



LED TV

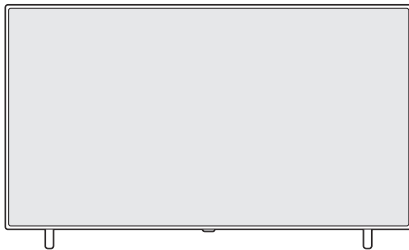
SERVICE MANUAL

CHASSIS : UJ55D/UT55D

MODEL : 65NANO80ASA
65NANO80ATA

CAUTION

BEFORE SERVICING THE CHASSIS, READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL05787804 (2501-REV00)

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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by $\triangle$ in the Exploded View.

It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.

Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer** should always be used during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and its components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1 W), keep the resistor 10 mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)

With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.

If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1 M Ω and 5.2 M Ω .

When the exposed metal has no return path to the chassis the reading must be infinite.

An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.

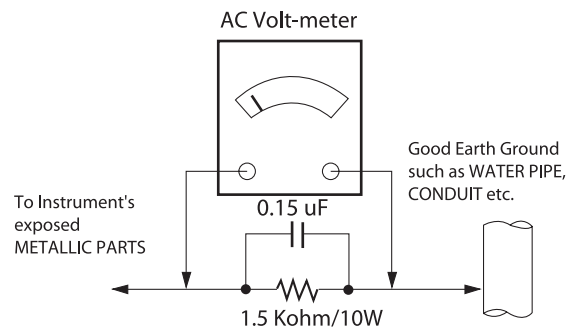
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 μ F capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.

Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which corresponds to 0.5 mA.

In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω

*Base on Adjustment standard

SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the **SAFETY PRECAUTIONS** on page 3 of this publication.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
 - a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
 - b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
 - c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.**CAUTION:** A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FET-VOM, etc) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10 % (by volume) Acetone and 90 % (by volume) isopropyl alcohol (90 % - 99 % strength)
CAUTION: This is a flammable mixture.
Unless specified otherwise in this service manual, lubrication of contacts is not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range of 500 °F to 600 °F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25 cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
 - a. Allow the soldering iron tip to reach normal temperature. (500 °F to 600 °F)
 - b. Heat the component lead until the solder melts.
 - c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
 - a. Allow the soldering iron tip to reach a normal temperature (500 °F to 600 °F)
 - b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
 - c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
CAUTION: Work quickly to avoid overheating the circuit board printed foil.
 - d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor

Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device

Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor

Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.

3. Solder the connections.

CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.

CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This specification is applied to the LED TV used UJ55D/
UT55D chassis.

2. Test condition

Each part is tested as below without special appointment.

- (1) Temperature: 25 °C ± 5 °C, CST: 40 °C ± 2 °C
- (2) Relative Humidity: 65 % ± 10 %
- (3) Power Voltage
: Standard input voltage (AC 100-240 V~, 50/60 Hz)
* Standard Voltage of each products is marked by models.
- (4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
- (5) The receiver must be operated for about 5 minutes prior to the adjustment.

3. Test method

- (1) Performance: LGE TV test method followed
- (2) Demanded other specification
 - Safety : CE, IEC specification
 - EMC : CE, IEC

4. General Specification

No.	Item		Specification	Remarks
1	Market		Central and South America / Colombia / Taiwan	
2	Broadcasting system		Digital: SBTVD	Brazil / South&Central AMERICA
			Digital: DVB-T, DVB-T2	Colombia
			Digital: DVB-T	Taiwan//Panama
			Analog : NTSC-M / PAL-N / PAL-M	Brazil / South&Central AMERICA/Colombia/Panama
			Analog : NTSC-M	Taiwan
3	Available Channel		VHF	Brazil / South&Central AMERICA
			UHF	
			DTV	
			CATV	
			VHF	Colombia / Panama / Taiwan
			UHF	
			DTV	
			CATV	
4	Receiving system		Digital : ISDB-T	for Brazil / South&Central AMERICA model
			Analog :NTSC-M/PAL-N/PAL-M	
			Digital : DVB-T DVB-T2	for Colombia
			Analog : :NTSC-M/PAL-N/PAL-M	for Colombia/Panama
			Digital : DVB-T	for Panama/Taiwan model
			Analog : NTSC-M	for Taiwan
5	HDMI Input	HDMI 1	PC / DTV Format	Support 6Gbps
		HDMI 2	PC / DTV Format	Support 6Gbps, Support ARC (Depanding on model)
		HDMI 3	PC / DTV Format	Support 6Gbps, Support ARC (Depanding on model)
		HDMI 4	PC / DTV Format	Support 6Gbps
6	Audio out	SPDIF	Optical Audio out	Rear
7	USB Input		EMF, DivX HD, For SVC (download)	JPEG, MP3, DivX HD

5. External Input Support Format

5.1. HDMI input(DTV)

No	Resolution	H-freq(kHz)	Indicate in the manual	V-freq(Hz)	Indicate in the manual	Pixel clock (MHz)	Proposed	Remarks
1	640*480	31.469	31.46	59.940	59.94	25.175	SDTV 480P	
2	640*480	31.500	31.50	60.000	60.00	25.200	SDTV 480P	
3	720*480	31.469	31.46	59.940	59.94	27.000	SDTV 480P	
4	720*480	31.500	31.50	60.000	60.00	27.027	SDTV 480P	
5	720*576	31.250	31.25	50.000	50.00	27.000	SDTV 576P	
6	1280*720	44.955	44.95	59.940	59.94	74.176	HDTV 720P	
7	1280*720	45.000	45.00	60.000	60.00	74.250	HDTV 720P	
8	1280*720	37.500	37.50	50.000	50.00	74.250	HDTV 720P	
9	1920*1080	28.125	28.12	50.000	50.00	74.250	HDTV 1080I	
10	1920*1080	33.716	33.71	59.940	59.94	74.176	HDTV 1080I	
11	1920*1080	33.750	33.75	60.000	60.00	74.250	HDTV 1080I	
12	1920*1080	26.973	26.97	23.976	23.97	74.176	HDTV 1080P	
13	1920*1080	27.000	27.00	24.000	24.00	74.250	HDTV 1080P	
14	1920*1080	28.125	28.12	25.000	25.00	74.250	HDTV 1080P	
15	1920*1080	33.716	33.71	29.970	29.97	74.176	HDTV 1080P	
16	1920*1080	33.750	33.75	30.000	30.00	74.250	HDTV 1080P	
17	1920*1080	56.250	56.25	50.000	50.00	148.500	HDTV 1080P	
18	1920*1080	67.433	67.43	59.940	59.94	148.352	HDTV 1080P	
19	1920*1080	67.500	67.50	60.000	60.00	148.500	HDTV 1080P	
20	1920*1080	112.500	112.50	100.000	100.00	297.000	UDTV 2160P	4K/8K120Hz model only (4K120Hz : K8Hpp(HDMI3/4), O22n / 8K120Hz : O22n + F22)
21	1920*1080	134.865	134.86	119.880	119.88	296.703	UDTV 2160P	
22	1920*1080	135.000	135.00	120.000	120.00	297.000	UDTV 2160P	4K/8K model only
23	3840*2160	53.946	53.94	23.976	23.97	296.703	UDTV 2160P	
24	3840*2160	54.000	54.00	24.000	24.00	297.000	UDTV 2160P	
25	3840*2160	56.250	56.25	25.000	25.00	297.000	UDTV 2160P	
26	3840*2160	67.433	67.43	29.970	29.97	296.703	UDTV 2160P	
27	3840*2160	67.500	67.50	30.000	30.00	297.000	UDTV 2160P	
28	3840*2160	112.500	112.50	50.000	50.00	594.000	UDTV 2160P	
29	3840*2160	134.865	134.86	59.940	59.94	593.407	UDTV 2160P	
30	3840*2160	135.000	135.00	60.000	60.00	594.000	UDTV 2160P	
31	3840*2160	225.000	225.00	100.000	100.00	1188.000	UDTV 2160P	4K/8K120Hz model only (4K120Hz : K8Hpp(HDMI3/4), O22n / 8K120Hz : O22n + F22)
32	3840*2160	269.730	269.73	119.880	119.88	1186.813	UDTV 2160P	
33	3840*2160	270.000	270.00	120.000	120.00	1188.000	UDTV 2160P	4K/8K model only
34	4096*2160	53.946	53.94	23.976	23.97	296.703	UDTV 2160P	
35	4096*2160	54.000	54.00	24.000	24.00	297.000	UDTV 2160P	
36	4096*2160	56.250	56.25	25.000	25.00	297.000	UDTV 2160P	
37	4096*2160	67.433	67.43	29.970	29.97	296.703	UDTV 2160P	
38	4096*2160	67.500	67.50	30.000	30.00	297.000	UDTV 2160P	
39	4096*2160	112.500	112.50	50.000	50.00	594.000	UDTV 2160P	
40	4096*2160	134.865	134.86	59.940	59.94	593.407	UDTV 2160P	
41	4096*2160	135.000	135.00	60.000	60.00	594.000	UDTV 2160P	
42	4096*2160	225.000	225.00	100.000	100.00	1188.000	UDTV 2160P	4K/8K120Hz model only (4K120Hz : K8Hpp(HDMI3/4), O22n / 8K120Hz : O22n + F22)
43	4096*2160	269.730	269.73	119.880	119.88	1186.813	UDTV 2160P	
44	4096*2160	270.000	270.00	120.000	120.00	1188.000	UDTV 2160P	8K model only
45	7680*4320	107.892	107.89	23.976	23.97	1186.813	8K	
46	7680*4320	108.000	108.00	24.000	24.00	1188.000	8K	
47	7680*4320	110.000	110.00	25.000	25.00	1188.000	8K	
48	7680*4320	131.870	131.87	29.970	29.97	1186.830	8K	
49	7680*4320	132.000	132.00	30.000	30.00	1188.000	8K	
50	7680*4320	220.000	220.00	50.000	50.00	2376.000	8K	
51	7680*4320	263.740	263.74	59.940	59.94	2373.660	8K	
52	7680*4320	264.000	264.00	60.000	60.00	2376.000	8K	
53	2560*1080	66	66.00	60	60.00	198	UDTV 2160P (21:9)	(4K/8K model only), Support only when Game Optimiser is On and Set the Wide Aspect Ratio to 21:9
54	2560*1080	131.748	131.74	120	120.00	347.81	UDTV 2160P (21:9)	4K/8K120Hz model only (4K120Hz : K8Hpp(HDMI3/4), O22n / 8K120Hz : O22n + F22), Support only when Game Optimiser is On and Set the Wide Aspect Ratio to 21:9

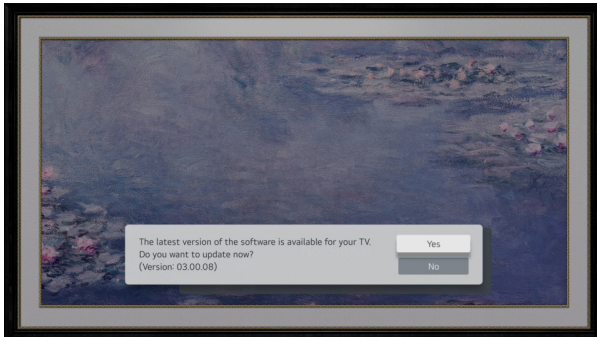
5.2. HDMI Input (PC)

No	Resolution	H-freq(kHz)	Indicate in the manual	V-freq(Hz)	Indicate in the manual	Pixel clock (MHz)	Proposed	Remarks
1	640*350	31.46	31.46	70.09	70.09	25.17	EGA	
2	720*400	31.46	31.46	70.08	70.08	28.32	DOS	
3	640*480	31.46	31.46	59.94	59.94	25.17	VESA(VGA)	
4	800*600	37.87	37.87	60.31	60.31	40	VESA(SVGA)	
5	1024*768	48.36	48.36	60	60.00	65	VESA(XGA)	
6	1360*768	47.71	47.71	60.01	60.01	84.75	VESA(WXGA)	
7	1152*864	54.34	54.34	60.05	60.05	80	VESA	
8	1280*1024	63.98	63.98	60.02	60.02	109	SXGA	FHD/4K/8K model only
9	1920*1080	67.5	67.50	60	60.00	148.5	WUXGA(Reduced Blanking)	
10	1920*1080	134.86	134.86	119.88	119.88	296.7	UDTV 2160P	4K/8K120Hz model only (4K120Hz : K8Hpp (HDMI3/4), O22n / 8K120Hz : O22n + F22)
11	1920*1080	135	135.00	120	120.00	297	UDTV 2160P	
12	3840*2160	53.946	53.94	23.976	23.97	296.703	UDTV 2160P	
13	3840*2160	54.000	54.00	24.000	24.00	297.000	UDTV 2160P	
14	3840*2160	56.250	56.25	25.000	25.00	297.000	UDTV 2160P	4K/8K model only
15	3840*2160	67.433	67.43	29.970	29.97	296.703	UDTV 2160P	
16	3840*2160	67.500	67.50	30.000	30.00	297.000	UDTV 2160P	
17	3840*2160	112.500	112.50	50.000	50.00	594.000	UDTV 2160P	
18	3840*2160	134.865	134.86	59.940	59.94	593.407	UDTV 2160P	
19	3840*2160	135.000	135.00	60.000	60.00	594.000	UDTV 2160P	
20	3840*2160	225	225.00	100	100.00	1188	UDTV 2160P	4K/8K120Hz model only (4K120Hz : K8Hpp (HDMI3/4), O22n / 8K120Hz : O22n + F22)
21	3840*2160	269.73	269.73	119.88	119.88	1186.8	UDTV 2160P	
22	3840*2160	270	270.00	120	120.00	1188	UDTV 2160P	
23	4096*2160	53.946	53.94	23.976	23.97	296.703	UDTV 2160P	4K/8K model only
24	4096*2160	54.000	54.00	24.000	24.00	297.000	UDTV 2160P	
25	4096*2160	56.250	56.25	25.000	25.00	297.000	UDTV 2160P	
26	4096*2160	67.433	67.43	29.970	29.97	296.703	UDTV 2160P	
27	4096*2160	67.500	67.50	30.000	30.00	297.000	UDTV 2160P	
28	4096*2160	112.500	112.50	50.000	50.00	594.000	UDTV 2160P	
29	4096*2160	134.865	134.86	59.940	59.94	593.407	UDTV 2160P	
30	4096*2160	135.000	135.00	60.000	60.00	594.000	UDTV 2160P	
31	4096*2160	225	225.00	100	100.00	1188	UDTV 2160P	4K/8K120Hz model only (4K120Hz : K8Hpp(HDMI3/4), O22n / 8K120Hz : O22n + F22)
32	4096*2160	269.73	269.73	119.88	119.88	1186.8	UDTV 2160P	
33	4096*2160	270	270.00	120	120.00	1188	UDTV 2160P	
34	7680*4320	107.89	107.89	23.97	23.97	1188	8K	8K model only
35	7680*4320	108	108.00	24	24.00	1188	8K	
36	7680*4320	110	110.00	25	25.00	1188	8K	
37	7680*4320	131.87	131.87	29.97	29.97	1188	8K	
38	7680*4320	132	132.00	30	30.00	1188	8K	
39	7680*4320	220	220.00	50	50.00	2376	8K	
40	7680*4320	263.74	263.74	59.94	59.94	2376	8K	
41	7680*4320	264	264.00	60	60.00	2376	8K	
42	2560*1440	88.78	88.78	59.95	59.95	241.5	3K	(4K/8K60Hz model only), Support only when UHD DeepColor is On
43	2560*1440	182.99	182.99	119.99	119.99	497.7	3K	(4K/8K120Hz model only), Support only when UHD DeepColor is On
44	2560*1080	66	66.00	60	60.00	198	UDTV 2160P (21:9)	(4K/8K model only), Support only when Game Optimiser is On and Set the Wide Aspect Ratio to 21:9
45	2560*1080	131.748	131.74	120	120.00	347.81	UDTV 2160P (21:9)	4K/8K120Hz model only (4K120Hz : K8Hpp(HDMI3/4), O22n / 8K120Hz : O22n + F22), Support only when Game Optimiser is On and Set the Wide Aspect Ratio to 21:9
46	3840*1600	99.419	99.41	60	60.00	521.75	UDTV 2160P (21:9)	(4K/8K model only), Support only when Game Optimiser is On and Set the Wide Aspect Ratio to 21:9
47	3840*1080	66.625	66.62	60	60.00	266.5	UDTV 2160P (32:9)	(4K/8K model only), Support only when Game Optimiser is On and Set the Wide Aspect Ratio to 32:9
48	3840*1080	137.25	137.25	120	120.00	549	UDTV 2160P (32:9)	(4K/8K120Hz model only), Support only when Game Optimiser is On and Set the Wide Aspect Ratio to 32:9
49	1920*1080	166.58	166.58	144	144.00	346.5	HDTV 1080P	144Hz Panel Support Model only
50	2560*1080	166.54	166.54	144	144.00	453	UDTV 2160P (21:9)	
51	2560*1440	222.15	222.15	144	144.00	604.25	3K	
52	3840*1080	166.56	166.56	144	144.00	666.25	UDTV 2160P (32:9)	
53	3840*1600	246.81	246.81	144	144.00	987.25	UDTV 2160P (21:9)	
54	3840*2160	333.18	333.18	144	144.00	1332.75	UDTV 2160P	
55	1920*1080	192.78	192.78	165	165.00	346.5	HDTV 1080P	165Hz Panel Support Model only
56	2560*1080	192.83	192.83	165	165.00	453	UDTV 2160P (21:9)	
57	2560*1440	257.16	257.16	165	165.00	604.25	3K	
58	3840*1080	192.87	192.87	165	165.00	666.25	UDTV 2160P (32:9)	
59	3840*1600	285.75	285.75	165	165.00	987.25	UDTV 2160P (21:9)	
60	3840*2160	385.75	385.75	165	165.00	1332.75	UDTV 2160P	

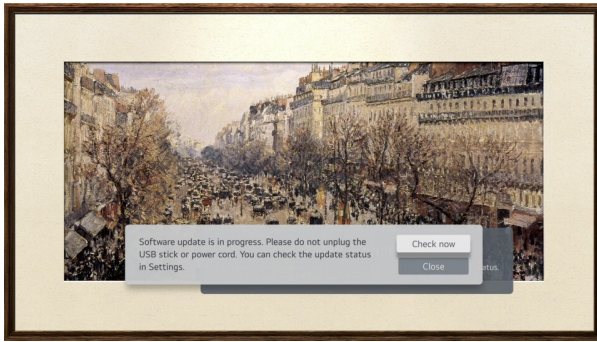
SOFTWARE UPDATE

1. USB DOWNLOAD

- (1) Plug in the USB to the TV
- (2) If there are update-able files in the USB, the TV would ask that the user want to process the SW upper version update.



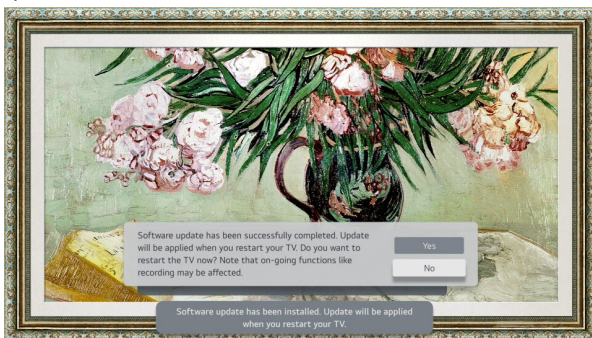
- (3) Click "Yes" button : Start Update



- (4) Click "Check Now" : Go to SW Update menu for monitoring
- (5) TV has been starting SW update



- (6) After finishing the update, it will show a pop-up below the picture.



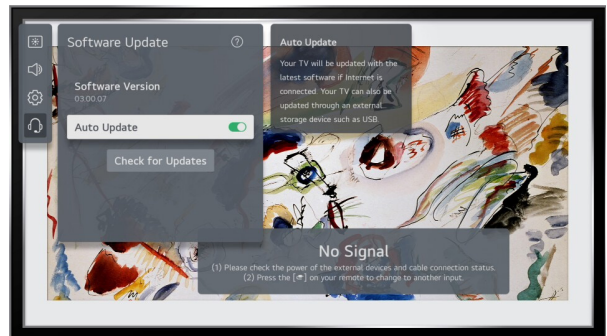
- (7) Click "Yes" : Tv will be turn off and on itself

2. NSU DOWNLOAD

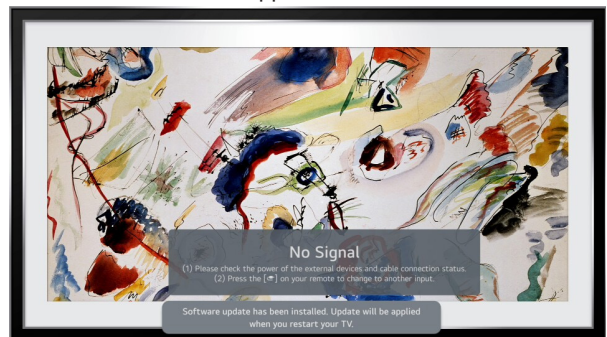
(This Function is needed to connect to the internet.)

Case 1) Auto Update On

- (1) Go to Menu → All Settings → Support → Software Update, then check Auto update is turned on.



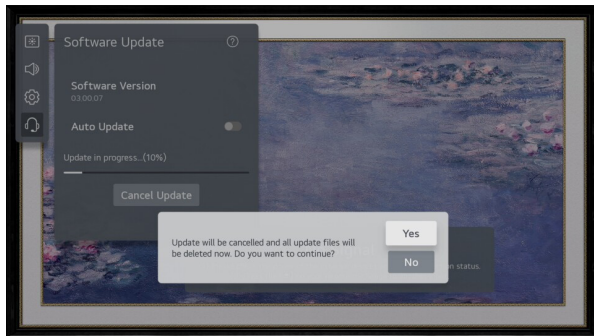
- (2) After the update complete, the user can check a pop-up below the picture, which indicated update is complete and the new version will be applied after the TV turn off and on.



- (3) If the user want to check the process of updating [Menu → All Settings → Support → Software Update]



(4) If it needs to cancel the update, click “cancel update” button



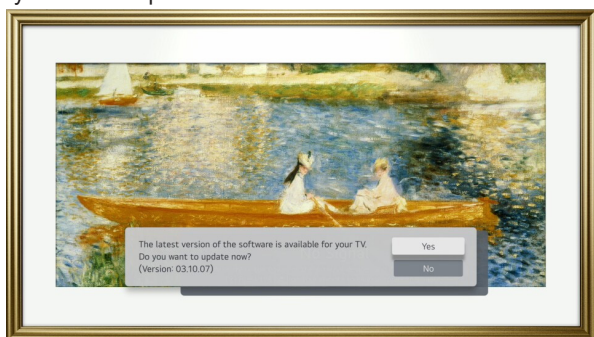
(5) [“No”] : update continue
[“Yes”] : update cancel

Case 2) NOT Allow Automatic Updates Toggle Item

(1) Go to Menu → All Settings → Support → Software Update

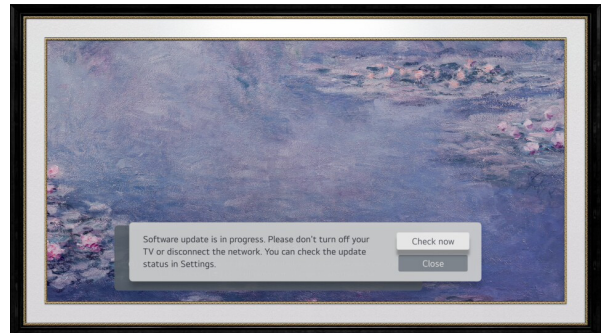


(2) If it found upper version SW than the TV SW version, TV would show a pop-up like below the picture.
“The latest version of the SW is available for your TV. Do you want to update now?”



(3) [Yes] : update starts.
[No] : Close the pop-up, check out later

(4) If the user started the update, the TV shows a pop-up below the picture.



(5) [CHECK NOW] : Just start the update
[Close] : Close the pop-up



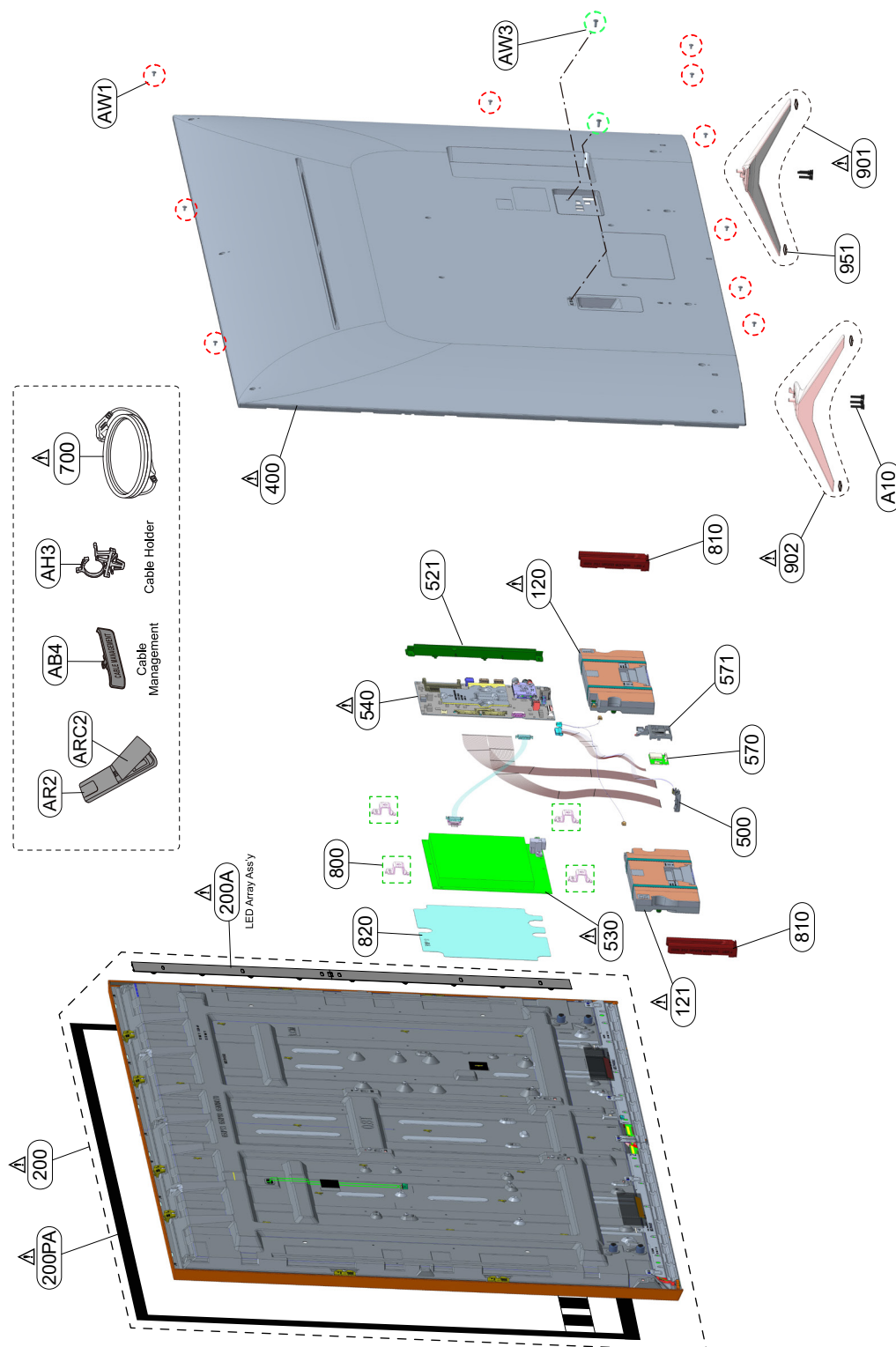
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

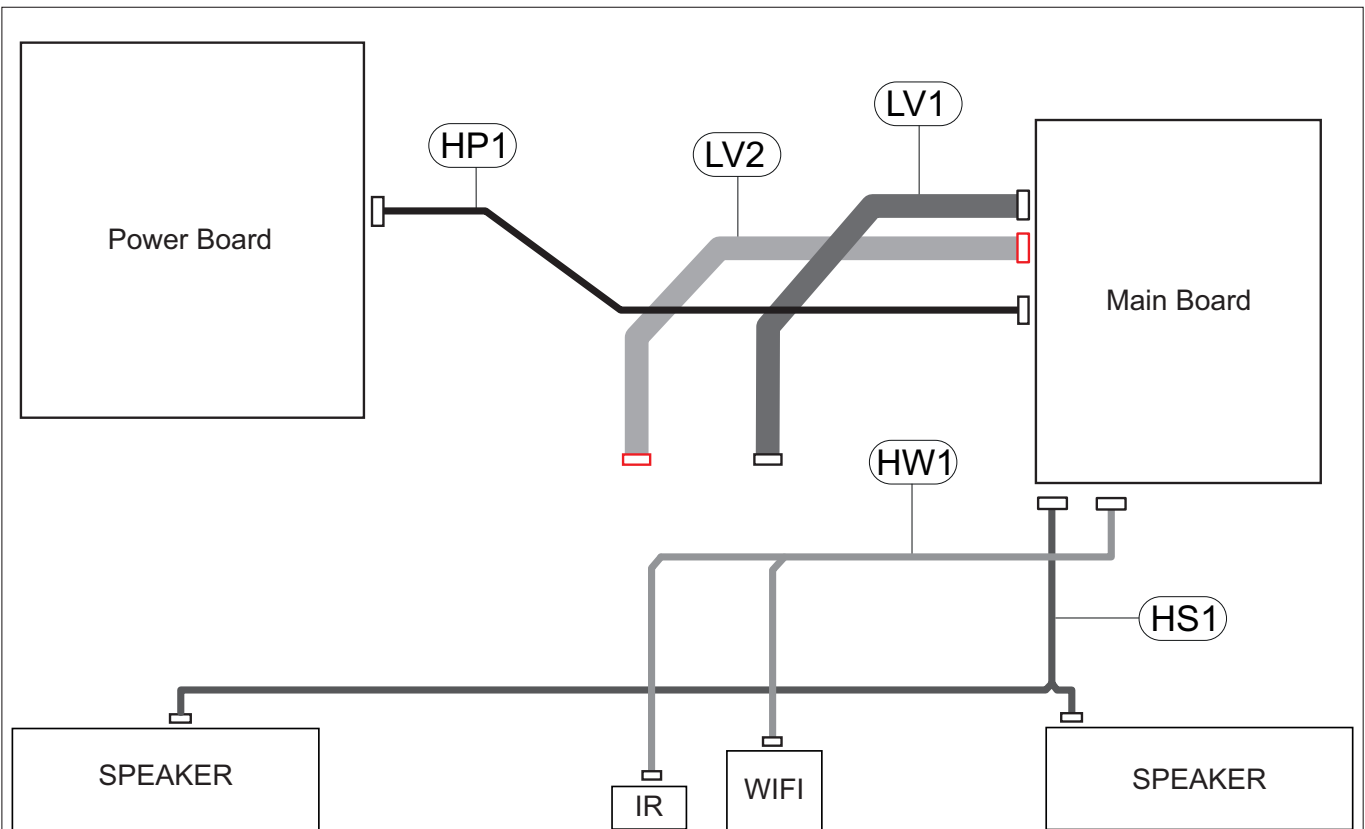
Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by  in the EXPLODED VIEW.

