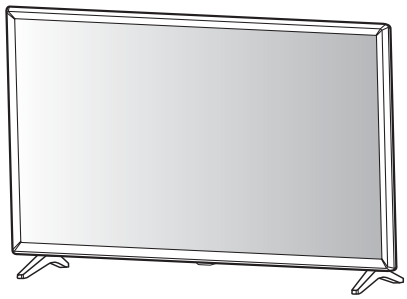
CONFIDENTIAL

LED TV
SERVICE MANUAL

CHASSIS : HA97D

MODEL :
32LM500BPUA

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



P/NO : MFL71388901 (1902-REV00)

CONTENTS

SAFETY PRECAUTIONS

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.

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 it's 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,

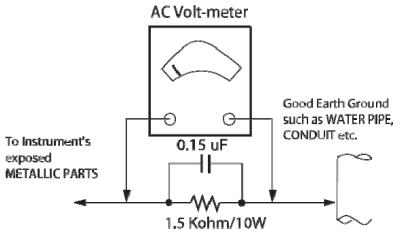
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

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 MΩ and 5.2 MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
Another 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 uF 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 is 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, FETVOM, 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 in 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 or 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 MS3553T.PB791 chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

1) Temperature: 25 °C ± 5 °C(77 °F ± 9 °F), CST: 40 °C ± 5 °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 : CB, IEC specification
   - EMC : CE, IEC/CISPR

4. Model General Specification

No.	Item	Specification					Remarks
1	Receiving System	NTSC-M,ATSC,64&256 QAM					
2	Promramme coverage	1) VHF:02~13 2)UHF:14~69 3)DTV:02~69 4)CATV:US 01~135 5)CADTV:US 01~135					Digital TV : VHF,UHF Analogue TV : VHF,UHF,CATV
3	Input Voltage	AC 120V~, 60Hz for USA+CA;AC127V~,60Hz for MX;					
4	Screen Size	32 inch Wide (1366 ×768)					
5	Aspect Ratio	16:9					
6	Module	LCM Model No.	Panel Model No.	Panel Maker	Resolution	Frame Rate	
		BOEI320WX1-01	HV320WHB-N56	BOE	HD	60 Hz	
7	Component & Com-posite Input	Component + AV					Bottom : CVBS(Y), Pb, Pr Bottom : Audio L/R
8	HDMI Input	HDMI2					Side
		HDMI1					Bottom
9	USB	USB					Side (USB 2.0)
10	OPTICAL OUT,	optical out					Side

5. Component Video Input (Y, C_b/P_b, C_r/P_r)

No.	Resolution	H-freq(kHz)	V-freq.(kHz)
1	720*480i	15.73	60.00
2	720*480p	31.50	60.00
3	1440*576i	16.63	50.00
4	720*576p	31.50	50.00
5	1280*720p	37.50	50.00
6	1280*720p	45.00	60.00
7	1920*1080i	28.13	50.00
8	1920*1080i	33.75	60.00
9	1920*1080p	56.25	50.00
10	1920*1080p	67.50	60.00

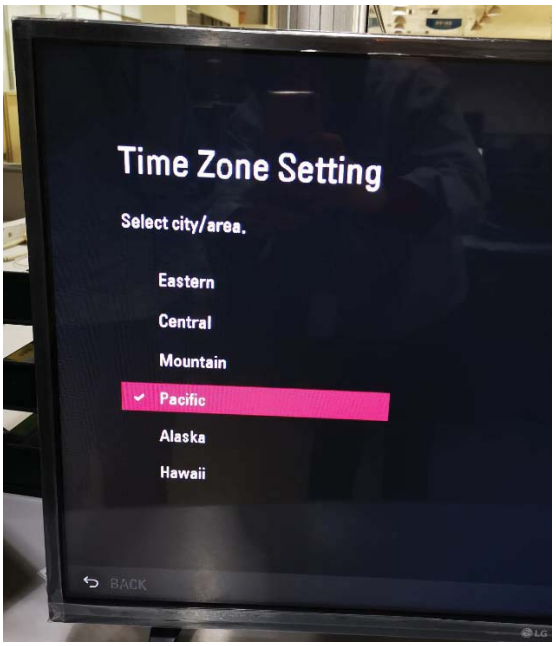
6. HDMI Input :

No.	Resolution	H-freq(kHz)	V-freq.(kHz)
PC(DVI)			
1	720*400	31.469	70
2	640*480	31.469	59.940
3	800*600	35.156	56.250
4	800*600	37.879	60.317
5	1024*768	48.363	60.004
6	1280*720	45.0	60.0
7	1280*768	47.776	59.870
8	1366*768	49.1	60.0
DTV			
1	640*480p	31.47	59.94
2	640*480p	31.5	60.00
3	720*480p	31.47	59.94
4	720*480p	31.5	60.00
5	1280*720p	44.96	59.94
6	1280*720p	45.00	60.00
7	720(1440)*480i	15.73	59.94
8	720(1440)*480i	15.75	60.00
9	720*576p	31.25	50.00
10	1280*720p	37.5	50.00
11	720(1440)*576i	15.63	50.00
12	1920*1080i	28.125	50.00
13	1920*1080i	33.72	59.94
14	1920*1080i	33.75	60.00
15	1920*1080p	26.97	23.976
16	1920*1080p	27.00	24.00
17	1920*1080p	33.716	29.976
18	1920*1080p	33.75	30.00
19	1920*1080p	56.25.	50.00
20	1920*1080p	67.432	59.94
21	1920*1080p	67.50	60.00

SOFTWARE UPDATE PROCEDURE

0. Reason why area code need to set when change mainboard.

Area code is related with broadcast country setting of user menu.
If it is applied wrong number, customer can not see own country in broadcast country list when initial set.
Check Area code after change mainboard.
It should be match with selling country.
Example(Broadcast Country setting of user menu)



Refer to appendix for details.

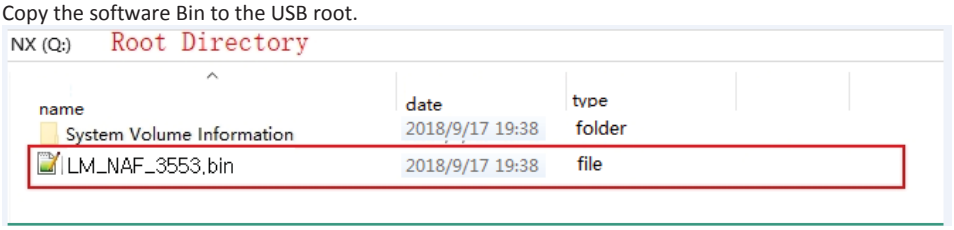
1. USB Upgrade

Check software upgrade bin file name as below.Only bin file name is the same as TV set,USB upgrade can be success.

Region	Model	Software Name(FY2019)
Nafta	32	LM_NAF_3553.bin

Need do AC on upgrade as below steps.

1. Copy the software Bin to the USB root.



2. Insert the USB to the mainboard USB port.
3. Then AC on.
4. Then the TV will upgrade, and need to reboot after upgrade success.

Upgrading:

LED indicator blinking red 1000ms green 1000ms alternate, TV will turn to upgrade succeed or failed status after finish upgrading.

Upgrade succeed:

LED indicator blinking red 250ms green 250ms alternate.

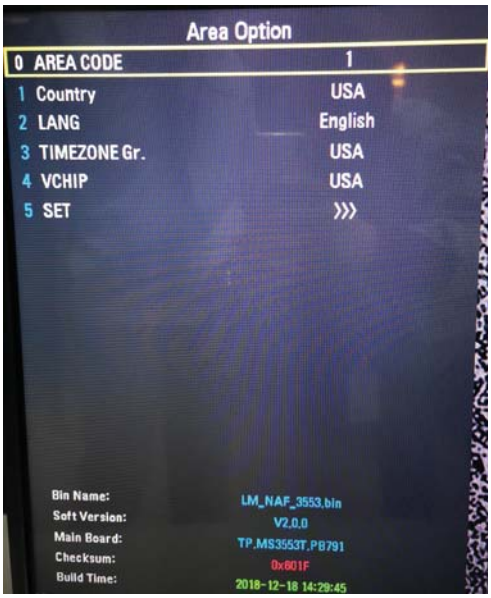
Upgrade failed:

LED indicator blinking red 1750ms green 250ms alternate.

Pull out USB and power on TV after upgrading finish.

2.AreaCode Setting Guide

SETTING+1147->Factory Settings->GENERAL SETTING->Area Option:



1.Area Code:

1~3: NAFTA

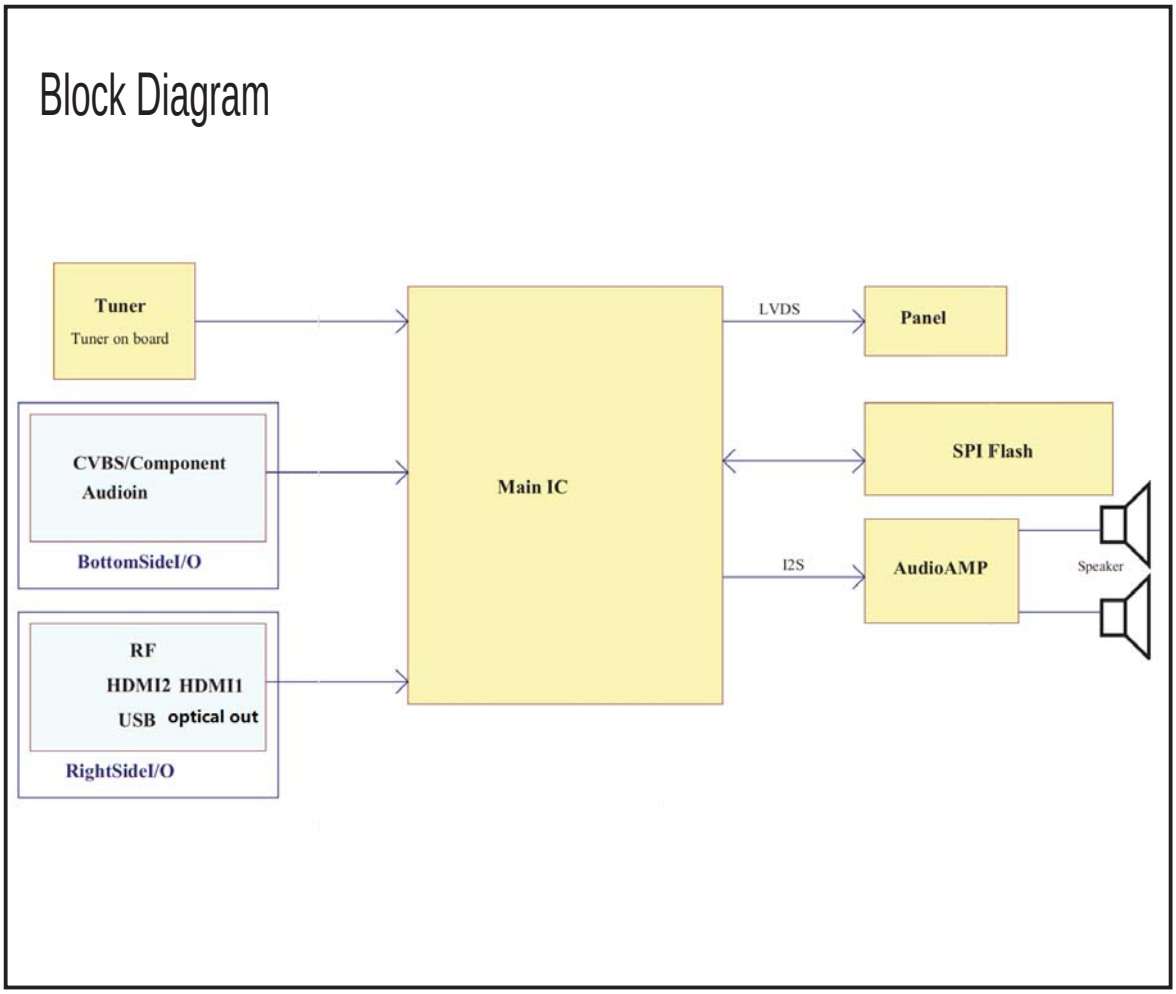
Region	Area Code	Subsidiary	Main Market	Sub Market
NAFTA	1	LGEUS	USA	USA
			USA	USA
			USA	USA
	3	LGECI	Canada	Canada
			Canada	Canada
	2	LGEMS	Mexico	Mexico
			Mexico	Mexico
			Mexico	Mexico

User can select area code by left and right key, and set area code with item “5 Set” by right and OK key.

