

HISTORY INFORMATION FOR THE FOLLOWING MANUAL:

SERVICE MANUAL

ORIGINAL MANUAL ISSUE DATE: 8/2012

AZ3FK CHASSIS
Segment: P-2

Version	Date	Subject
1.0	8/2012	Original manual issue.
2.0	10/2012	Addition model of KDL-60EX640(AUS).

LCD Digital Color TV

SONY®

SERVICE MANUAL

AZ3FK CHASSIS

Segment: P-2

LCD Digital Color TV

SONY®

MODEL LIST

<i>MODEL</i>	<i>COLOR</i>	<i>COMMANDER</i>	<i>DEST.</i>	<i>MODEL</i>	<i>COLOR</i>	<i>COMMANDER</i>	<i>DEST.</i>
<i>KLV-60EX640</i>	<i>Black</i>	<i>RM-GA023</i>	<i>AFRICA MIDDLE EAST PACIFIC ISLAND SAUDI ARABIA</i>				
<i>KDL-60EX640</i>	<i>Black</i>	<i>RM-GD024</i>	<i>AUSTRALIA</i>				

WARNINGS AND CAUTIONS - ENGLISH

CAUTION

These servicing instructions are for use by qualified service personnel only.

To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

WARNING!!

An isolation transformer should be used during any service to avoid possible shock hazard, because of live chassis.

The chassis of this receiver is directly connected to the ac power line.

CARRYING THE TV

Be sure to follow these guidelines to protect your property and avoid causing serious injury.

- Carry the TV with an adequate number of people; larger size TVs require two or more people.
- Correct hand placement while carrying the TV is very important for safety and to avoid damages.

SAFETY-RELATED COMPONENT WARNING!!

Components identified by shading and ! mark on the schematic diagrams, exploded views, and in the parts list are critical for safe operation. Replace these components with Sony parts whose part numbers appear as shown in this manual or in supplements published by Sony. Circuit adjustments that are critical for safe operation are identified in this manual.

Follow these procedures whenever critical components are replaced or improper operation is suspected.

WARNINGS AND CAUTIONS - FRENCH

ATTENTION!!

Ces instructions de service sont à l'usage du personnel de service qualifié seulement.

Pour prévenir le risque de choc électrique, ne pas faire l'entretien autre que celui contenu dans le Mode d'emploi à moins que vous soyez qualifié à faire ainsi.

WARNING!!

Afin d'éviter tout risque d'électrocution provenant d'un châssis sous tension, un transformateur d'isolement doit être utilisé lors de tout dépannage. Le châssis de ce récepteur est directement raccordé à l'alimentation du secteur.

POUR TRANSPORTER LE TÉLÉVISEUR

Tenez compte de ce qui suit pendant l'installation du téléviseur :

- Débranchez tous les câbles avant de transporter le téléviseur.
- Transportez le téléviseur avec le nombre de personnes approprié ; un téléviseur de grande taille doit être transporté par au moins deux personnes.
- Lors du transport du téléviseur, l'emplacement des mains est très important pour votre sécurité, ainsi que pour éviter de causer des dommages.

ALERTE!!

Afin d'éviter tout risque d'électrocution provenant d'un châssis sous tension, un transformateur d'isolement doit être utilisé lors de tout dépannage. Le châssis de ce récepteur est directement raccordé à l'alimentation du secteur.

ATTENTION AUX COMPOSANTS RELATIFS A LA SECURITE!!

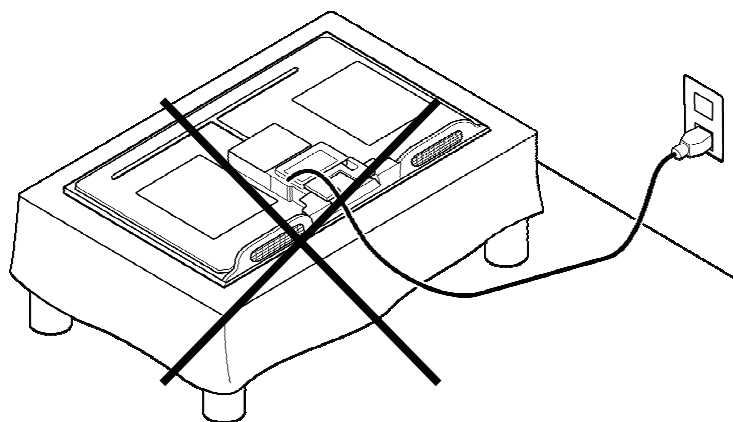
Les composants identifiés par une trame et par une marque ! sur les schémas de principe, les vues explosées et les listes de pièces sont d'une importance critique pour la sécurité du fonctionnement. Ne les remplacer que par des composants Sony dont le numéro de pièce est indiqué dans le présent manuel ou dans des suppléments publiés par Sony. Les réglages de circuit dont l'importance est critique pour la sécurité du fonctionnement sont identifiés dans le présent manuel. Suivre ces procédures lors de chaque remplacement de composants critiques, ou lorsqu'un mauvais fonctionnement suspecte.