It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.

Do not modify the original design without permission of manufacturer.



WIRING DIAGRAM



HP1



HW1



LV1



LV2



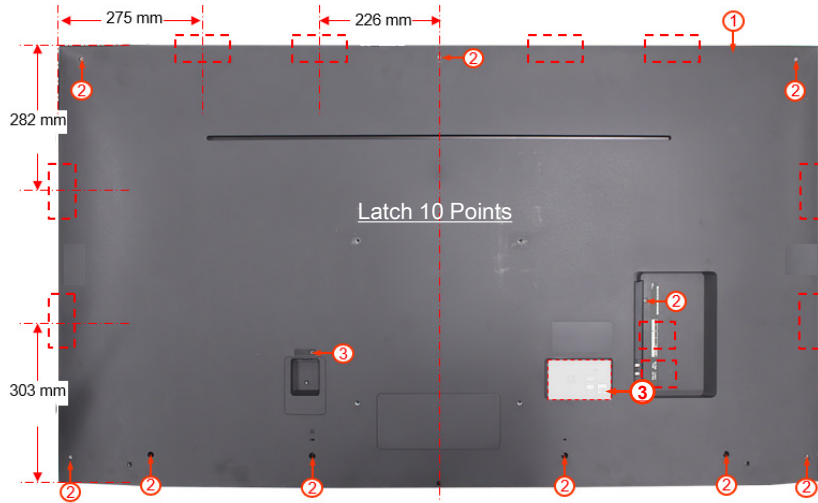
HS1



ASSEMBLY / DISASSEMBLY GUIDE (SET)

■ Disassembly

1. After Screw & Holder Disassemble, please remove Cover Assy., Rear from Module.



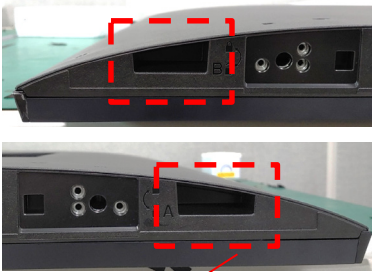
② Screw 10EA(M3*5.5)

③ Screw 2EA(P4*10)



┌─┐: Latch location(Holder_8EA / Side AV_2EA)

(1) Remove Screw.



It is easy to pull it to put your finger in the groove.



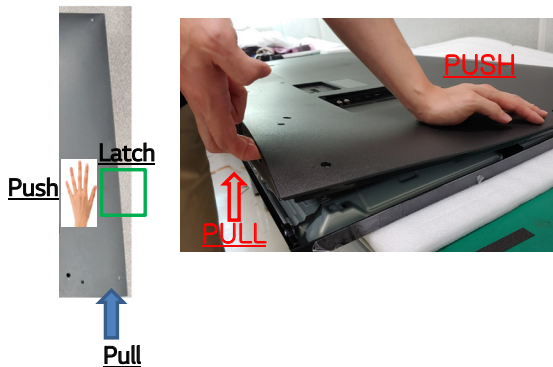
An illustrative photograph

* Remove both the right side latch and left side latch. Hold the Right(Left) bottom handle and lift the B/C. At the same time, gently pushing the push points. (Separate the B/C from bottom to top direction) (first lower side, and then the upper side.)

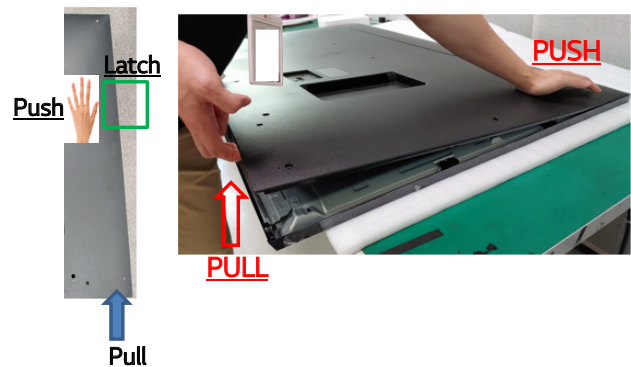
* If push with strong force from left side, Side Latch will break.

(2) Remove Latch(Holder)

Step1) Lower Right(Left) Side

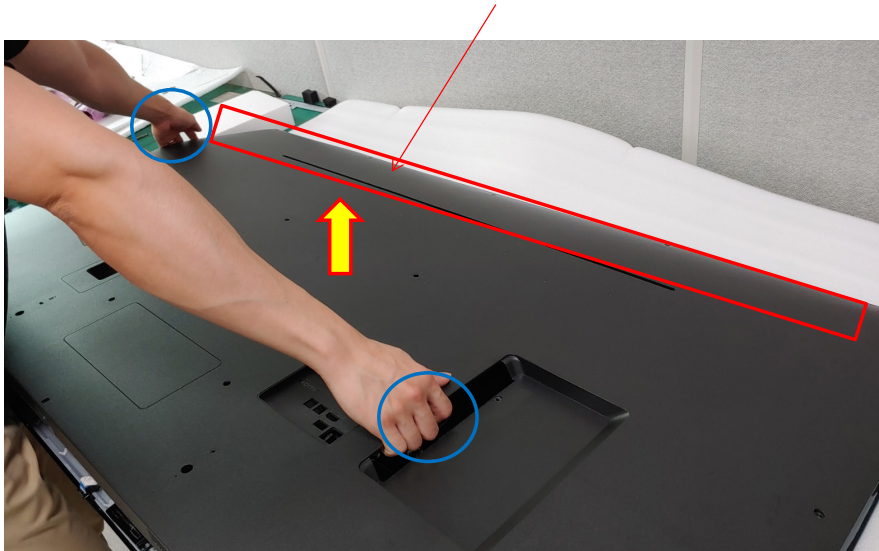


Step2) Upper Right(Left) Side



* After holding the mark(○)and lift the bottom of the B/C, push the B/C in the upward direction .

* Caution : Latch can be separated on the top position, don't pull it hard for upward. Latch can be have damage. Must be refer to disassembly Video.



* Damage Holder
(when you have wrong disassembly method)

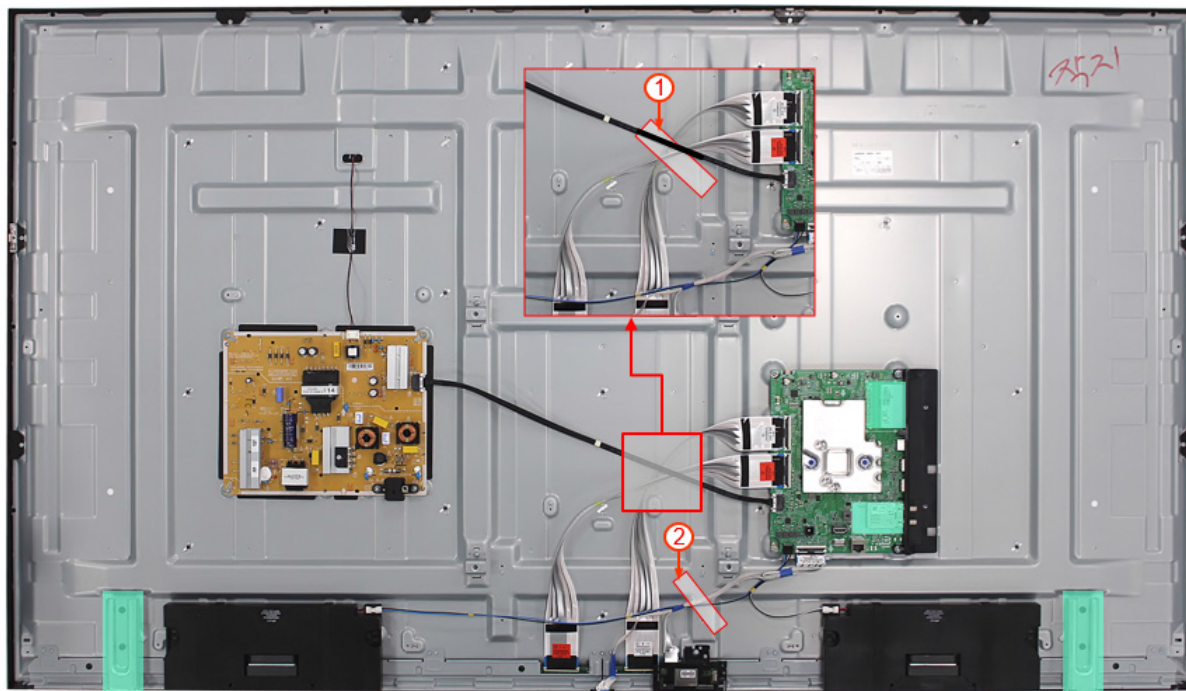


(OK)

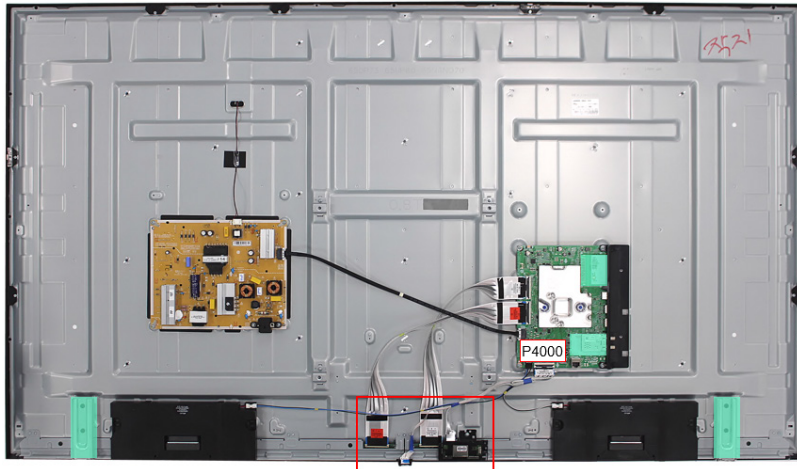


(NG)

2. Detach Tape.



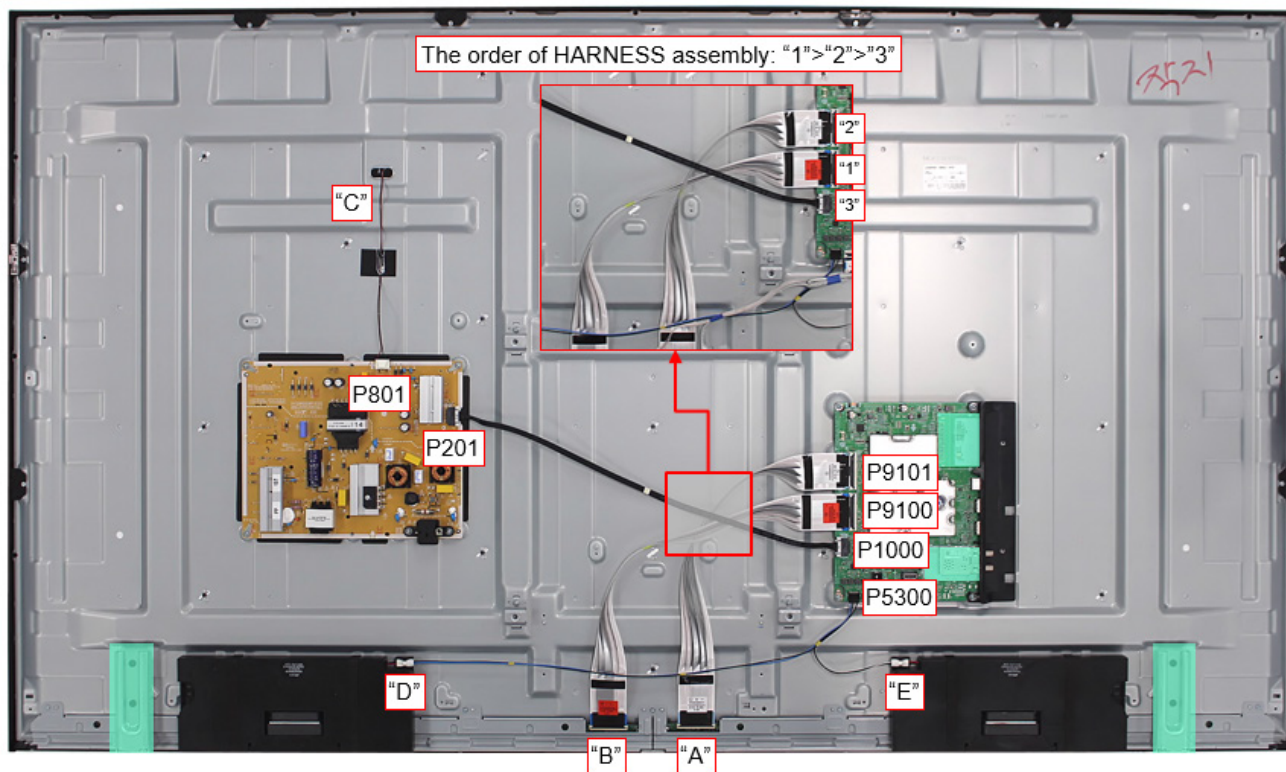
3. After Screw Disassemble, please remove IR&WIFI BRACKET and HARNESS.



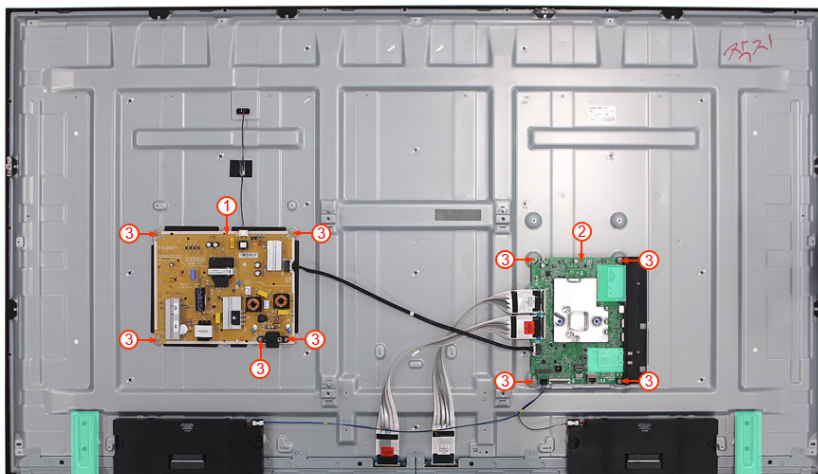
② Screw 1EA(M3*5.5)



4. Remove all sort of cable



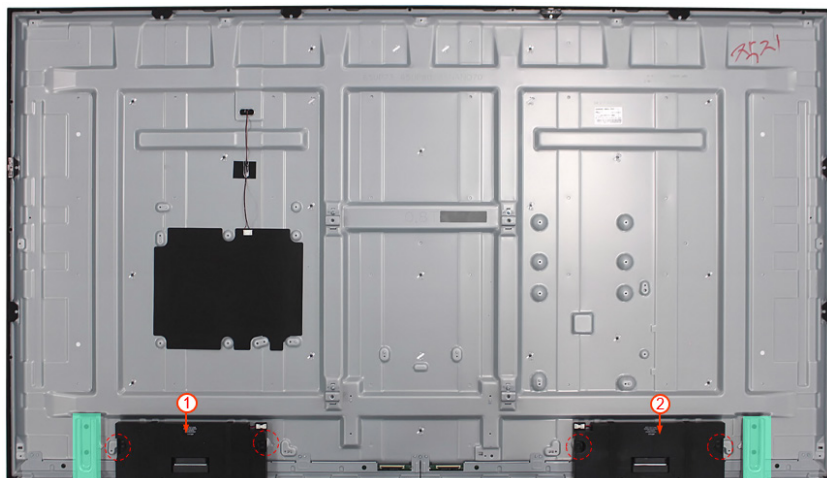
5. After Screw Disassemble, remove POWER / MAIN PCB



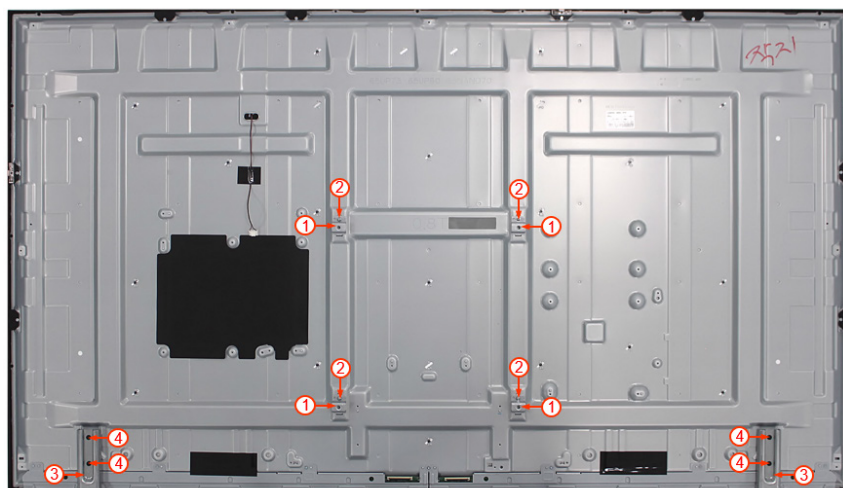
③ Screw 9EA(M3*5.5)

*SCREW TORQUE
NO3 SCREW : 5 ~ 7Kgf.cm

6. Remove Speaker.



7. After Screw Disassemble, remove the Vesa SUPPORTER and 2Pole Supporter.

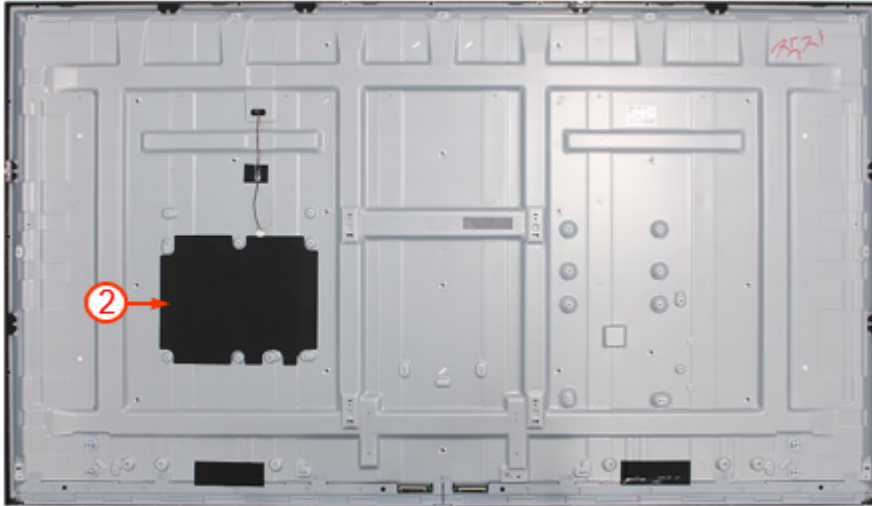


② Screw 4EA(M3*5.5)

④ Screw 4EA(M4*8)

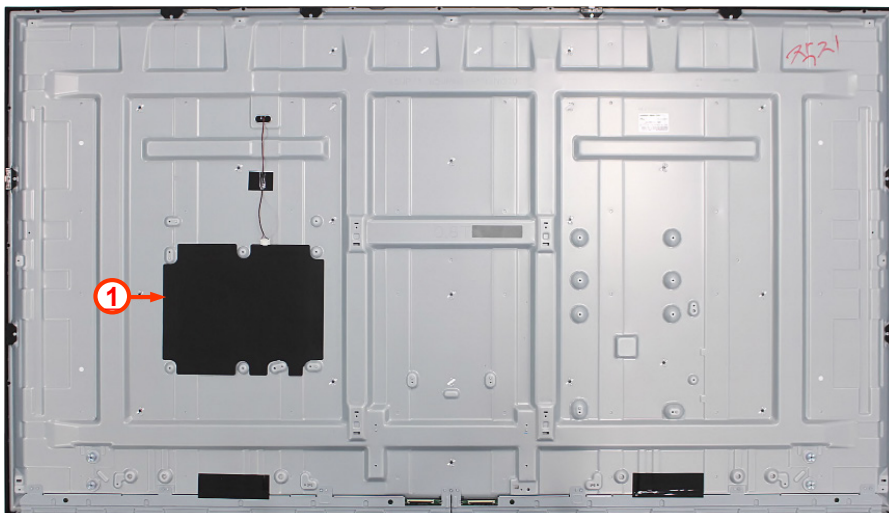
*SCREW TORQUE
NO2 SCREW : 5 ~ 7Kgf.cm
NO4 SCREW : 8 ~ 12Kgf.cm

8. Remove Insulator.

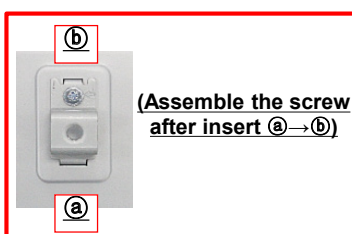
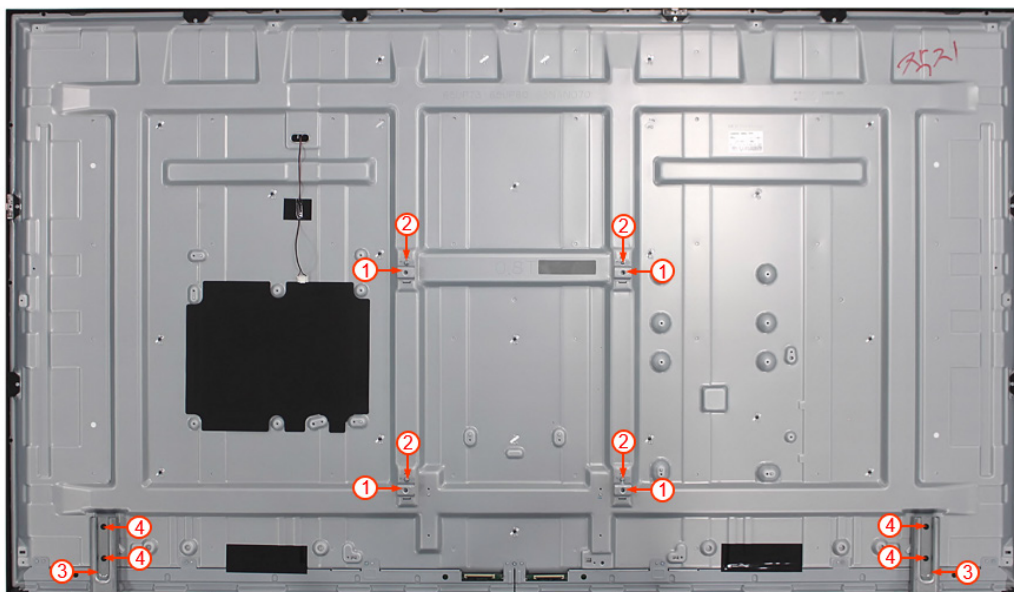


■ Assembly

1. Attach the INSULATOR.



2. Assemble/Fix the Vesa SUPPORTER and 2Pole Supporter.



② Screw 4EA(M3*5.5)

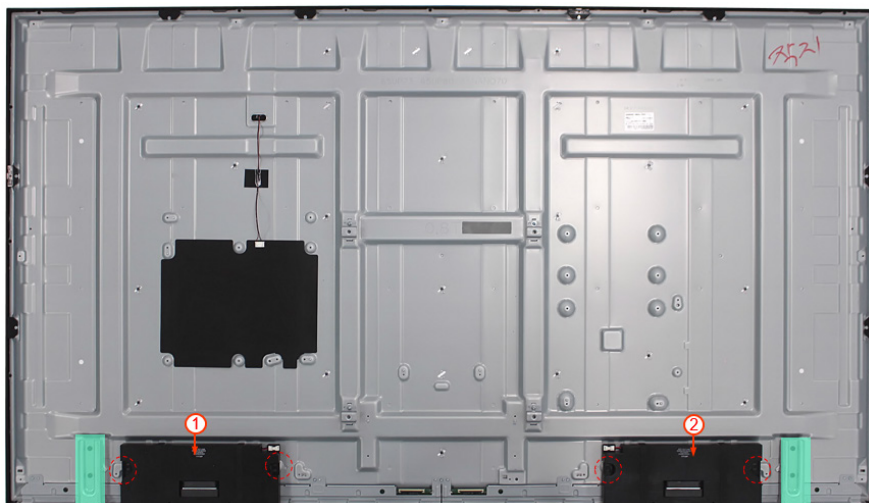
④ Screw 4EA(M4*8)

* SCREW TORQUE

NO2 SCREW : 5 ~ 7Kgf.cm

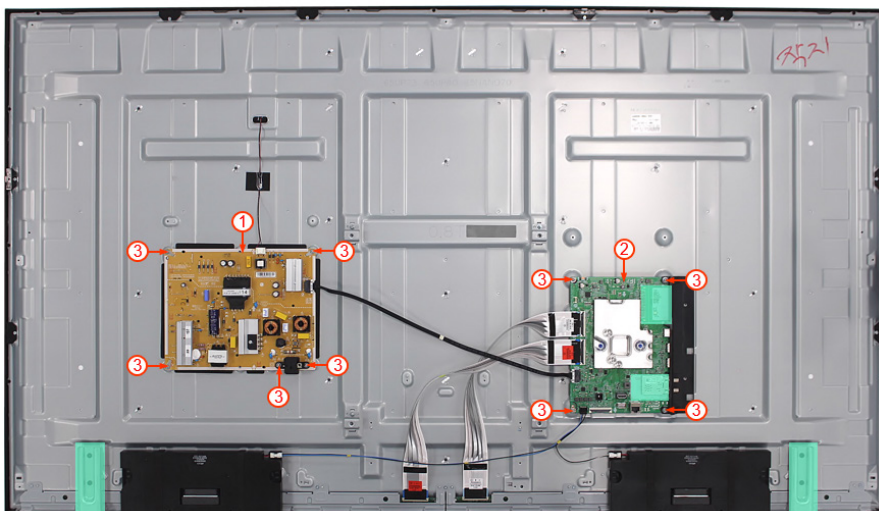
NO4 SCREW : 8 ~ 12Kgf.cm

3. Assemble SPEAKER.



Press the  edge of mark rubbing it using palm to insert Speaker Rubber.

