (page 54 "Optical Engine")
2. Remove the 2 screws to remove the DA module [A].



y041m1067

3. Remove the 1 screw to remove the DA sensor board [A].

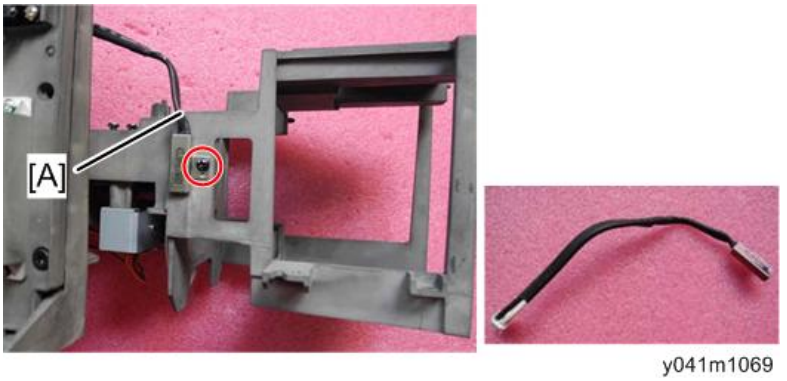


y041m1068

Thermal Switch

1. Remove the optical engine. (page 54 "Optical Engine")

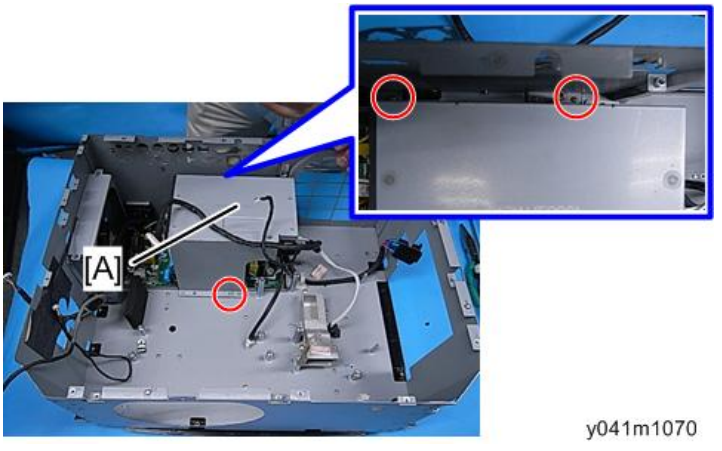
2. **Remove the 1 screw to remove the thermal switch [A].**



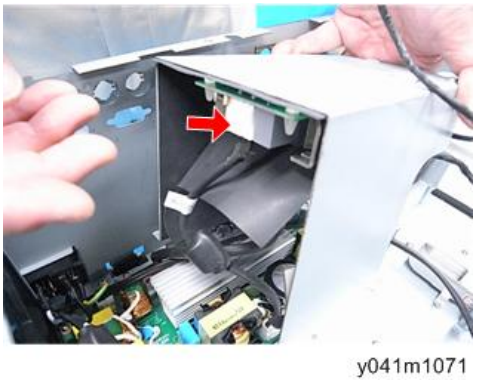
y041m1069

Lamp Driver

1. **Remove the 3 screws and unplug the 1 connector to remove the lamp driver module [A].**



y041m1070

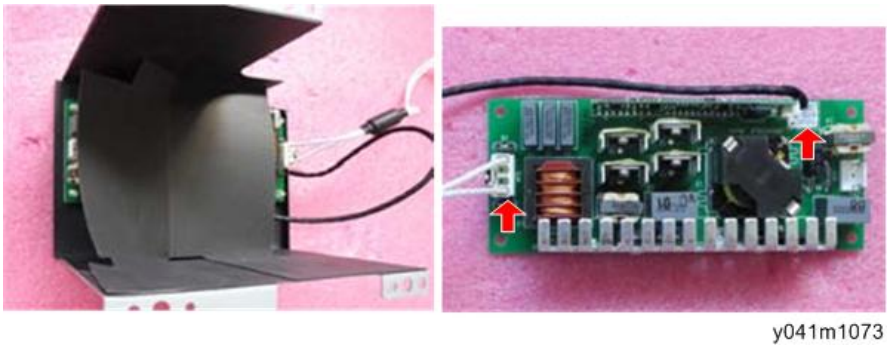


y041m1071

2. Separate the lamp driver from the lamp driver shielding.

y041m1072

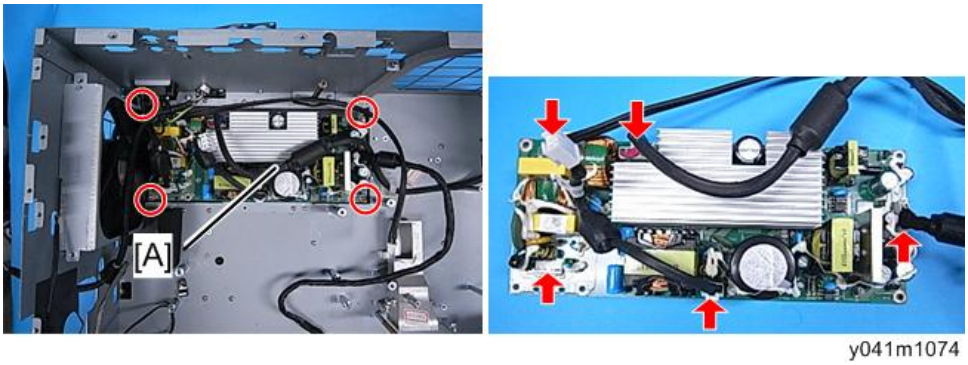
3. Unplug the 2 connectors.



y041m1073

LVPS

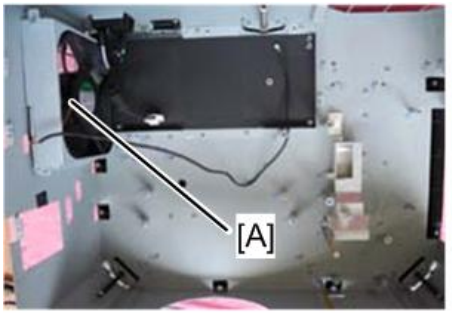
1. Remove the 4 screws and unplug the 5 connectors to remove the LVPS [A].

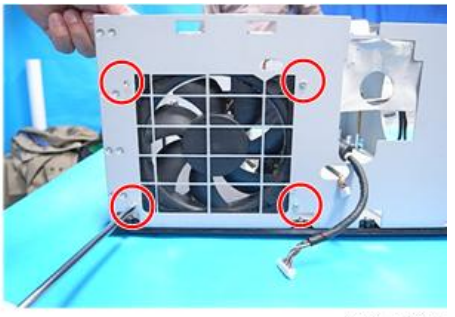


y041m1074

DMD Fan

1. Remove the 4 screws to remove the DMD fan module [A].





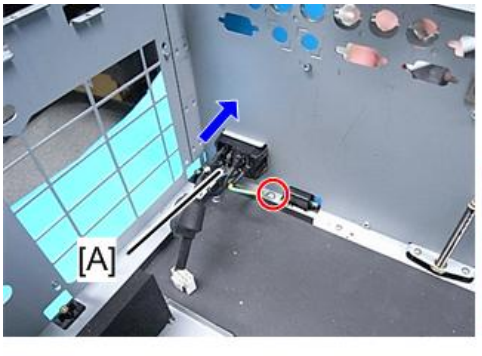
y041m1075

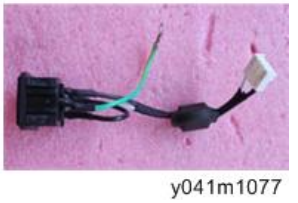
2. Separate the DMD fan, Fan rubber and fan bracket.


y041m1076

Bottom Cover, Bottom Shielding, AC inlet

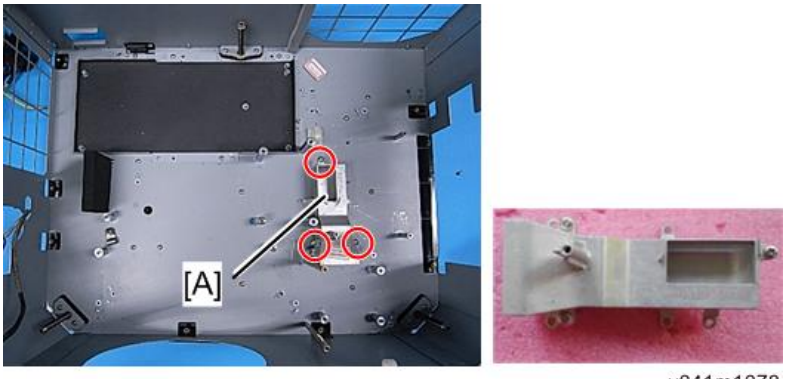
1. Remove the 1 screw to remove the AC inlet [A].





y041m1077

2. **Remove the 3 screws to remove the blower duct [A].**



y041m1078

3. **Remove the 18 screws to separate the bottom shielding [A] and bottom cover [B].**

y041m1079

y041m1080

Required Action After Replacing Parts

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

Action after repair	Changed parts					Software	Description page
	Main board	Optical engine	DA module	Blower	Color wheel	After firmware update	
System firmware update	v					v	Chapter 6. (page 99 "Firmware Update")
Color wheel index	v				v		Chapter 5. (page 95 "Color Wheel Index")
OSD reset	v					v (*1)	Chapter 5. (page 97 "OSD Reset")
DA calibration			v			v	Chapter 5. (page 91 "DA Calibration")
Lens calibration	v	v	v	v	v	v	Chapter 5. (page 91 "Lens Calibration")
Re-write lamp hours	v						Chapter 5. (page 94 "Re-write Lamp Hours")

Action after repair	Changed parts					Software	Description page
	Main board	Optical engine	DA module	Blower	Color wheel	After firmware update	
Re-write Serial Number (S/N)	v						Chapter 6. (page 112 "Re-write Serial Number (S/N)")
Fan calibration	v			v			Chapter 5. (page 92 "Fan Calibration")
Focus adjustment		v					Chapter 5. (page 96 "Focus Adjustment")
Rod adjustment		v (*1)	v (*1)				Chapter 4. (page 85 "Rod Adjustment")

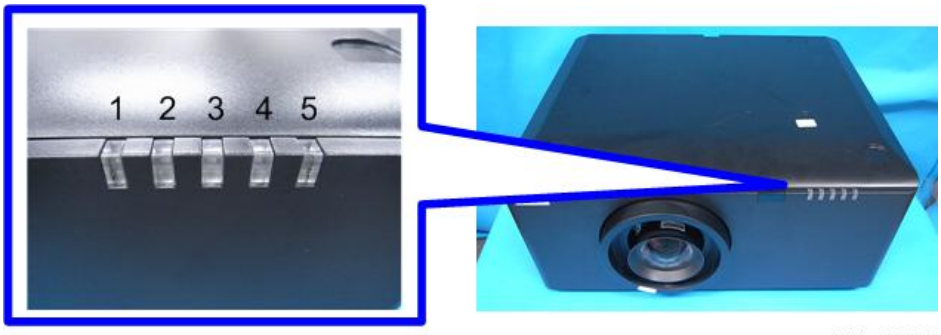
(*1) This action is not always required. Perform it only if the situation demands it.