2.LangGr.:English.
3.TeletextLangGr.: English.
4.CountryGroup:Display the subsidiary , such LGEUS, LGECI, and so on.
5.Set:Select the area code user want, and press OK or Right key to set area code, and then TV will reboot and the country will change to the countries has selected in area option.

BLOCK DIAGRAM

MAIN



EXPLODED VIEW

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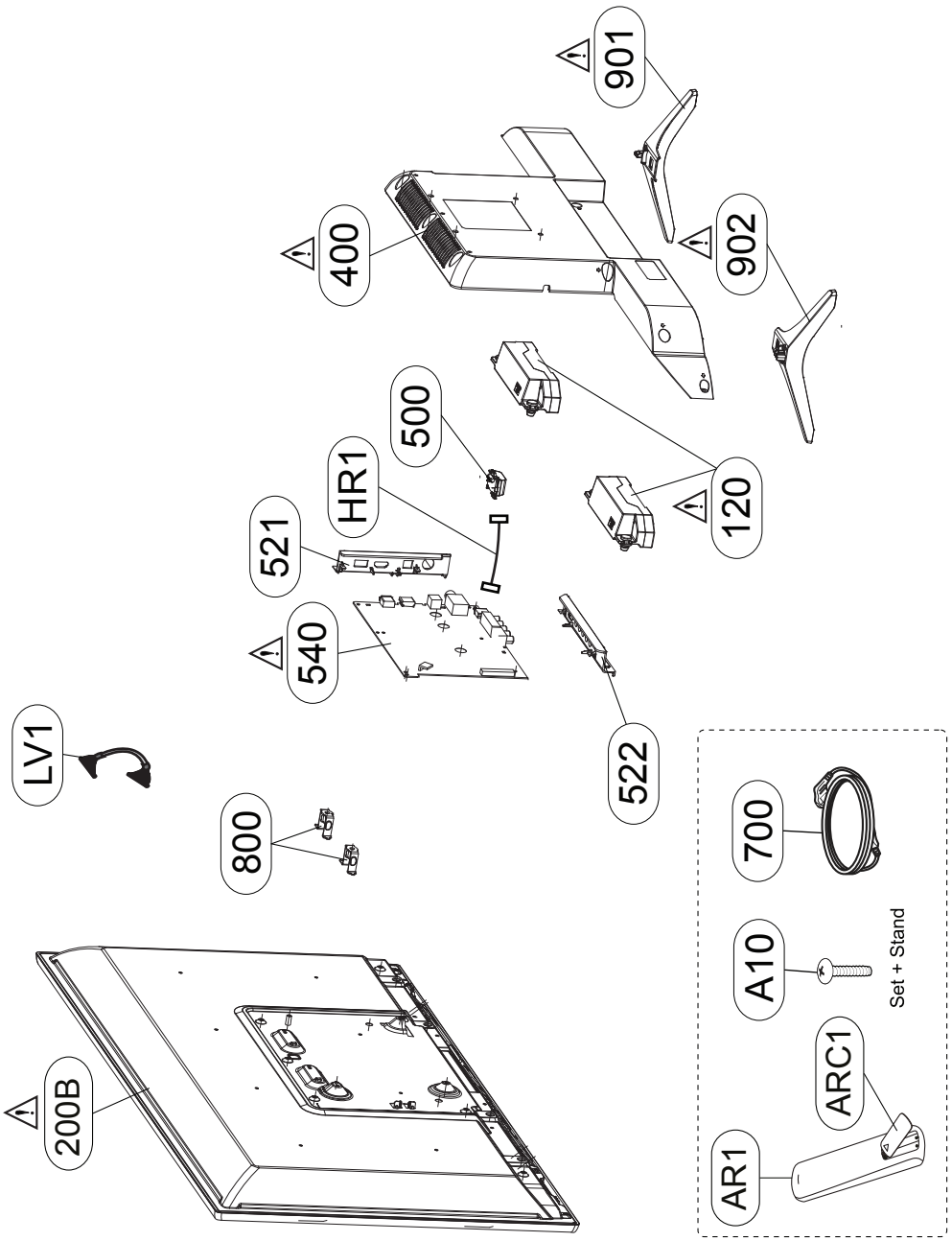
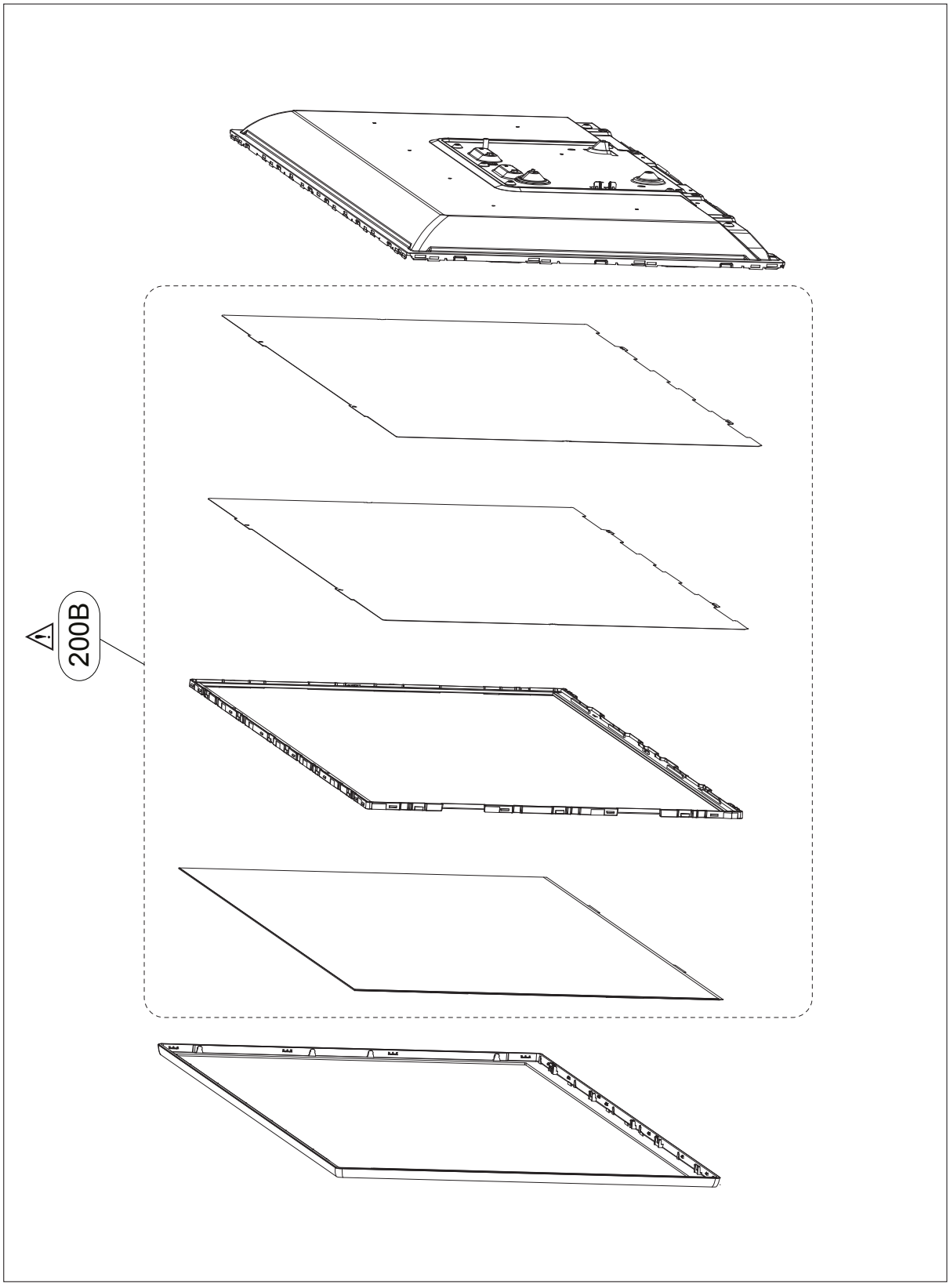
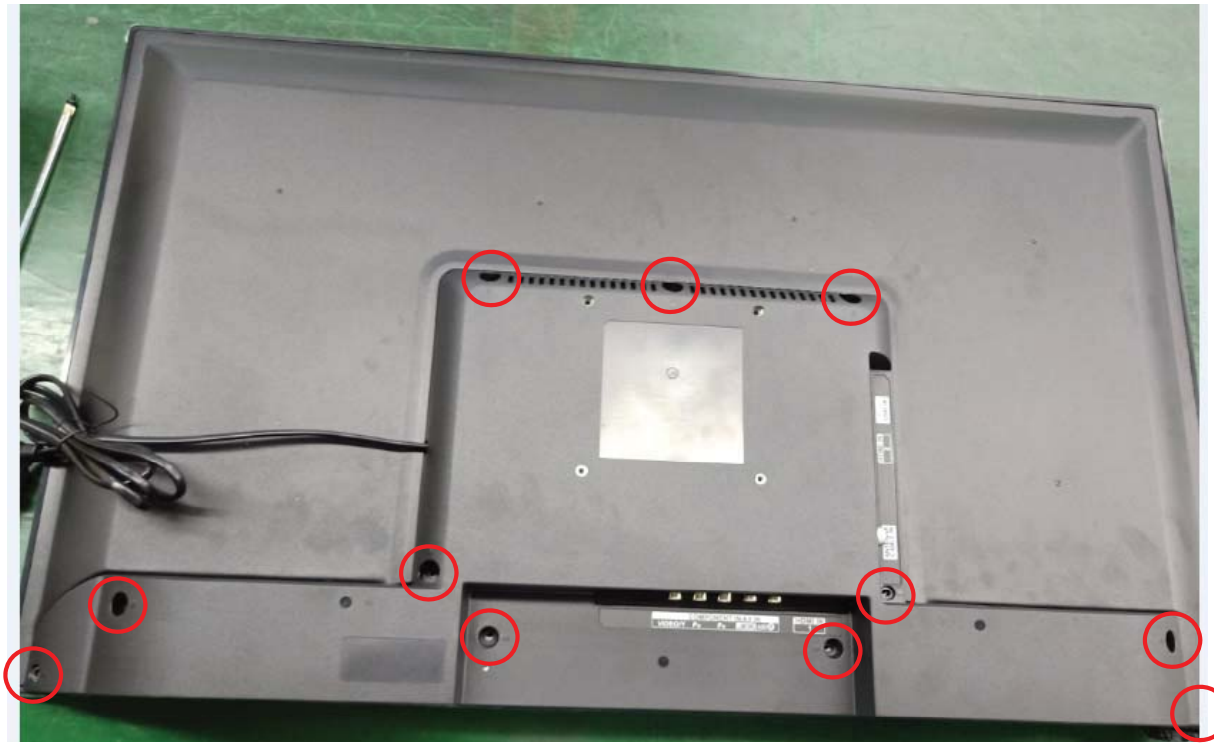