USE CAUTION WHEN HANDLING THE LCD PANEL

When repairing the LCD panel, be sure you are grounded by using a wrist band.

When repairing the LCD panel on the wall, the LCD panel must be secured using the 4 mounting holes on the rear cover.

- 1) Do not press on the panel or frame edge to avoid the risk of electric shock.
- 2) Do not scratch or press on the panel with any sharp objects.
- 3) Do not leave the module in high temperatures or in areas of high humidity for an extended period of time.
- 4) Do not expose the LCD panel to direct sunlight.
- 5) Avoid contact with water. It may cause a short circuit within the module.
- 6) Disconnect the AC power when replacing the backlight (CCFL) or inverter circuit. (High voltage occurs at the inverter circuit at 650Vrms.)
- 7) Always clean the LCD panel with a soft cloth material.
- 8) Use care when handling the wires or connectors of the inverter circuit. Damaging the wires may cause a short.
- 9) Protect the panel from ESD to avoid damaging the electronic circuit (C-MOS).
- 10) It is recommended not to exceed 1 hour of Power-On nor Burn-in period with LCD panel face down condition, in repair activity.



SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

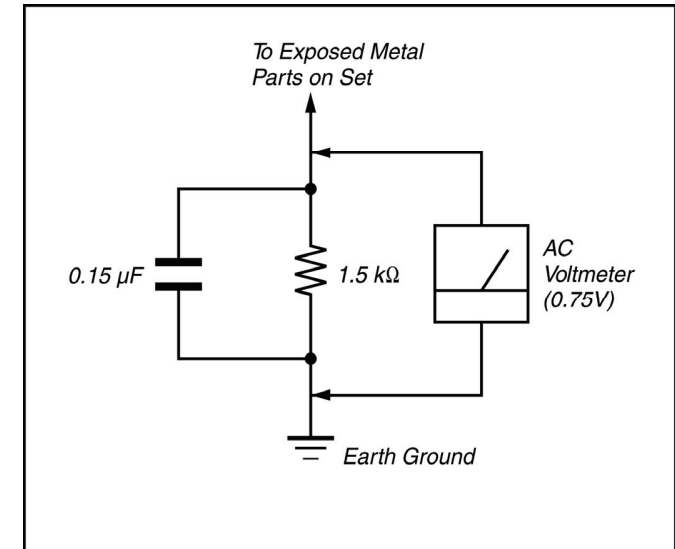
1. Check the area of your repair for unsoldered or poorly soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are “pinched” or touching high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.
8. For safety reasons, repairing the Power board and/or Inverter board is prohibited.

Leakage Test

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes).

Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instructions.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low voltage scale. The Simpson's 250 and Sanwa SH-63TRD are examples of passive VOMs that are suitable. Nearly all battery-operated digital multimeters that have a 2 VAC range are suitable (see Figure A).



FigureA. Using an AC voltmeter to check AC leakage.

How to Find a Good Earth Ground

A cold-water pipe is a guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground.

If the retaining screw is to be used as your earth ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms.

If a cold-water pipe is not accessible, connect a 60- to 100-watt trouble- light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side on the line; the lamp should light at normal brilliance if the screw is at ground potential (see Figure B).