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

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

4. Troubleshooting

Front Panel LEDs



y041m0086

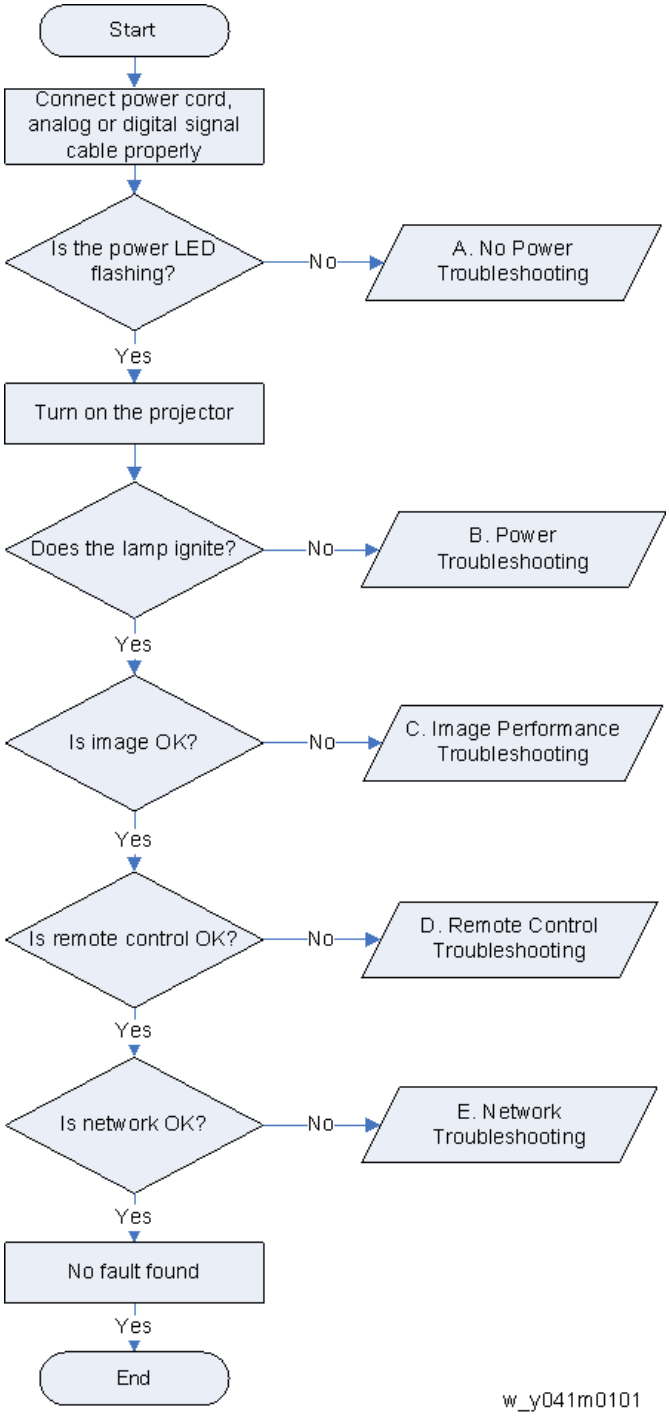
1. Filter LED
2. Error LED
3. Temp LED
4. Lamp LED
5. Power LED

LED status and meanings

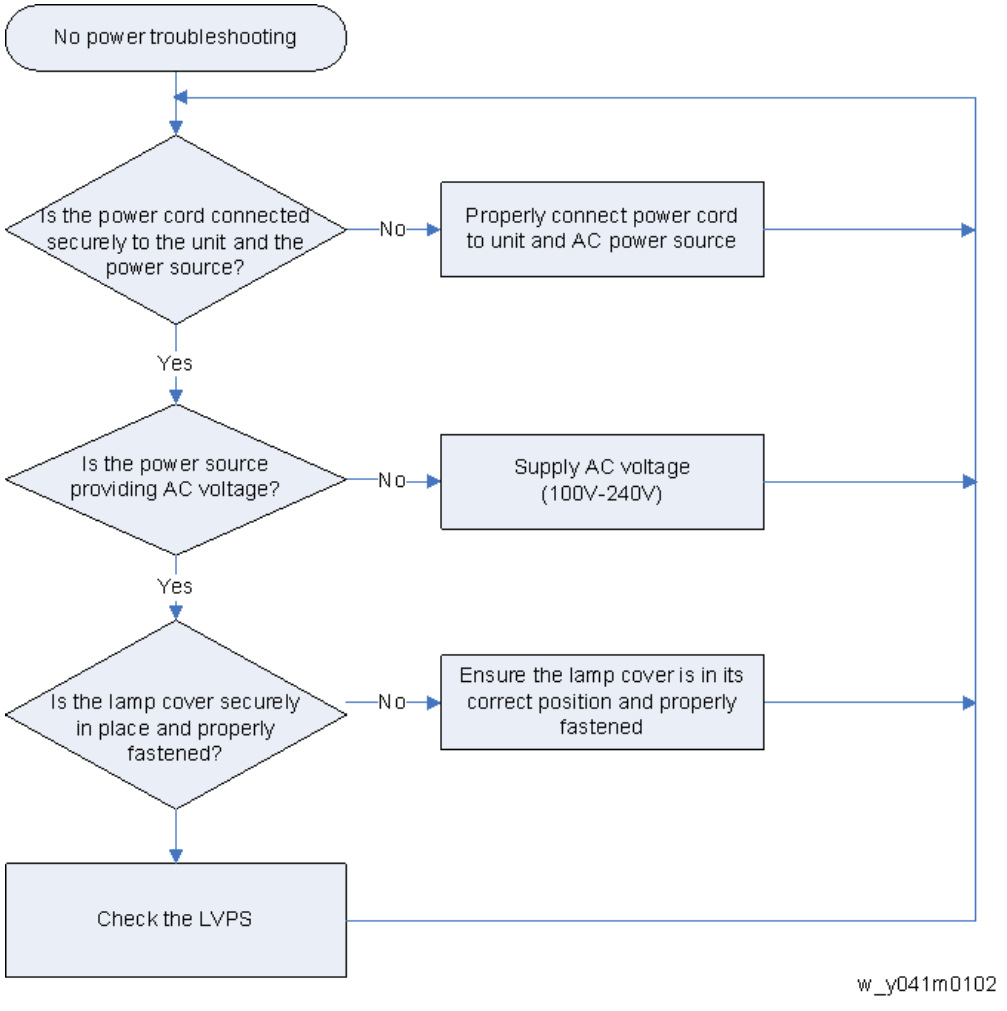
Message	Filter LED (Red)	Error LED (Red)	Temp LED (Red)	Lamp LED (Red)	Power LED (Red)	Power LED (Blue)
Standby state (Input power cord)	-	-	-	-	Flashing	-
Power on (Warming)	-	-	-	-	-	Flashing
Power on & lamp lighting	-	-	-	-	-	Steady light
Power off (Cooling)	-	-	-	-	-	Flashing
Error (Lamp fail)	-	Flashing	-	Steady light	-	-
Error (Fan fail)	-	Flashing	Flashing		-	-
Error (Over temp)	-	Flashing	Steady light	-	-	-

Message	Filter LED (Red)	Error LED (Red)	Temp LED (Red)	Lamp LED (Red)	Power LED (Red)	Power LED (Blue)
Error (Filter Switch)	Flashing	Flashing	-	-	-	-
Burn in (Lamp off)	-	-	-	-	Flashing	Flashing
Shutter on	Steady light	-	-	-	-	-

Main Procedures



A. No Power Troubleshooting

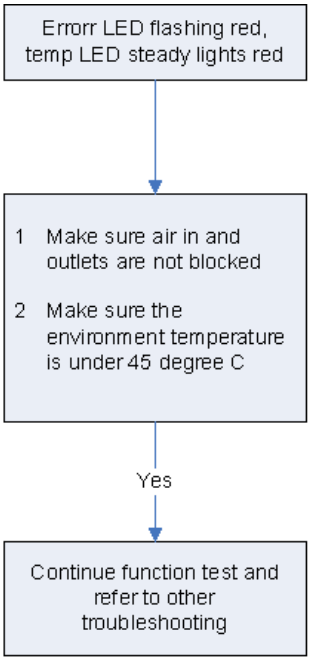


B. Power Troubleshooting

Make sure all connectors are connected properly.

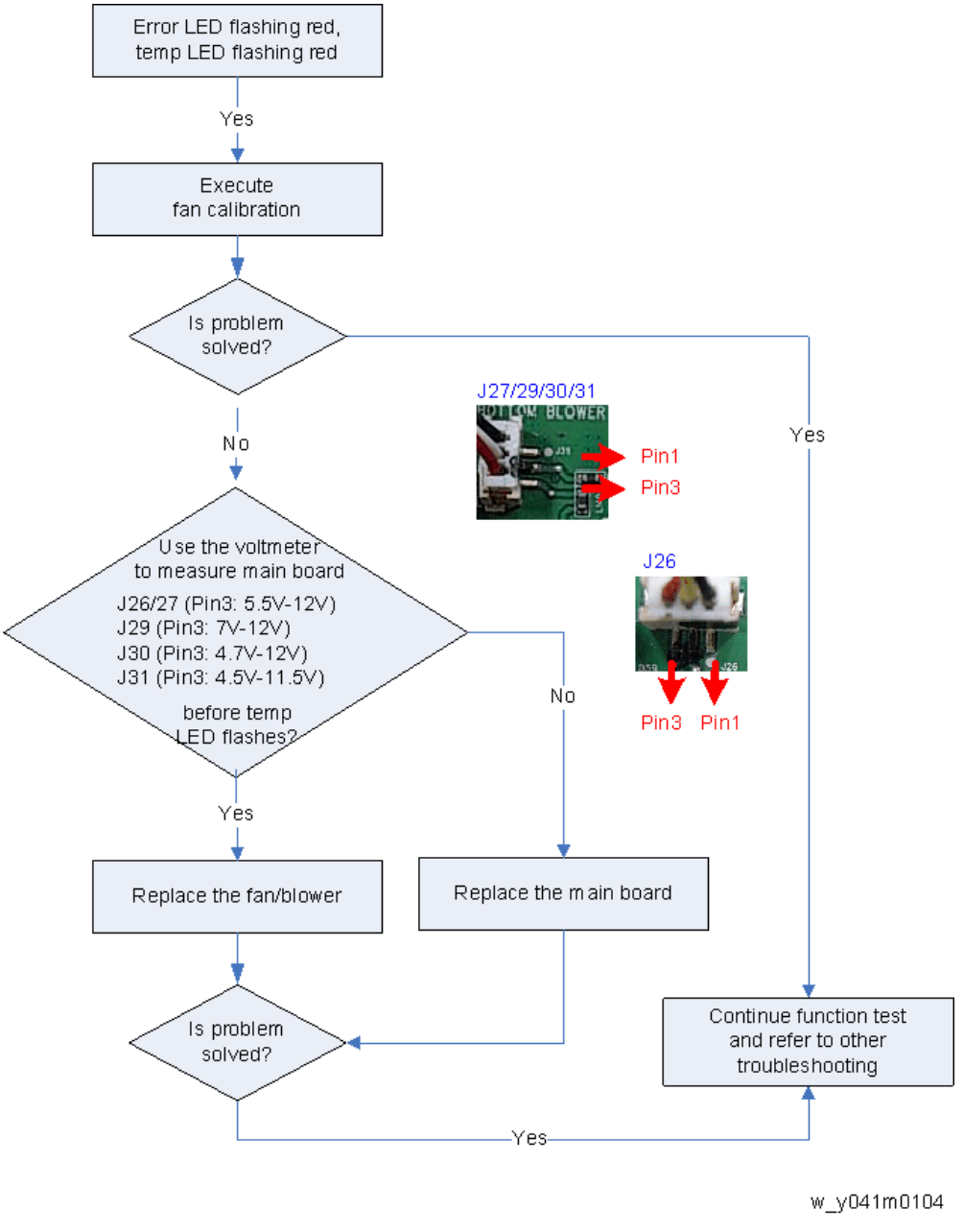
Check LED indicator.