EXPLODED VIEW(MODULE)

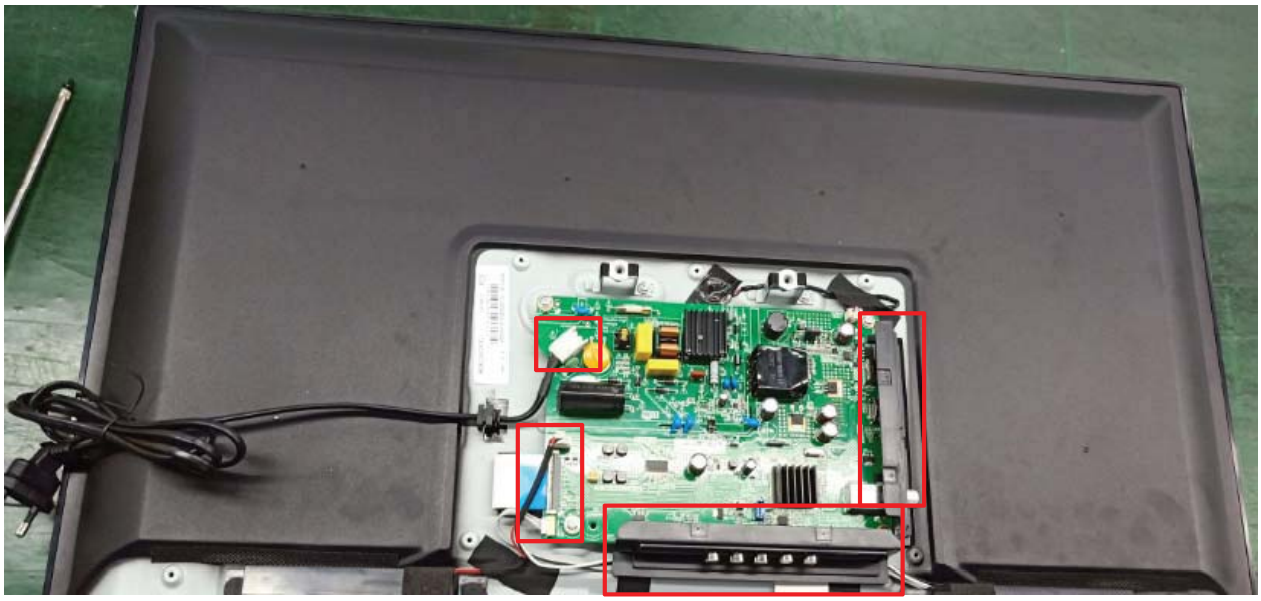


DISASSEMBLY

1. After unpacking, lay the TV flat on the working table and remove the back shell screws.

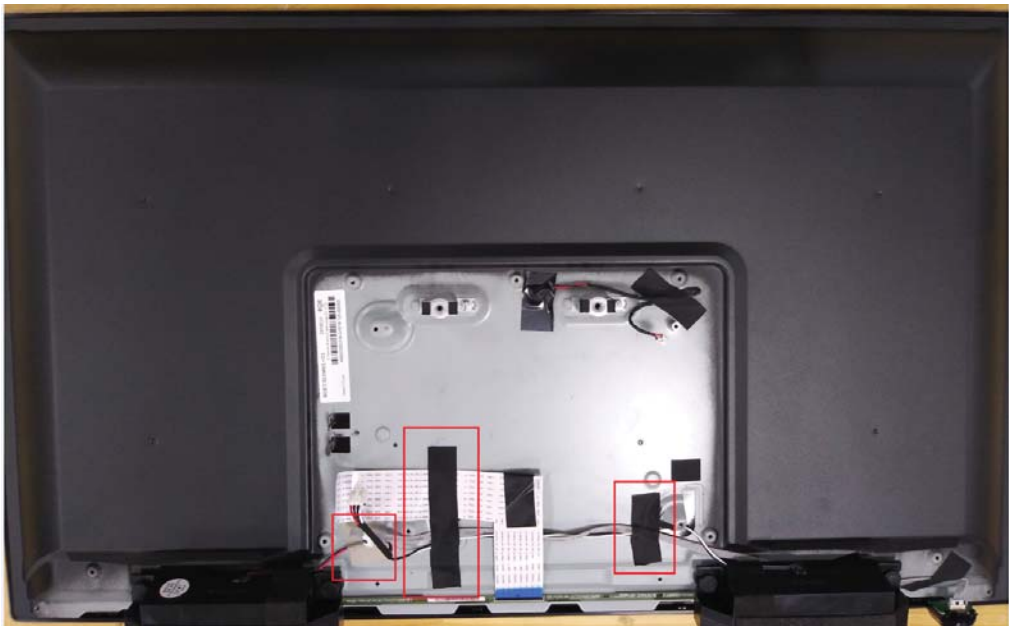


2. After removing the back shell, unplug the power cord, speaker cord, IR plate cord and LVDS cord respectively, and then remove the side baffle.