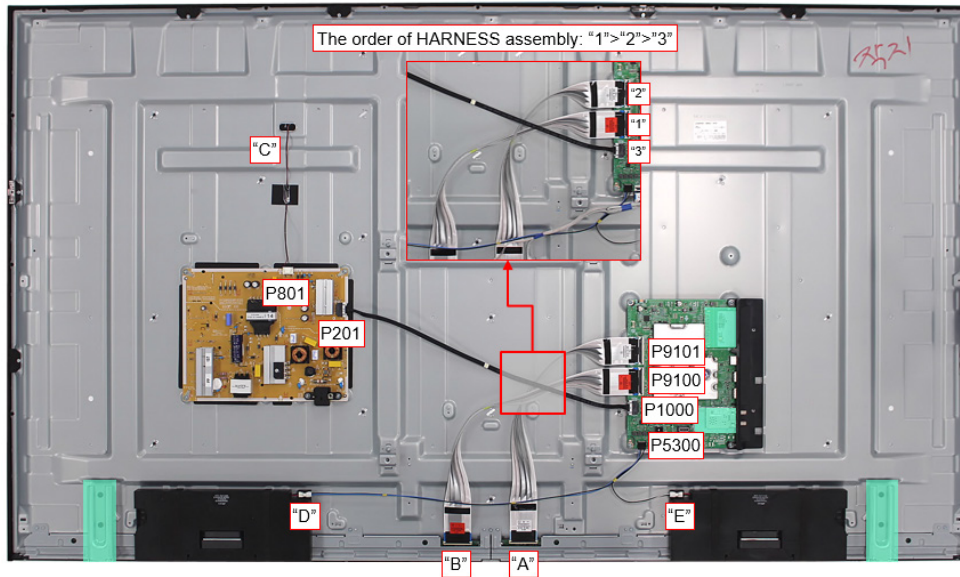
4. Assemble/Fix the POWER / MAIN PCB.



③ Screw 9EA(M3*5.5)

* SCREW TORQUE
NO3 SCREW : 5 ~ 7Kgf.cm

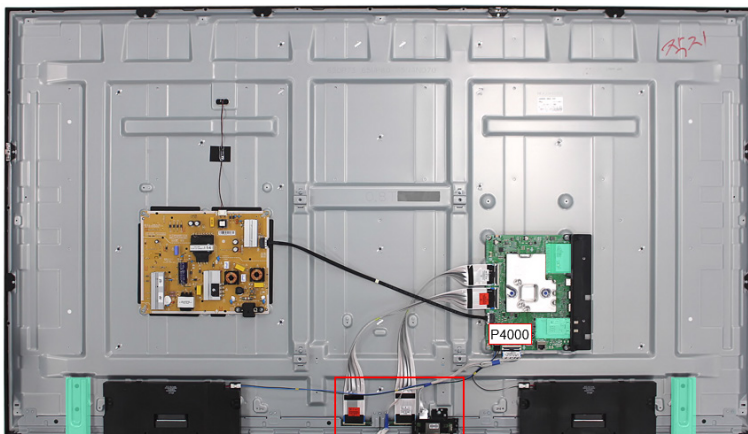
5. Insert the HARNESS.



- Insert the HARNESS

- 1) MAIN P9101 → MODULE "A"
- 2) MAIN P9100 → MODULE "B"
- 3) MODULE "C" → POWER P801
- 4) MAIN P1000 → POWER P201
- 5) MAIN P5300 → SPEAKER "D"
SPEAKER "E"

6. Assemble /Fix the IR&WIFI BRACKET and HARNESS.



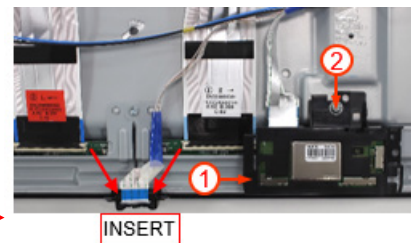
② Screw 1EA(M3*5.5)

*SCREW TORQUE

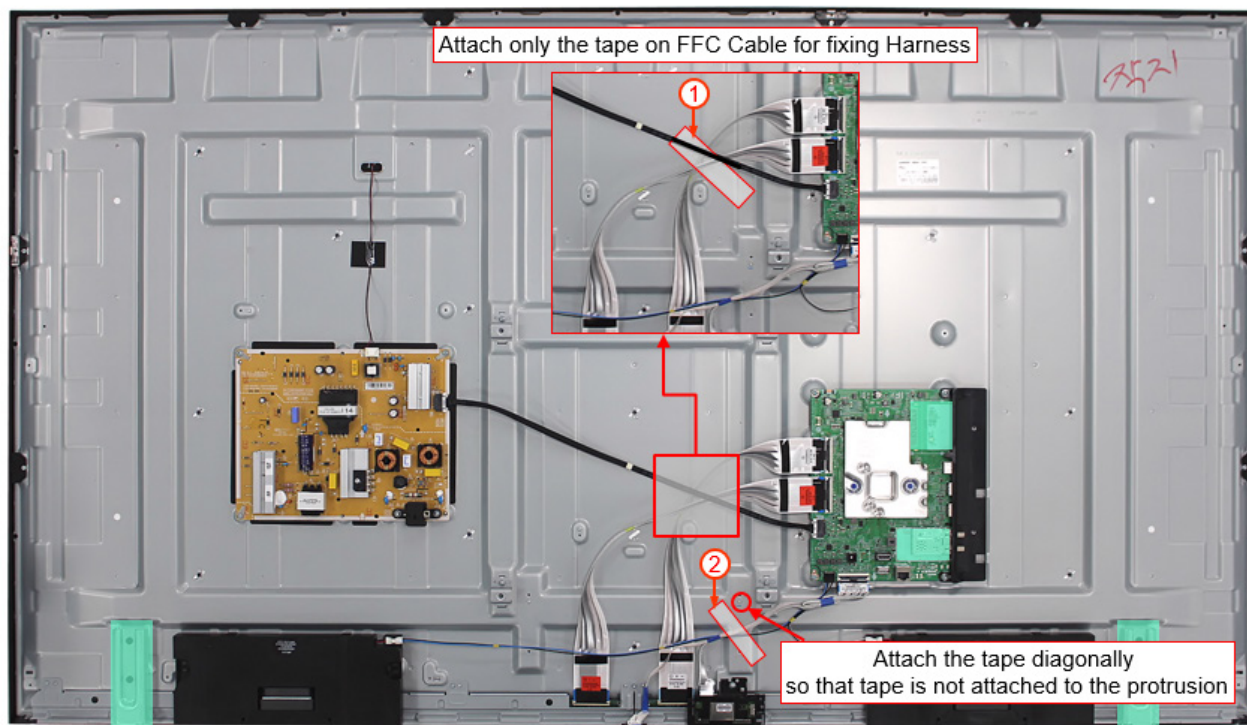
NO2 SCREW : 5 ~ 7Kgf.cm

* Insert the HARNESS

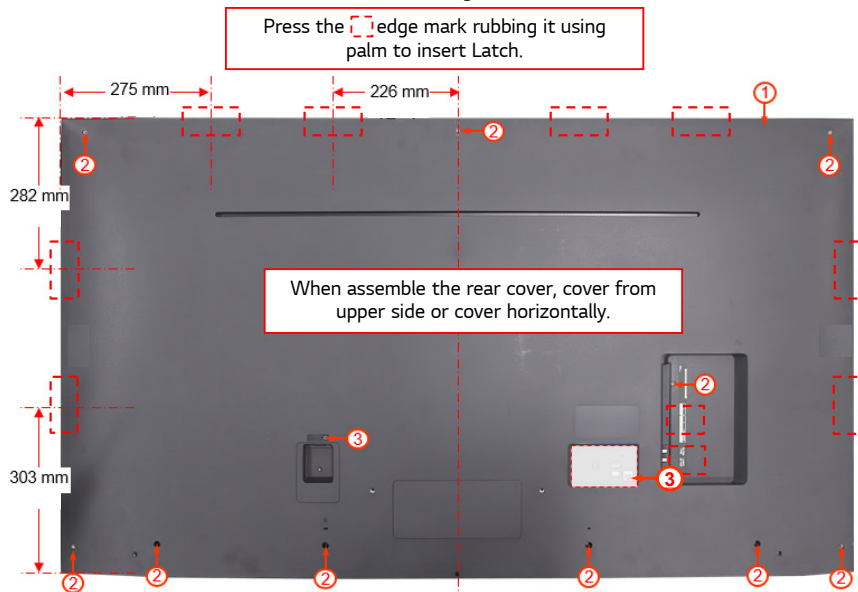
- 1)BRACKET HARNESS -> MAIN P4000



7. Arrange the harness.[Attach the Tape.]



8. Assemble/Fix the COVER Assy., REAR.



② Screw 10EA(M3*5.5)

③ Screw 2EA(P4*10)

*SCREW TORQUE
NO2, 3 SCREW : 5 ~ 7Kgf.cm

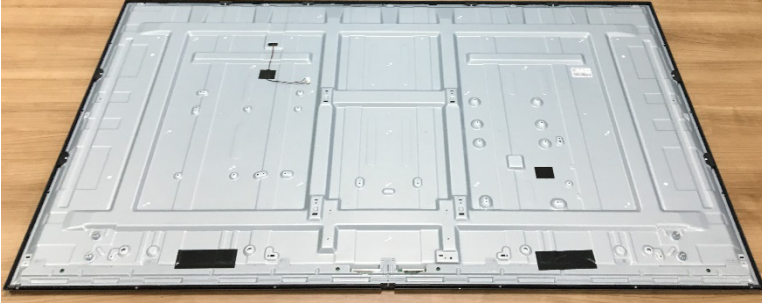


※ Caution
Latch is not assembled properly.
If the latch is not assembled properly,
the latch must be pressed again.

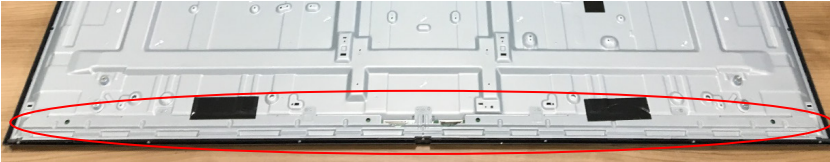
ASSEMBLY / DISASSEMBLY GUIDE (MODULE)

1. LCM status

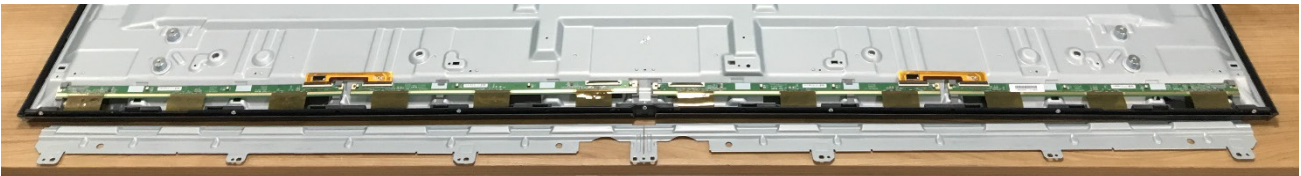
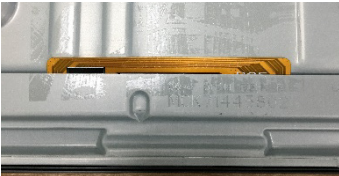
- Panel face on flat surface LCM located to floor
(such as a table where the entire outside of C/Top can be supported)



- ## 2. Disassemble SPCB Cover Shield screws 7ea (Use General Screw Driver.), and detach the bridge protect black tape 2ea. (When you detach the tape, be careful not to crumple or tear the contents inside.)

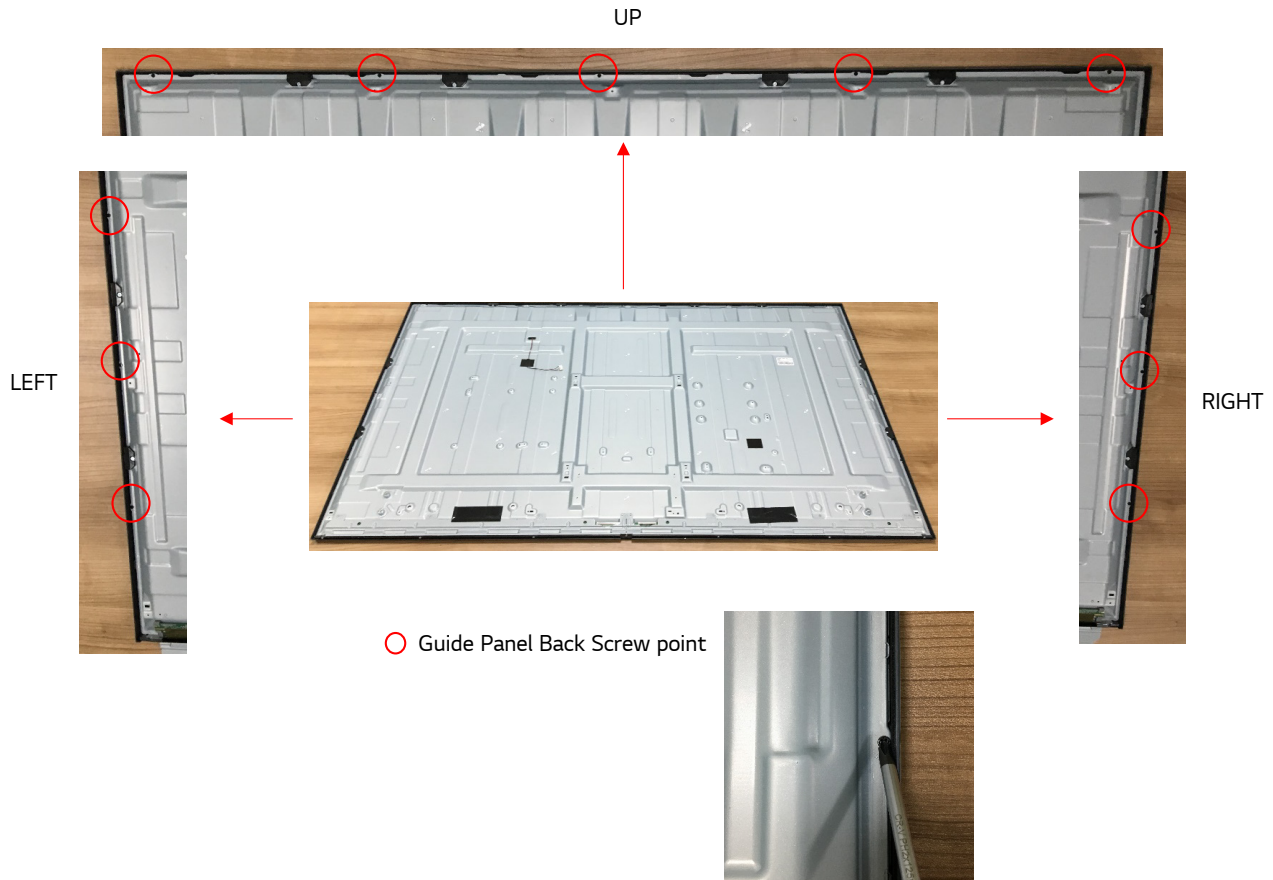


- ## 3. Disassemble the screw and tape, and then move each SPCB cover shield L/R to disassemble it.



4. Loosen the Guide Panel tightening screw.(Guide Panel Back 3-sided)

- Screw Spec : M2*4.0mm Tapping Screw(BLACK)
- Location : Up(5ea)/Left(3ea)/Right(3ea)
- Driver : Normal size screw TIP Driver is available.



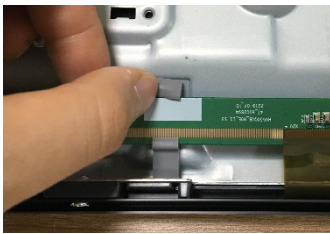
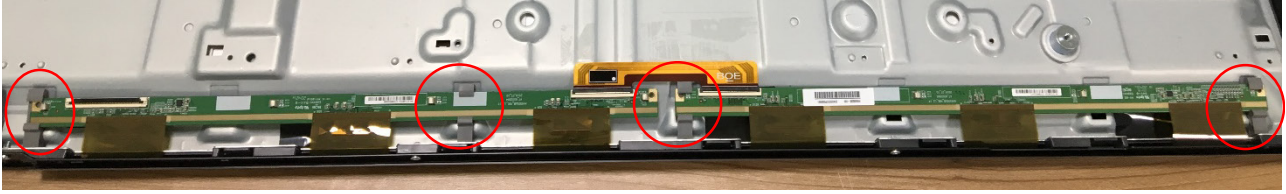
5. Disassemble 7screws on the lower side of the C/top.

- Screw Spec: M3*8 (Silver)
- Driver : Normal size screw TIP Driver is available.



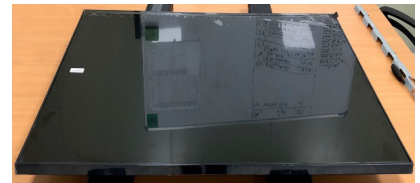
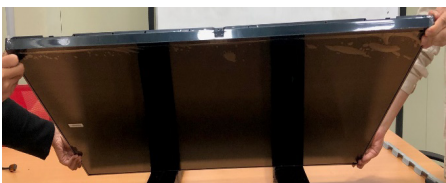
6. Disassemble Panel SPCB L/R from the SPCB Holder.

- Grasp the top side of the SPCB and pull it to release the top side hook of the holder, and then disassemble the SPCB from the bottom side of the hook of the holder.
(Holder quantity is Left 4ea / Right 4ea. And below image is just right side.)



7. Reverse LCM

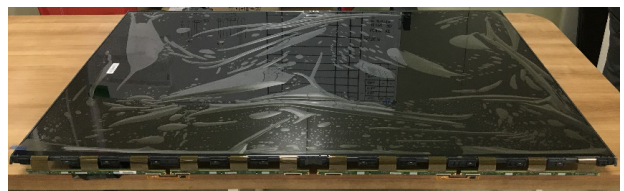
- Must be worked more than two people, one on the left and one on the right side with both hands reverse 180 degrees.



(Case Top down Screw already released, so be caution Case top down falling when Reverse LCM)

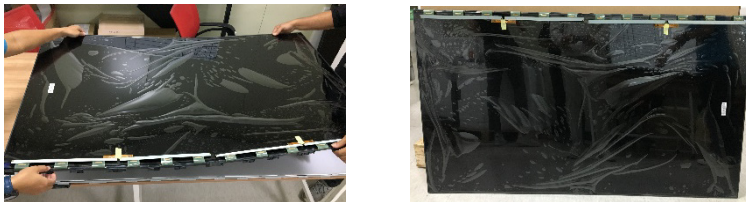
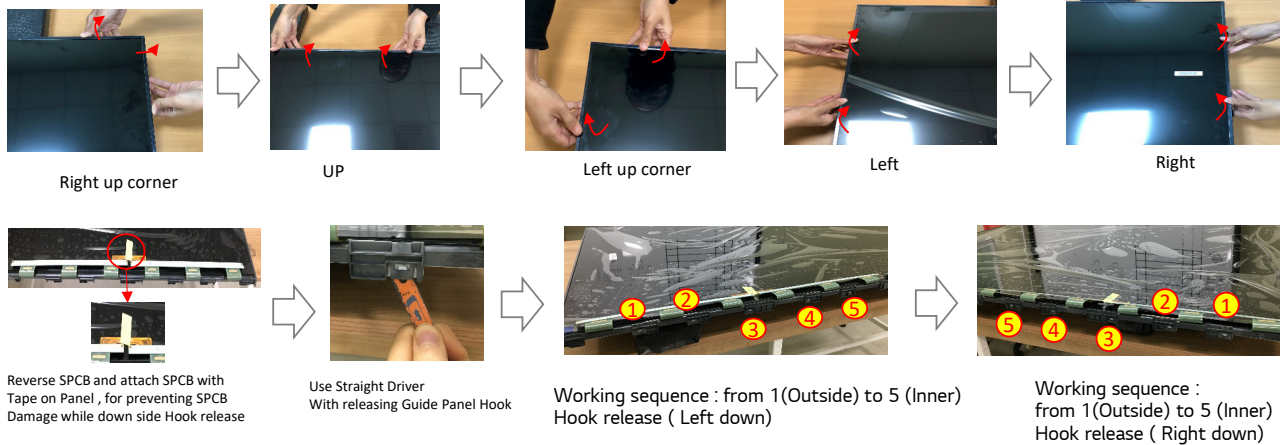
8. Case Top Down release

- disassembly horizontally side direction

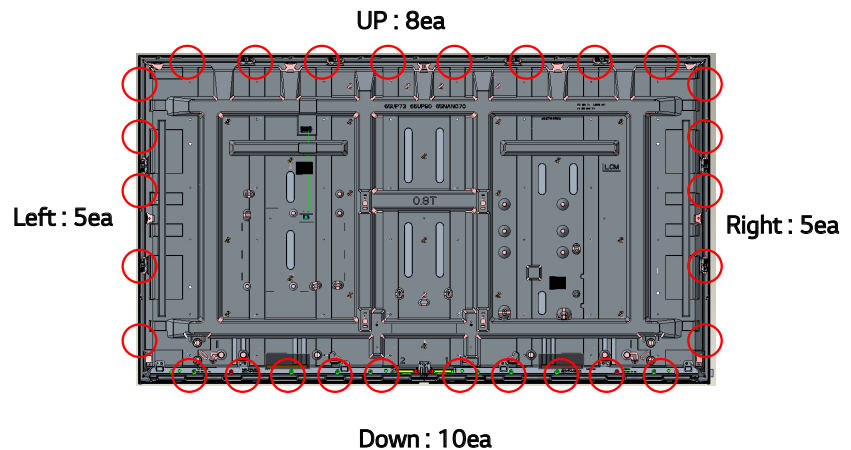
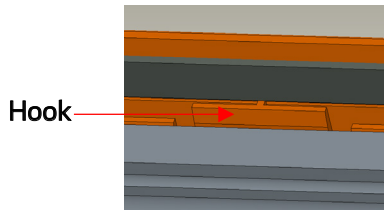


9. Release sequence

: Right UP Corner Hook → UP Hook → Left UP Corner Hook → Left Hook → Right Hook → Left Down (From outside to Inner) → Right Down (From outside to Inner)

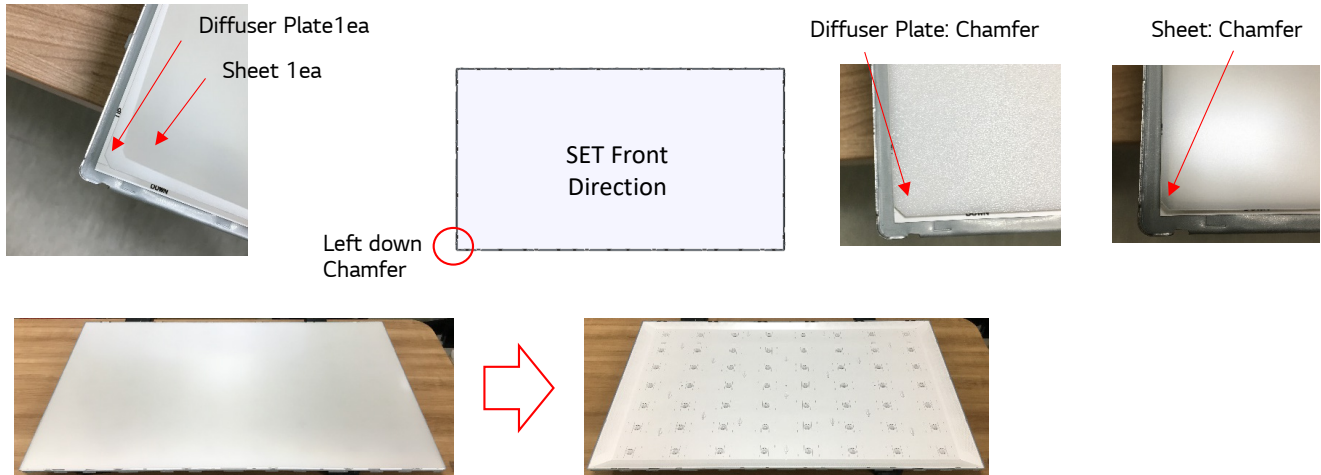


After Releasing Guide Panel all rounded hook, Remove Guide Panel-Board assy with UP Direction.



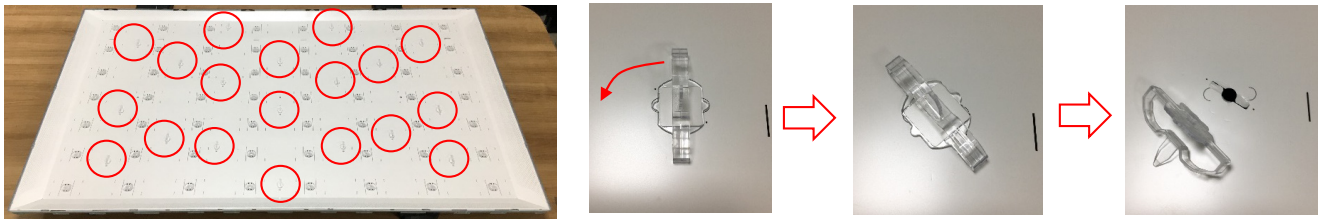
10. Disassemble Sheet (1 sheet) and Diffuser Plate.

- Remove 1 sheets and one Diffuser Plate by lifting them at the same time.
- Assembly direction is divided by the chamfer shape of the Sheets/Diffuser Plate on the front left down side of SET. (other than that, the corners are Right angle or Rounded)



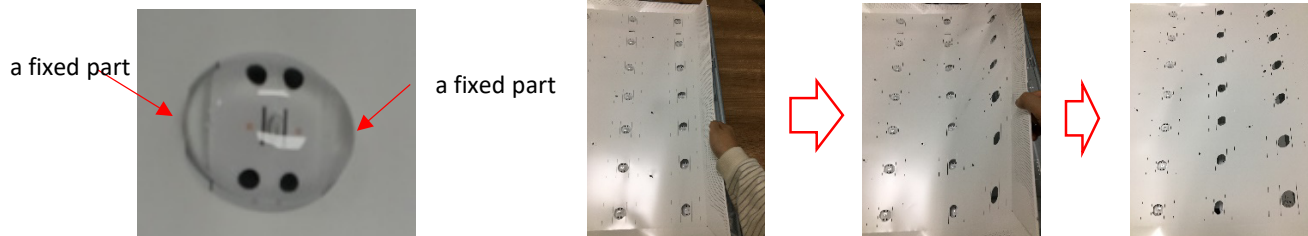
11. Disassembly of 19ea Support Diffuser Plates

- Rotate the Support DP counterclockwise 45 degrees to align it to the assembly hole and lift it upwards to disassemble (Total 19ea)



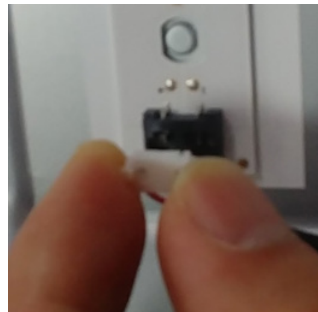
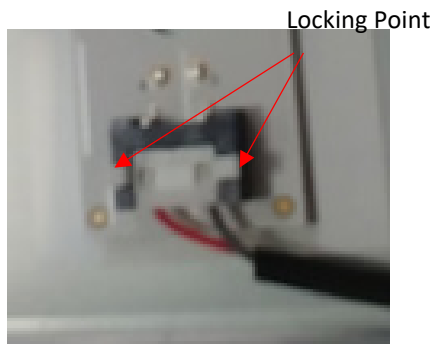
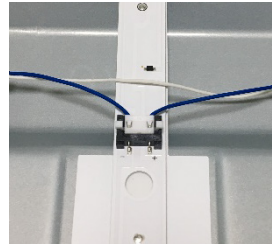
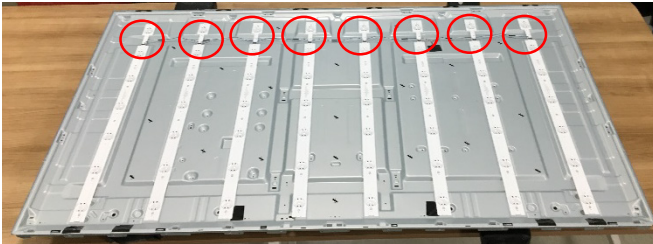
12. Disassemble the Reflector Sheet.