Error LED flashing red, temp LED steady lights red

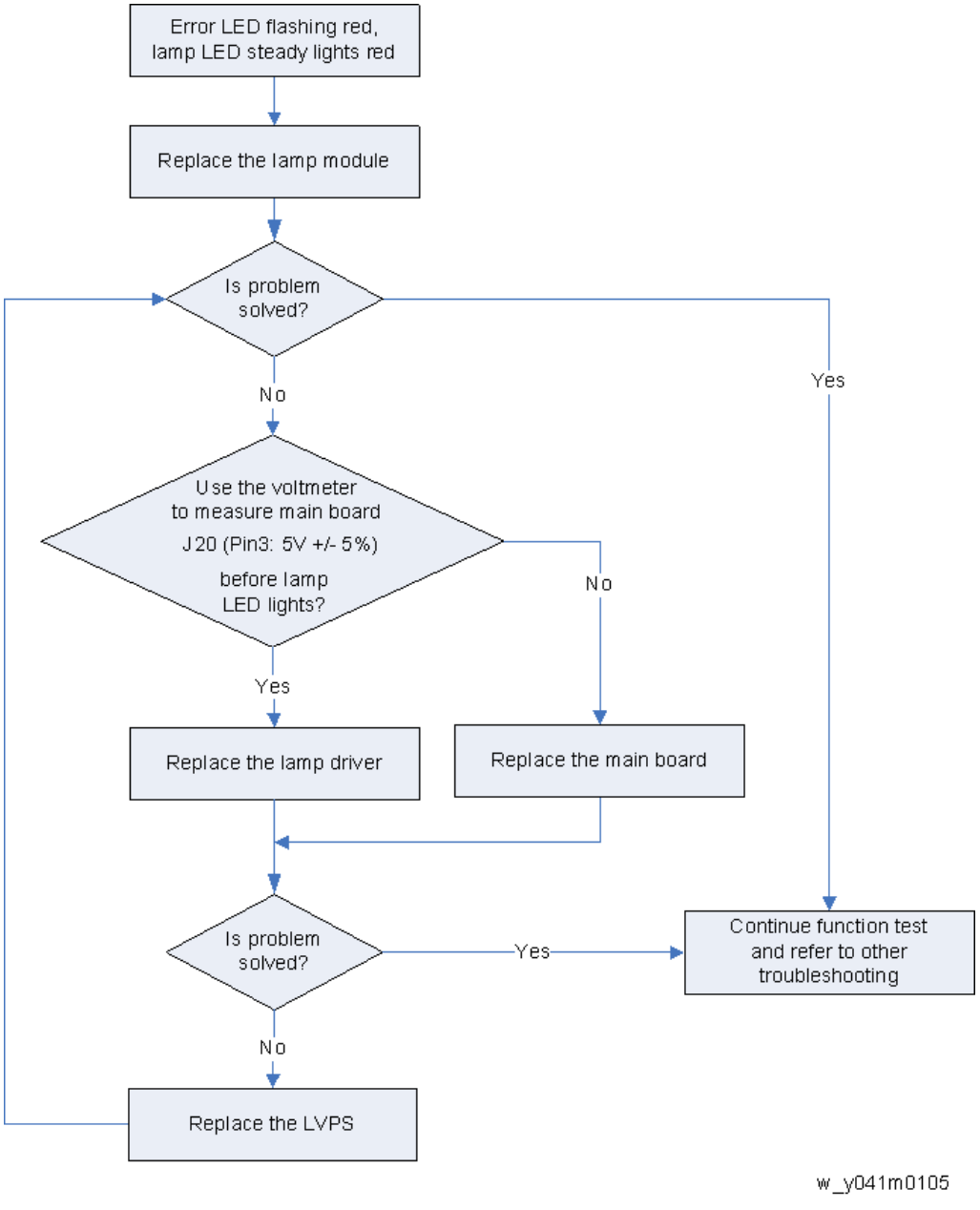


w_y041m0103

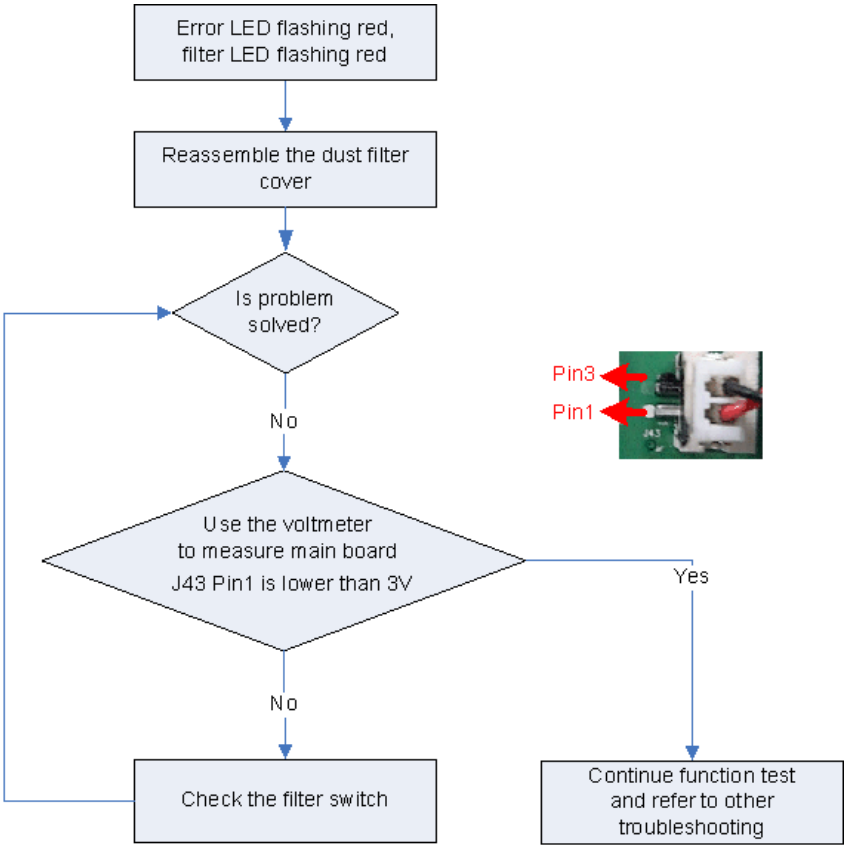
Error LED flashing red, temp LED flashing red



Error LED flashing red, lamp LED steady lights red

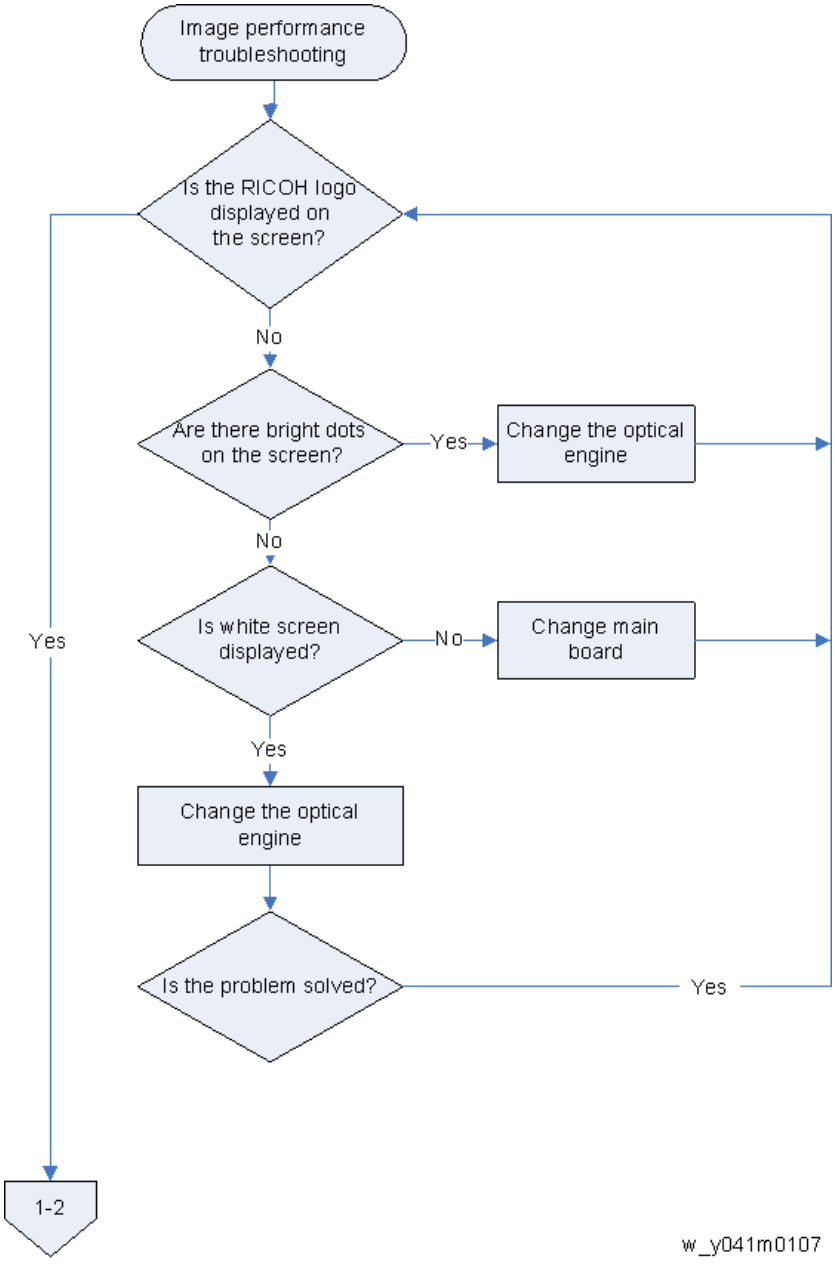


Error LED flashing red, filter LED flashing red

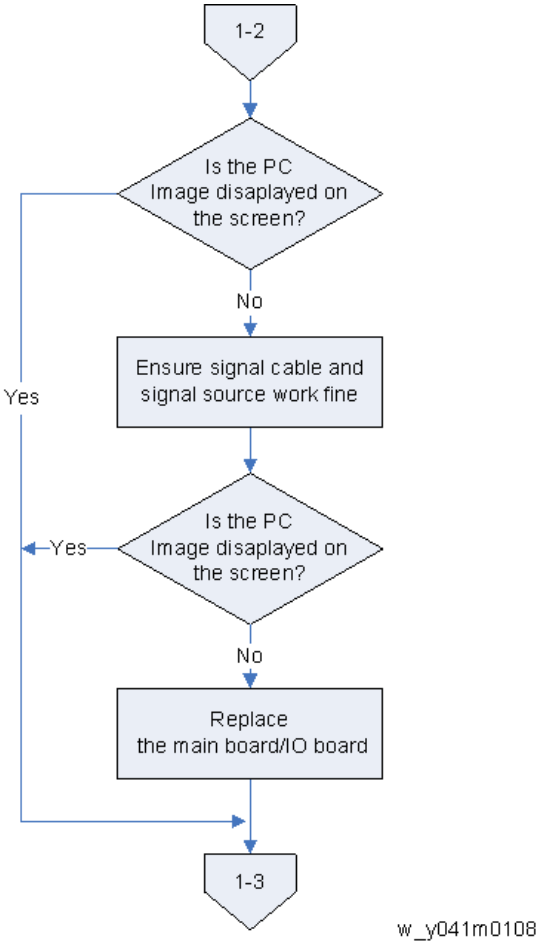


C. Image Performance Troubleshooting

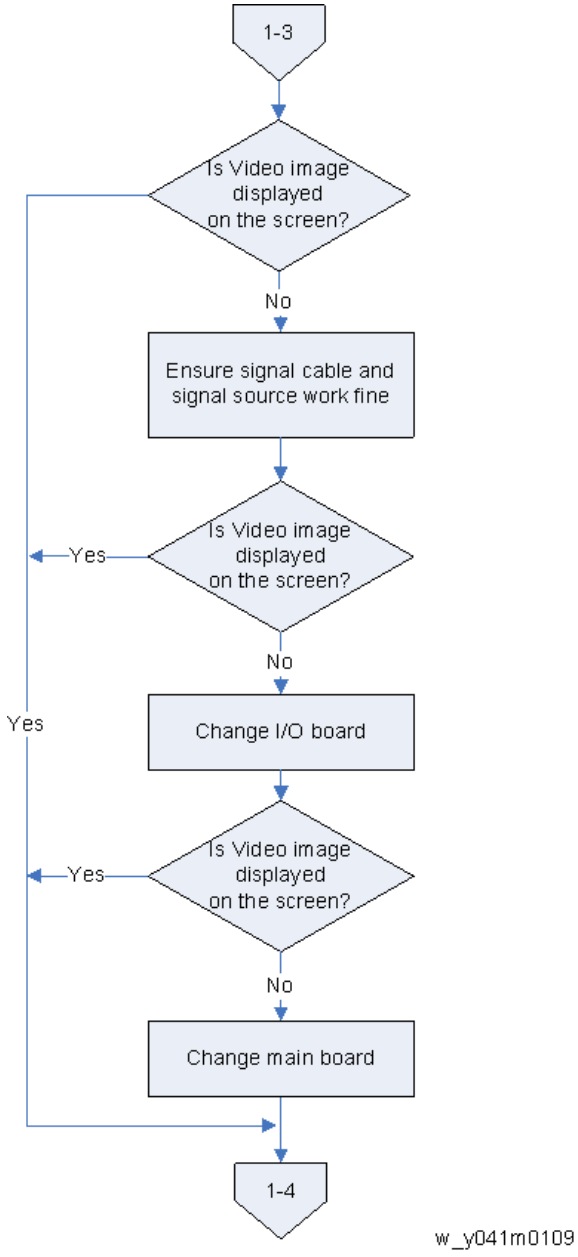
1-1 (Is the RICOH logo displayed on the screen?)