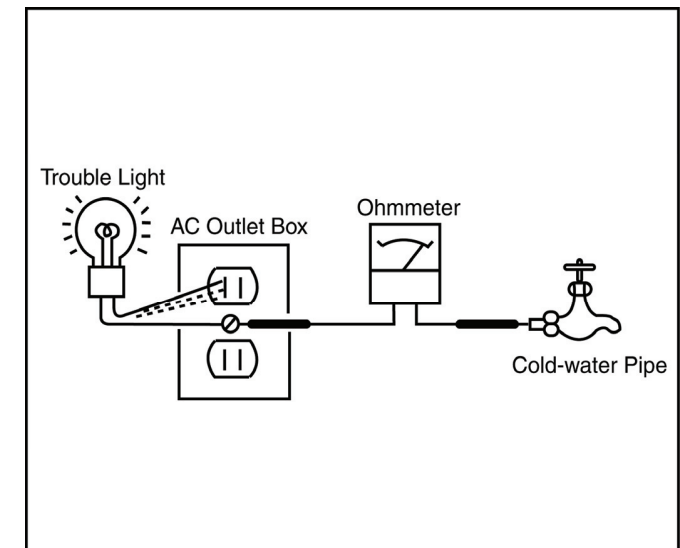


Figure B. Checking for earth ground.

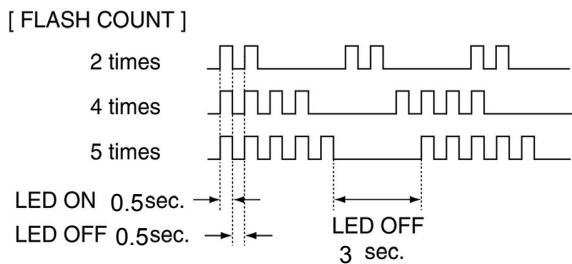
SELF DIAGNOSIS FUNCTION

The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY LED will automatically begin to flash. The number of times the LED flashes translates to a probable source of the problem. A definition of the STANDBY LED flash indicators is listed in the instruction manual for the user’s knowledge and reference. If an error symptom cannot be reproduced, the remote commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

DIAGNOSTIC TEST INDICATORS

When an error occurs, the STANDBY LED will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the LED will identify the first of the problem areas. Result for all of the following diagnostic items are displayed on screen. If the screen displays a “0”, no error has occurred .

DISPLAY OF STANDBY LED FLASH COUNT



Note: One flash counts is not self-diagnostic.

STBY LED Flash time	Service menu Item name (Screen Display)	Diagnostic Item Description
2	MAIN_POWER	12V_AMP Error
		12V_SW Error
		24V_Error
3	DC_ALERT1	3V3/5V Error
	AUDIO_PROT	Audio Error
4	BALANCER_ERR	Not used
5	TCON_ERR	T-con Error
	PANEL_ID_NVM_ERR	Panel ID Error
6	BACKLIGHT_ERR	Back Light Error
7	TEMP_ERR	Not used
8	-	Not used
9	-	Not used
10	-	Not used
11	-	Not used
12	-	Not used