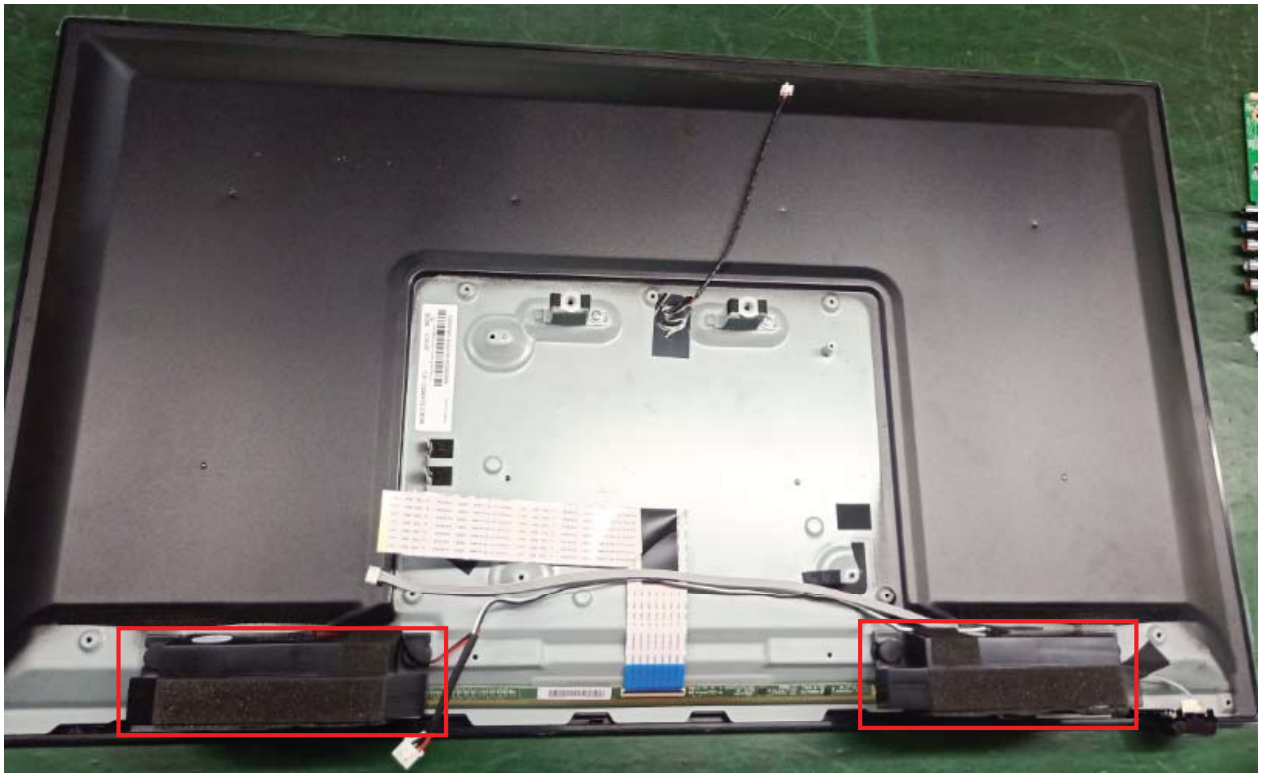


3. Unplug the backlight and remove the tape, remove the main board screws and remove the main board.

4. Remove tape holding wire & conductive cloth.

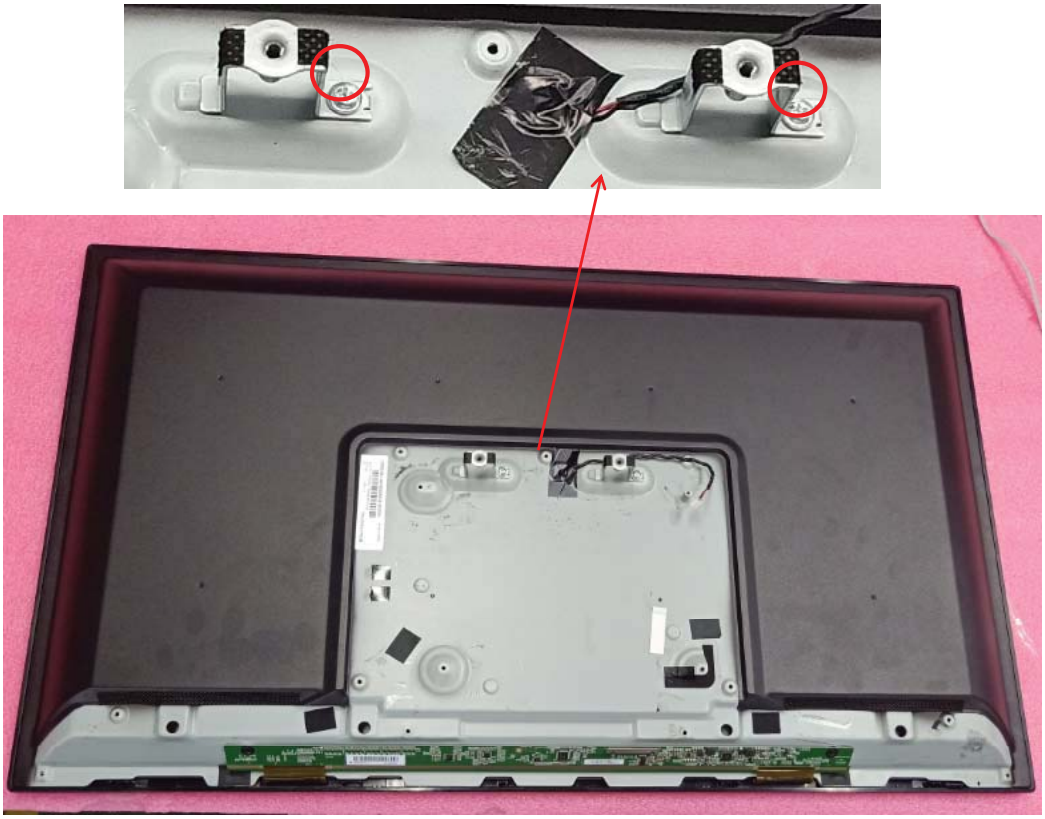


5. Remove the speakers.



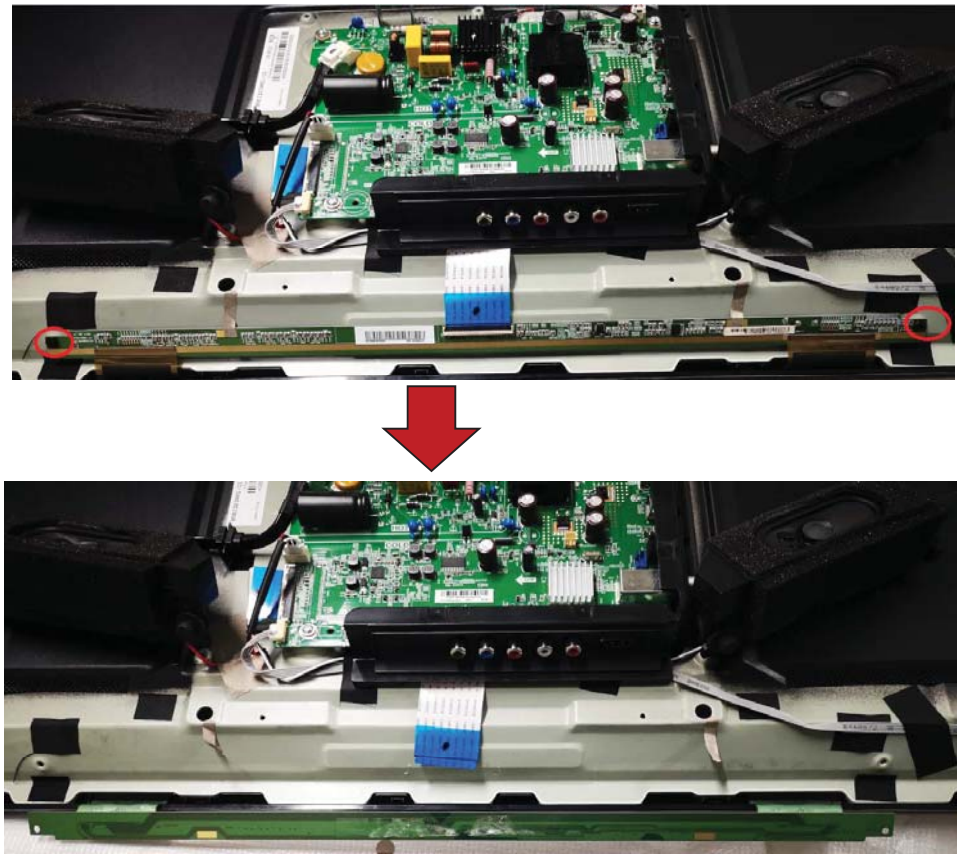
6. Remove the tape holding the IR plate, remove the IR plate and remove the LVDS line.

7. Remove the wall hanger.



8. Lay the mirror flat on the workbench.

9. Remove 2 screws from source PCB.



10. LCM reverse and remove the front frame.

11. Remove the mirror.

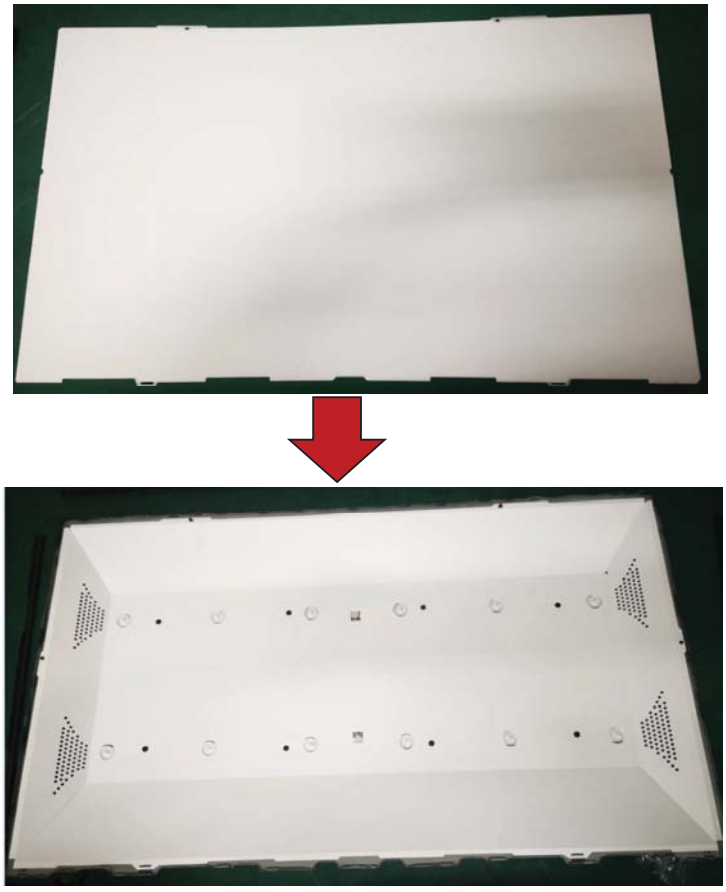
12.Remove the strip.

Top/Side

Down

top6ea/side L 3ea/side R 3ea/down 7ea

13. Optical sheet disassemble.



TROUBLE SHOOTING GUIDE

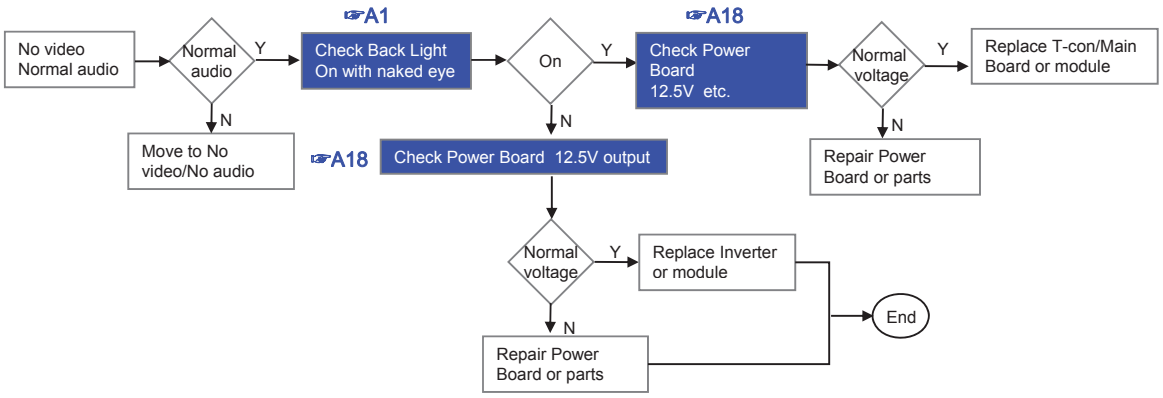
Contents of Standard Repair Process

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

Standard Repair Process

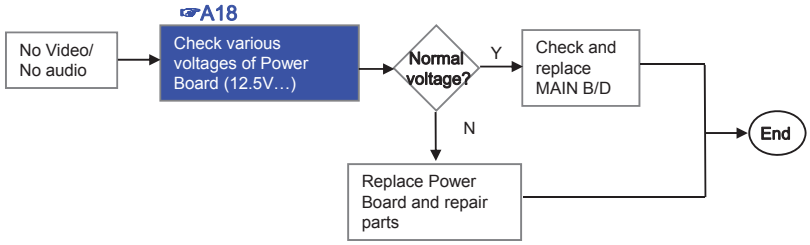
	Error symptom	A. Video error	Established date		
		No video/ Normal audio	Revised date		1/13

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



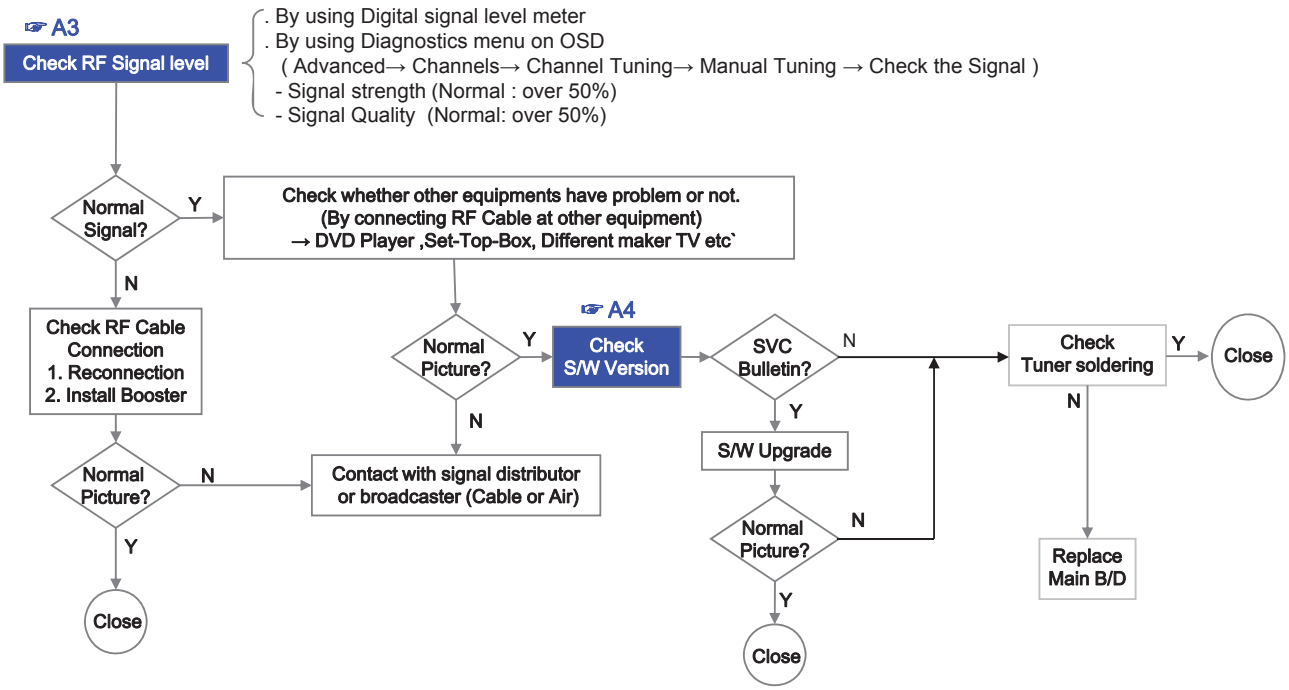
Standard Repair Process

	Error symptom	A. Video error	Established date		
		No video/ No audio	Revised date		2/13