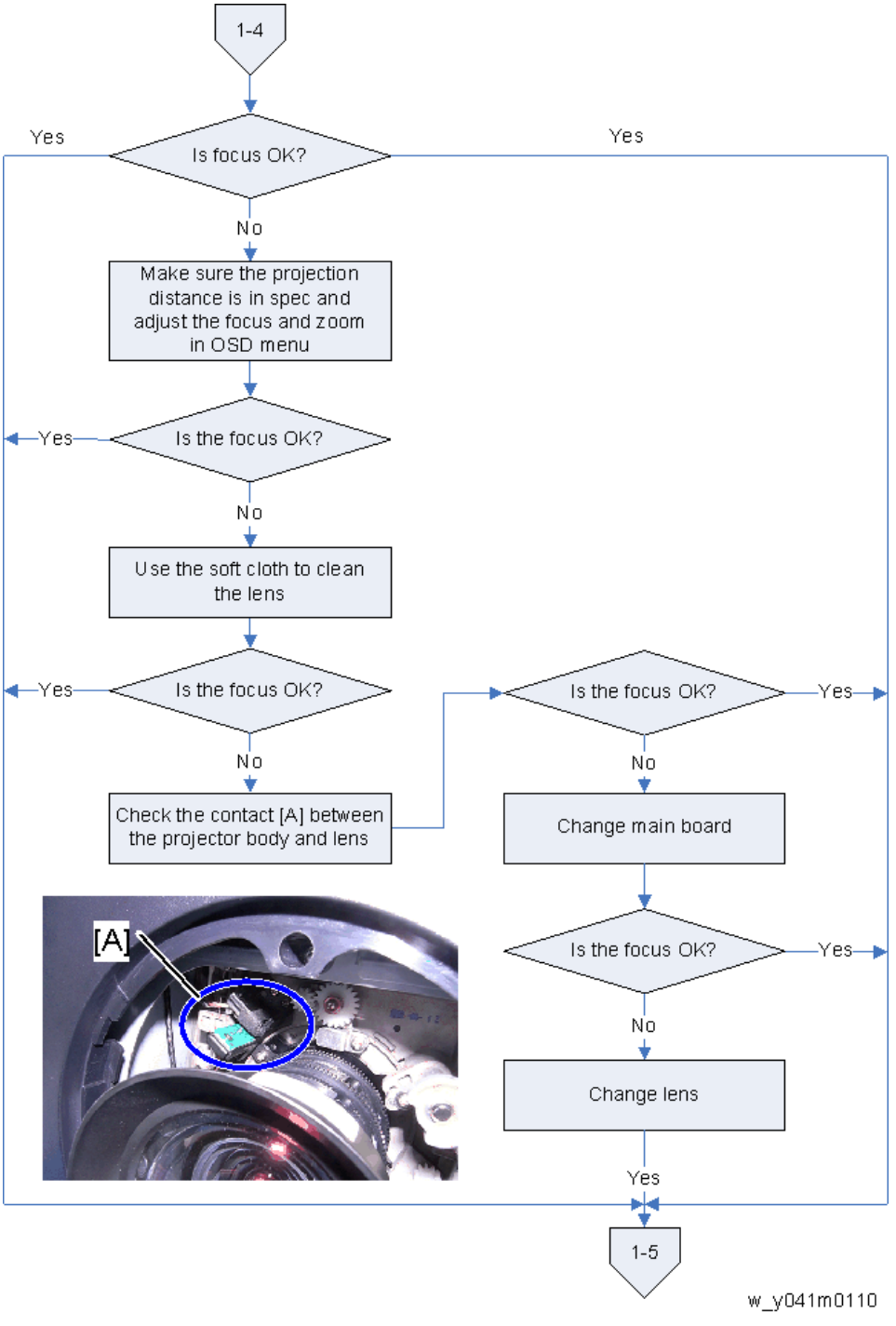
1-2 (Is the PC image displayed on the screen?)



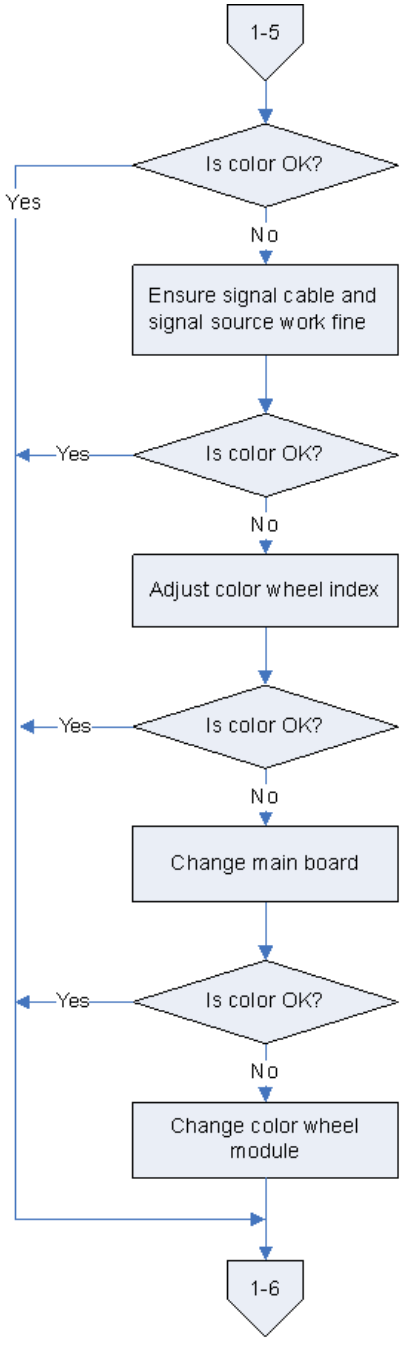
1-3 (Is video image displayed on the screen?)



1-4 (Is focus ok?)

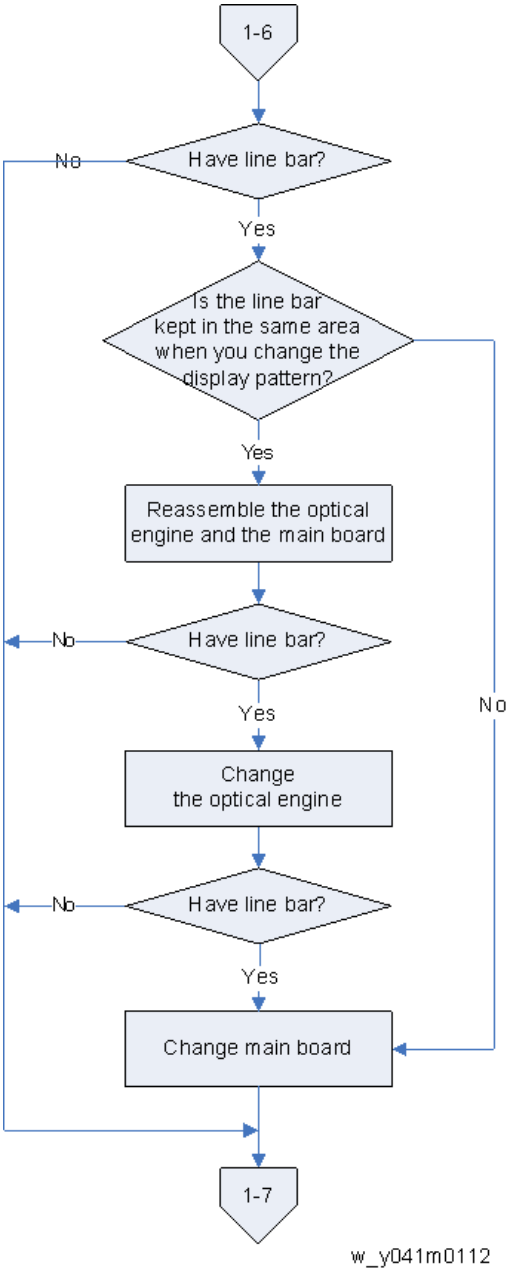


1-5 (Is color ok?)

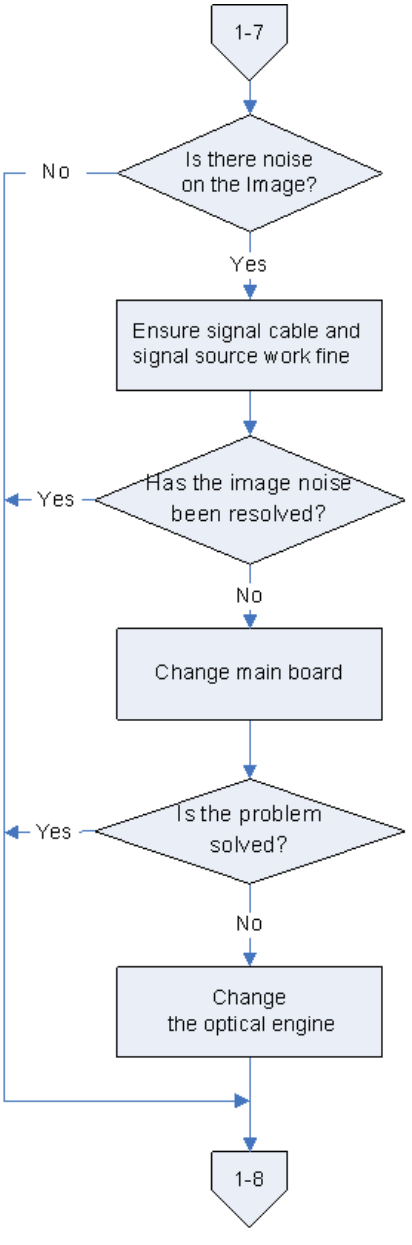


w_y041m0111

1-6 (Have line bar?)

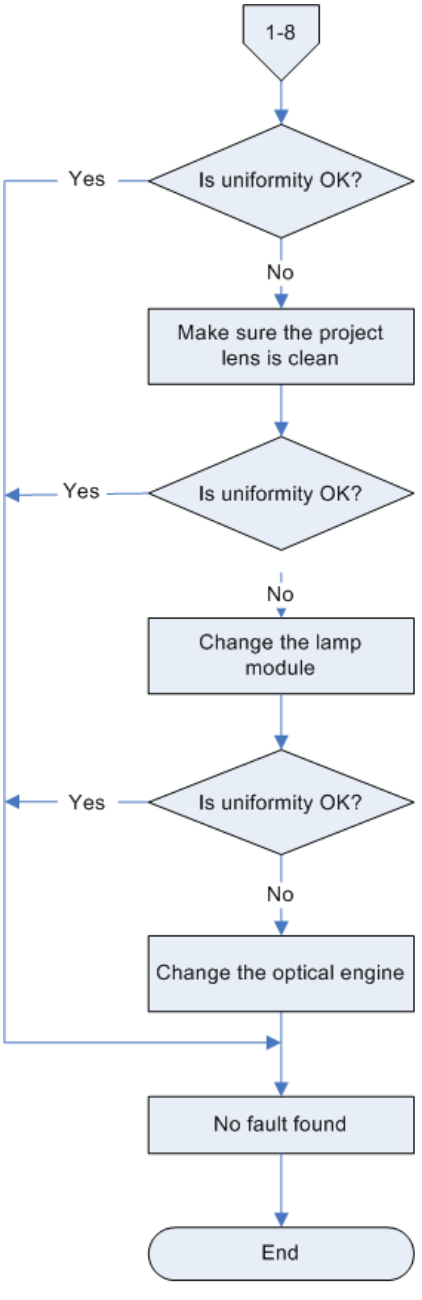


1-7 (Is there noise on the image?)