- As the reflector hole is fixed to the lens, disassemble the reflector by release the the fixation of lens from the end on the right.



13. Release the Led array connector.

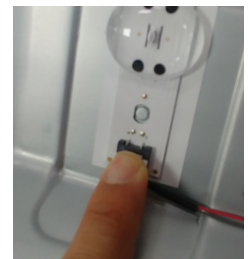
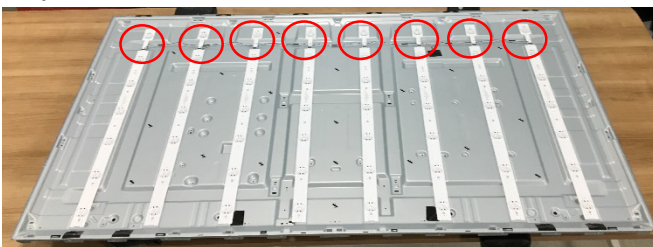
- Press the left/right locking part of the wire connector at the same time and lift it up and release it. (Total 8ea)



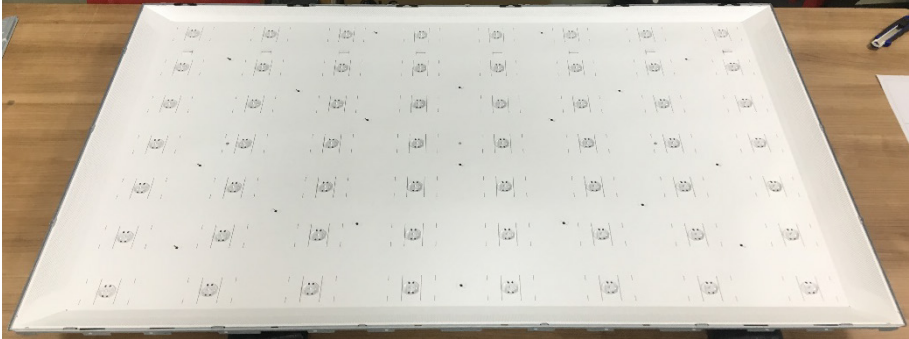
14. Disassemble the Led Array and Attach the New Led Array.

- Disassemble the Led Array Bar (Led Array and Cover Bottom are fixed with two-sided tape, so use appropriate force to cover the Led Array.
Take it off and attach a new Led Array.

15. Assembly of the Led array connector- Attach the connector on the wire ass'y by pushing it upward and downward.

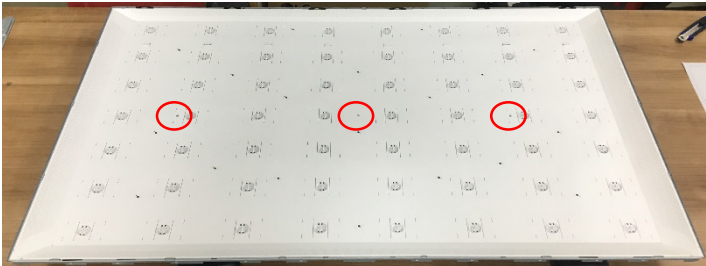


16. Attach the reflector sheet.



17. Position the Reflector sheet

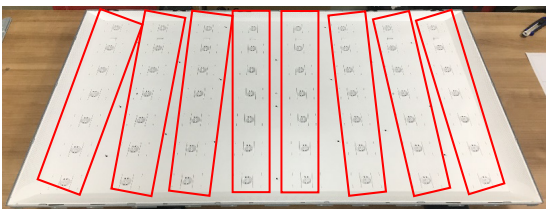
- Align the reflector with the reflector guide hole at 3ea locations on the center/left/right of the reflector and assemble two support plates first.



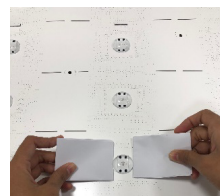
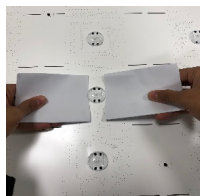
18-1. Fixing the Reflector Lens Hole

- Tighten the reflector hole to the lens in order of No. 1 → 2 → 3 → 4 in the figure below.
(Use Card or nail to insert the reflector sheet into the bottom of the lens.)
It is recommended to push the reflector sheet into the bottom of the lens using tools such as a card, as it may be difficult to tighten when using nails.

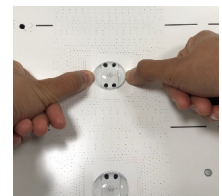
4 3 2 1 1 2 3 4



Using tools

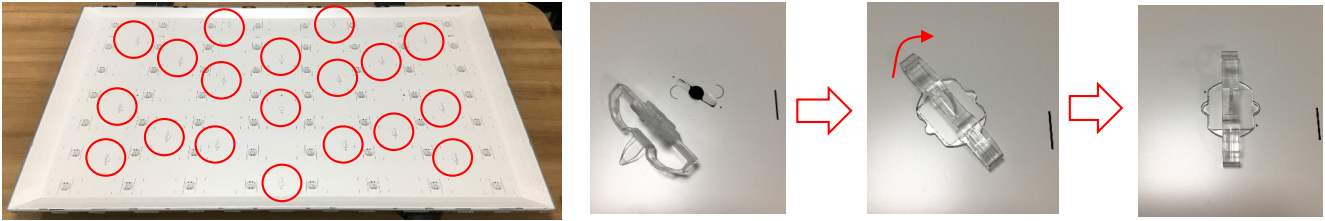


Using nails



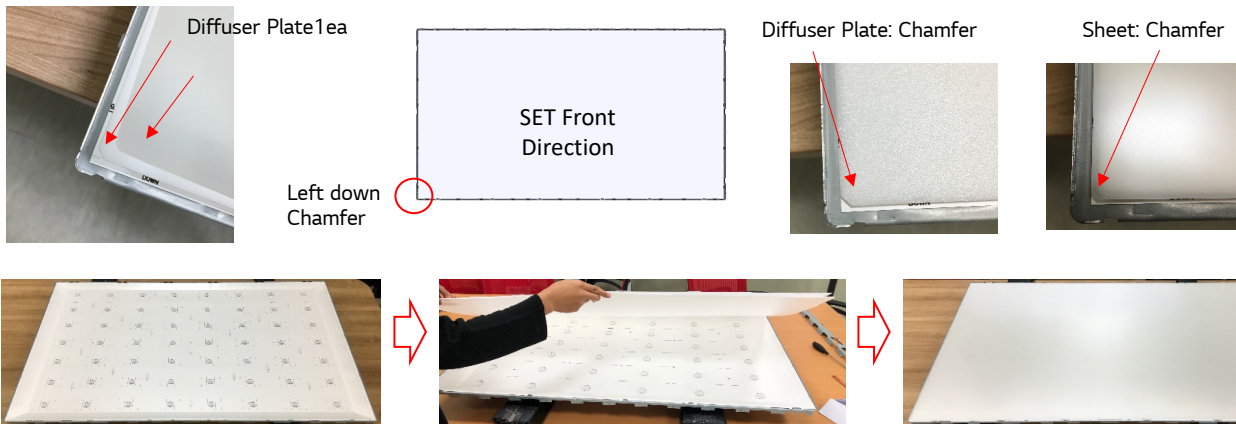
18-2. Assembly of 19 Support Diffuser Plates

- Insert the Support DP into the Support DP Hole on the Cover Bottom and rotate it clockwise 45 degrees (total 19ea), After assembly, the Support DP is vertical Position to the LCM.

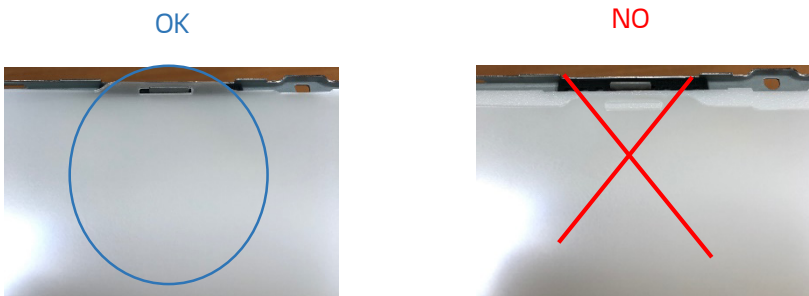


19. Assembly of Sheet (1 sheets) and Diffuser Plate

- Place 1 sheets + 1 Diffuser Plate on top of Cover Bottom.
- Assemble the sheet shape (Chamfer) on the front left side of the SET.

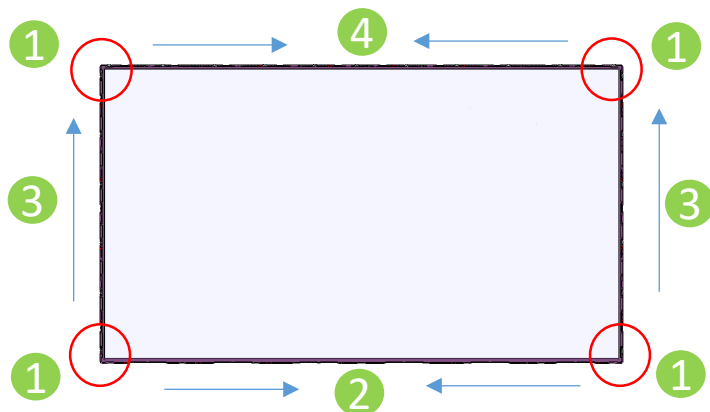


Precautions: Check that the sheet hanging hole on the upper/lower/left/right outer is properly seated on the cover Bottom Sheet hanging.



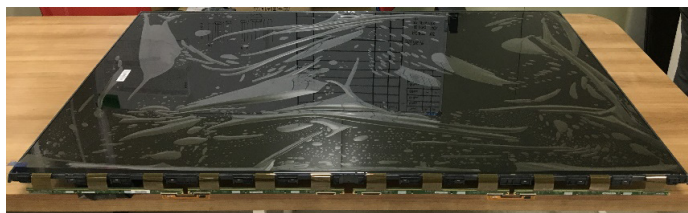
20. Assemble the Guide Panel

- Press the guide panel 4 side down in the upper and lower direction in line with the cover Bottom face to tighten it, and then tighten it in order of 2 and 3.
- Check Hook fastening. (Gap of Sheet and guide panel.)



21. Case Top Down assembly

- Insert Side direction



22. C/Top Lower side Screw 7ea assembly

- Screw Spec: M3*8 (Silver)
- Driver : M3 Screw Module Driver available.

*** Caution : While Screw assembly, be care SPCB COF damage from driver Tip**



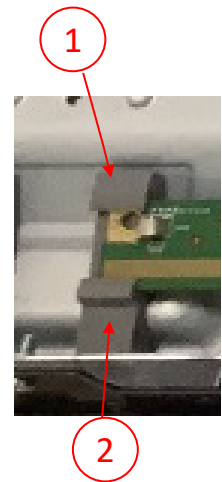
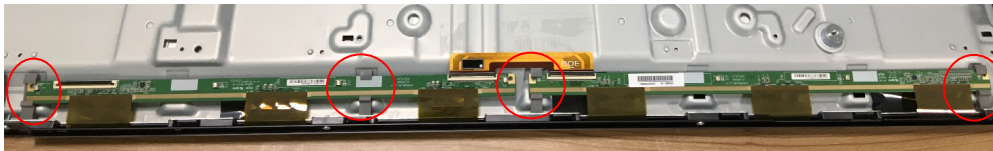
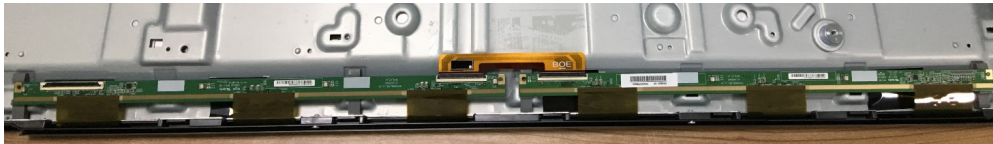
23. Reverse LCM.

- Must be worked more than 2 people, one on the left and one on the right side with both hands reverse 180 degrees.



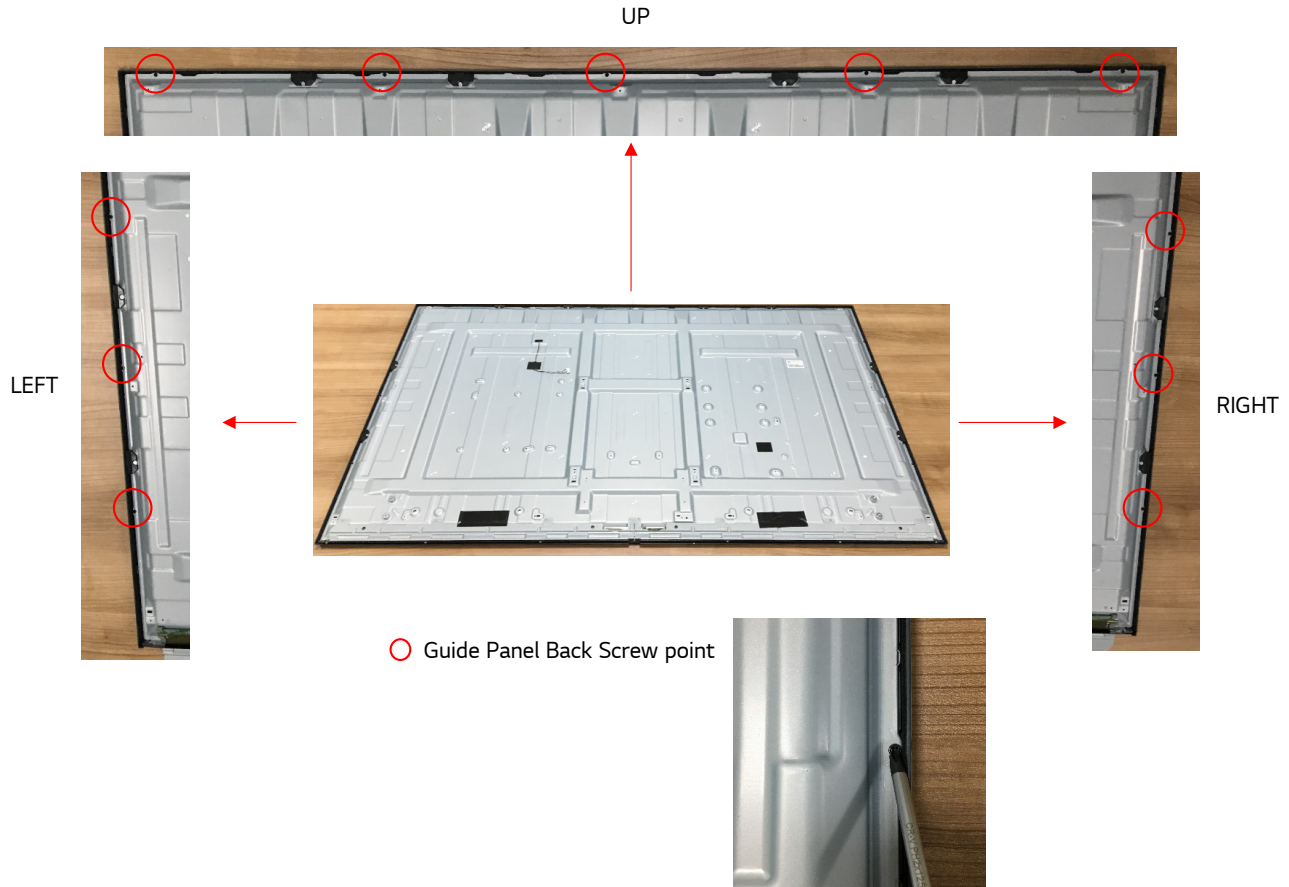
24. Assemble the Panel SPCB L/R to the SPCB Holder.

- First, enter the upper part of the holder and then press the lower part of the holder to tighten the SPCB.

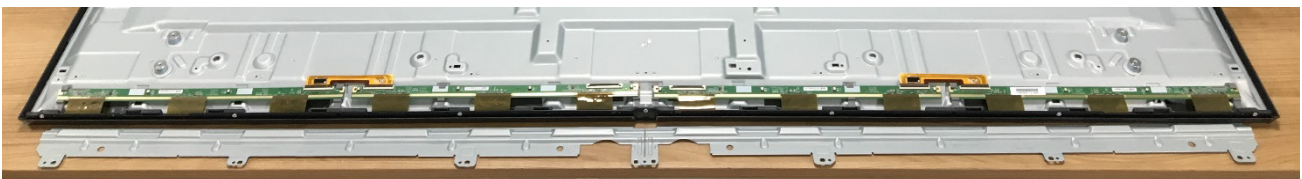


25. Assemble the Guide Panel tightening screw.(Guide Panel Back 3-sided)

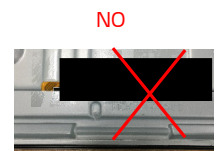
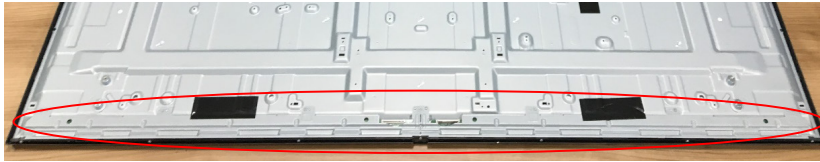
- Screw Spec : M2*4.0mm Tapping Screw(BLACK)
- Location : Up(5ea)/Left(3ea)/Right(3ea)
- Driver : Normal size screw TIP Driver is available.



26. Assemble SPCB Cover shield to Cover Bottom.



27. Assemble SPCB Cover shield screws 7ea (Use M3 Screw module Driver.) and attach the bridge protect black tape 2ea.
(After attach the tape, bridge should not be seen.)



FINISH



TROUBLE SHOOTING GUIDE

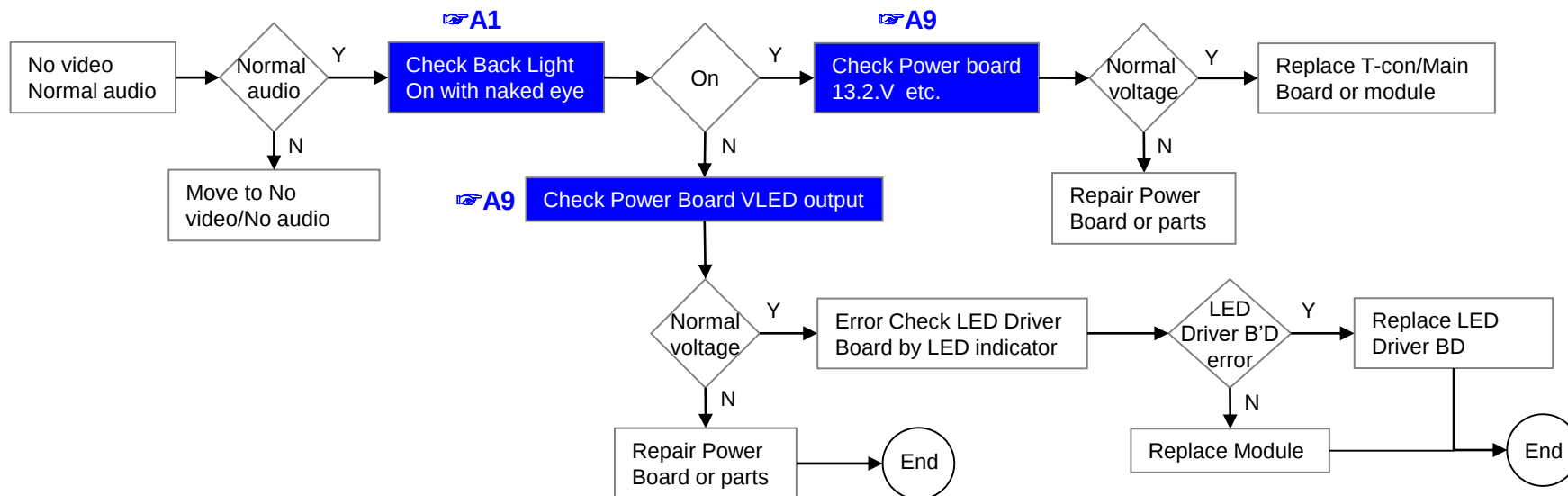
Contents of Standard Repair Process

No.	Error symptom (High category)	Error symptom (Mid category)	Page	Remarks
1	A. Video error	No video/Normal audio	1	
2		No video/No audio	2	
3		Picture broken/ Freezing	3	
4		Color error	4	
5		Vertical/Horizontal bar, residual image, light spot, external device color error	5	
6	B. Power error	No power	6	
7		Off when on, off while viewing, power auto on/off	7	
8		Off when on, off while viewing, power auto on/off	8	
9	C. Audio error	No audio/Normal video	9	
10		Wrecked audio/discontinuation/noise	10	
11	D. Function error	Remote control & Local switch checking	11	
12		Magic Remote control operating checking	12	
13		WiFi operating checking	13	
14		External device recognition error	14	
15		Voice Recognition Function Error	15	
16	E. Noise	Circuit noise, mechanical noise	16	
17	F. Exterior error	Exterior defect	17	

First of all, Check whether there is SVC Bulletin in GSCS System for these model.

	Error symptom	A. Video error	Established date		
		No video/ Normal audio	Revised date		1/17

First of all, Check whether all of cables between board is inserted properly or not.
(Main B/D↔ Power B/D, Each Cable for Panel, Speaker Cable, IR B/D Cable,,,)



※Precaution A4 & A2

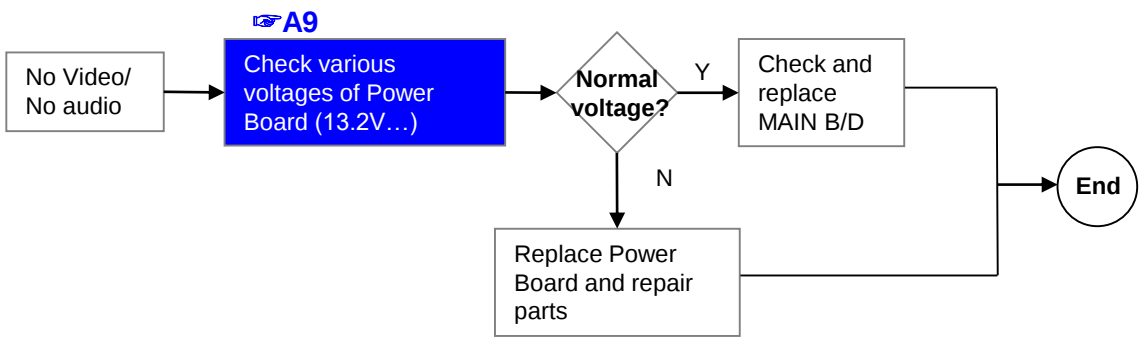
Always check & record S/W Version and White Balance value before replacing the Main Board

Replace Main Board

Re-enter White Balance value

Standard Repair Process

	Error symptom	A. Video error	Established date		
		No video/ No audio	Revised date		2/17

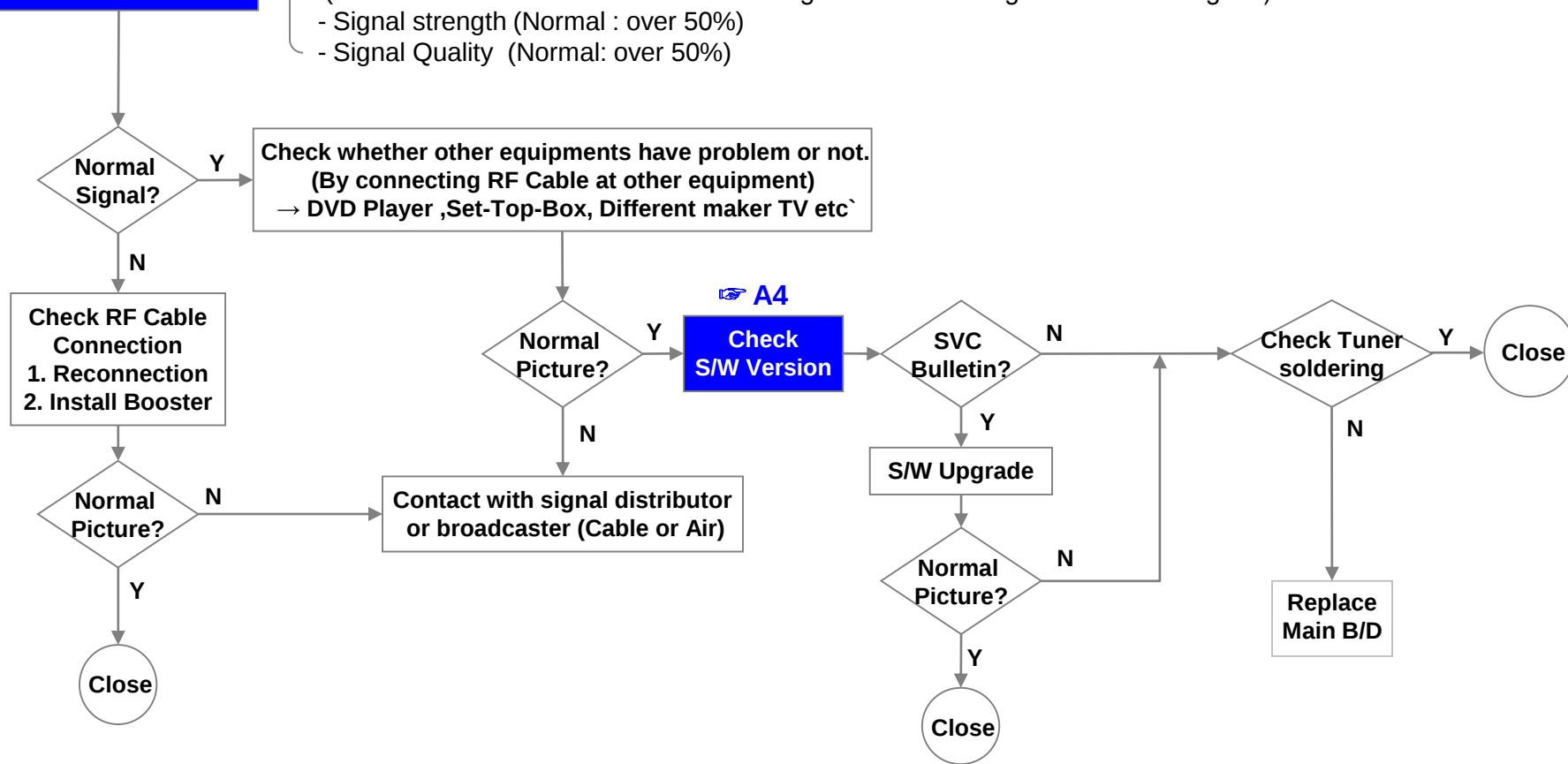


	Error symptom	A. Video error	Established date		
		Picture broken/ Freezing	Revised date		3/17

👉 A3

Check RF Signal level

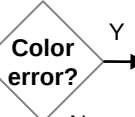
- . By using Digital signal level meter
- . By using Diagnostics menu on OSD
(Advanced→ Channels→ Channel Tuning→ Manual Tuning → Check the Signal)
- Signal strength (Normal : over 50%)
- Signal Quality (Normal: over 50%)



	Error symptom	A. Video error	Established date		
		Color error	Revised date		4/17

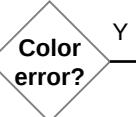
 A6

Check color by input
-External Input
-HDMI

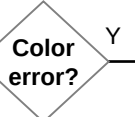


 A7

※ Check and replace Link Cable (EPI or Vx1 Cable) and contact condition



Replace Main B/D



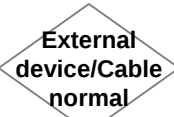
Replace module

 A20

Check Test pattern



Check external device and cable



Replace Main/T-con B/D

Request repair for external device/cable

HDMI error

Check external device and cable



Replace Main/T-con B/D

	Error symptom	A. Video error	Established date		
		Vertical / Horizontal bar, residual image, light spot, external device color error	Revised date		5/17

Vertical/Horizontal bar, residual image, light spot

A6

Check color condition by input
-External Input
-HDMI

A20

Check Test pattern

Screen normal?