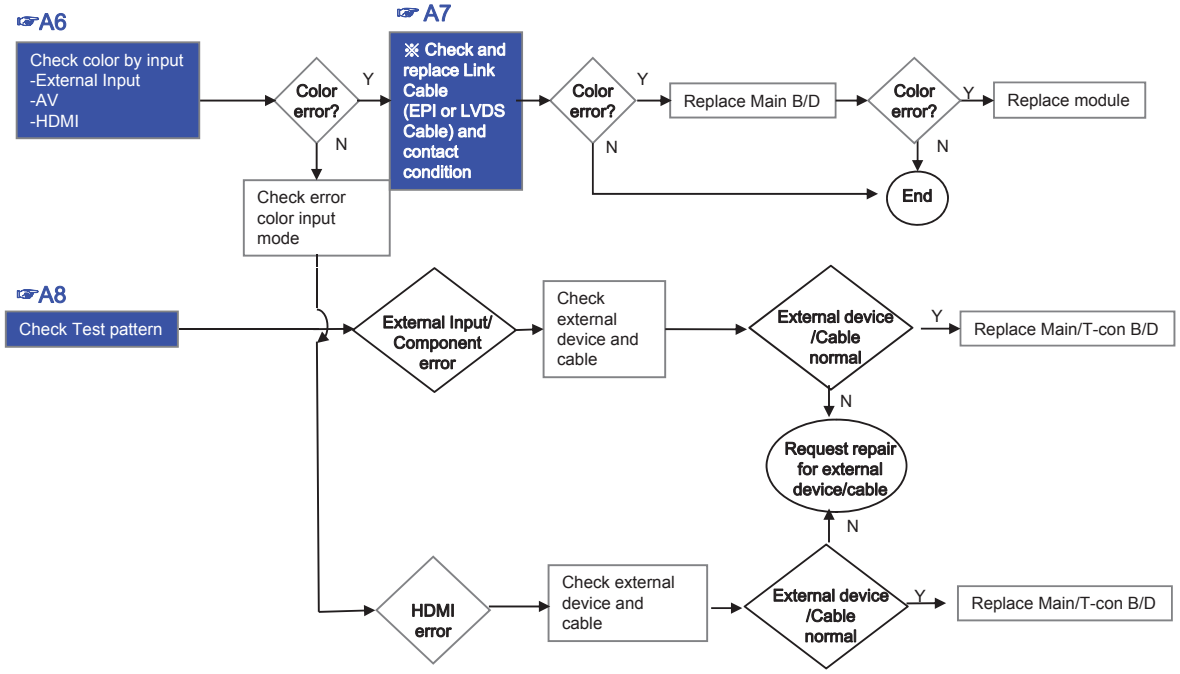
Standard Repair Process

	Error symptom	A. Video error	Established date		
		Picture broken/ Freezing	Revised date		3/13



Standard Repair Process

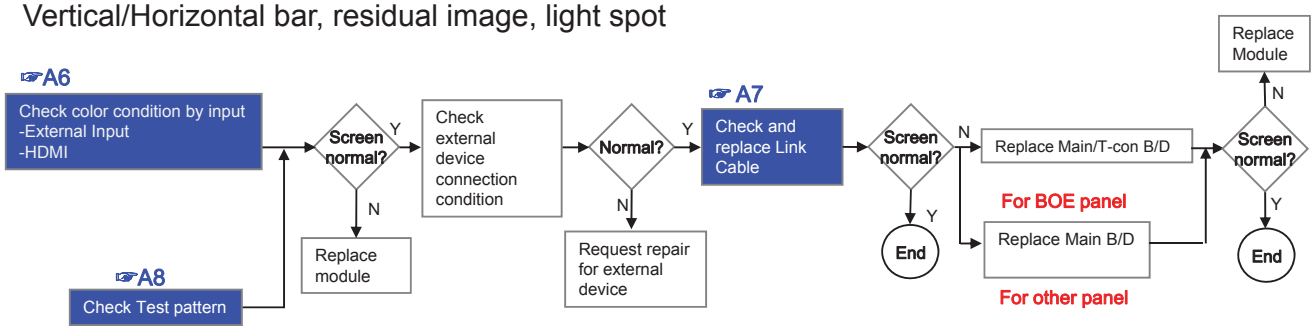
	Error symptom	A. Video error	Established date		
		Color error	Revised date		4/13



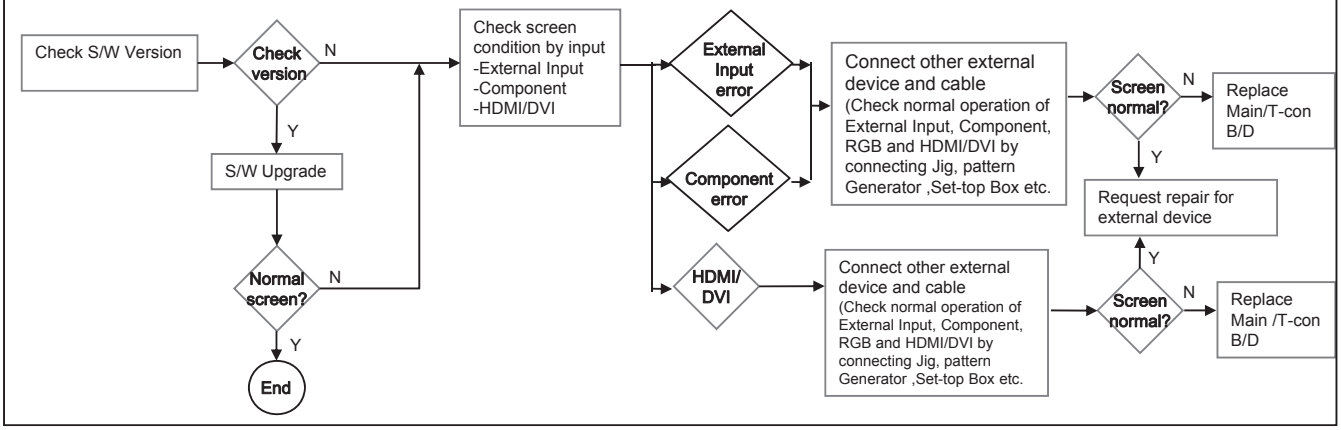
Standard Repair Process

	Error symptom	A. Video error	Established date		
		Vertical / Horizontal bar, residual image, light spot, external device color error	Revised date		5/13

Vertical/Horizontal bar, residual image, light spot

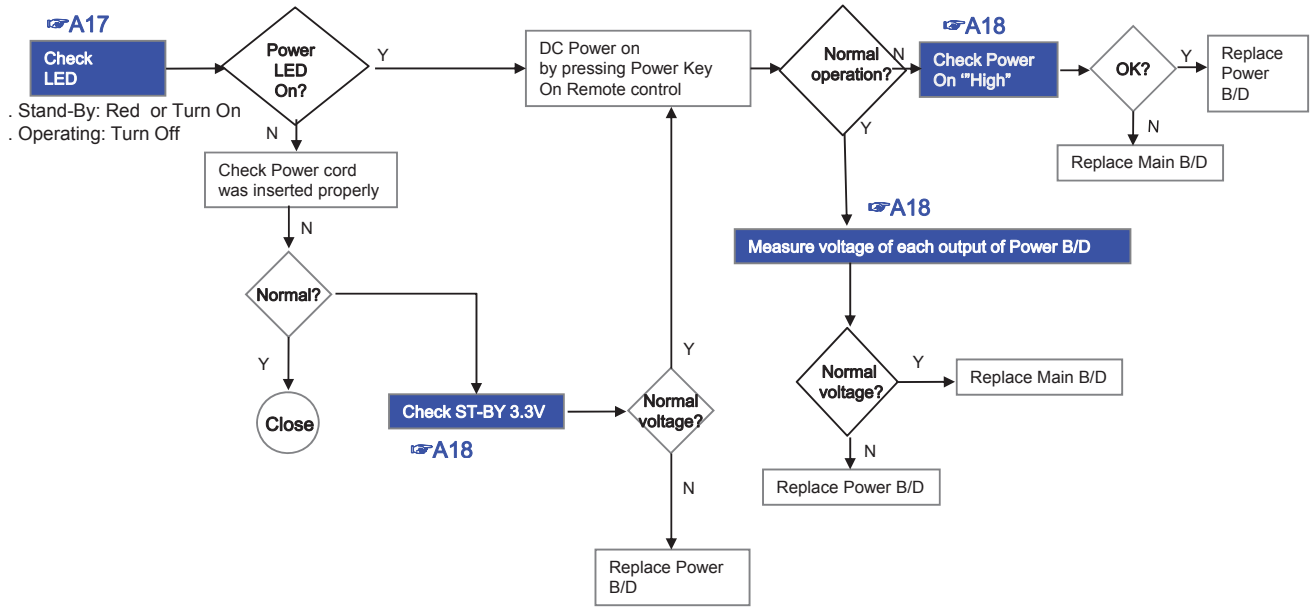


External device screen error-Color error



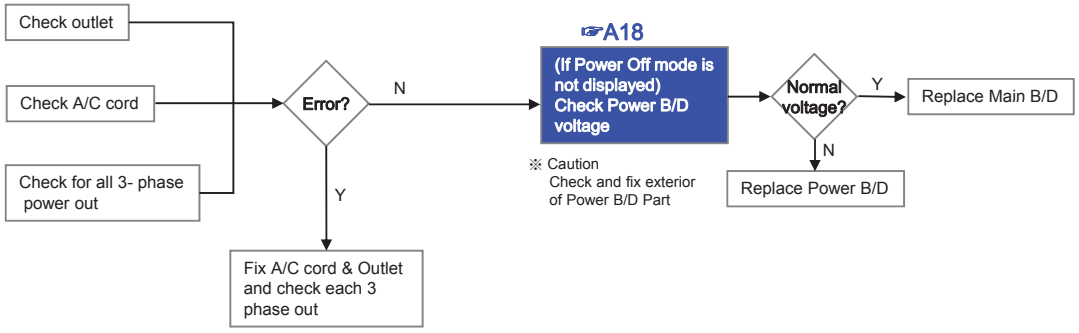
Standard Repair Process

	Error symptom	B. Power error	Established date		
		No power	Revised date		6/13



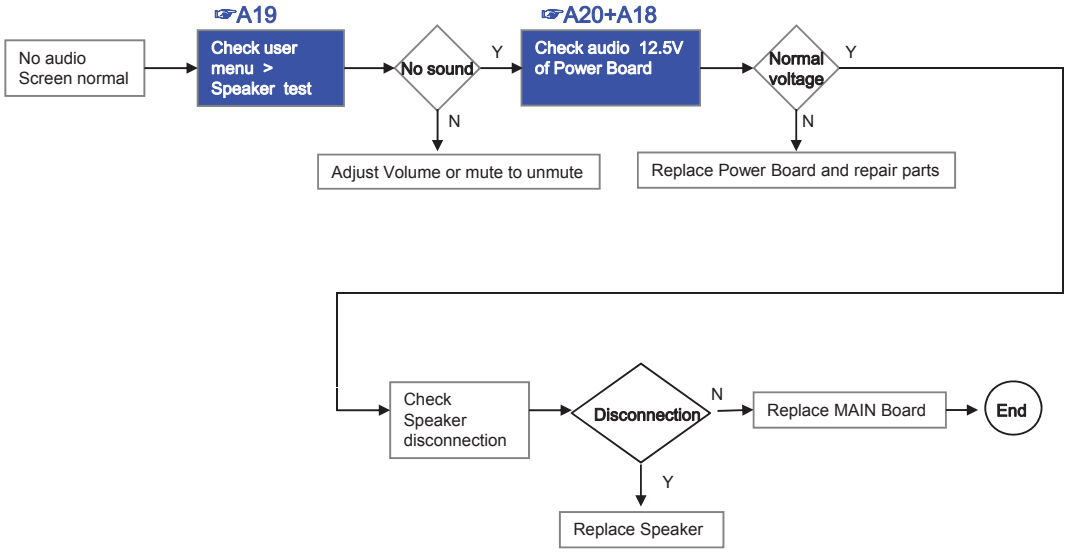
Standard Repair Process

	Error symptom	B. Power error	Established date		
		Off when on, off while viewing, power auto on/off	Revised date		7/13