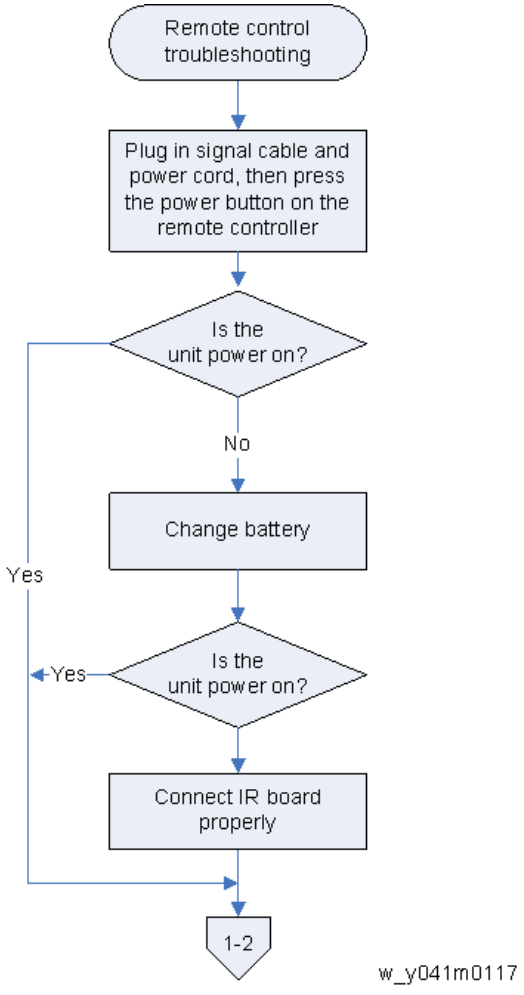
w_y041m0113

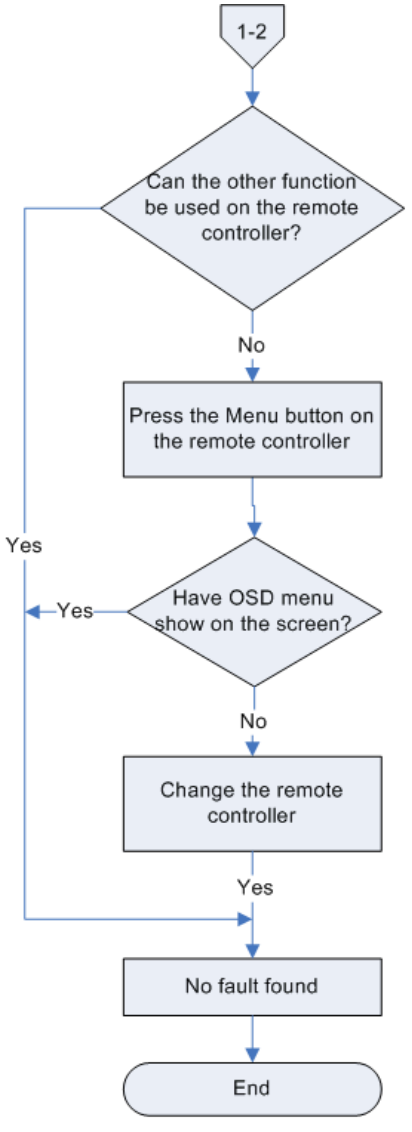
1-8 (Is uniformity ok?)



w_y041m0114

D. Remote Control Troubleshooting

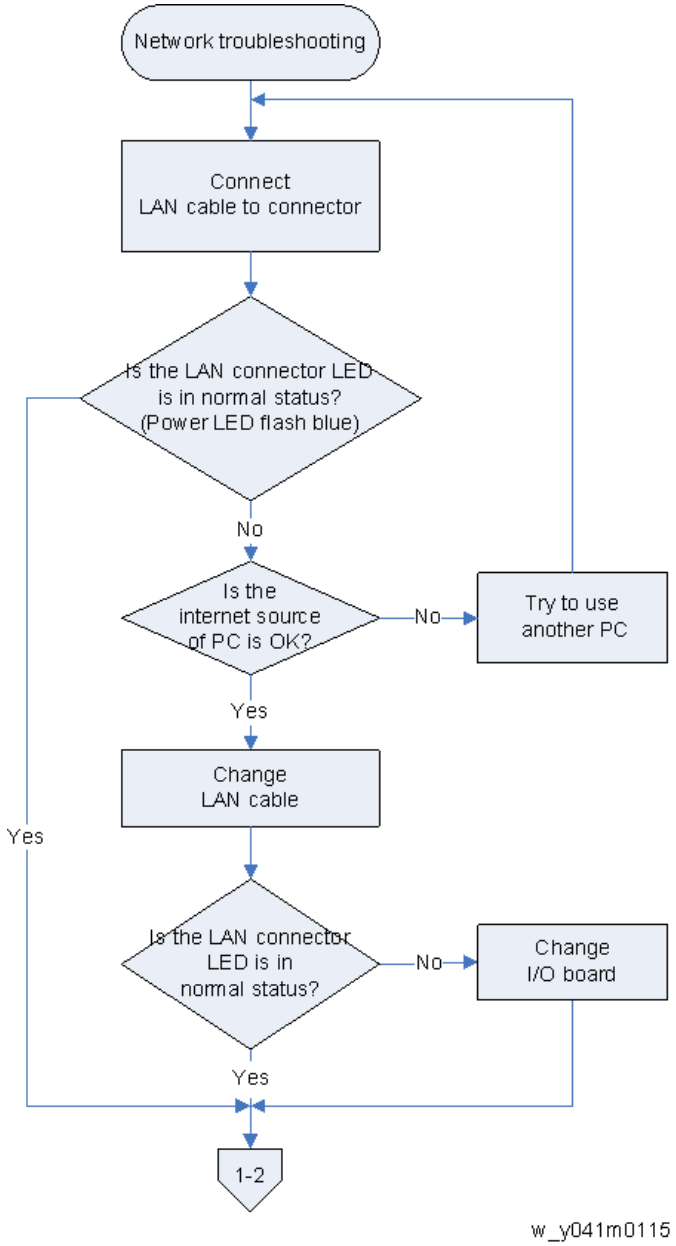



1-2
Can the other function be used on the remote controller?
No
Press the Menu button on the remote controller
Yes
Have OSD menu show on the screen?
Yes
No
Change the remote controller
Yes
No fault found
End

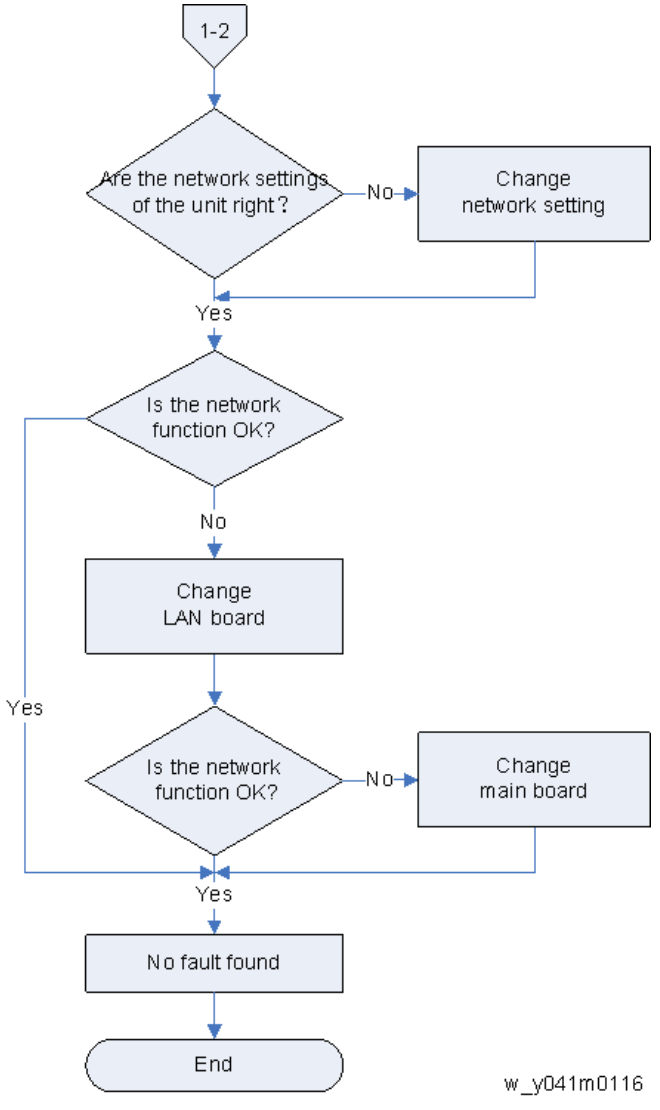
w_y041m0118

E. Network Troubleshooting

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

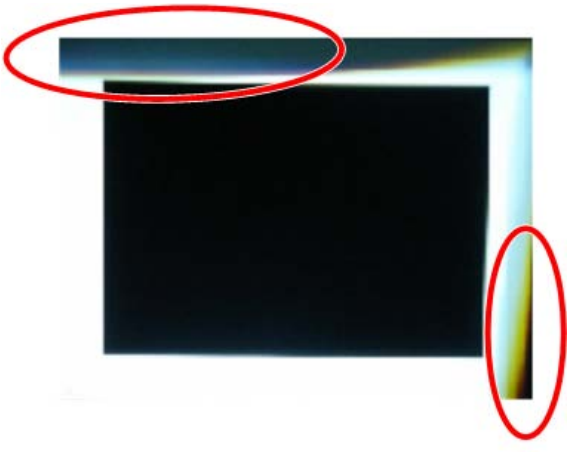


1-2 Are the network settings of the unit right?



Rod Adjustment

If either of the defects ringed in red appears when projecting an image, perform the adjustment described below.



y0180040

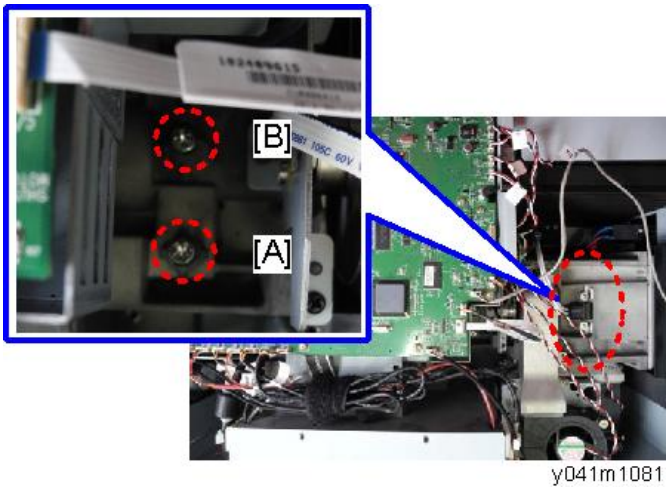
Environment

- The distance between the engine and the screen must be 2.0 M.
- This process should be done in a dark environment (under 2 lux).

Procedure

1. Display a "white" pattern.
2. Adjust the screws to readjust the image.

   Screw [A] should be adjusted first, and then Screw [B]. Adjust until the yellowish or bluish parts disappear.



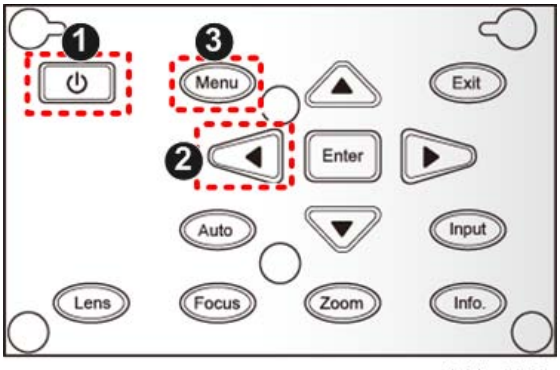
y041m1081

5. Test & Inspection

Service Mode

How to Enter the Service Mode

1. Turn on the projector.
2. Press the "Power [1]", "Left [2]", "Left [2]" and "Menu [3]" keys sequentially.



w_y041m0013

Note

- You can use the remote controller to enter the service mode in the same way.
- 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
Model Name	Shows the name of the projector.

Setting Item	Description
FW / PIC ver:	Shows the present PW392/PIC firmware version of the projector. (page 99 "PIC/PW392/DDP2431 FW Update")
LAN / DDP ver:	Shows the present LAN/DDP2431 firmware version of the projector. (page 104 "LAN Firmware Update Procedure") (page 99 "PIC/PW392/DDP2431 FW Update")
GEO ver:	Shows the present GEO board version of the projector.
Lamp Driver ver:	Shows the present lamp driver version of the projector.
MAC:	Shows the MAC address of the projector.
SN:	Shows the serial number of the projector. (page 112 "Re-write Serial Number (S/N)")
Display Hour	Shows the operating hours of the projector. You can also rewrite the lamp hours. (page 94 "Re-write Lamp Hours")
Lens Calibration	Use this to calibrate the lens of the projector. (page 91 "Lens Calibration")
Temperature	DFU
Wave Form IDs	Shows the wave form IDs of the projector.
Wave Form ID	DFU
Security Code	DFU
Color Wheel	Use this to adjust the R/G/B value to improve the image when the color reproduction is not correct. (page 95 "Color Wheel Index")
Factory Reset	DFU
Burn in setting	DFU
Spoke Test	DFU
Internal Pattern Test	DFU
Color Calibration	DFU

Setting Item	Description
Error Log	Records the times of the failure of power on of the projector such as excessive temperature, lamp failure or fan lock.
Current Blower	Shows the current blower RPM values of the projector.
Factory Blower	Shows the factory blower RPM values of the projector.
Lamp Voltage	Shows the lamp voltage value of the projector.
Mode Adjust	DFU
DA Calibration	Use this to calibrate the DA of the projector. (page 91 "DA Calibration")
Custom Pattern	DFU
Rotation Mode	DFU

Test Equipment and Conditions

Test Equipment Needed

- PC
- DVD player with multi-system, equipped with "Component", "Composite", "S-Video" and "HDMI".
- HDTV source (480P,720P,1080i,1080P)*

  * You can also use a computer with an HDMI port.