Replace module

Check external device connection condition

Normal?

Request repair for external device

A7

Check and replace Link Cable

Screen normal?

End

Replace Main/T-con B/D

For LGD panel

Replace Main B/D

For other panel

Replace Module

Screen normal?

End

External device screen error-Color error

Check S/W Version

Check version

S/W Upgrade

Normal screen?

End

Check screen condition by input
-External Input
-Component
-HDMI/DVI

External Input error

Component error

HDMI/DVI

Connect other external device and cable
(Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)Connect other external device and cable
(Check normal operation of External Input, Component, RGB and HDMI/DVI by connecting Jig, pattern Generator, Set-top Box etc.)

Screen normal?

Replace Main/T-con B/D

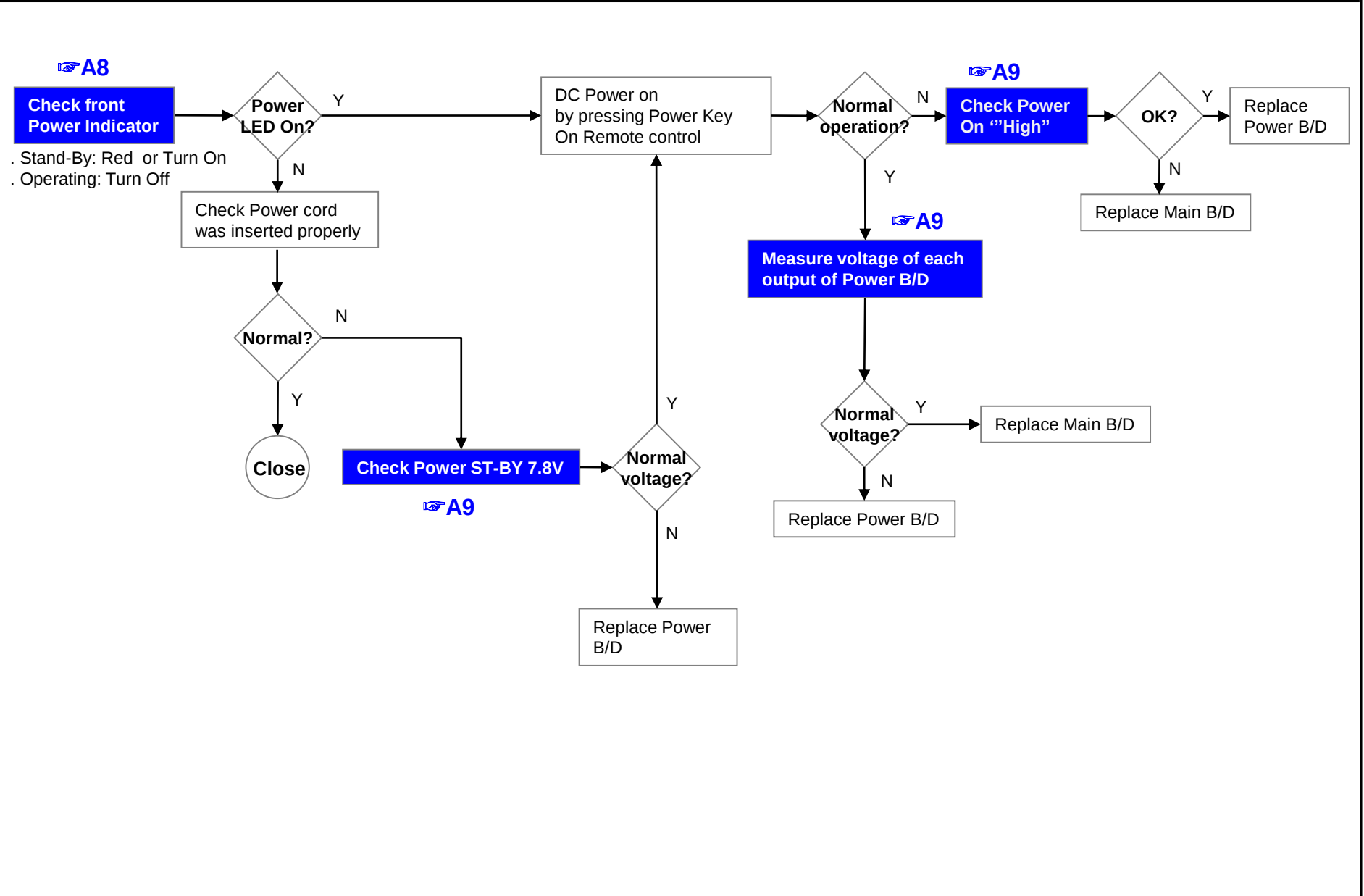
Request repair for external device

Screen normal?

Replace Main /T-con B/D

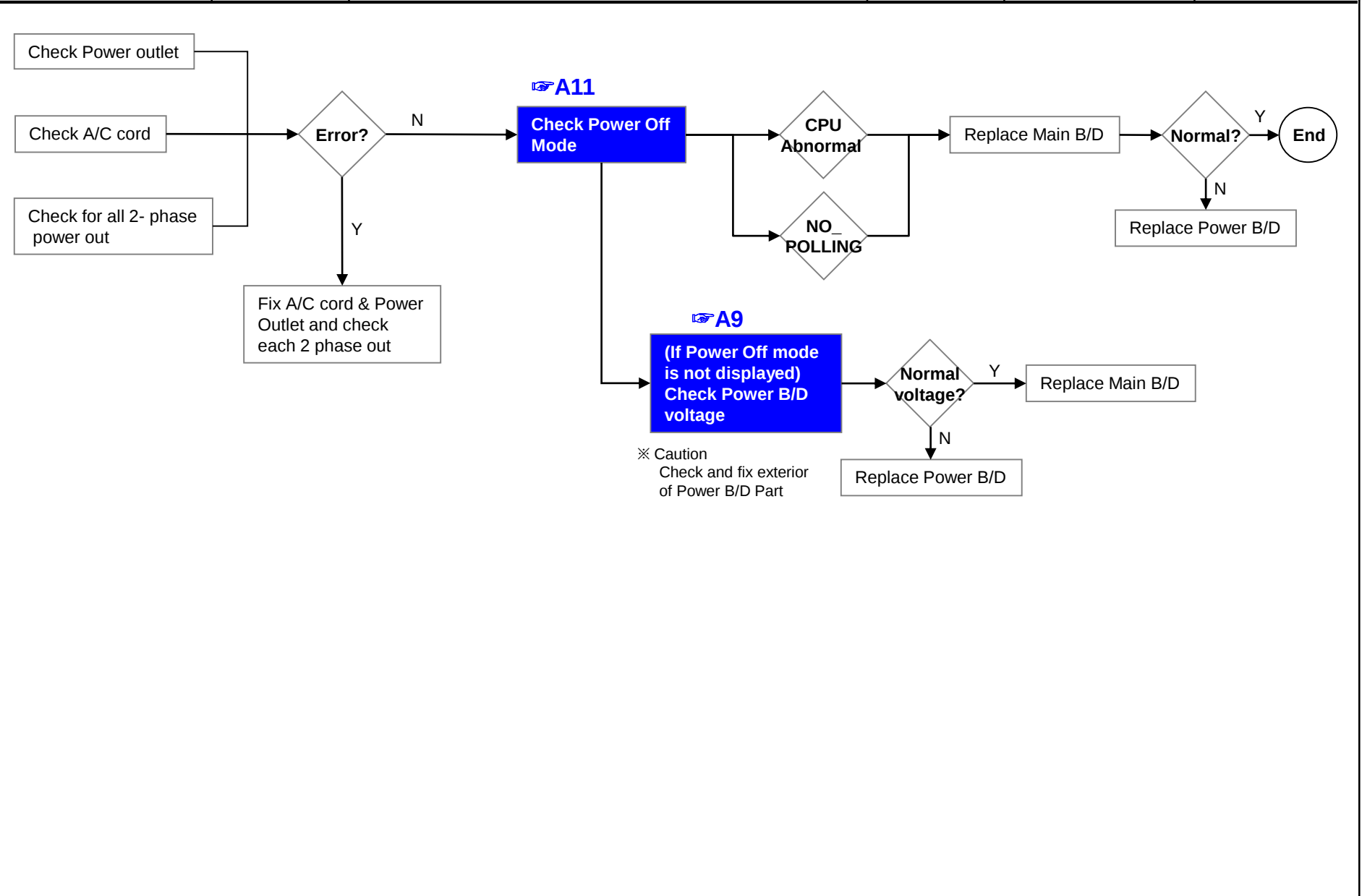
Standard Repair Process

	Error symptom	B. Power error	Established date		
		No power	Revised date		6/17



Standard Repair Process

	Error symptom	B. Power error	Established date		
		Off when on, off while viewing, power auto on/off	Revised date		7/17



Standard Repair Process

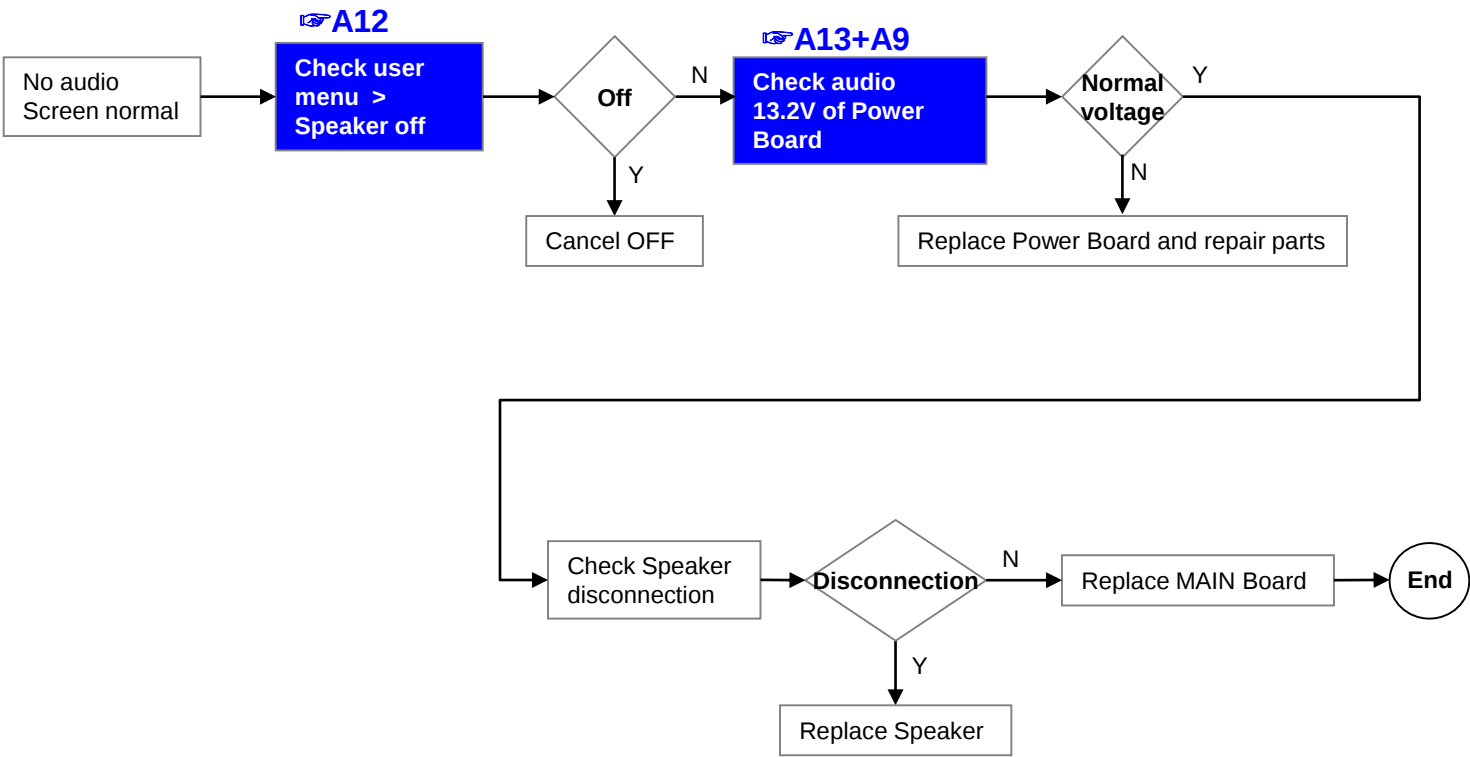
	Error symptom	B. Power error	Established date		
		Off when on, off while viewing, power auto on/off	Revised date		8/17

* Please refer to the all cases which can be displayed on power off mode.

Power off history	Contents	Explanation	Action Details
00~09, 0A~0Z	Normal operation	Occurs during normal operation (Remote_Key, Local_Key etc)	Normal Case
10~19, 1A~1Z	Power environment	Items required for power environment inspection (AC_DET etc)	Power Inspection and replacement
20~29, 2A~2Z	External equipment/ Network	Power operation by external equipment/network (HDMI CEC, WiFi/Lan/BT etc)	Normal Case - Settop CEC Check the settings - TV HDMI Setting > Simple Link Menu check - Check 'Turn on TV with mobile device' Menu on the TV
30~39, 3A~3Z	User Scene	Records according to customer use (Timer setting, reservation setting, no operation/no signal condition, initialization etc)	Normal Case - Check your TV's 'Reservation Time Settings' - Input signal check (Auto power off after 15 minutes in case of no signal)
40~49, 4A~4Z	App/CP	App button operation on the remote control (Netflix key, Disney key etc)	Normal Case
50~59, 5A~5Z	SW Update	S/Ware Update record	Normal Case
60~69, 6A~6Z	System Error	System malfunction (need to check Main PCBA /SW)	SW latest version check and update Main check and replacement
70~79, 7A~7Z	AR/AOD	Records left during AR/AOD operation	Normal Case
80~89, 8A~8Z	WOV	Operation via Voice	Normal Case - Check your TV's 'Voice Recognition Settings' * Turn off the function or change the sensitivity setting, etc
90~99, 9A~9Z	Specific country	Specific country only (satellite, disaster etc)	N/A
B0~B9, BA~BZ	OLED(BDP)	OLED only (Panel defect)	OLED Module check and replacement (BDP)
C0~C9, CA~CZ	OLED	OLED only (Compensatory action)	OLED Module check and replacement (Except BDP)
D0~D9, DA~DZ	OLED(etc)	OLED 모델 only (Fan, FPC cable error etc)	Checking T-con and main connection cable Checking Fan / Heatsink Connection Status
L0~L9, LA~LZ	Life style	Standby me model etc	N/A
R0~R9, RA~RZ	A+	Rollable model only	N/A
M0~M9, MA~MZ	Wireless model	Wireless model only	N/A
F0~F9, FA~FZ	Process/SVC Records	Process/SVC Records (in-stop, Power Only etc)	Normal Case - N/A
XX	Initial value	Initial value not recorded yet	Normal Case

Standard Repair Process

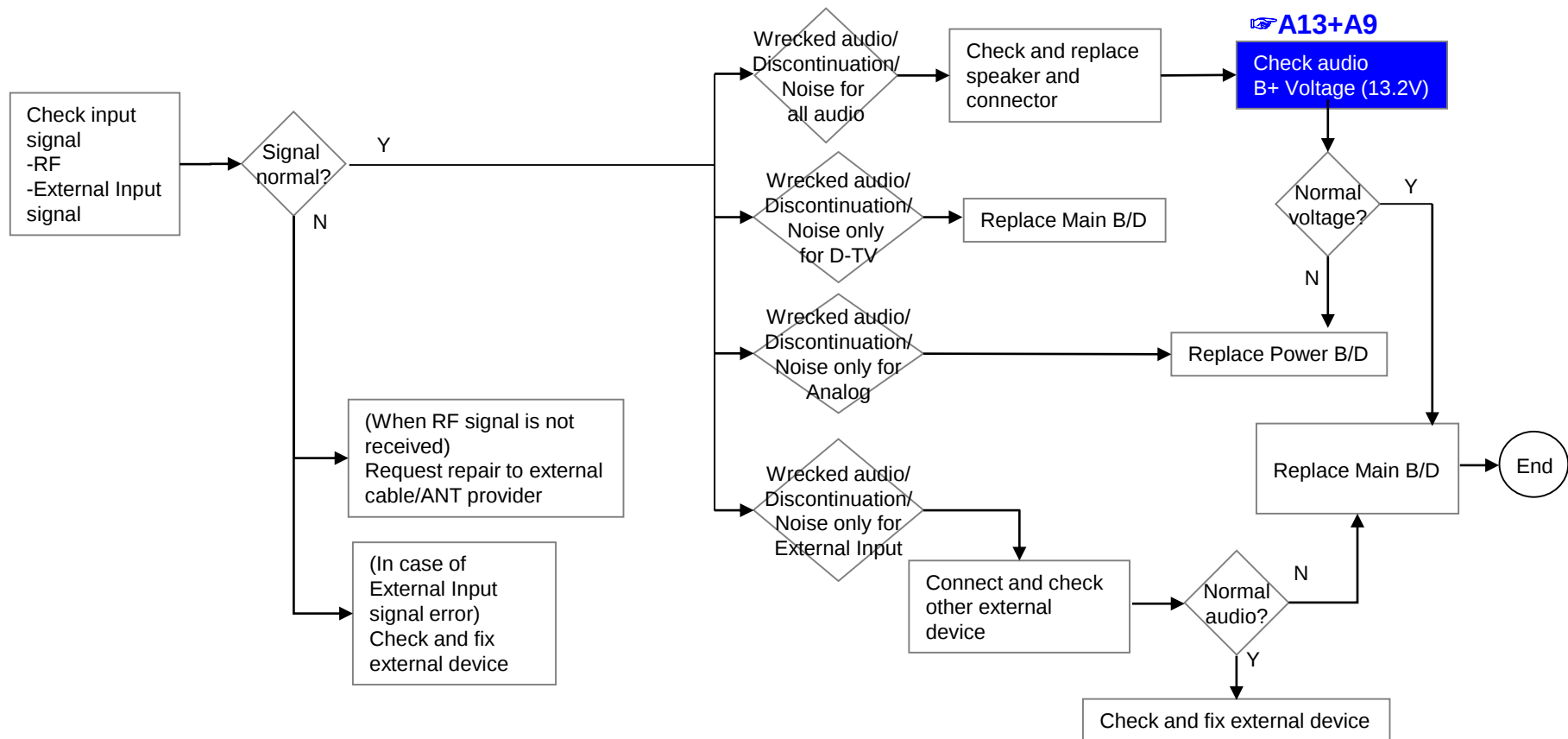
	Error symptom	C. Audio error	Established date		
		No audio/ Normal video	Revised date		9/17



Standard Repair Process

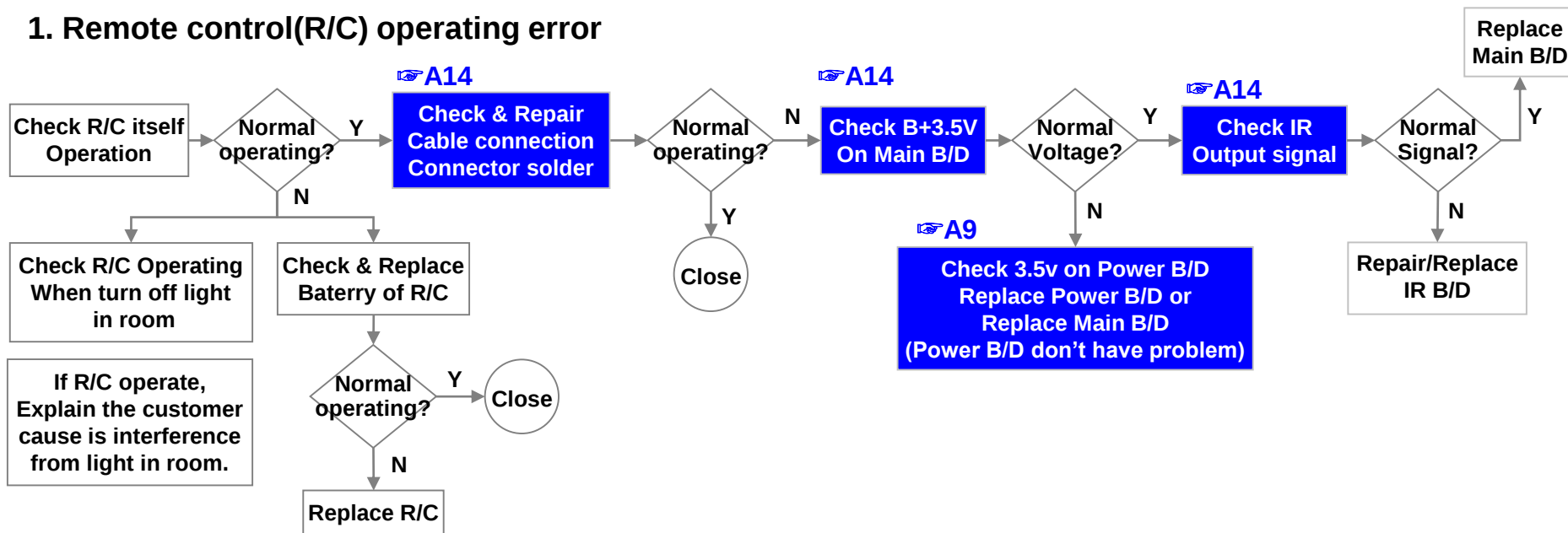
	Error symptom	C. Audio error	Established date		
		Wrecked audio/ discontinuation/noise	Revised date		10/17

→ abnormal audio/discontinuation/noise is same after “Check input signal” compared to No audio



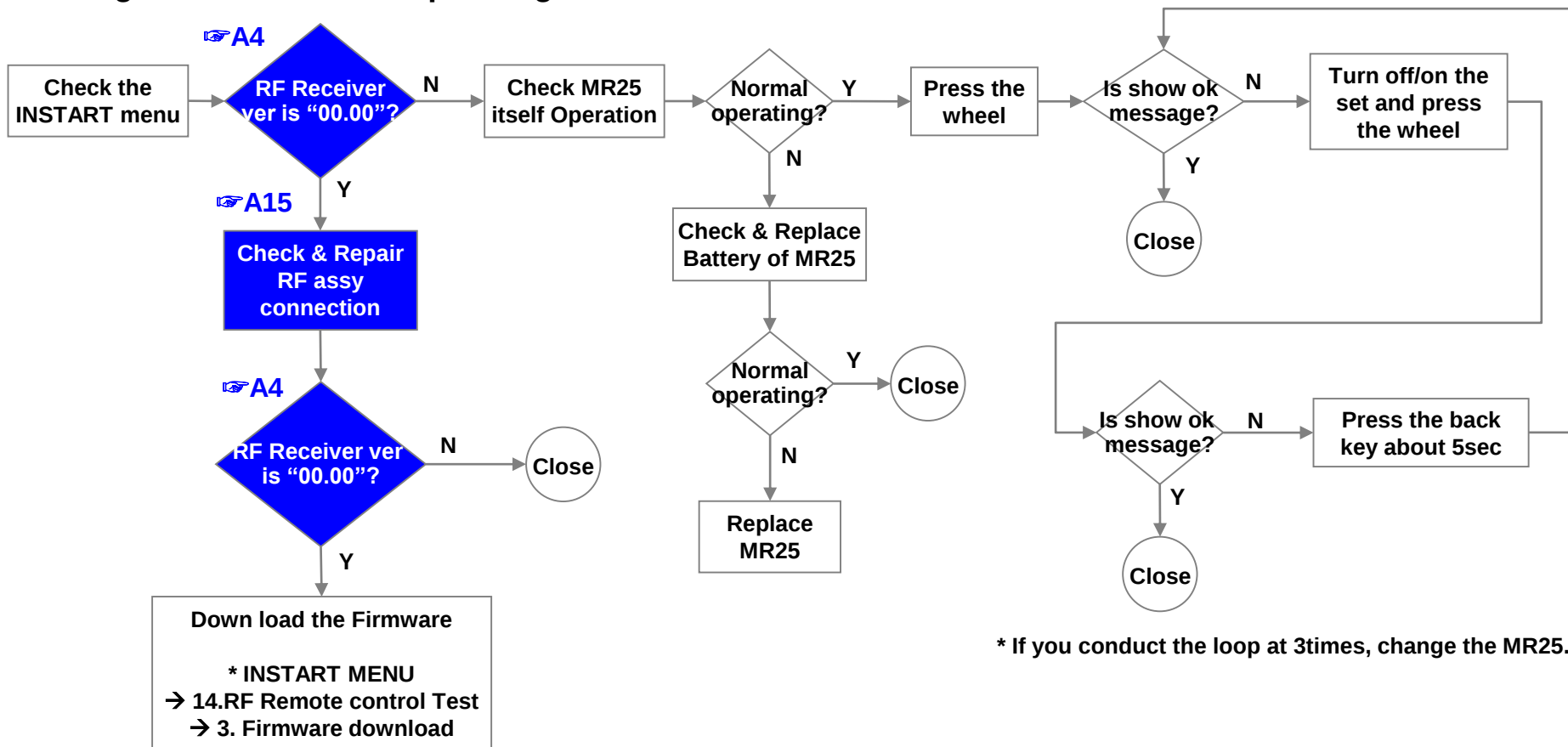
	Error symptom	D. Function error	Established date		
		Remote control & Local switch checking	Revised date		11/17

1. Remote control(R/C) operating error



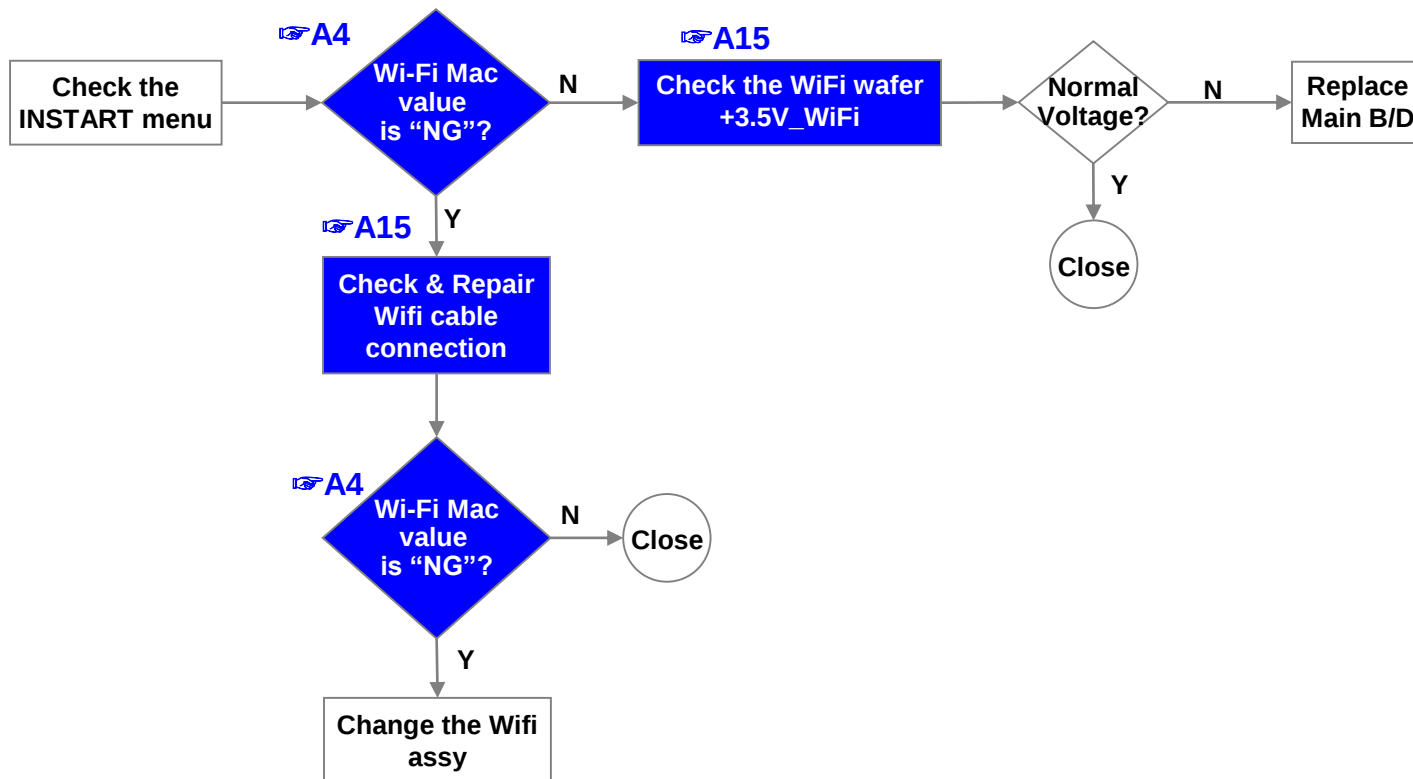
	Error symptom	D. Function error	Established date		
		Magic Remote control operating checking	Revised date		12/17