Standard Repair Process

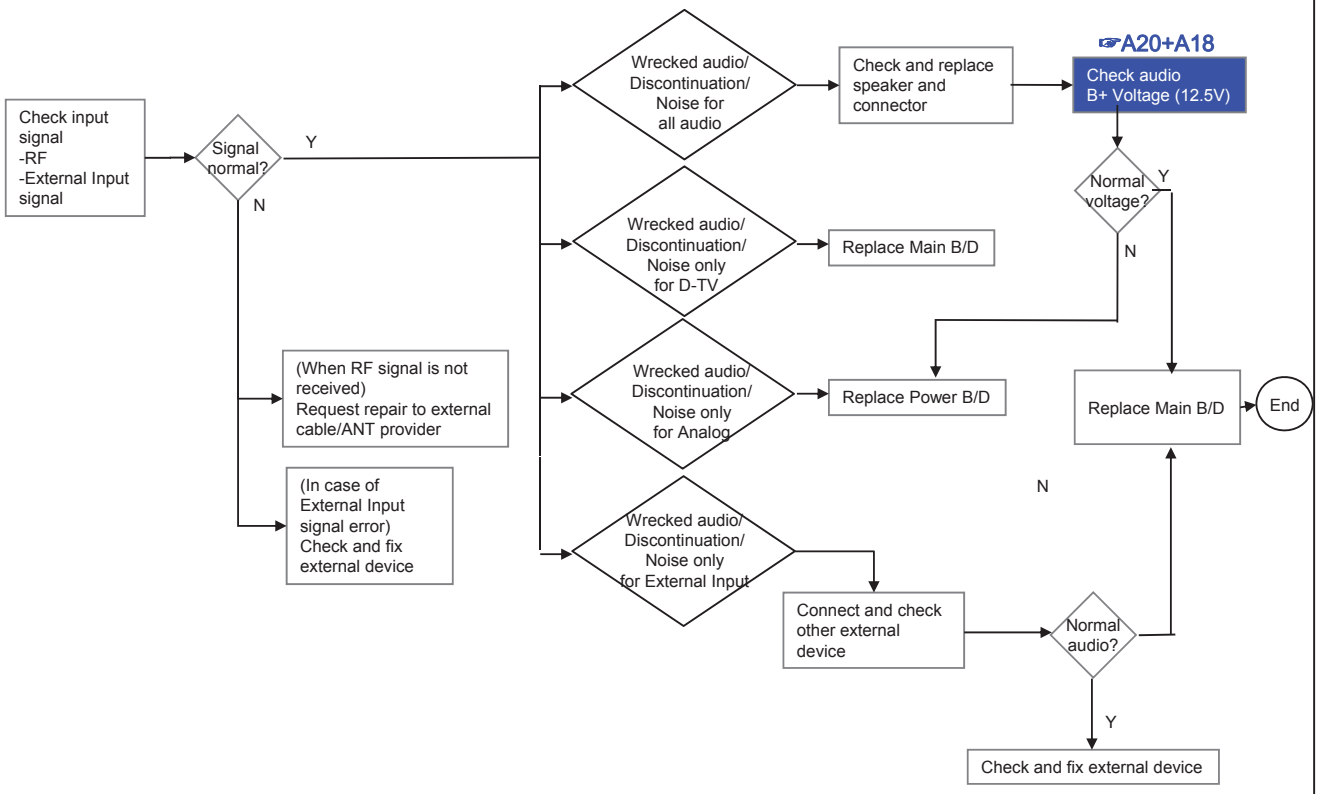
	Error symptom	C. Audio error	Established date		
		No audio/ Normal video	Revised date		8/13



Standard Repair Process

	Error symptom	C. Audio error	Established date		
		Wrecked audio/ discontinuation/noise	Revised date		9/13

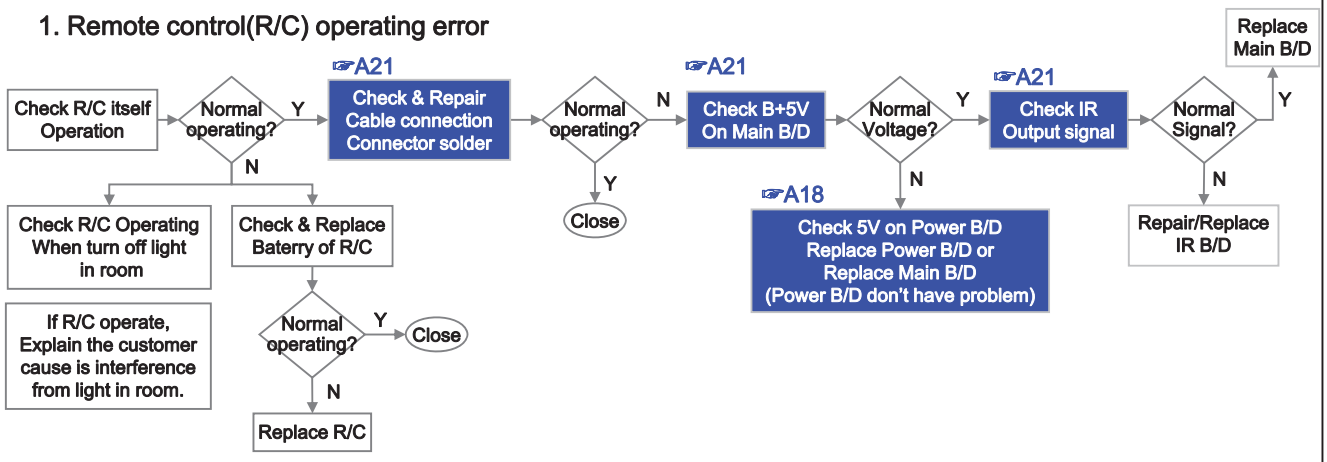
→ abnormal audio/discontinuation/noise is same after “Check input signal” compared to No audio



Standard Repair Process

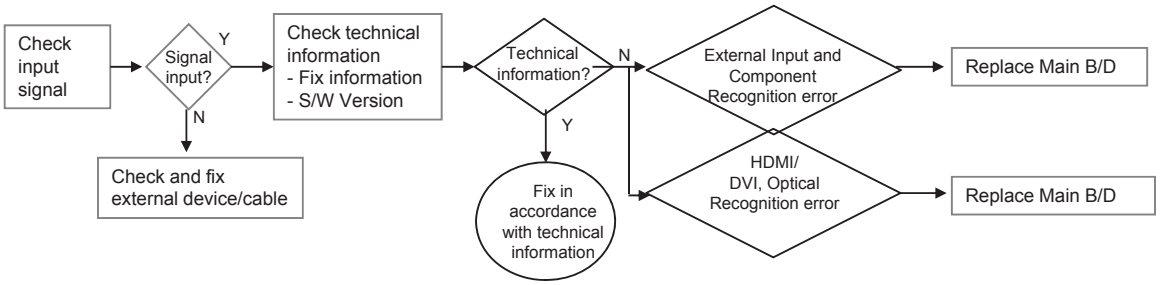
	Error symptom	D. Function error	Established date		
		Remote control & Local switch checking	Revised date		10/13

1. Remote control(R/C) operating error



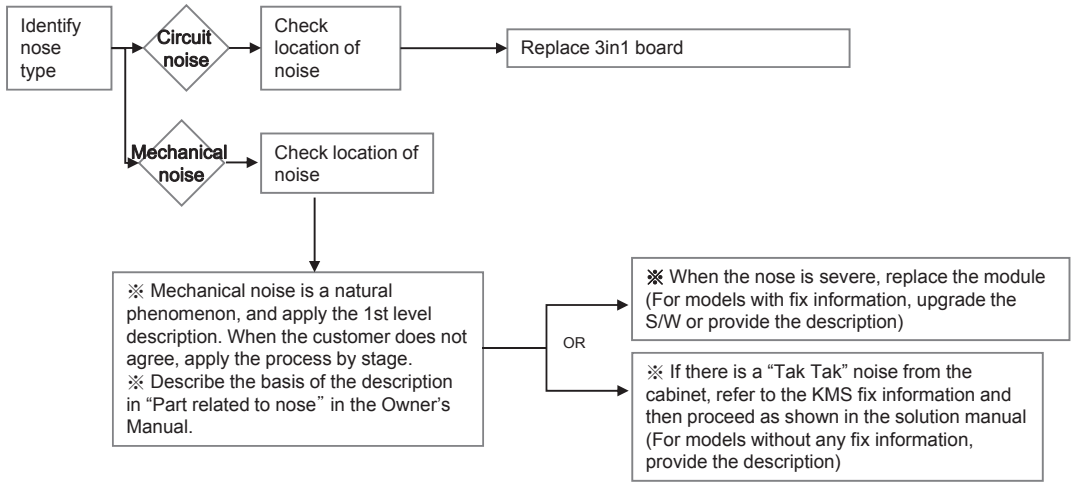
Standard Repair Process

	Error symptom	D. Function error	Established date		
		External device recognition error	Revised date		11/13



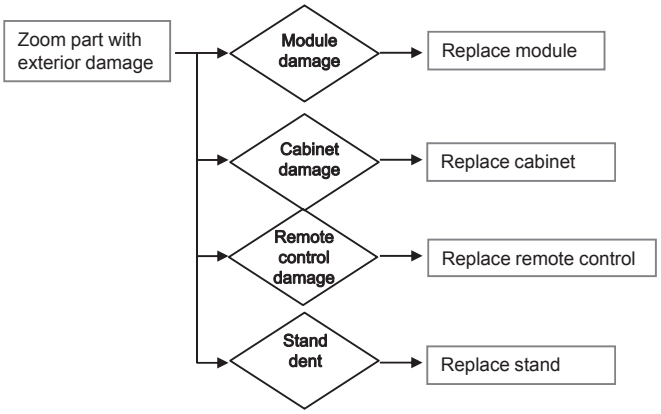
Standard Repair Process

	Error symptom	E. Noise	Established date		
		Circuit noise, mechanical noise	Revised date		12/13



Standard Repair Process

	Error symptom	F. Exterior defect	Established date		
		Exterior defect	Revised date		13/13



Contents of Standard Repair Process Detail Technical Manual

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Contents of Standard Repair Process Detail Technical Manual