Recommended Test Condition

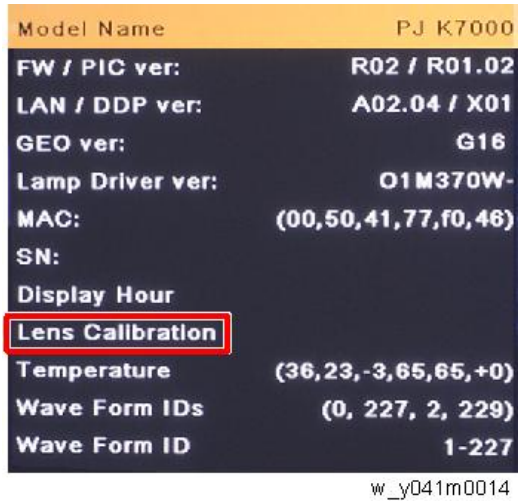
- Ambient brightness: Dark room less than 2 lux.
- Product must be warmed up for 3 minutes.
- Screen size: 60 inches diagonal.

Calibration

Lens Calibration

After repairing the lens unit, lens calibration should be done. (page 62 "Required Action After Replacing Parts ")

1. **Put the projector on a horizontal place.**
2. **Press the "Power -> Left -> Left -> Menu" keys to get into service mode.**
3. **Select "Lens Calibration" to execute lens calibration.**



w_y041m0014

Inspection item

Check if the lens shift module is moving smoothly.

Criteria

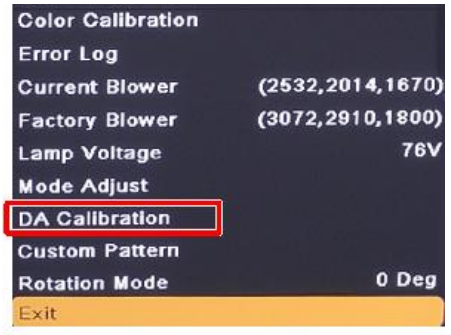
If the lens shift module does not move smoothly or sounds noisy, check whether the motor is working properly. If the motor is working properly, replace the optical engine.

DA Calibration

When the image is too dim, do ''DA Calibration".

1. **Press the "Power -> Left -> Left -> Menu" keys to get into service mode.**

2. **Choose “DA Calibration”.**



w_y041m0015

3. **Select ‘‘DA Reset’’, then press the “Enter” key to reset.**

w_y041m0016

Fan Calibration

After replacing a Blower (TC Blower, Top Blower, Bottom Blower) or the main board, do the following steps.

Before doing fan calibration, the unit must be cooled down, or the calibration will be fail.

1. **Put the projector on a horizontal surface.**
2. **Insert the power cord and turn the power switch.**
3. **Press and hold down the “Up” key, then press the "Power" key, then release the "Up" key until the power LED changes from purple to blue.**

   After fan calibration is finished, the projector will start automatically..
4. **Press the “Power -> Left ->Left -> Menu” keys to get into service mode and check "Factory Blower".**

w_y041m0017

The three numbers (RPM values) for “Factory Blower” must be within the following ranges: 2888~3088, 2660~2860, 1654~1854.

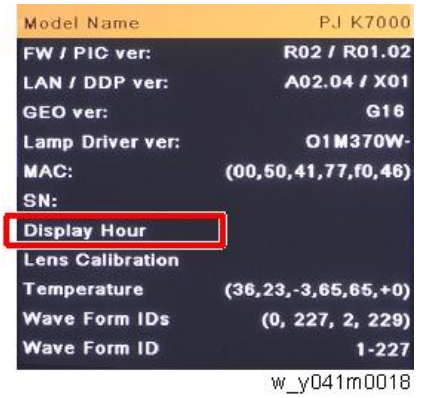
If the RPM does not meet the above ranges, replace the blower.

Re-write Lamp Hours

After replacing the main board, you must rewrite the lamp hours.

Write down the lamp hours before the replacement and put back the same value after replacing the board.

1. **Press the “Power -> Left -> Left -> Menu” keys to get into service mode.**
2. **Select "Display Hour" and then press the "Enter" key.**



w_y041m0018

3. **Select “Lamp Hours (Normal)”, then use the “Left” or “Right” keys to re-write the Lamp Hours.**

w_y041m0019

4. **Select “Lamp Hours (Eco)”, then use the “Left” or “Right” keys to re-write the Lamp Hours.**

w_y041m0020

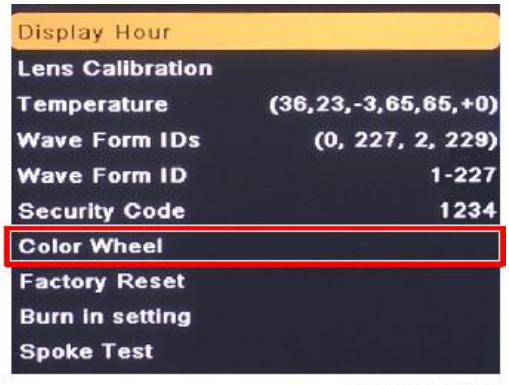
Note

- “Left” key = decrease lamp hours
- “Right” key = increase lamp hours

Color Wheel Index

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

1. **Press the “Power -> Left -> Left -> Menu” keys to get into service mode.**
2. **Select "Color Wheel", and then press the "Enter" key.**



w_y041m0088

3. **Select "CW Index ", then use the "Left" or "Right" keys to adjust the color balance of the projected image.**

w_y041m0087

Focus Adjustment

1. Try projecting an image from the distance at which you expect to use the projector.
2. Press [Zoom] on the control panel or remote control to check that the zoom operates normally.
3. Press [Focus] on the control panel or remote control to check that the focus adjustment operates normally.

Test Inspection Procedure

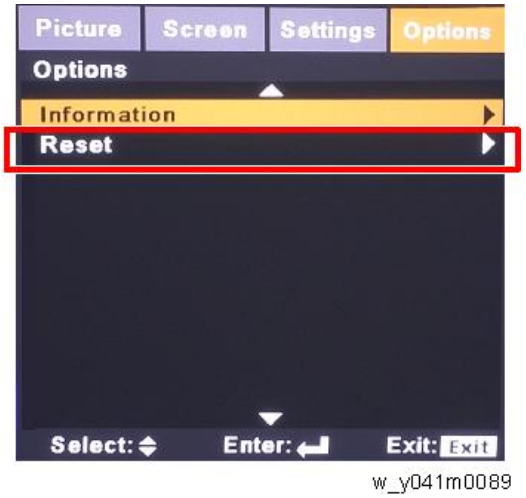
Check points

Check item	Check point
Firmware version	All firmware version must be the latest version
TB implementation	Related TB must be implemented
Exterior	The exterior must be undamaged.
Logo	Missing logo, missing prints and blurred prints are unacceptable
Lamp cover	It should be locked in the correct place.
Zoom in/out	The function should work smoothly
Keypad	All keypad keys must operate smoothly

OSD Reset

After the final QC step, we have to erase all saved change again and restore the OSD default setting. The following actions will allow you to erase all end-users' settings and restore the default setting:

1. **Press the “Menu” key to enter the OSD menu.**
2. **Select "Options" and then execute the "Reset" function.**



w_y041m0089

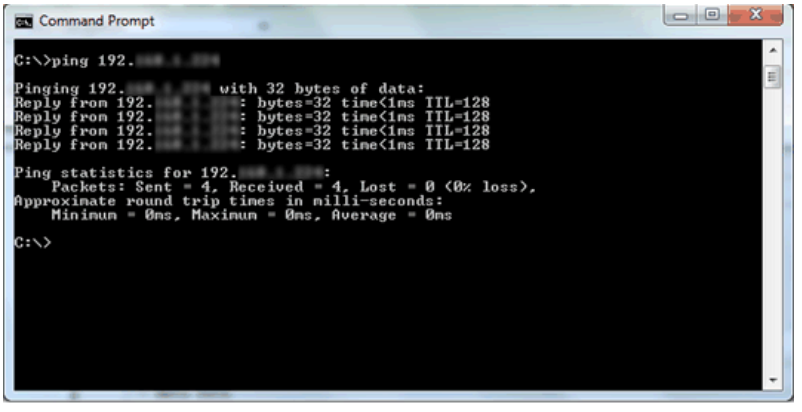
Network Test

1. **Connect one end of the LAN cable to the LAN connector on the projector and the other end to the network.**
2. **Connect the computer to the network.**
3. **Open the Windows Command Prompt.**
4. **Enter the ping command as follows, and then press the Enter key to execute it.**

   ping xxx.xxx.xxx.xxx

   The "xxx" fields represent the projector's IP address.

   Example: ping 192.168.0.100



w_y041m0090

5. **Check the communication result.**

   If communication succeeds

   The message "Reply from xxx.xxx.xxx.xxx: bytes=xxx time=xxms TTL=xxx" appears. (The "xxx" fields vary according to the operating environment.)

   If communication fails

   The message "Request timed out." or "Destination Host Unreachable." appears. If this happens, check the following:

   - Check whether the projector's LAN cable is connected properly.

   - Press the projector's Menu key and select "Settings" and then "Network" in the OSD menu to check whether the network settings have been configured correctly.

6. Firmware Update

PIC/PW392/DDP2431 FW Update

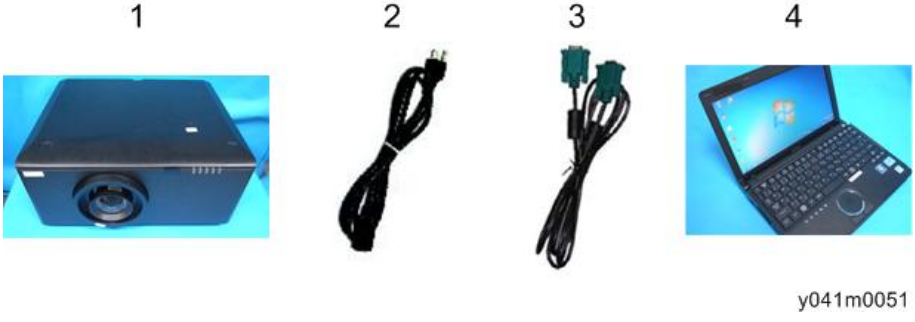
Equipment Needed

Software

- FW update file

Hardware

1. Projector
2. Power cord
3. Female to female RS232 cable
4. PC

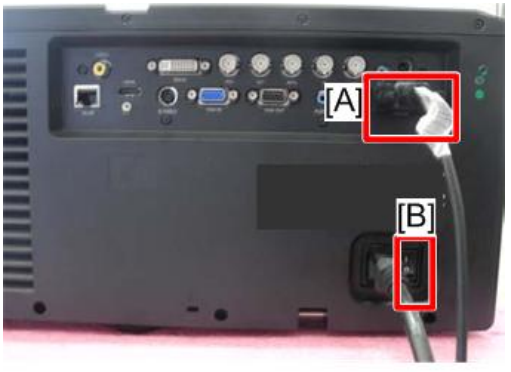


Firmware Update Procedure

Connection

1. **Plug in the power cord.**

2. Connect the projector and PC with the RS232 cable [A].

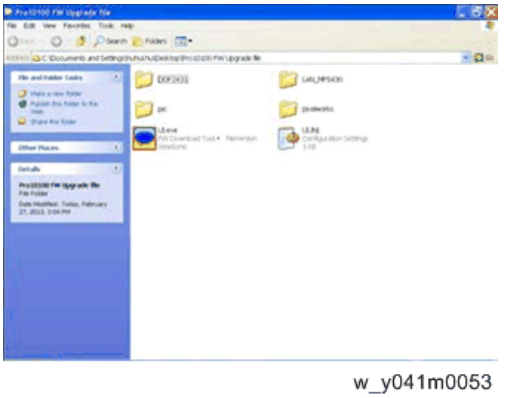


y041m0052

3. Turn on the "Power Switch" [B], and let the projector get into standby mode.

Download software and update

1. Download the latest FW program file from the website, unzip the file and save it on your desktop, then double click the folder.