2. Magic Remote control operating error

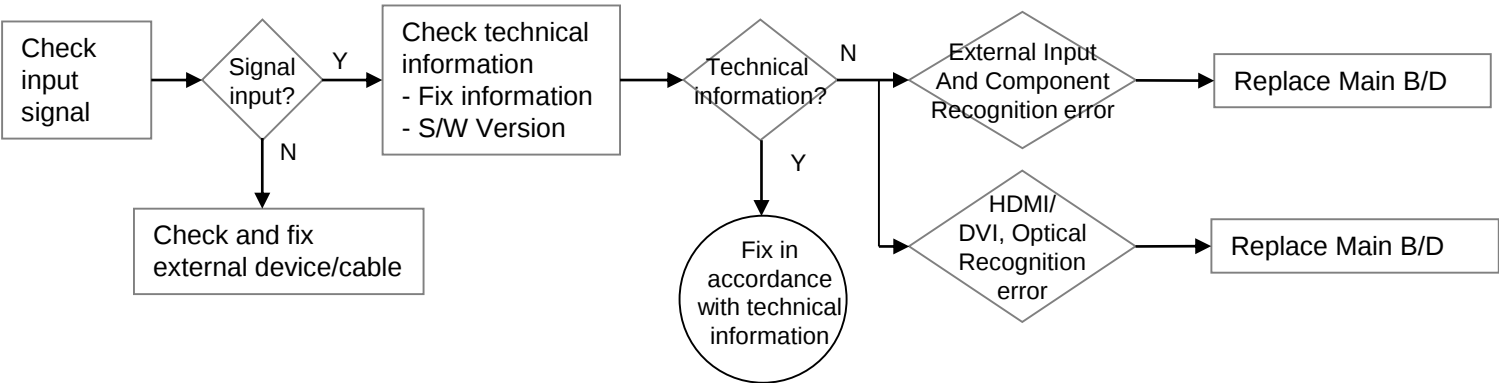


	Error symptom	D. Function error	Established date		
		WiFi operating checking	Revised date		13/17

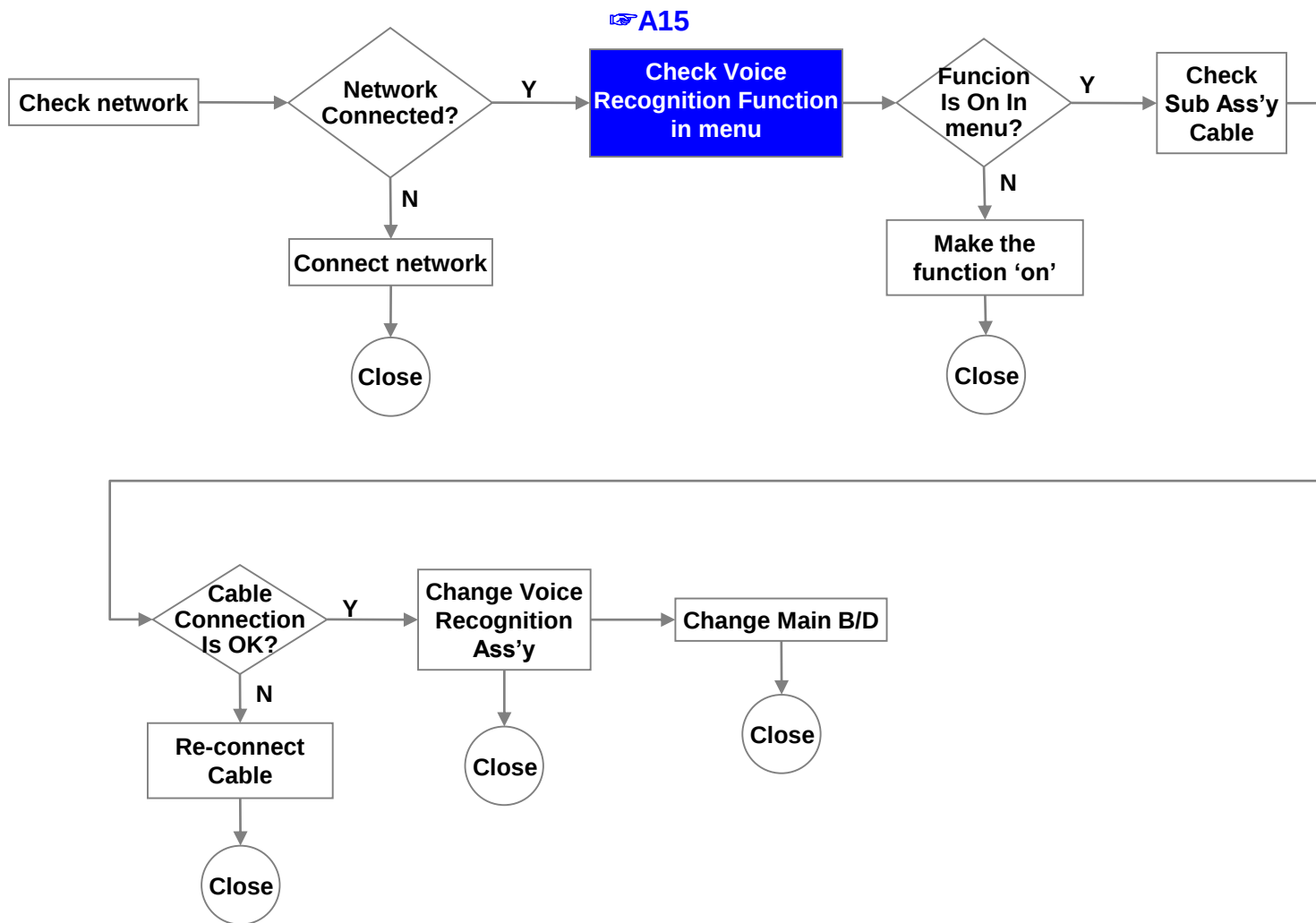
3. WiFi operating error



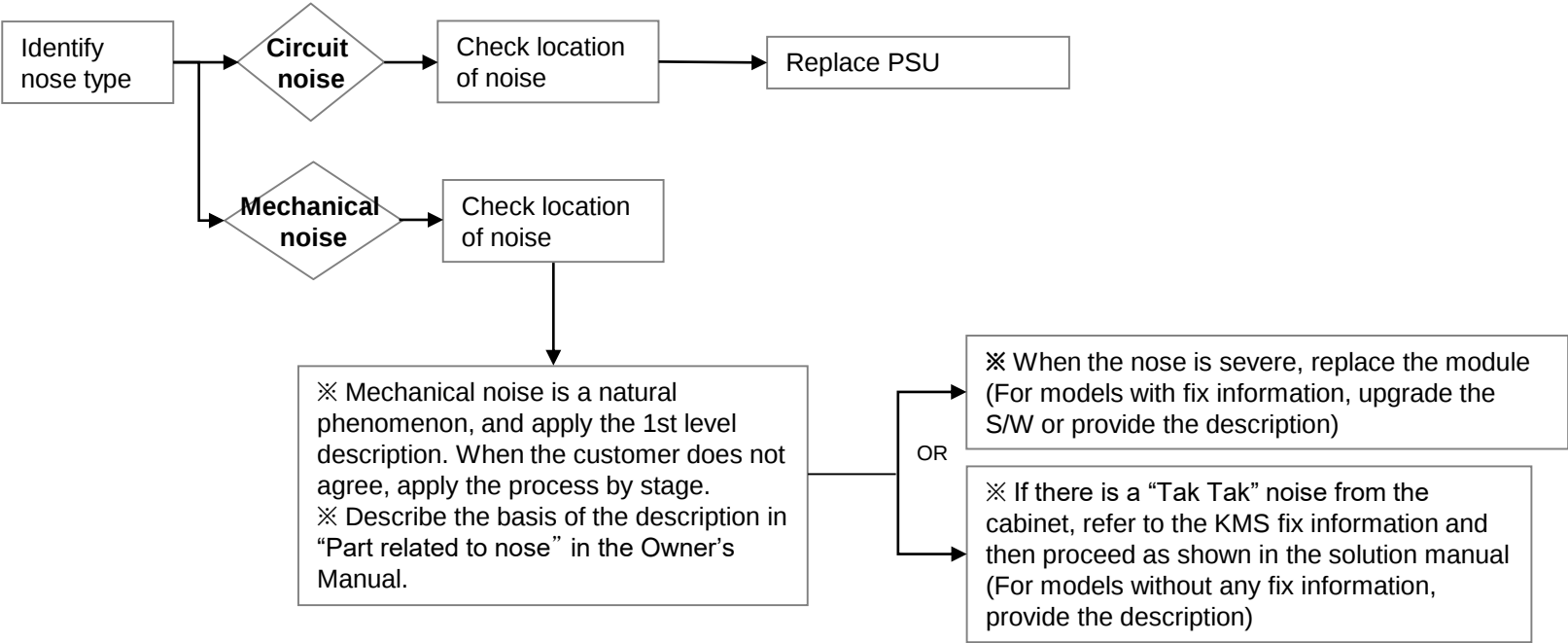
	Error symptom	D. Function error	Established date		
		External device recognition error	Revised date		14/17



	Error symptom	D. Function error	Established date		
		Voice Recognition Function Error	Revised date		15/17

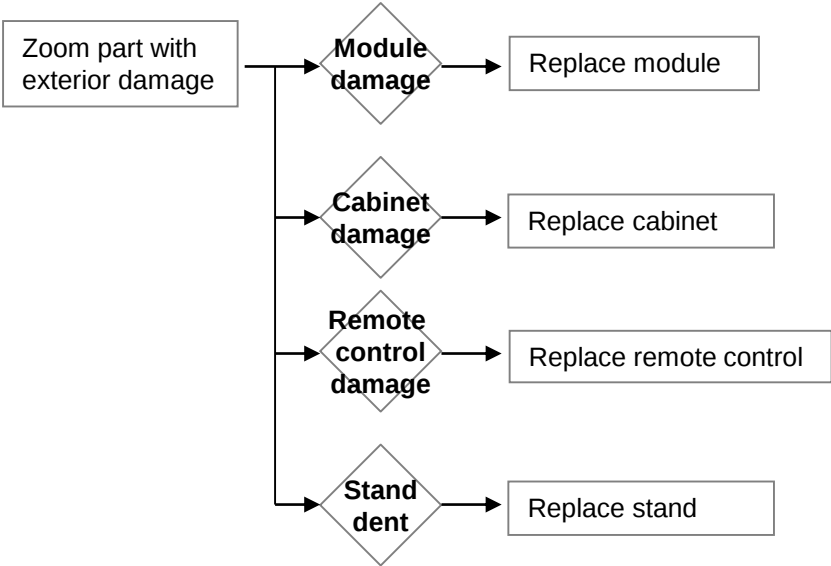


	Error symptom	E. Noise	Established date		
		Circuit noise, mechanical noise	Revised date		16/17



Standard Repair Process

	Error symptom	F. Exterior defect	Established date		
		Exterior defect	Revised date		17/17



Contents of Standard Repair Process Detail Technical Manual

No.	Error symptom	Content	Page	Remarks
1	A. Video error_ No video/Normal audio	Check LCD back light with naked eye	A1	
2		Check White Balance value	A2	
3	A. Video error_ video error /Video lag/stop	TUNER input signal strength checking method	A3	
4		Version checking method	A4	
5		Tuner Checking Part	A5	
6	A. Video error _Vertical/Horizontal bar, residual image, light spot	Connection diagram	A6	
7	A. Video error_ Color error	Check Link Cable (Vx1/EPI) reconnection condition	A7	
8	<Appendix> Defected Type caused by T-Con/ Inverter/ Module	Check Cable (1) ~ (2)	A-1/11 A-2/11	
9		Exchange Main Board (1) ~ (3)	A-3/11 ~ A-5/11	
10		Exchange Module (1) ~ (3)	A-6/11 ~ A-8/11	
11		Exchange T-Con (1) ~ (2)	A-9/11 ~ A-10/11	Only using T-con model
12		Exchange Power Board(PSU)	A-11/11	

Continue to the next page

Contents of Standard Repair Process Detail Technical Manual

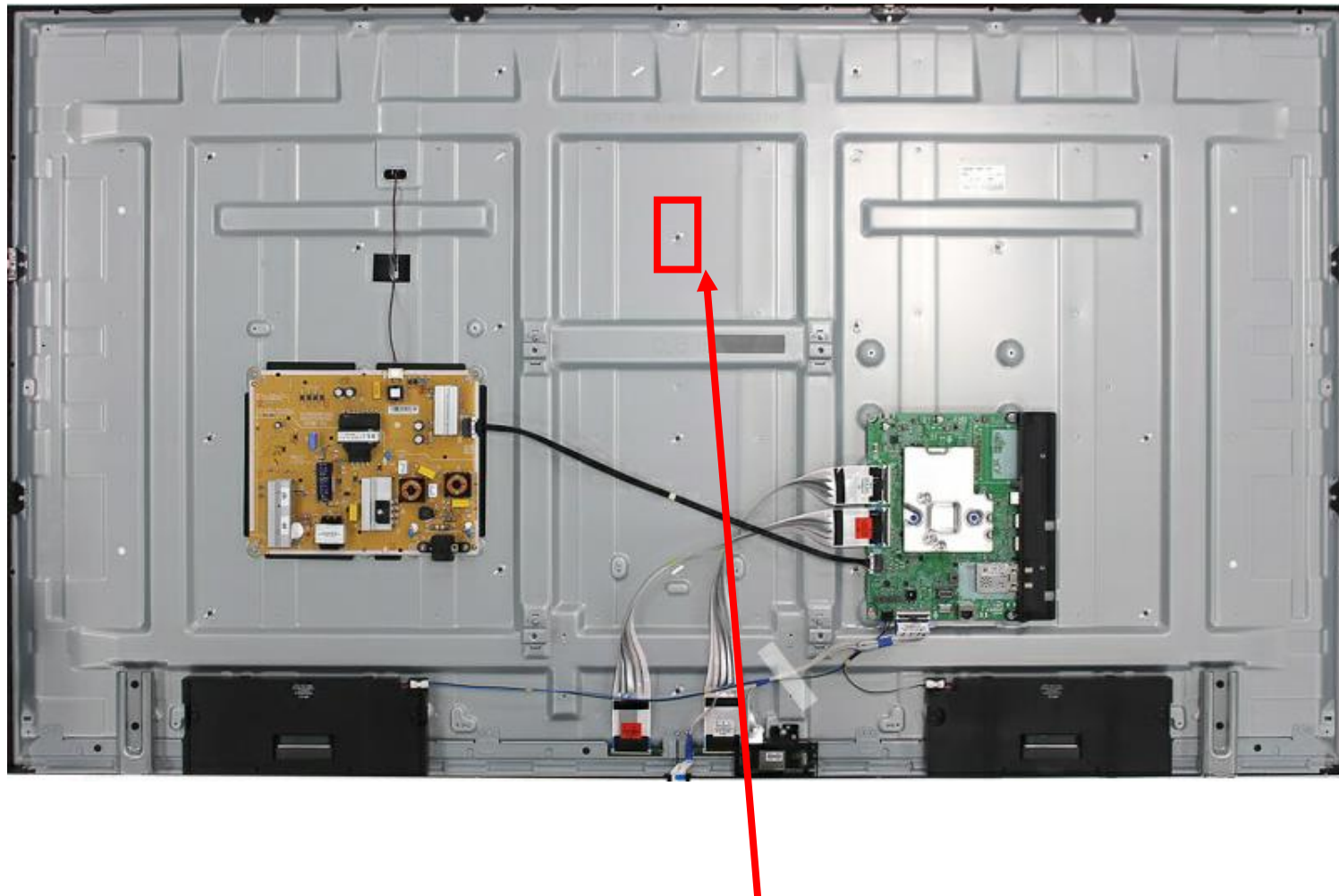
Continued from previous page

No.	Error symptom	Content	Page	Remarks
13	B. Power error_ No power	Check front display LED	A17	
14		Check power input Voltage & ST-BY 7.8V	A18	
15	B. Power error_Off when on, off while viewing	POWER OFF MODE checking method	A19	
16	C. Audio error_ No audio/Normal video	Checking method in menu when there is no audio	A20	
17		Voltage and speaker checking method when there is no audio	A21	
18	D. Function error	Remote control operation checking method	A22	
19		Motion Remote operation checking method	A23	
20	E. Etc	How to use the Service remote control	A24-A26	
21		Check items after Main B/D replacement	A27	
22		Adjustment Test pattern - ADJ Key	A28	

Standard Repair Process Detail Technical Manual

	Error symptom	A. Video error_No video/Normal audio	Established date		
	Content	Check LCD back light with naked eye	Revised date		A1

65NANO80/81

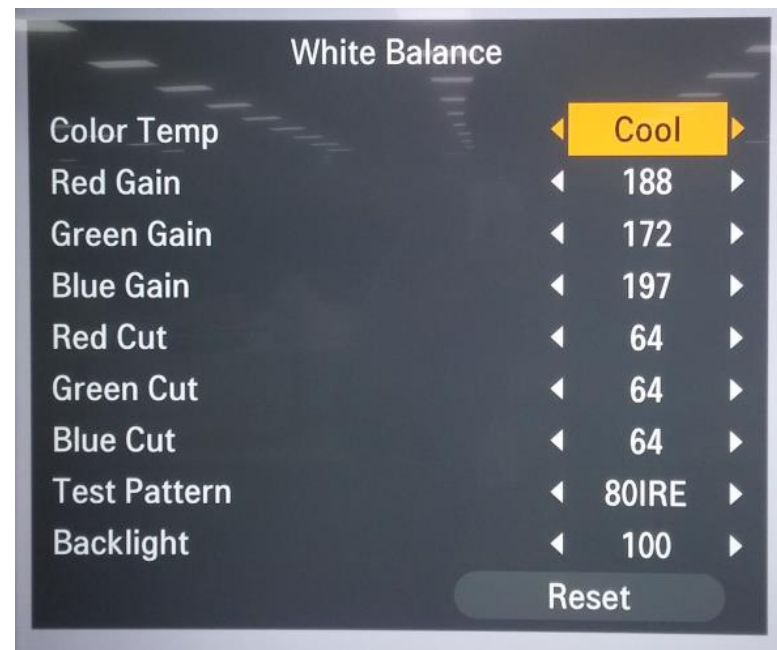
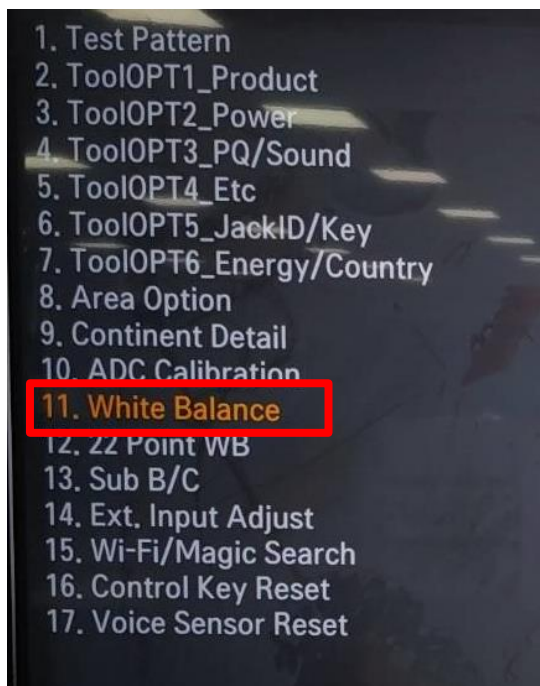


After turning on the power and disassembling the case, check with the naked eye, whether you can see light from locations.

Standard Repair Process Detail Technical Manual

	Error symptom	A. Video error_No video/Normal audio	Established date		
	Content	Check White Balance value	Revised date		A2

<ALL MODELS>



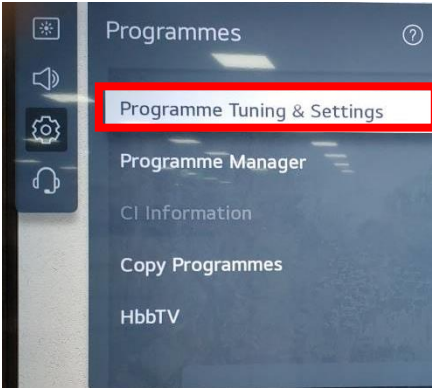
Entry method

1. Press the ADJ button on the remote control for adjustment.
2. Enter into White Balance.
3. After recording the R, G, B (GAIN, Cut) value of Color Temp(Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.

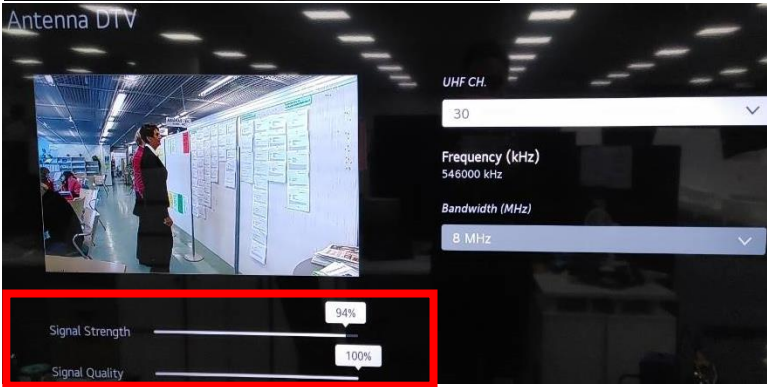
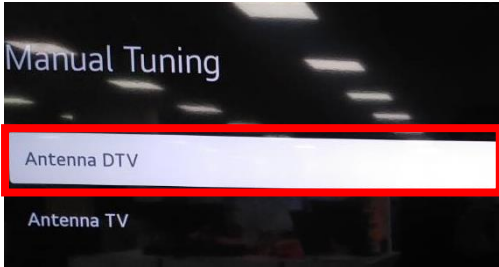
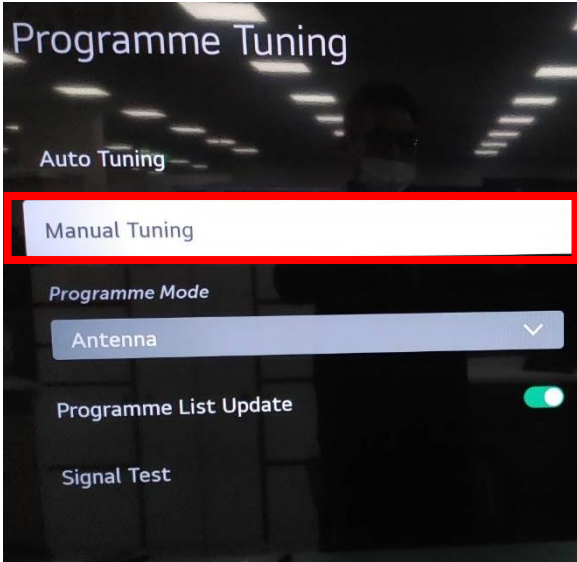
Standard Repair Process Detail Technical Manual

	Error symptom	A. Video error_Video error, video lag/stop	Established date		
	Content	TUNER input signal strength checking method	Revised date		A3

<ALL MODELS>



All Setting → General → Programmes
→ Programme Tuning & Settings
→ Manual Tuning



When the signal is strong,
use the attenuator (-10dB,
-15dB, -20dB etc.)



Standard Repair Process Detail Technical Manual

	Error symptom	A. Video error_Video error, video lag/stop	Established date		
	Content	Version checking method	Revised date		A4

1. Checking method for remote control for adjustment

Version

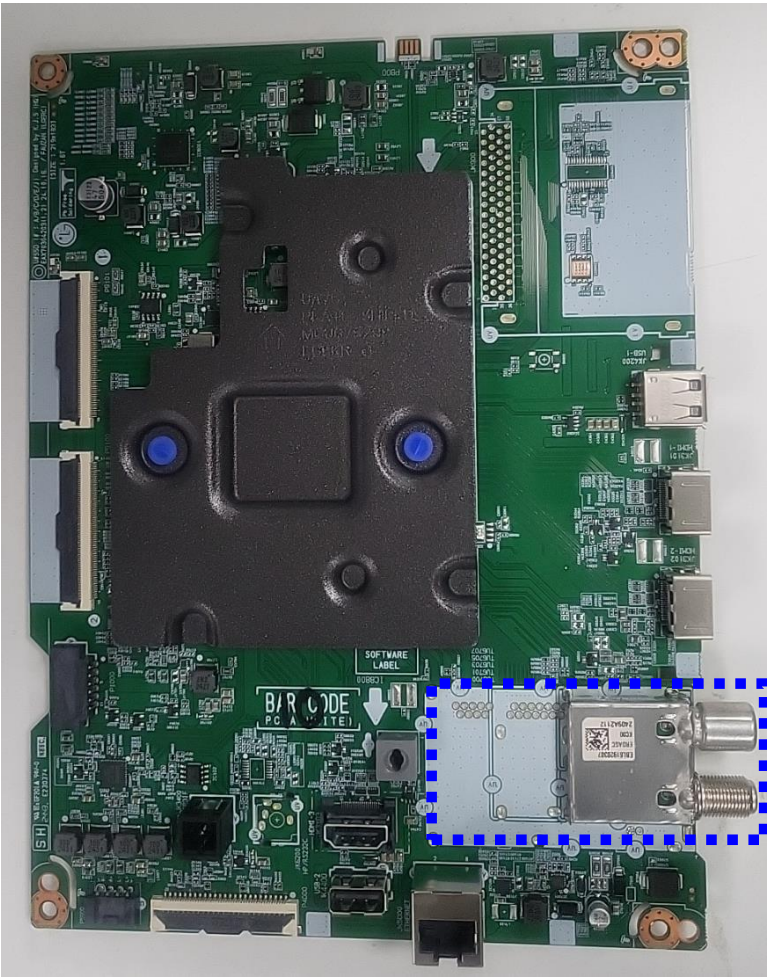
TV Information		HDMI Information	Power On/Off Status		
Model Name :	KEY0000103E	HDMI History	1. 13(0)	21. 59(3)	41. 11(N/A)
Serial Number :	55		2. 11(N/A)	22. 13(3)	42. 13(2)
S/W Version :	03.00.06.01		3. 13(0)	23. 11(N/A)	43. 11(N/A)
Micom Version :	V3.01.1		4. 11(N/A)	24. 13(3)	44. 13(2)
VR-TR Channel/Speed :	1(2412MHz)/USB 2.0		5. 01(0)	25. 11(N/A)	45. 11(N/A)
MAC Address :	7C:64:6C:01:B5:EC		6. F1(0)	26. 13(3)	46. 13(2)
RF Receiver Version :	e7:33:00:00		7. 13(3)	27. 11(N/A)	47. 11(N/A)
UTT :	1		8. 11(N/A)	28. 13(3)	48. 13(2)
Country Group :	KR		9. 13(3)	29. 11(N/A)	49. 11(N/A)
ToolOPT1_Product :	34755921		10. 11(N/A)	30. 13(3)	50. 13(2)
ToolOPT2_Power :	1323030	EDID	11. 13(3)	31. 11(N/A)	51. 11(N/A)
ToolOPT3_PQ/Sound :	1050752		12. 11(N/A)	32. 13(3)	52. 13(2)
ToolOPT4_Etc :	65		13. 13(3)	33. 11(N/A)	53. 11(N/A)
ToolOPT5_JackID/Key :	12068150		14. 11(N/A)	34. 13(3)	54. 13(2)
ToolOPT6_Energy/Country :	55626939		15. 13(3)	35. 11(N/A)	55. 11(N/A)
			16. 11(N/A)	36. 01(2)	56. 13(2)
			17. 13(3)	37. 3E(2)	57. 11(N/A)
			18. 11(N/A)	38. 13(2)	58. 13(2)
			19. 57(3)	39. 11(N/A)	59. 11(N/A)
			20. 58(0)	40. 13(2)	60. 13(2)



Press the IN-START with the remote control for adjustment

Standard Repair Process Detail Technical Manual

	Error symptom	A. Video error_Video error, video lag/stop	Established date		
	Content	TUNER checking part	Revised date		A5

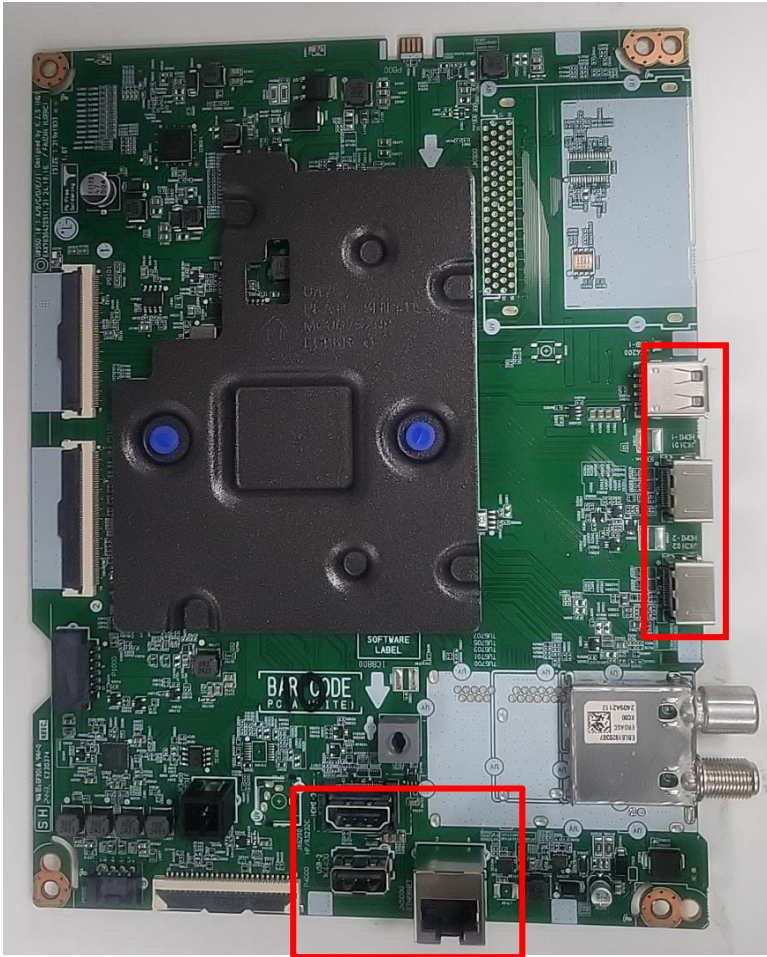


- Checking method:
- 1. Check the signal strength or check whether the screen is normal when the external device is connected.
 - 2. After measuring each voltage from power supply, finally replace the MAIN BOARD.