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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

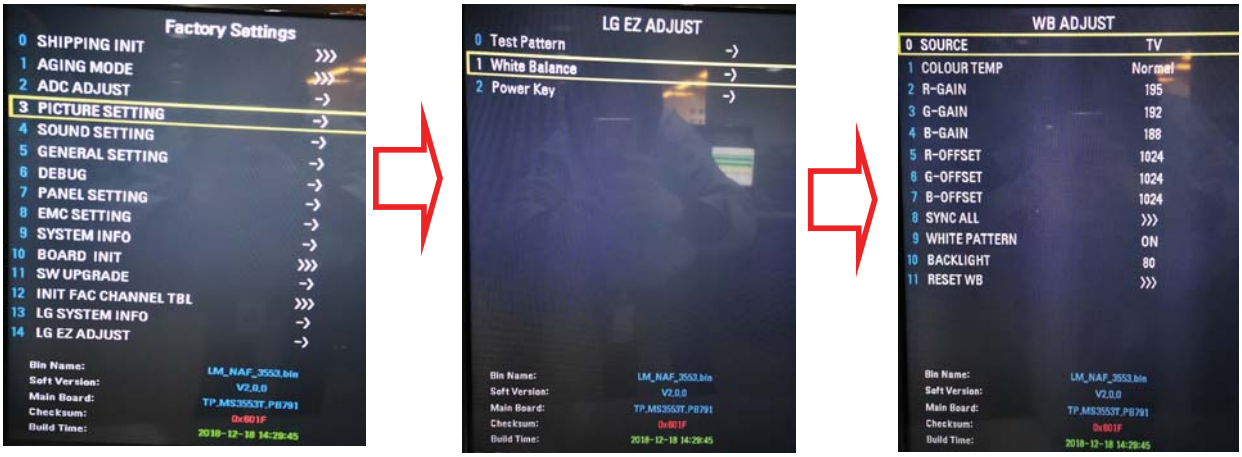
<32LM500*>

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

<32">



Entry method

1. Press the ADJ button on the remote control for adjustment.

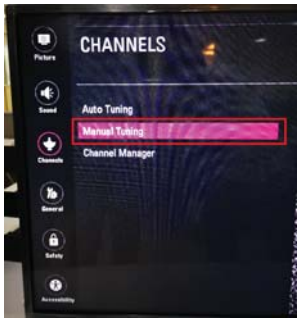
2. Enter into White Balance.

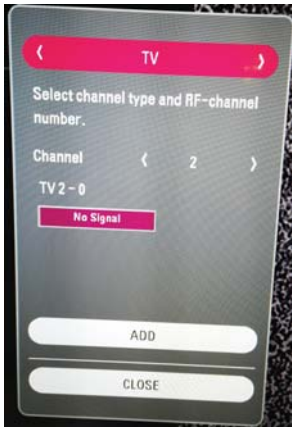
3. After recording the R, G, B (GAIN, Cut) value of Color Temp (Cool/Medium/Warm), re-enter the value after replacing the MAIN BOARD.

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>





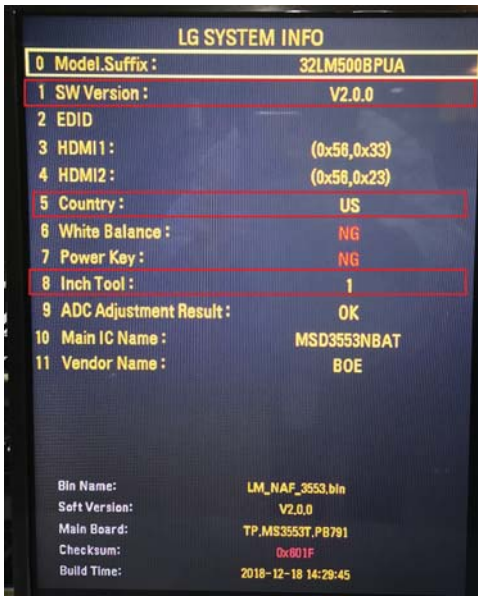
Standard Repair Process Detail Technical Manual

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

<ALL MODELS>

1. Checking method for remote control for adjustment

Version



Press the IN-START with the remote control for adjustment , need check SW Version , Country , Inch Tool , etc..

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

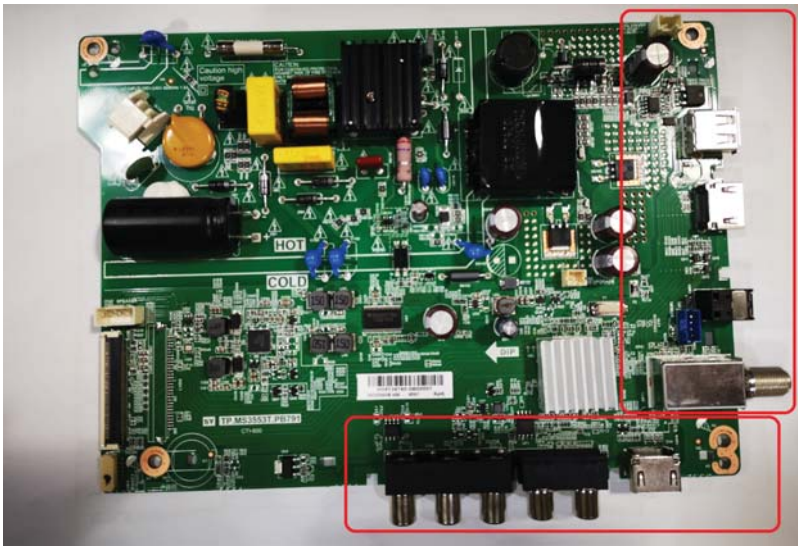
<32LM500*>

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 (1)	Revised date		A6

<32LM500*>



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

Standard Repair Process Detail Technical Manual

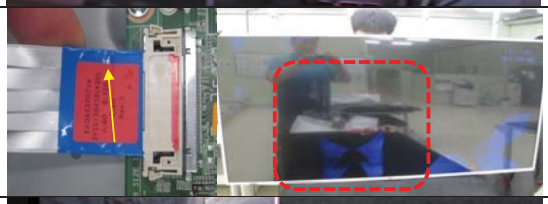
	Error symptom	A. Video error_Color error	Established date		
	Content	Check Link Cable(LVDS or Mini LVDS) reconnection condition	Revised date		A7

<32LM500*>

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

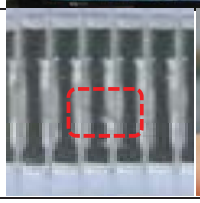
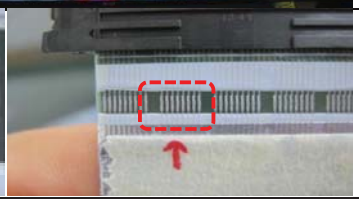
Appendix. Examples of Symptoms(Image error)

Check for poor cable contact

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	LVDS cable connection problem	
CABLE	Color spread	LVDS cable connection problem	
CABLE	Color spread	LVDS cable connection problem	
CABLE	Screen stop	Due to foreign substance withi nLVDS cable PIN	 

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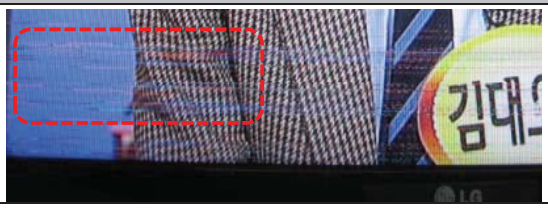
Appendix. Examples of Symptoms(Main)

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	

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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	

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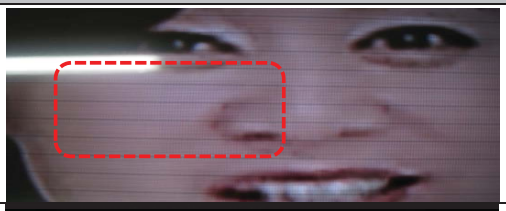
Appendix. Examples of Symptoms(Main)

Check parts by symptom

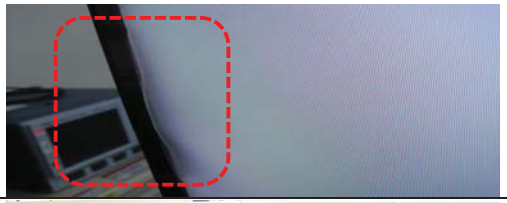
Item	Symptom Name	Cause	Symptom Image
Main	Broken picture	No problem at the initial stage, G-color spread after 10 minutes	
Main	Right-side Screen problem	Right-side screen problem	
Main	LG logo Screen problem	Screen picture spread problem	
Main	Right-side picture problem	No problem at the initial stage.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

Appendix. Examples of Symptoms(Module)

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	

Appendix. Examples of Symptoms(Module)

Check parts by symptom

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	

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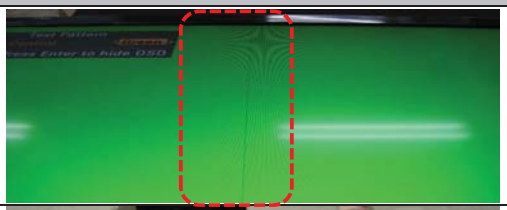
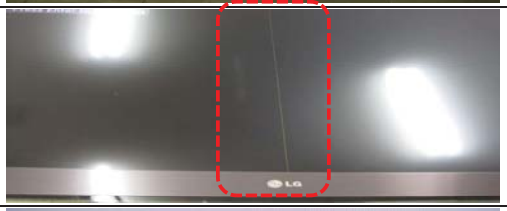
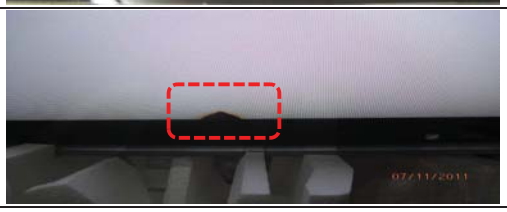
Appendix. Examples of Symptoms(Module)

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	

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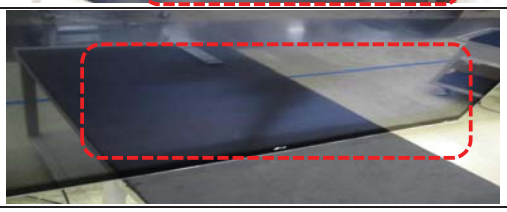
Appendix. Examples of Symptoms(Main(T-Con))

Check parts by symptom

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

Appendix. Examples of Symptoms(Main(T-Con))

Check parts by symptom

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

Appendix : Exchange Power Board (PSU)

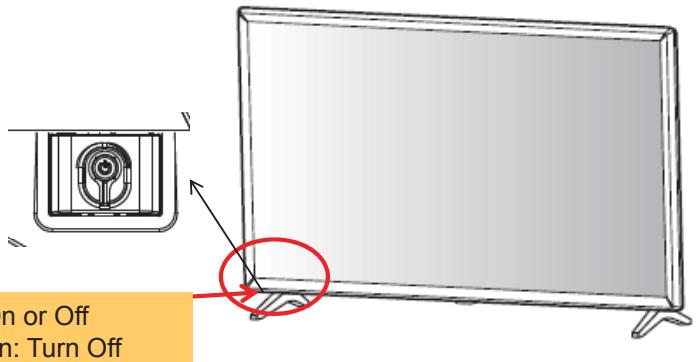
No Light

No picture/Sound Ok

A-11/11

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

Power On(Press)