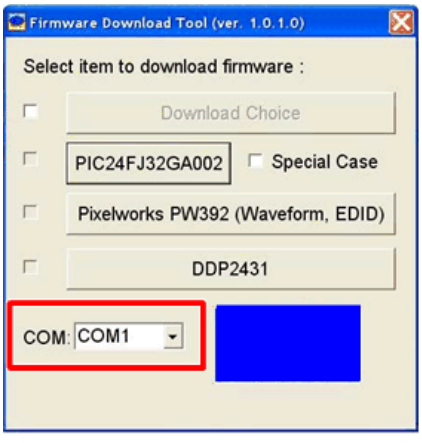


w_y041m0053

2. Execute the UI.exe file.

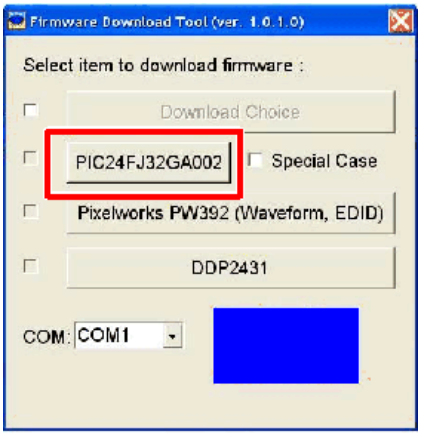
w_y041m0054

3. **Select the COM port which you are using (see the red square below for an example).**



w_y041m0055

4. **Click "PIC24FJ32GA002" to update the PIC firmware.**



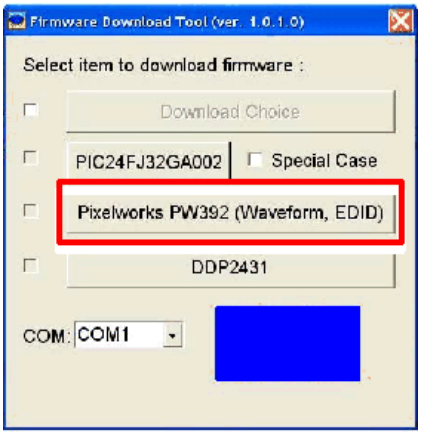
w_y041m0056

The PIC firmware will run automatically.

5. **"Download OK" will appear. Click "OK".**

w_y041m0057

6. **Click "Pixelworks PW392 (Waveform, EDID)" to update the PW392 firmware.**



w_y041m0058

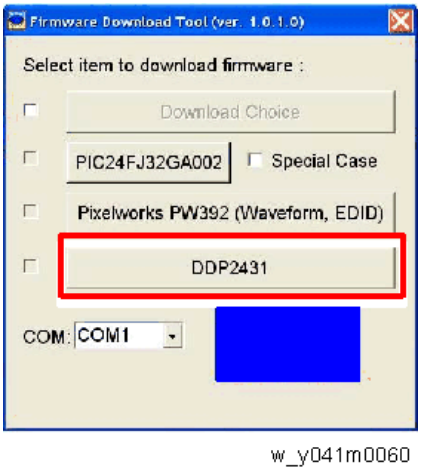
The PW392 firmware will run automatically.

7. **"Flash Completed" will appear. Click "OK".**

w_y041m0059

After updating the PW392 firmware, the projector power will turn on automatically. Please ignore it, and continue to update the DDP2431 firmware.

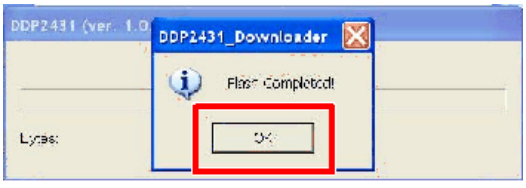
8. **Click "DDP2431" to update the DDP2431 firmware.**



w_y041m0060

The DDP2431 firmware will run automatically.

9. **“Flash Completed” will appear. Click “OK“.**

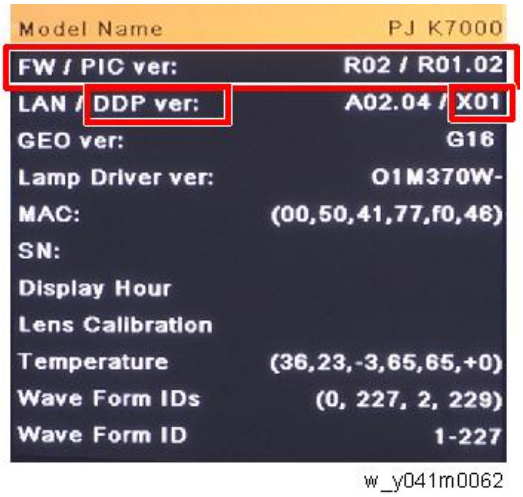


w_y041m0061

Check the PW392/PIC/DDP2431 FW version

1. **Restart the projector.**
2. **Press the "Power -> Left -> Left -> Menu" keys to get into service mode to check the PW392/PIC/DDP2431 FW version.**

   "FW / PIC ver:" shows, on the left, the PW392 firmware version and, on the right, the PIC firmware version.



w_y041m0062

LAN Firmware Update Procedure

Equipment Needed

Software

- LAN firmware update file

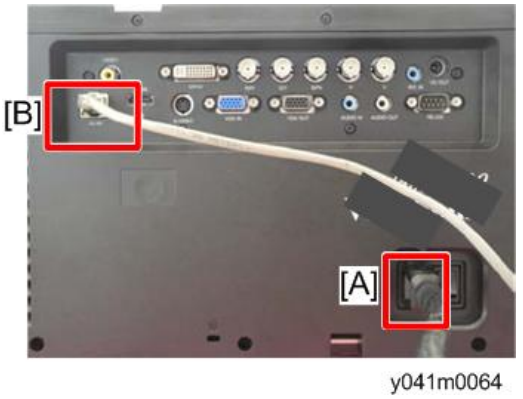
Hardware

1. Projector (XX)
2. Power cord
3. LAN cable
4. PC

y041m0063

Connect the Projector & Check the LAN Setting

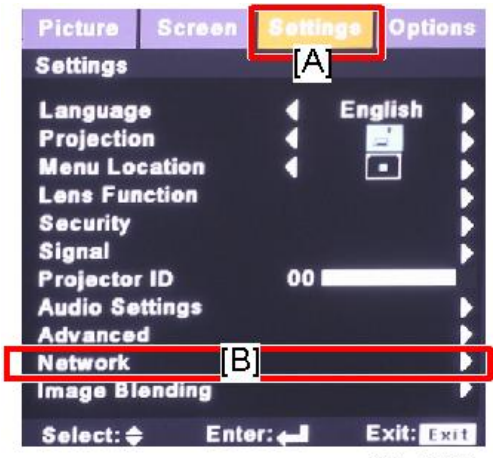
1. **Plug the power cord into the projector [A].**



y041m0064

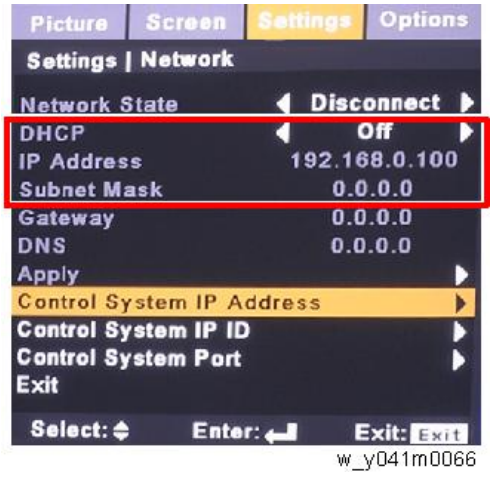
2. **Plug the LAN cable into the projector [B].**
3. **Turn on the projector, then press the "Menu" key to access the OSD menu.**

4. Use the right key to select "Setting" [A].



w_y041m0065

5. Select "Network" [B], and then press the "Enter" key.
6. Make sure that “DHCP” is “Off”.

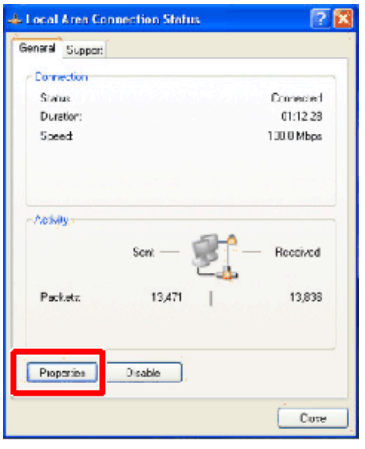


w_y041m0066

7. Write down the IP address and subnet mask: 192.168.0.100 and 255.255.255.0, in this example.

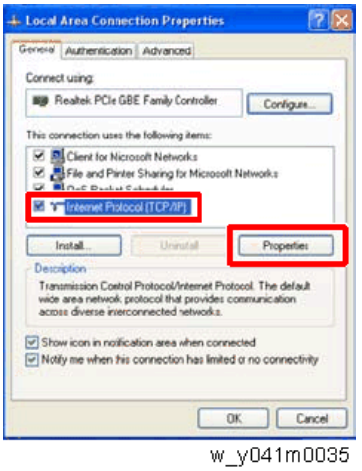
PC Network Setting

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



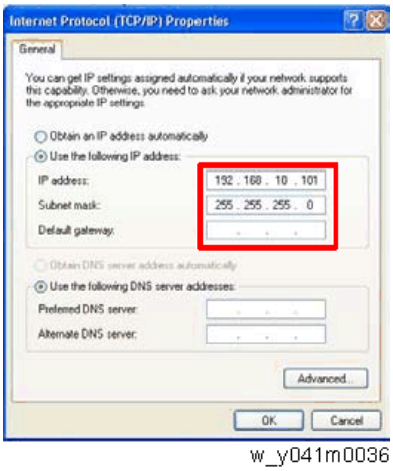
w_y041m0034

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



w_y041m0035

3. **Modify the IP address to 192.168.0.101, 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.

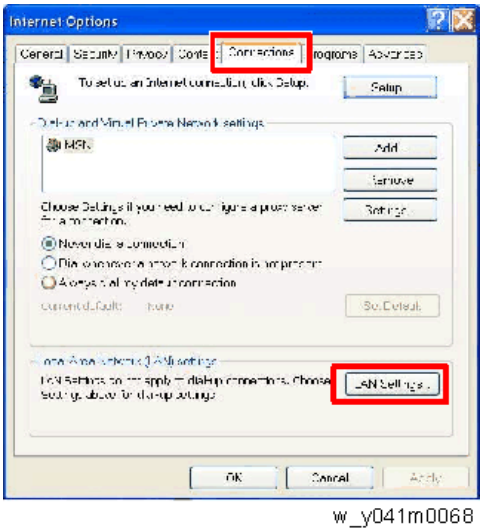
4. **Click "OK".**
5. **Click "Close" to quit the setting screen.**

Proxy Setting

1. **Execute “Internet Explorer”, and then choose “Tools -> Internet Options".**

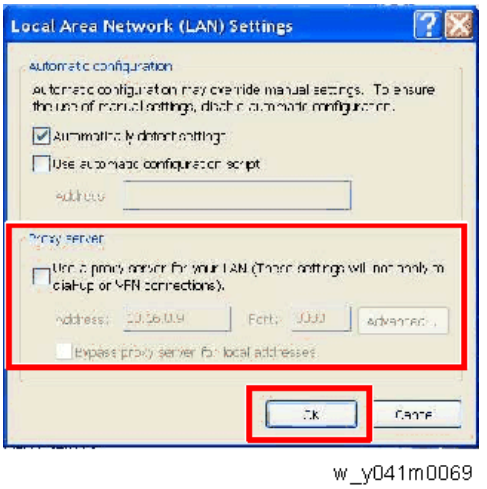
w_y041m0067

2. Select "Connections -> LAN Settings".



w_y041m0068

3. Cancel selection of the proxy server as shown below, and then click "OK".

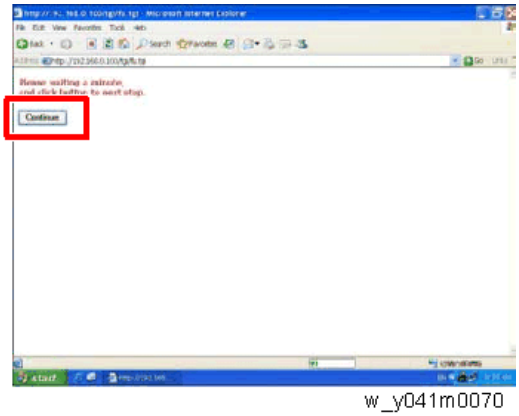


w_y041m0069

LAN FW Update Procedure

1. Execute "Internet Explorer" and visit "http://192.168.0.100/tgi/fu.tgi".

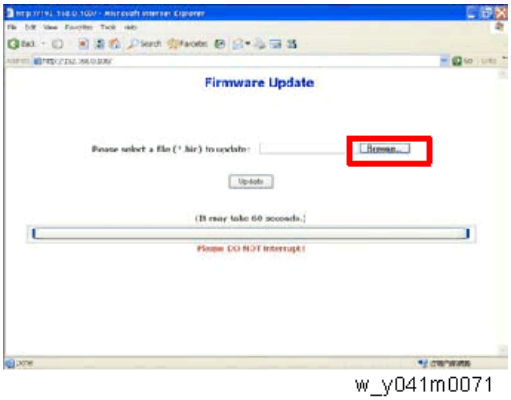
2. **Click “Continue”.**



w_y041m0070

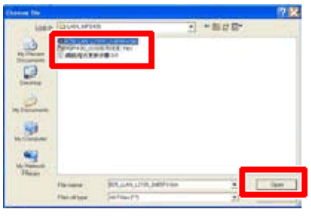
The “Firmware Update” image will appear on the screen.