Standard Repair Process Detail Technical Manual

	Error symptom	A. Video error _Vertical/Horizontal bar, residual image, light spot	Established date		
	Content	connection diagram	Revised date		A6

<ALL MODELS>

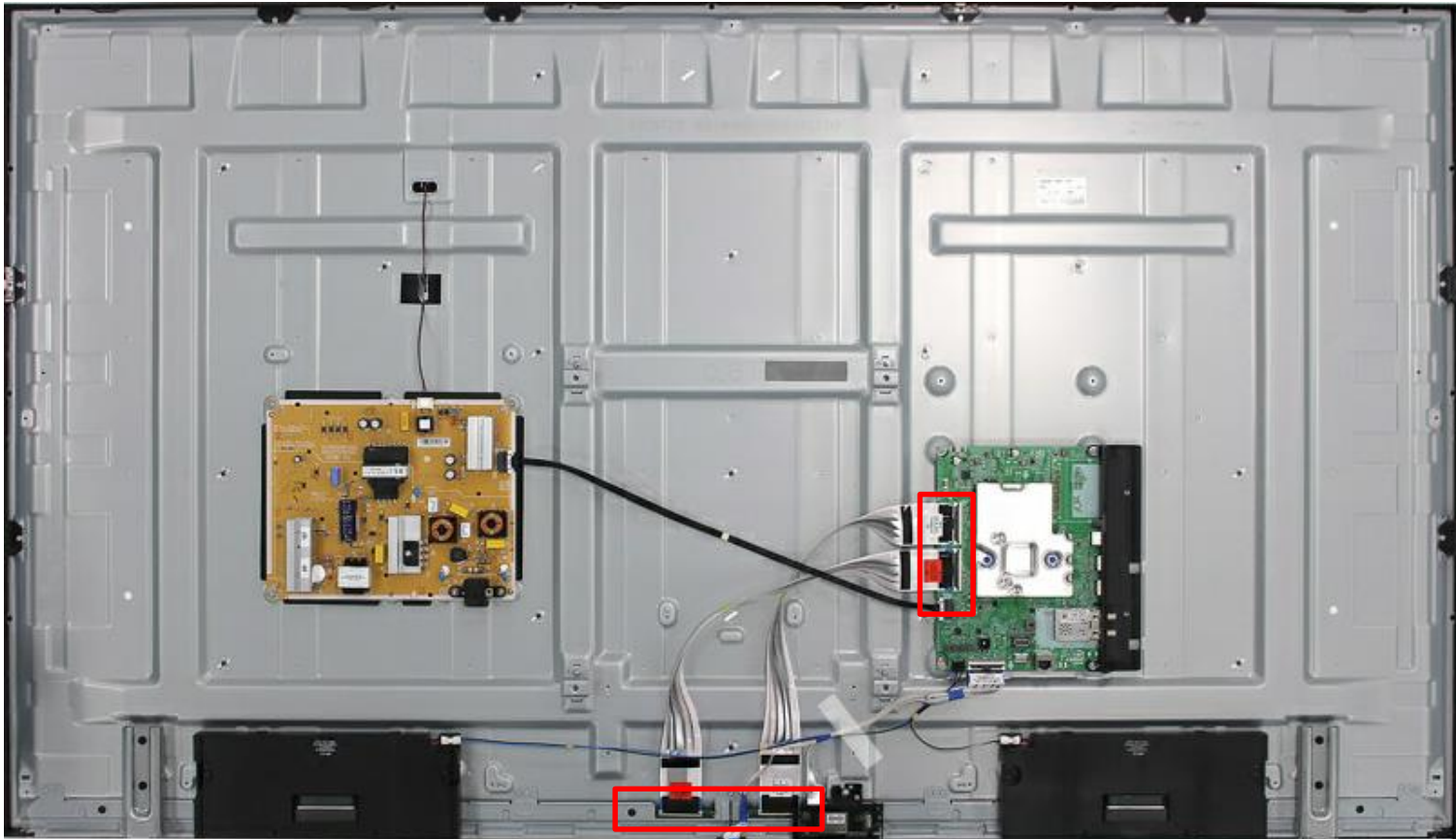


As the part connecting to the external input, check the screen condition by signal

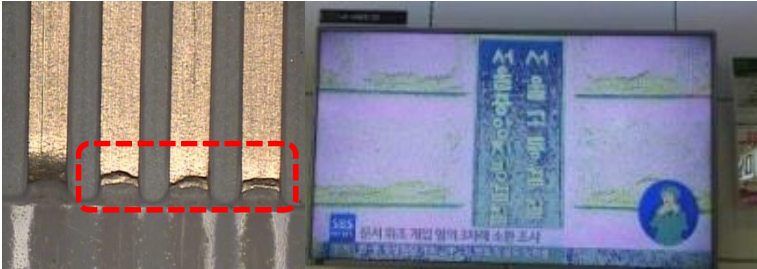
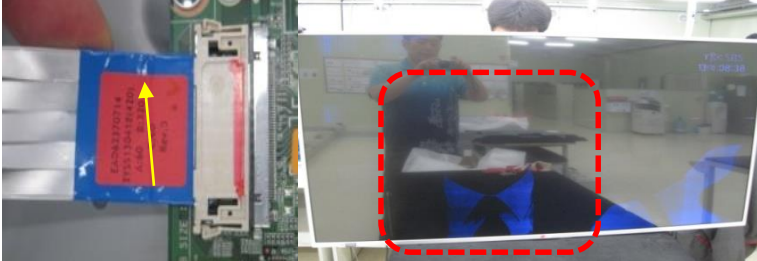
Standard Repair Process Detail Technical Manual

	Error symptom	A. Video error_Color error	Established date		
	Content	Check Link Cable(Vx1/EPI/CEDS) reconnection condition	Revised date		A7

65NANO80/81

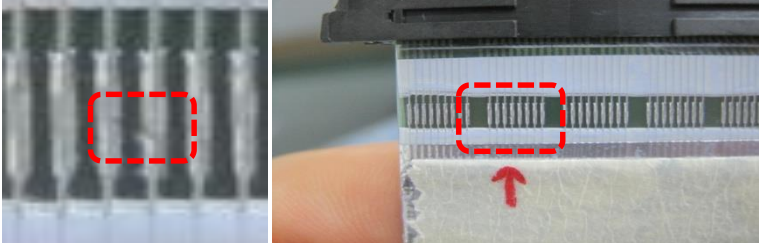


Check the contact condition of the Link Cable, especially dust or mis insertion.

Item	Symptom Name	Cause	Symptom Image
CABLE	Color smear	Poor broken pin of FFC cable	
CABLE	R Color Excessive	Color is Excessive due to FFC Cable Contact.	
CABLE	Screen darkness	screen is dark due to poor contact due to disconnection of the FFC cable pin.	
CABLE	G Color Excessive	G color transient due to poor FFC cable connection	

Appendix. Examples of Symptoms(Image error)

Check for poor cable contact

Item	Symptom Name	Cause	Symptom Image
CABLE	Color spread	FFC connection problem	
CABLE	Color spread	FFC connection problem	
CABLE	Color spread	FFC connection problem	
CABLE	Screen stop	Due to foreign substance within FFC PIN	

Appendix. Examples of Symptoms(Main)

Check parts by symptom

Item	Symptom Name	Cause	Symptom Image
Main	Screen noise	Bit noise from horizontal screen	
Main	Screen noise	Broken screen due to Main IC problem	
Main	Dark picture	Dark left-side screen	
Main	Broken picture	Top/bottom screen part Picture problem due to tuner Inner side quality problem	

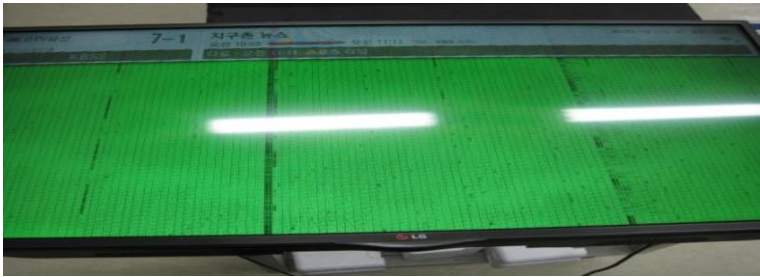
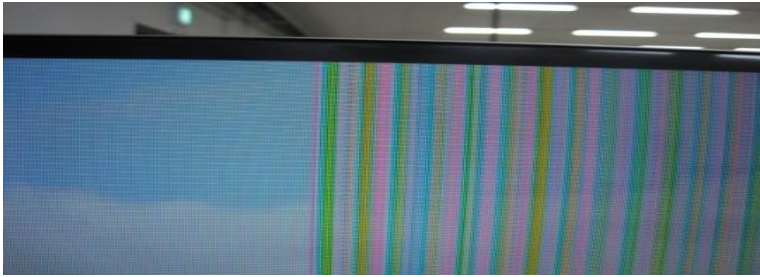
Appendix. Examples of Symptoms(Main)

Check parts by symptom

Item	Symptom Name	Cause	Symptom Image
Main	Broken screen	Broken screen in a horizontal manner	
Main	Screen spread	Screen corner appears blurry	
Main	Color Spread	Color spread on the screen	
Main	Blurry Screen	Blurry picture on the screen	

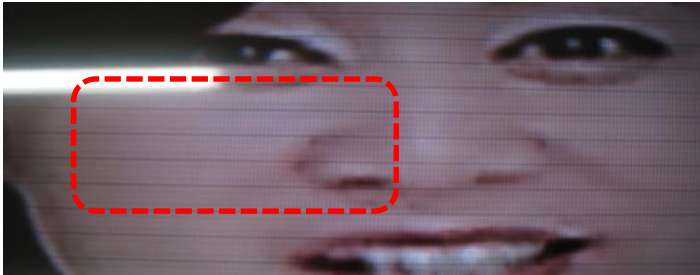
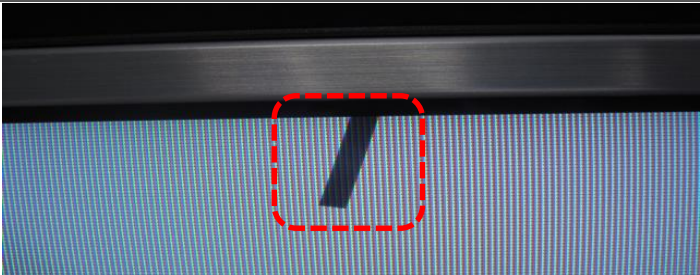
Appendix. Examples of Symptoms(Main)

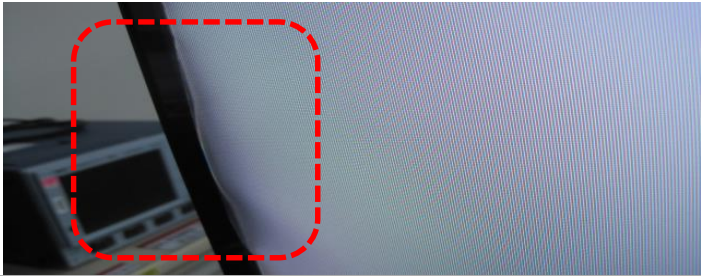
Check parts by symptom

Item	Symptom Name	Cause	Symptom Image
Main	Broken picture	No problem at the initial stage, G-color spread after 10 minutes	
Main	Right-side Screen problem	Right-side screen problem	
Main	LG logo Screen problem	Screen picture spread problem	
Main	Right-side picture problem	No problem at the initial stage. During Heat run, right-side picture problem	

Appendix. Examples of Symptoms(Module)

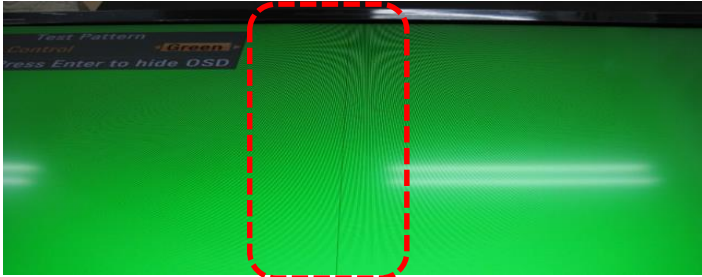
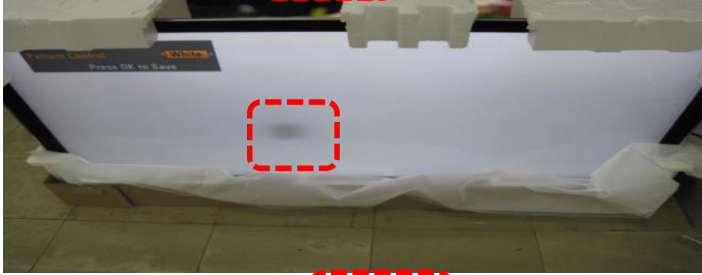
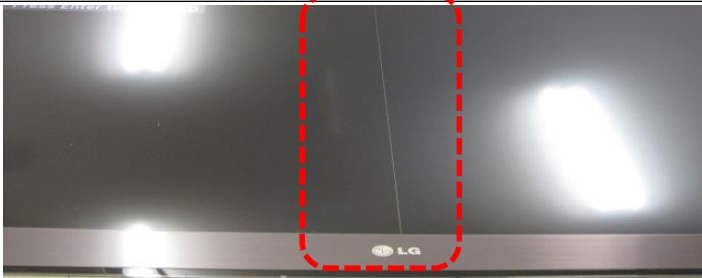
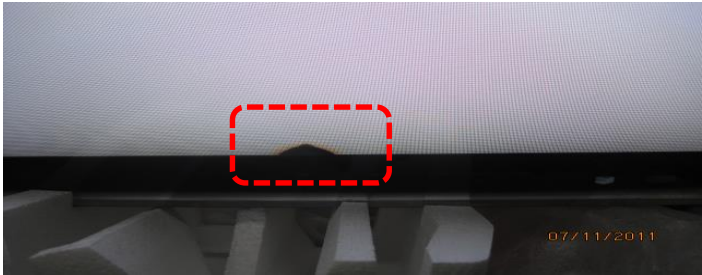
Check parts by symptom

Item	Symptom Name	Cause	Symptom Image
MODULE	Isometric Horizontal Bar	Isometric horizontal bars occur throughout the screen	
MODULE	Internal matter	BLU internal foreign matter inflow	
MODULE	Image broken	6 block image broken	
MODULE	Image broken	Screen sync signal broken	

Item	Symptom Name	Cause	Symptom Image
MODULE	Image broken	Internal damage and image breakage due to external impact	
MODULE	Bend on the screen	Bending due to lateral external impact and internal bending of BLU	
MODULE	Vertical smear	Vertical spreading on cube screen in no signal	
MODULE	Over color	Screen contour part brightly Over color	

Appendix. Examples of Symptoms(Module)

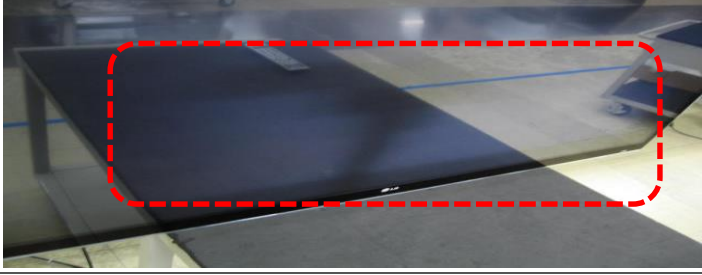
Check parts by symptom

Item	Symptom Name	Cause	Symptom Image
MODULE	Vertical bar	Center Vertical Bar	
MODULE	Screen darkness	Center of the screen 1 block dark	
MODULE	Vertical bar	Center Vertical Bar	
MODULE	Darkness at the bottom of the screen	MODULE internal BLU breakage	

Appendix. Examples of Symptoms(Only if using T-con Board) Check parts by symptom

Item	Symptom Name	Cause	Symptom Image
T-CON	screen lower image broken	T-Con is defective and the picture below the screen is broken	
T-CON	screen lower image broken	T-Con is defective and the picture below the screen is broken	
T-CON	screen lower image broken	T-Con is defective and the picture below the screen is broken	
T-CON	screen lower image broken	T-Con is defective and the picture below the screen is broken	

Appendix. Examples of Symptoms(Only if using T-con Board) Check parts by symptom

Item	Symptom Name	Cause	Symptom Image
T-CON	Image Broken	T-CON Wafer Locking The strength is weak and cable contact failure occurs	
T-CON	Darkness at the top of the screen	Initial normal operation, upper darkness during heat run	
T-CON	Image Broken	The entire screen is dark and bit noise occurs	
T-CON	Image Broken	The entire screen is dark and bit noise occurs	

Appendix : Exchange Power Board (PSU)



No Light

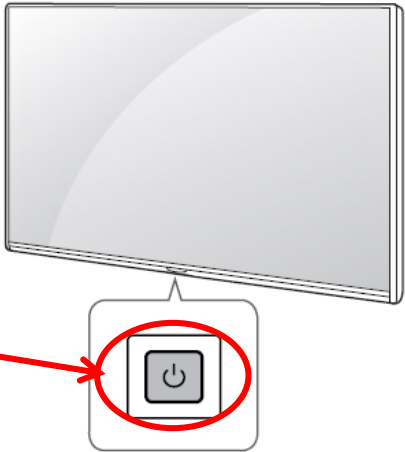


No picture/Sound Ok

Standard Repair Process Detail Technical Manual

	Error symptom	B. Power error _No power	Established date		
	Content	Check front Power Indicator	Revised date		A17

ST-BY condition: On or Off
Power ON condition: Turn Off



Using button



Power On (Press)
Power Off¹⁾ (Press and Hold)
Menu Control (Press²⁾)
Menu Selection (Press and Hold³⁾)

- 1) All running apps will close, and any recording in progress will stop. (Depending on country)
- 2) You can access and adjust the menu by pressing the button when TV is on.
- 3) You can use the function when you access menu control.

Adjusting the menu

When the TV is turned on, press the  button one time. You can adjust the Menu items using the button.



Turns the power off.



Changes the input source.



Adjusts the volume level.



Scrolls through the saved programmes.



Standard Repair Process Detail Technical Manual

	Error symptom	B. Power error _No power	Established date		
	Content	Check power input voltage and ST-BY 7.8V	Revised date		A18

SET Model	Power P/N, Name
65NANO80/81 Series	EAY65895568, LGP6065AT-22U1

Power Check Sequence

1. AC input Check : SK100 (100~240Vac)
2. PWR-ON Check :
 - SET On : above 3V
 - SET St-by : 0V
3. 13.2V DC Check :
 - SET On : 13.2V
 - SET St-by : 7.8V
4. MS Level Check : MS

MS Level	Range [V]	LED On/Off
MS (0V)	0 ~ 0.25	Off
MS (2V)	1.75 ~ 2.25	On (Home mode)
MS (3V)	2.75 ~ 3.25	On (Store Mode)

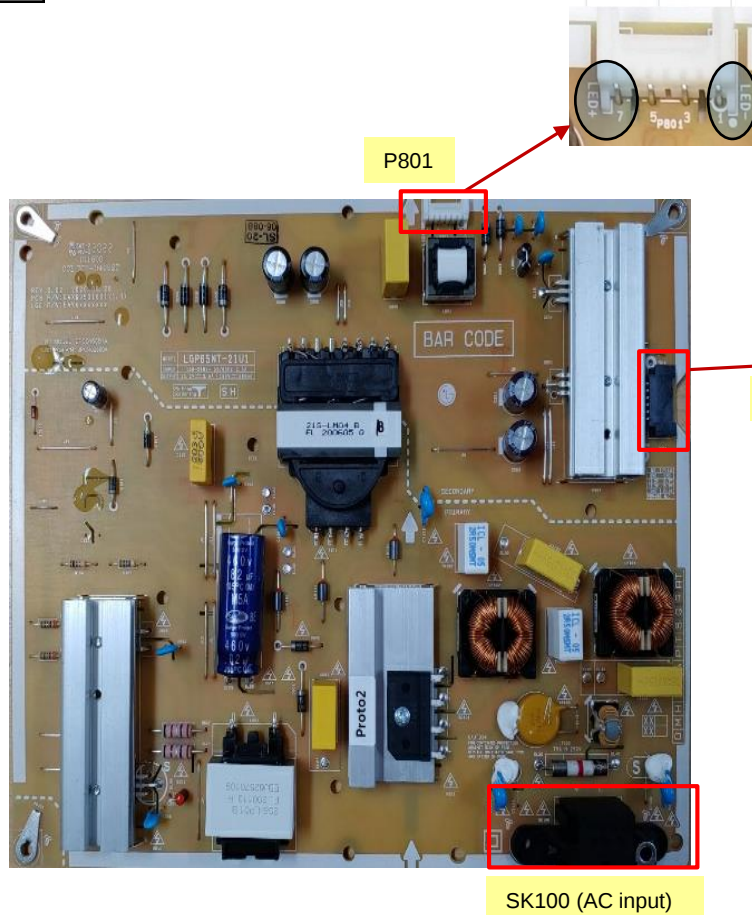
※ Home mode : General Customer
Store mode : use Store

5. LED voltage Check : P801, Pin 1-7

65UR80/81	Picture Condition : VIVID (Back light 100)	
	Min	Max
	163.8V	200.2V

P801 Type : SMAW200A-H07AA2(WH) Maker : YEONHO	
Pin No.	Assignment
1	LED-
2	Remove
3	N.C
4	Remove
5	N.C
6	Remove
7	LED+

P201 YEONHO (SMAW200-H12S5K)			
Pin No.	Assignment	Pin No.	Assignment
1	PWR-ON	2	N.C
3	GND	4	13.2V
5	13.2V	6	13.2V
7	13.2V	8	13.2V
9	GND	10	GND
11	MS	12	PDIM

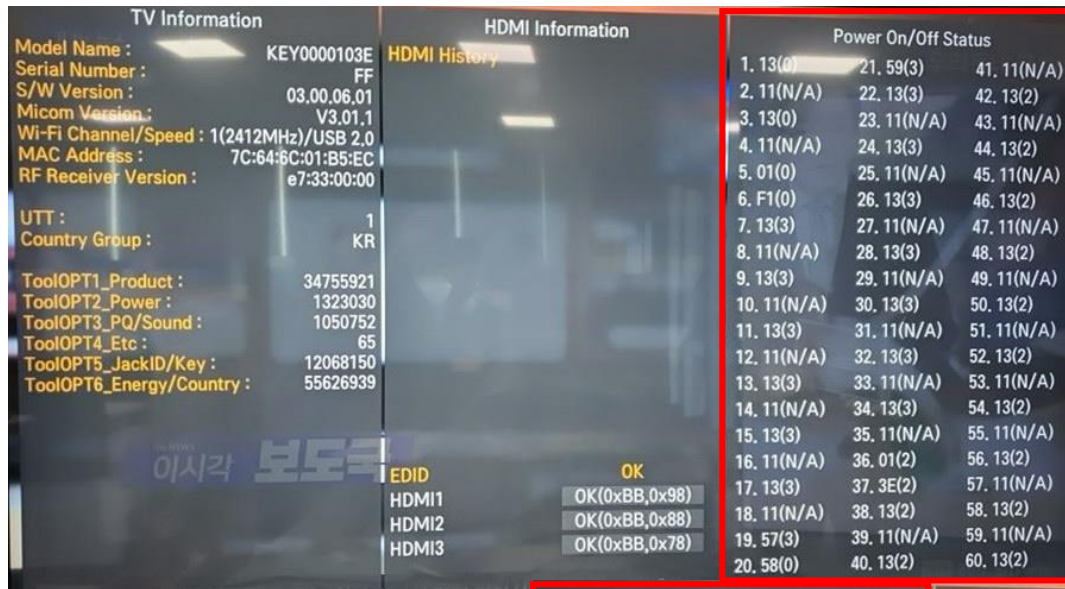


all condition meets, Power Board OK.

Standard Repair Process Detail Technical Manual

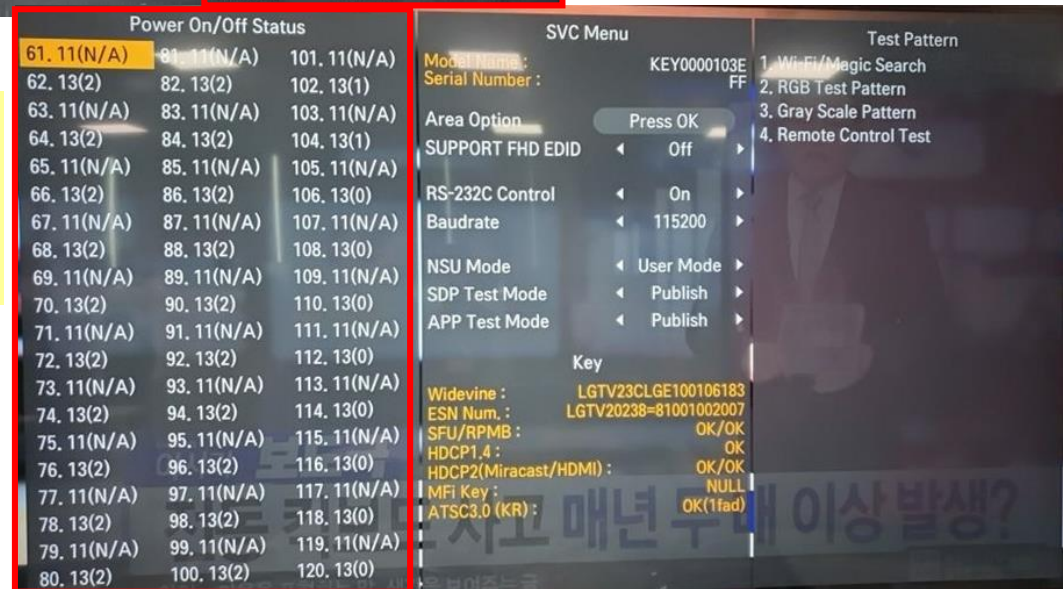
	Error symptom	B. Power error _Off when on, off whiling viewing	Established date		
	Content	POWER OFF MODE checking method	Revised date		A19

<ALL MODELS>



Entry method

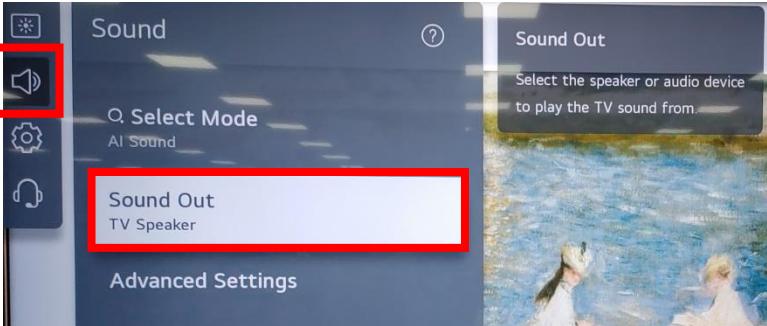
1. Press the IN-START button of the remote control for adjustment.
2. Check the entry into adjustment item 3.