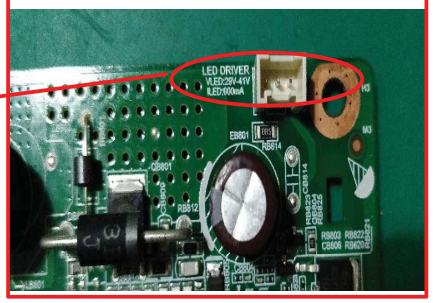
Power Off(Press)

Standard Repair Process Detail Technical Manual

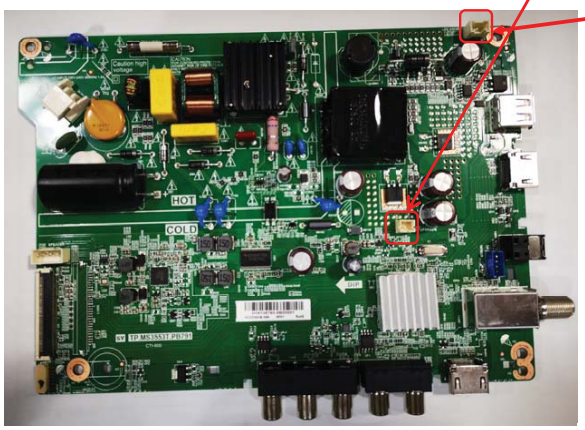
	Error symptom	B. Power error _No power	Established date		
	Content	Check power input voltage	Revised date		A18

Backlight Forward Voltage	Symbol	Values			Unit
		Min	Typ	Max	
28	VF	29	31.5	34	Vdc
32		34.8	37.8	40.8	
43		69.6	75.6	81.6	

<32”>



Check the DC 12V.



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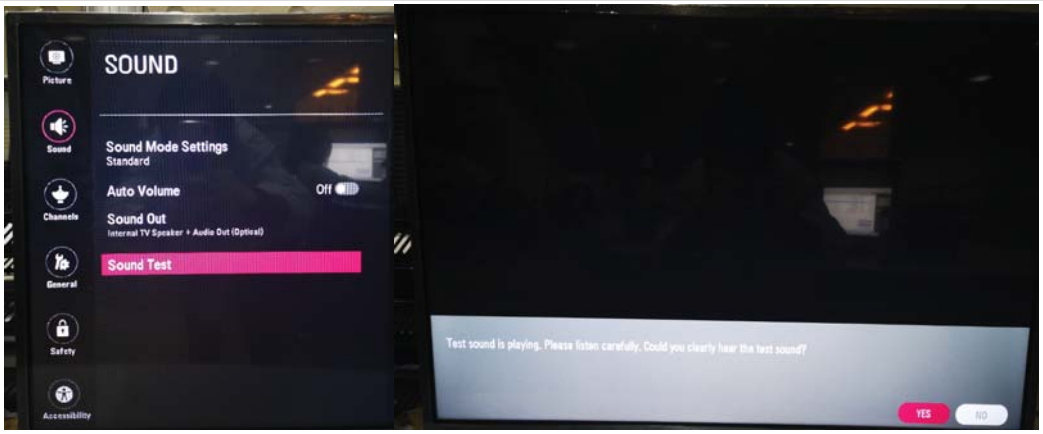
A18

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		A19

<ALL MODELS>

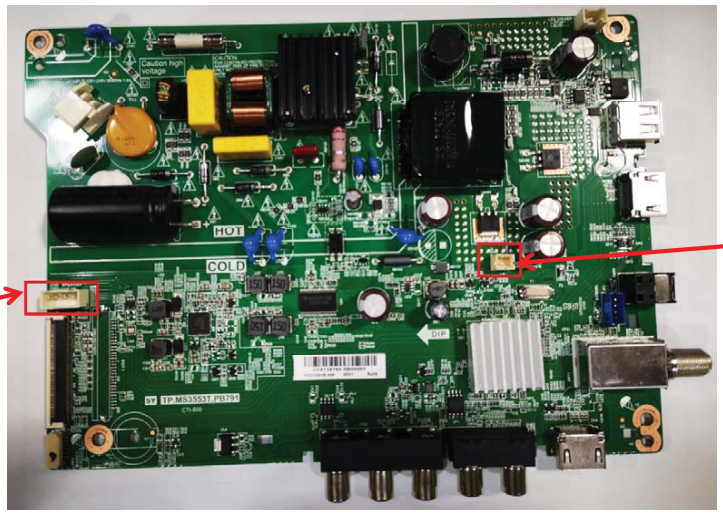


Checking method

1. Press the Setting button on the remote control
2. Select the Sound function of the Menu
3. Select the “Speaker test”
4. You can listen the sound

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		A20



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②

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 12V connector of Main Board

2.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.

A20

Standard Repair Process Detail Technical Manual

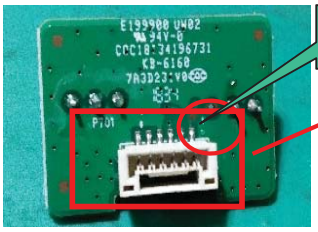
	Error symptom	D. Function error	Established date		
	Content	Remote control operation checking method	Revised date		A21

①

IR Sensor & Keypad & LED

Front

Rear



③

<32'>

②

Checking order to check remote control

Pin	Pin name
1	K0
2	5V
3	IR
4	GND
5	R
6	G

Checking order

1.Check IR cable condition between IR & Main board.(Check picture number① and ②)
2.Check the standby 5V on the terminal 2 pin (③)
3.AS checking the Pre-Amp(IR LED light) , the power is in ON condition, the LED light will be flashing 3 times, otherwise, it's defective.

A21

Standard Repair Process Detail Technical Manual

	Error symptom	E. Etc	Established date		
	Content	How to use the Service remote control	Revised date		A22

1. How to access the remote control

1. How to access the remote control

A. Using remote control and enter “in start” key and enter password “0413” into the TV set information interface.
B. Using remote control and enter “ADJ” key and enter password “0413” into the TV adjust interface.

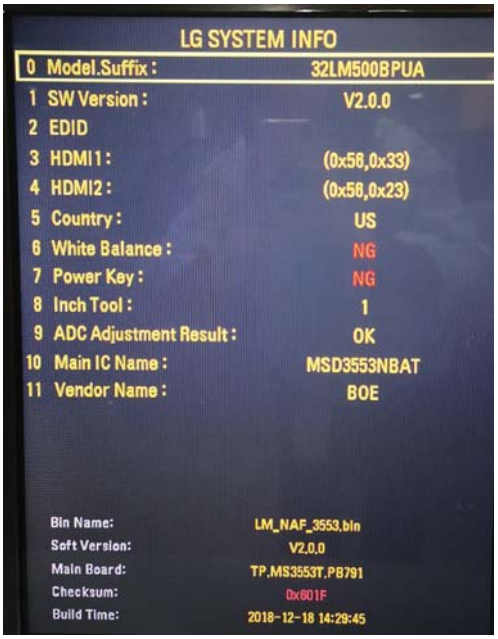
2. Remote control part definition

Refer to remote control part definition comparison table as following.

Standard Repair Process Detail Technical Manual

	Error symptom	E. Etc	Established date		
	Content	How to use the Service remote control	Revised date		A23

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		A24

2. Remot control part definition

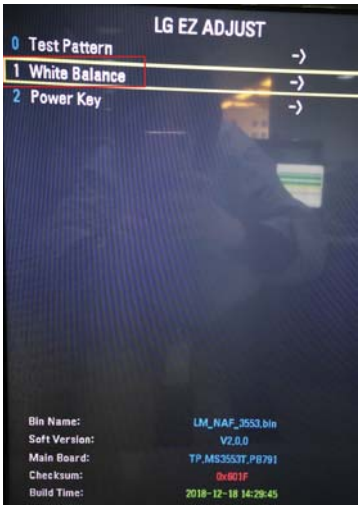
No.	Key Name	Key Function
1	P-ONLY	Factory mode
2	INPUT	Input Source chagne Ex)HDMI, USB, Component
3	POWER	Power on/off
4	S	Sound Test Ex)Sound 100, 80, 50, 0
5	PSM	Changes Picture Mode
6	SSM	Changes Sound Mode
7	MPX	changes Stereo mode
8	EYE	Green Eye test OSD Green Eye value display
9	IN START	TV set information Model, S/W version, results
10	ADJ	Adjust menu
11	MENU	User menu
12	EXIT	Exit
13	▲	Arrow ▲
14	◄	Arrow ◄
15	OK	OK
16	►	Arrow ►
17	▼	Arrow▼
18	VOL+	Volum up
19	VOL-	Volum down
20	MUTE	Mute
21	INSTOP	Factory Reset
22	CH▲	Chanel Up
23	CH▼	Channel down
24	1	Number 1
25	2	Number 2
26	3	Number 3
27	4	Number 4
28	5	Number 5
29	6	Number 6
30	7	Number 7
31	8	Number 8
32	9	Number 9
33	0	Number 0
34	TV	Change TV source
35	AV1	AV 1 source Hot key
36	COMP1	COMP 1 source Hot key
37	HDMI1	HDMI 1 source Hot key
38	HDMI2	HDMI 2 source Hot key

Standard Repair Process Detail Technical Manual

	Error symptom	E. Etc	Established date		
	Content	Check items after Main B/D replacement	Revised date		A25

Check items afer Main B/D(White Balance)

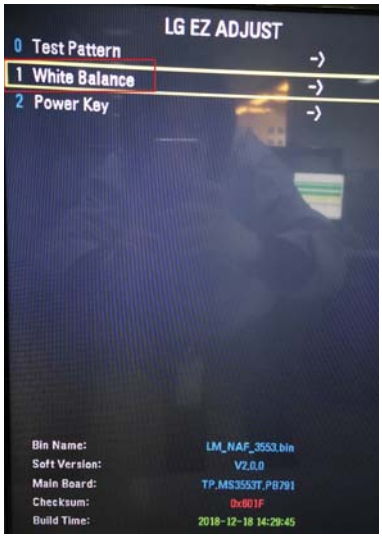
2. Press the Service remote control ADJ Key.



No.13 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		A26



You can view 8 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!)

	Error symptom	E. Etc	Established date		
	Content	Software Upgrade	Revised date		A27

USB Upgrade

Check software upgrade bin file name as below. Only bin file name is the same as TV set ,USB upgrade can be success.
need do AC on upgrade as below steps.

Region	Model	Software Name(FY2019)
Nafta	32	LM_NAF_3553.bin

•Copy the software Bin to the USB root.
2. Insert the USB to the mainboard USB port.
3. Then AC on.
4. Then the TV will upgrade, and need to reboot after upgrade success.

Upgrading:
LED indicator blinking red 200ms no light 200ms alternate, TV will turn to upgrade succeed or failed status after finish upgrading.

Upgrade succeed:
Two times fast blinking per 300ms, once no light and once red.

Upgrade failed:
Maintain red color.

Notice:It will automatically shut down, can not manually power off during the upgrade.
Pull out USB and power on TV after upgrading finish.


LG
Life's Good