3. **Click “Browse”.**



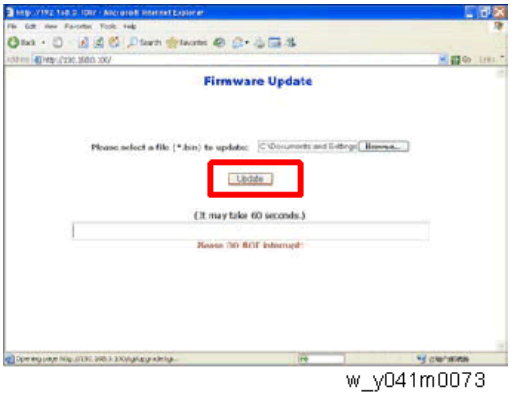
w_y041m0071

4. **Select the LAN FW file (*.bin) which you saved, and then click “Open”.**



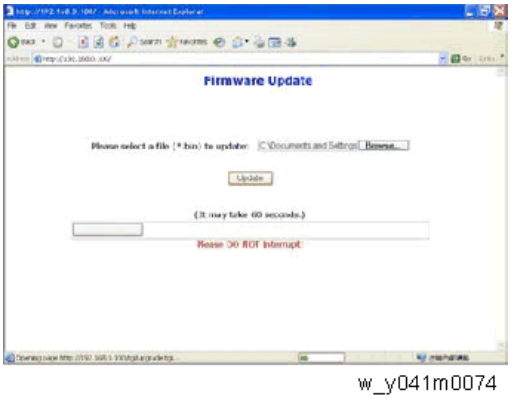
w_y041m0072

5. Click “Update” to start updating.



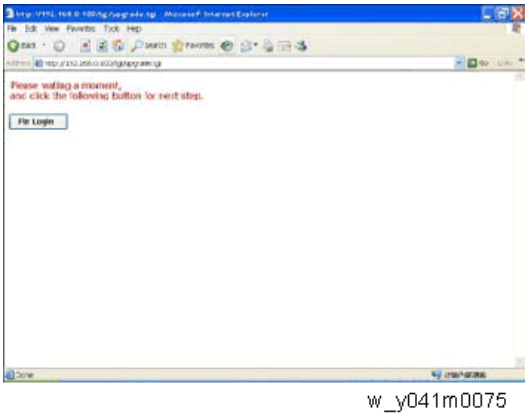
w_y041m0073

6. The screen appears like this during the firmware update procedure.



w_y041m0074

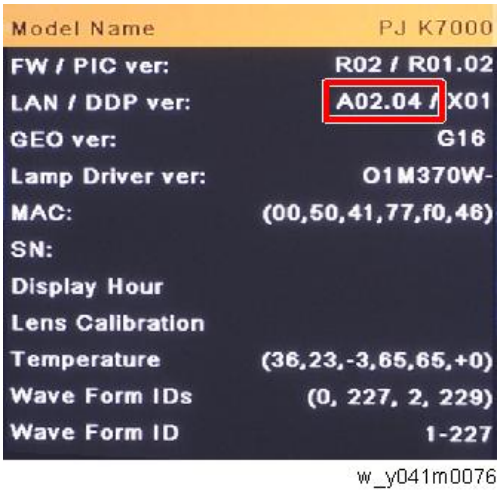
7. The following appears when the firmware update procedure is complete.



w_y041m0075

Check LAN FW Version

1. Restart the projector.
2. Press the "Power -> Left -> Left -> Menu" keys to get into service mode to check the LAN FW version.



w_y041m0076

Re-write Serial Number (S/N)

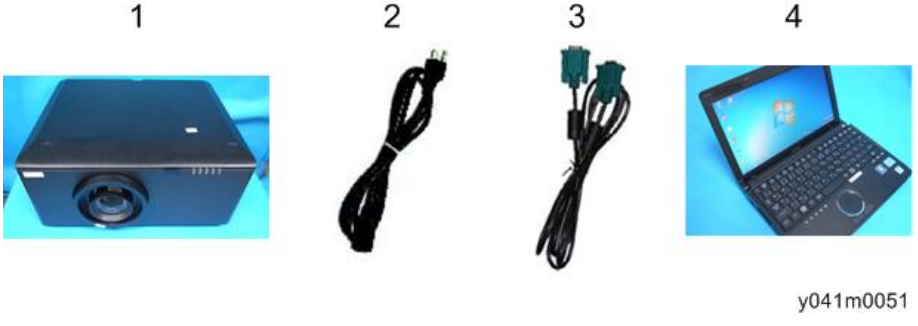
Equipment Needed

Software

- FW update file

Hardware

1. Projector
2. Power cord
3. Female to female RS232 cable
4. PC

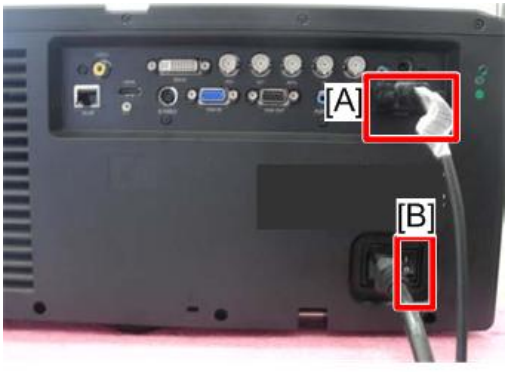


Re-write Serial Number (S/N)

Connection

1. **Plug in the power cord.**

2. Connect the projector and PC with the RS232 cable [A].

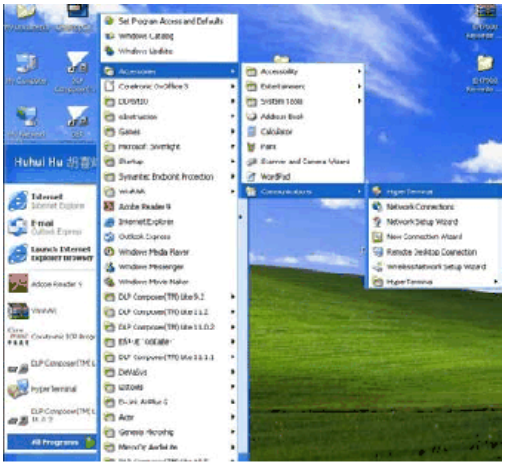


y041m0052

3. Turn on the "Power Switch" [B], then press the "Power" key to turn on the projector.

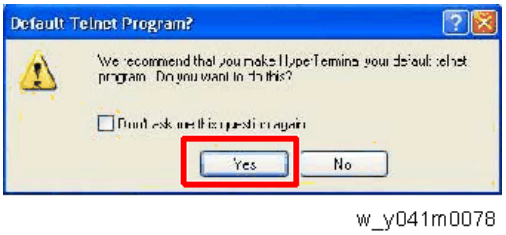
Re-write serial number (S/N)

1. Select "Start -> All programs -> Accessories -> Communications -> Hyper Terminal".



w_y041m0077

2. Click "Yes".



w_y041m0078

3. **Edit the name item, then click “OK”.**

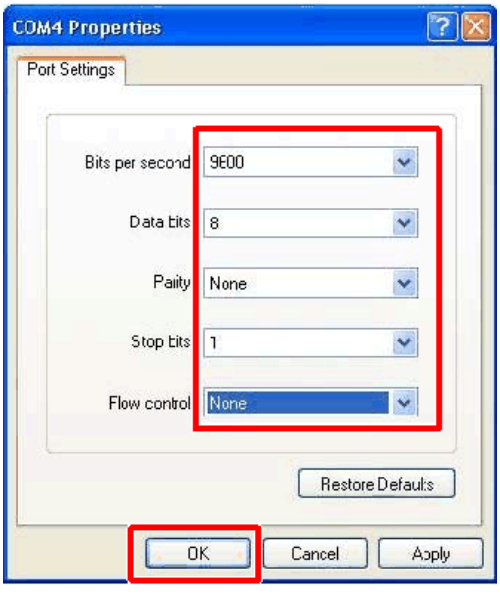
w_y041m0079

4. **Select the COM port which you are using. Then click "OK".**

w_y041m0080

5. **Port Settings.**
   - Bits per second: 9600
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None

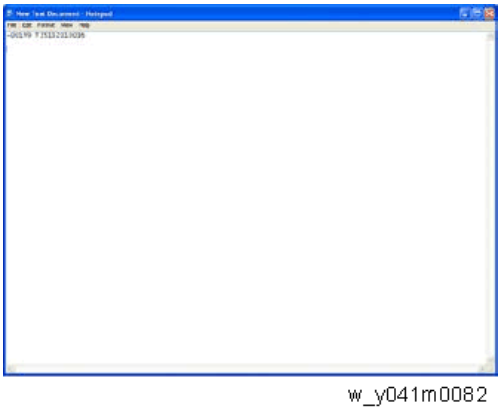
   Click “OK”.



w_y041m0081

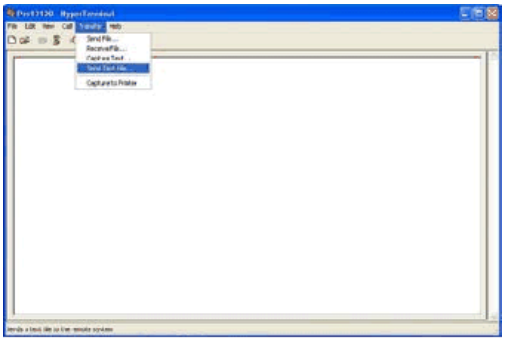
6. **Create a new text document, and input "~00199 TJ5132010016", press "Enter" key, then save it. (Input the S/N which belongs to your projector)**

   After inputting the S/N, you must press "Enter" key.



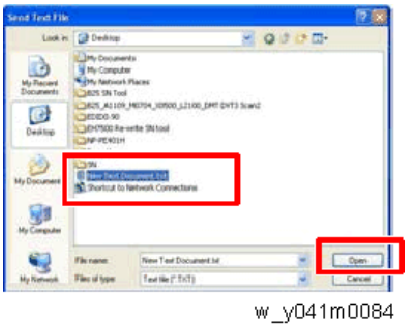
w_y041m0082

7. Open the Hyper Terminal, then select "Transfer -> Send text file".



w_y041m0083

8. Select the text document which you created, and then click "Open".



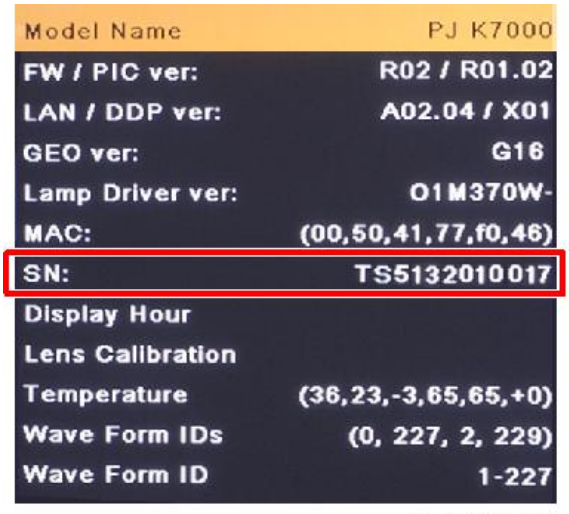
w_y041m0084

9. Select "File" -->"Save"

Check Serial Number (S/N)

1. Restart the projector.

2. **Press the "Power -> Left -> Left -> Menu" keys to get into service mode to check the S/N.**



w_y041m0085

MEMO

MEMO

MEMO