Standard Repair Process Detail Technical Manual

	Error symptom	C. Audio error_No audio/Normal video	Established date		
	Content	Checking method in menu when there is no audio	Revised date		A20

<ALL MODELS>

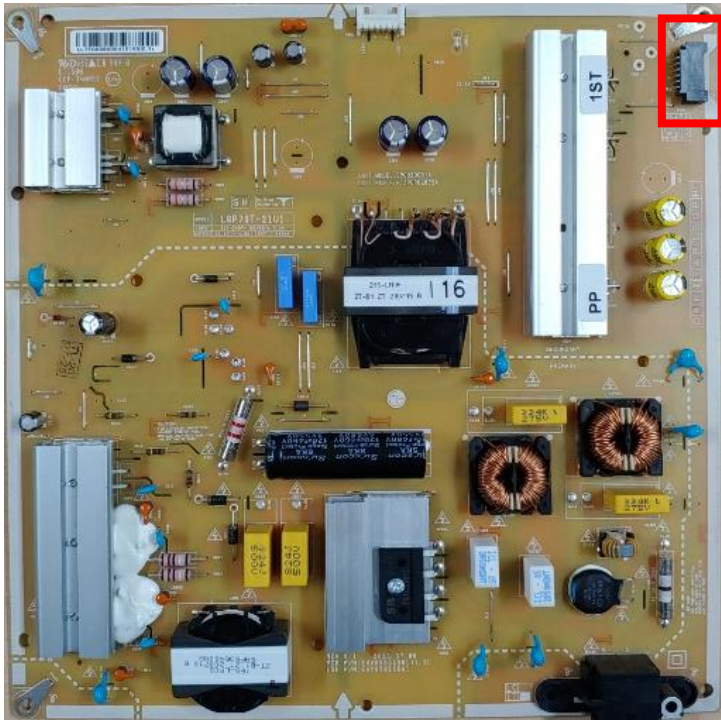


Checking method

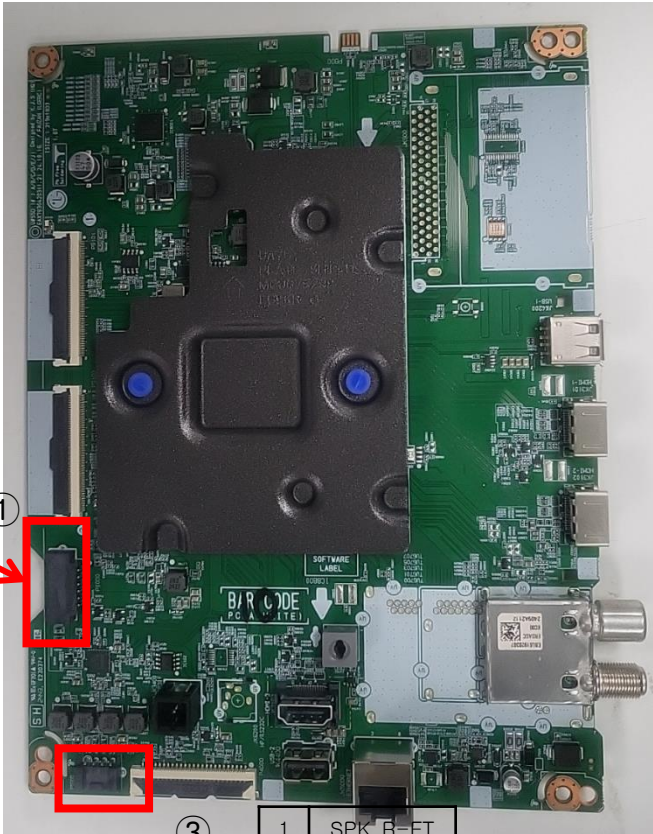
1. Press the Setting button on the remote control.
2. Select the Sound function of the Menu.
3. Select the Sound Out.
4. Select TV Speaker.

Standard Repair Process Detail Technical Manual

	Error symptom	C. Audio error_No audio/Normal video	Established date		
	Content	Voltage and speaker checking method when there is no audio	Revised date		A21



MS	PDIM
GND	GND
13.2V	13.2V
13.2V	13.2V
GND	13.2V
PWR-ON	N.C



1	SPK_R-FT
2	SPK_R+FT
3	SPK_L-FT
4	SPK_L+FT

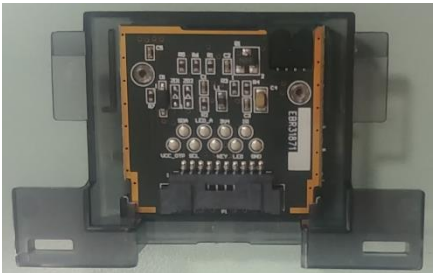
Checking order when there is no audio

1. Check the contact condition of or 13.2V connector of Main Board.
2. Measure the 13.2V input voltage supplied from Power Board.
(If there is no input voltage, remove and check the connector.)
3. Connect the tester RX1 to the speaker terminal and if you hear the Chik Chik sound when you touch the GND and output terminal, the speaker is normal.

Standard Repair Process Detail Technical Manual

	Error symptom	D. Function error	Established date		
	Content	Remote control operation checking method	Revised date		A22

①
IR & EYE Sensor



③

Pin	Pin name
1	VCC
2	WIFI_DM
3	WIFI_DP
4	GND
5	WOL/WIFI_ON
6	VCC
7	WIFI_SUSPEND/RESUEM
8	GND
9	COMBO_RESET
10	BT_WAKEUP_HOST
11	GND
12	VCC
13	
14	
15	
16	EYE_SDA
17	EYE_SCL
18	GND
19	IR
20	LED_R
21	GND
22	VCC
23	KEY2
24	MIC_DATA
25	MIC_CLK

Checking order to check remote control

Checking order

1. Check IR cable condition between IR & Main board.(Check picture number① and ②.)
2. Check the standby 3.5V on the terminal 22 pin. (③)
3. AS checking the Pre-Amp(IR LED light), the power is in ON condition, an Analog Tester needle should move slowly, otherwise, it's defective.

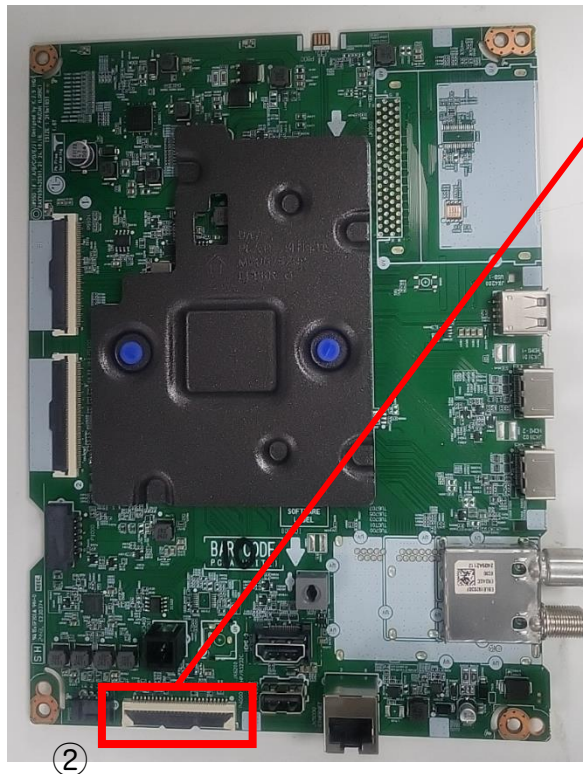
Standard Repair Process Detail Technical Manual

	Error symptom	D. Function error	Established date		
	Content	Remote control operation checking method	Revised date		A23

① Wifi & BT Front



Wifi & BT Rear



③

Pin	Pin name
1	VCC
2	WIFI_DM
3	WIFI_DP
4	GND
5	WOL/WIFI_ON
6	VCC
7	WIFI_SUSPEND/RESUEM
8	GND
9	COMBO_RESET
10	BT_WAKEUP_HOST
11	GND
12	VCC
13	
14	
15	
16	EYE_SDA
17	EYE_SCL
18	GND
19	IR
20	LED_R
21	GND
22	VCC
23	KEY2
24	MIC_DATA
25	MIC_CLK

Checking order to check motion remote/wifi

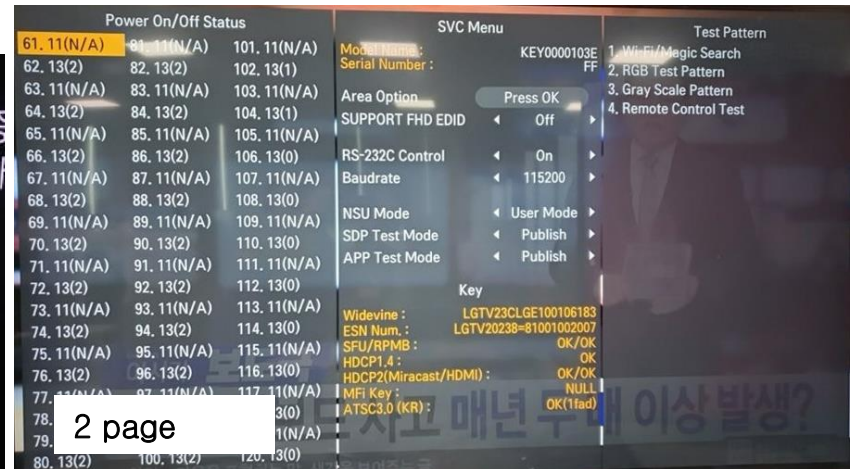
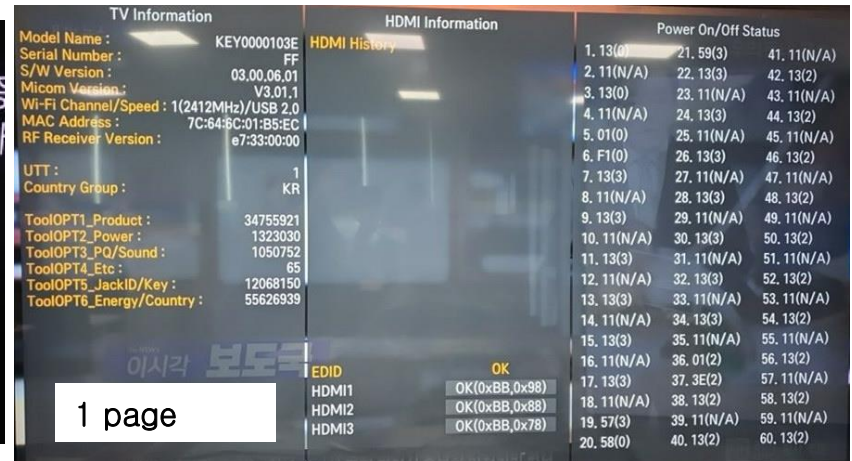
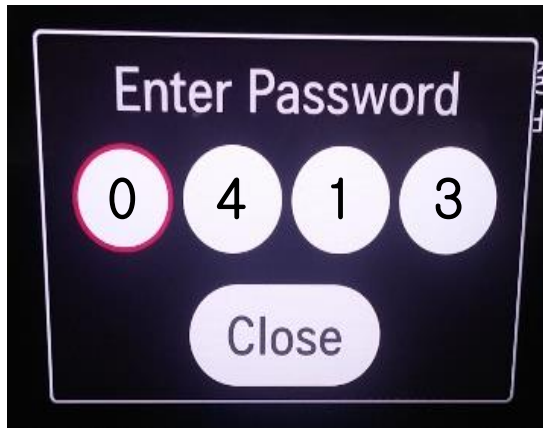
Checking order

1. Check BT/Wifi cable condition between BT/Wifi assy & Main board.(Check ① and ②)
2. Check the 3.5V on the terminal 1. (③)

Standard Repair Process Detail Technical Manual

	Error symptom	E. Etc	Established date		
	Content	How to use the Service remote control	Revised date		A24

1. How to access the remote control



Standard Repair Process Detail Technical Manual

	Error symptom	E. Etc	Established date		
	Content	How to use the Service remote control	Revised date		A25

2. Remote control part definition



POWER	Power On/Off
ETC (Added Function)	[ETC] Each time pressing the KEY button, Mode gets changed to ETC and P-ONLY each time All KEY function [PIP PR-][PIP PR+][SWAP] [PIP INPUT][DVI] KEY Function
P-ONLY (Added Function)	Changed to factory mode All KEY function &[INFO][STILL][HDMI HOT][USB HOT][HDMI4] KEY Action
INPUT	Change to the external device mode
ARC	Change in the order of 16:9=>Zoom1=>Zoom2=>Cinema Zoom=>Auto Screen=>4:3=>16:9
PSM	Changes in the order of Bright Picture=>Easy Picture=>Cinema=>Spots=>Game=> Custom Picture1=>Custom Picture2=>Bright Picture
SSM (Added Function)	Standard(user)=>music=>cinema=>sports=>game=>standard(user)
PIP	Picture In Picture is activated
TEXT	Access to the Power Only mode
CAP	Broadcasting caption(on/off)
MPX	Stereo mode (mono, stereo, foreign language) access
	Used when in factory mode
Simplink (Added Function)	Access to the Simplink-connected device
EYE	Digital EYE function ON/OFF For some Model, access to the Test Pattern
TILT	Used for screen tilting change (Access to the old PDP control mode)

Standard Repair Process Detail Technical Manual

	Error symptom	E. Etc	Established date		
	Content	How to use the Service remote control	Revised date		A26



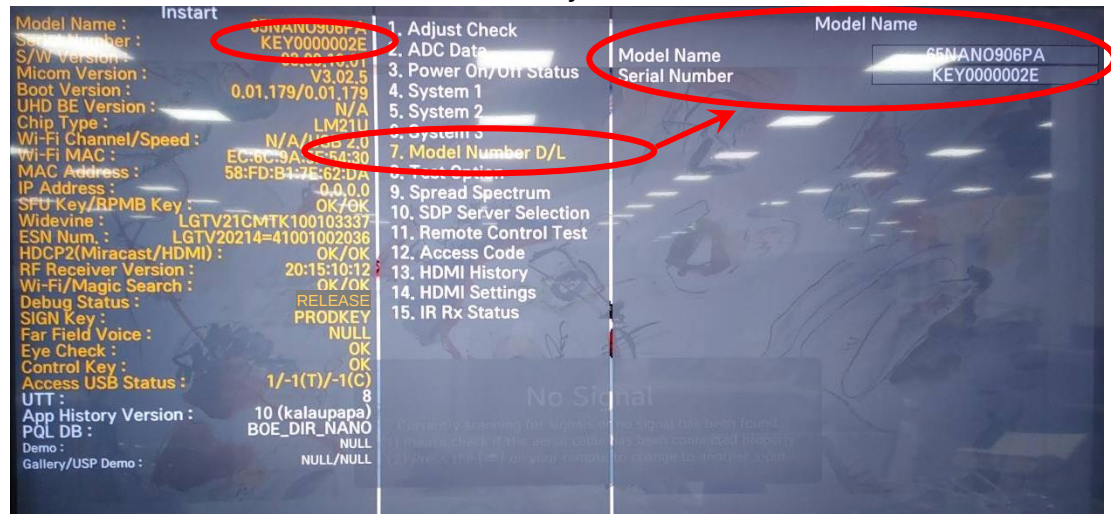
B-TOOTH (Added function)	Connected to Blue-Tooth
IN-START	Model Nam ex) 42PG60D-NA Current Model Name S/W Version ex) V03.11.0 Current S/W version MICOM Version ex) V3.05.0 current Mi-Com version UTT ex) User TV total usage time
ADJ	POWER OFF STATUS ex) Shows power-off status Test Pattern (Off=>White=>Red=>Green=>Blue=>Black=>Pattern=>Off) Change
X-STUDIO (Added function)	HDD,USB, external device's HDD screen is activated
MENU	User function gets activated
EXIT	Exit from the current mode
TIME SHIFT (Added function)	Moves forward/backward of recorded contents
MUTE	Mute function (0 Volume)
IN-STOP	SET to factory mode
VOL + -	Volume Up/Down
CH + -	Channel Up/Down
AV1,2,3 (Added function)	Connects to external input 1,2,3
COMP1,2 (Added function)	Connects to Component 1,2
HDMI1,2,3,4 (Add function)	Connects to HDMI 1,2,3,4
DVI (Add function)	Connects to DVI

Standard Repair Process Detail Technical Manual

	Error symptom	E. Etc	Established date		
	Content	Check items after Main B/D replacement	Revised date		A27

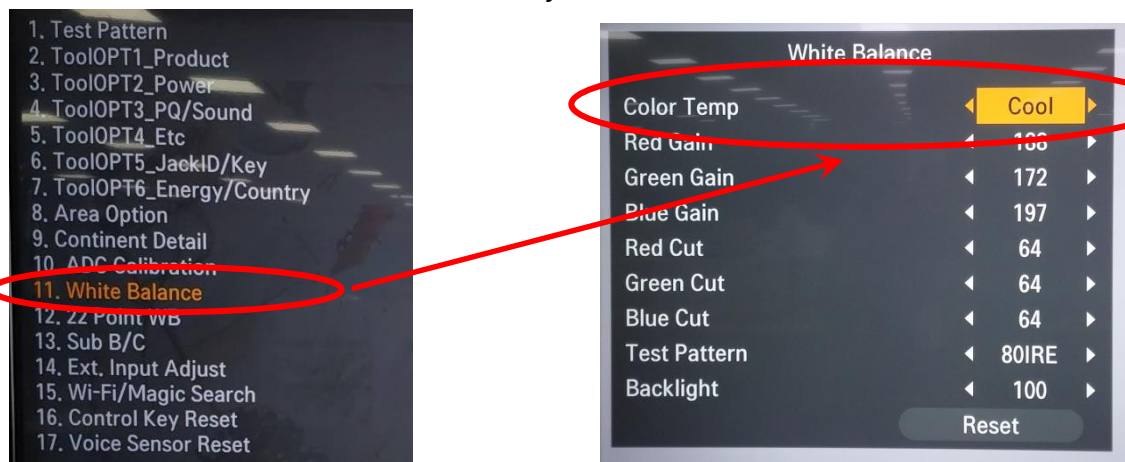
Check items after Main B/D(Model Number D/L, White Balance)

1. Press the Service remote control instart Key.



No.7 Select Model Number D/L
- Key in the model name and serial number after checking the ID label on the back cover.

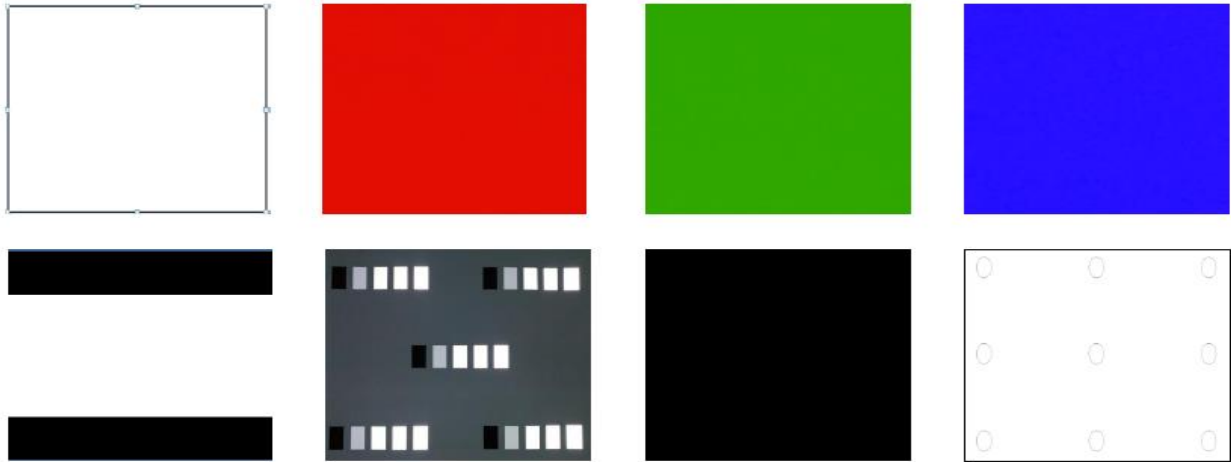
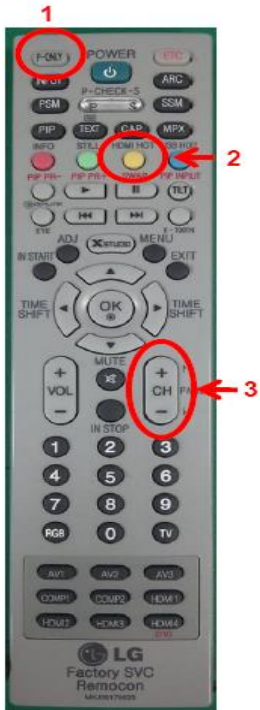
2. Press the Service remote control ADJ Key.



No.11 Select White Balance
- Record the R, G, B (GAIN, Cut) value of the color temperature before main board replacement.
After replacing the main board, key in the recorded value.

Standard Repair Process Detail Technical Manual

	Error symptom	E. Etc	Established date		
	Content	Adjustment Test pattern - ADJ Key	Revised date		A28



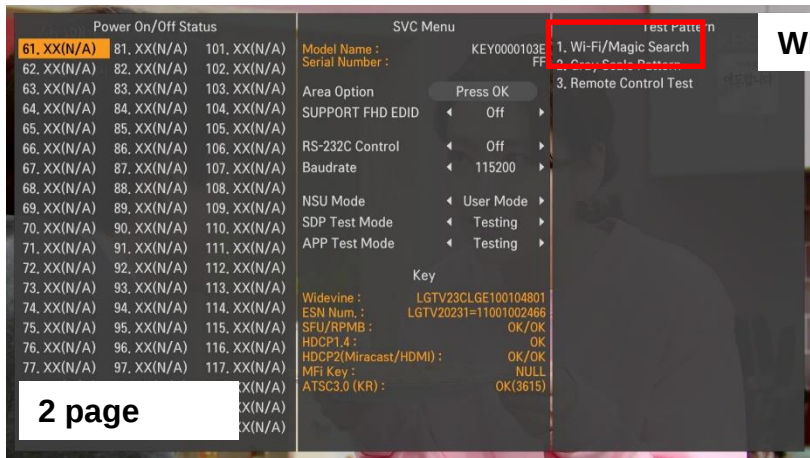
P-ONLY → HDMI HOT(Yellow button) → CH '+' or '-'
You can view 11 types of patterns using the ADJ Key

Checking item :

1. Defective pixel
2. Residual image
3. MODULE error (ADD-BAR,SCAN BAR..)
4. Video error (Classification of MODULE or Main-B/D!)

Standard Repair Process Detail Technical Manual

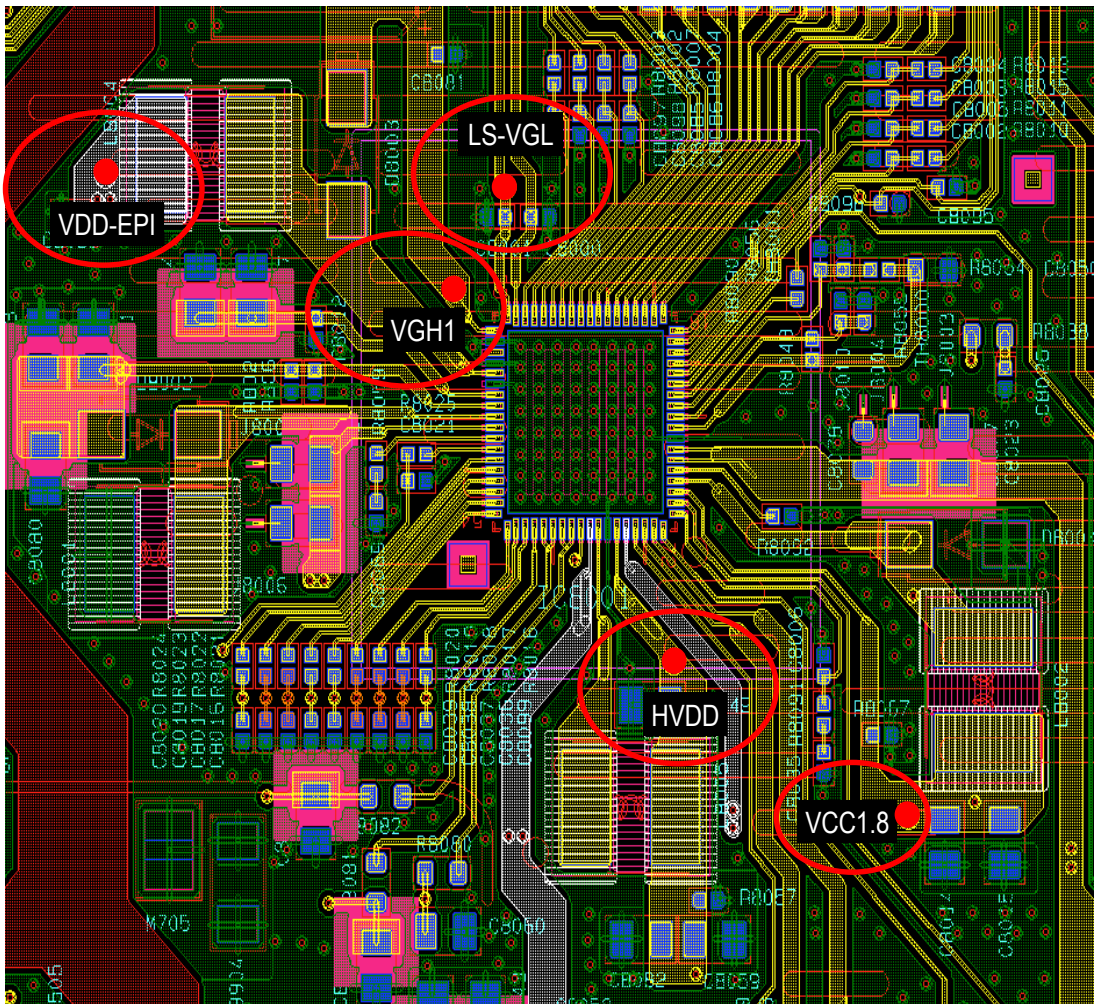
	Error symptom	F. WIFI /RF	Established date		
	Content	How to Check Wifi / RF	Revised date		A29



WiFi / Magic Search



- Checkpoints for the power supplied from Main B/D to Module
 - The voltage of the 5 points may be different for each module, but it must be within the voltage range as shown in the table below.
 - If there is no power when it's connected to the Module, remove the cable connected to the Module and check.
(If the module is defective, the power may be lost because of the Module, not because of the Main B/D)



Pin Name	Voltage range	Note
VCC1.8	1.73V ~ 1.98V	
LS-VGL	-11V ~ -9V	
HVDD	VDD-EPI / 2 (7.7V~8.1V)	HVDD uses half the voltage of VDD-EPI
VDD-EPI	16.2V ~ 16.8V	
VGH1	32V ~ 36V	