SELF-DIAGNOSTIC SCREEN DISPLAY

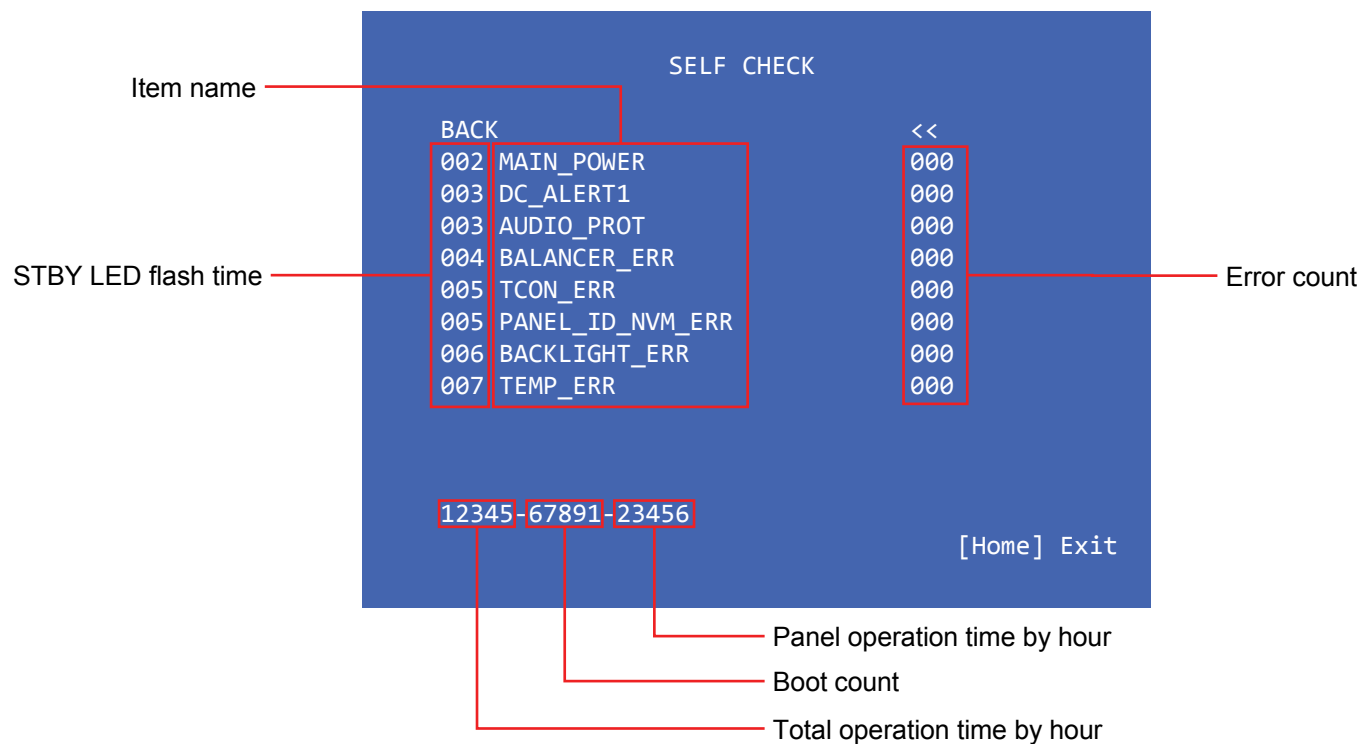
For errors with symptoms such as “power sometimes shuts off” or “screen sometimes goes out” that cannot be confirmed, it is possible to bring up past occurrences of failure for confirmation on the screen:

[To Bring Up Screen Test]

In standby mode, press buttons on the remote commander sequentially in rapid succession as shown below:



* : Note that this differs from entering the service mode (volume +)

[SELF DIAGNOSTIC SCREEN DISPLAY]

Since the diagnostic results displayed on the screen are not automatically cleared, always check the self-diagnostic screen. After you have completed the repairs, clear the result display to "0".

Clearing the Self Check Diagnostic List

1. Error history and Error count : Press the Channel 8 => Channel 0 .
2. Panel operation time : Press the Channel 7 => Channel 0 .

Exiting the Self-diagnostic screen

To exit the Self Diagnostic screen, turn off the power to the TV by pressing the POWER button on the remote or the POWER button on the TV.

SEC 1. DISASSEMBLY AND PARTS LIST

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

The components identified by mark  contain confidential information. Strictly follow the instructions whenever the components are repaired and/or replaced.

Note: When removing the rear cover, to prevent damaging the rear cover, please refer “**APPENDIX-1**”.

Note: LCD panel have points installing with some tapes.

About the procedure of those disassembly and assembly methods, please refer to “**APPENDIX-2**”.

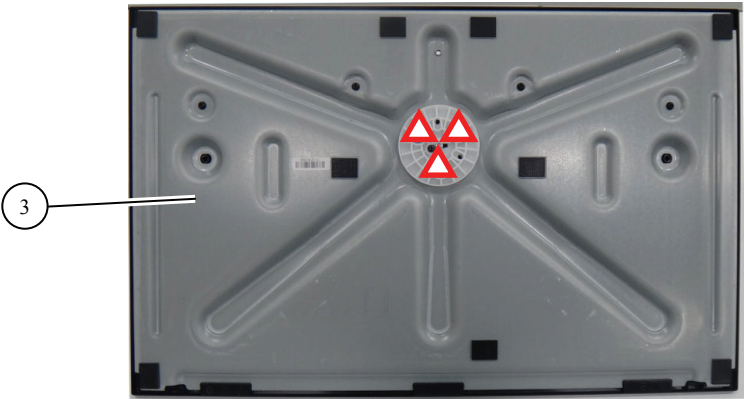
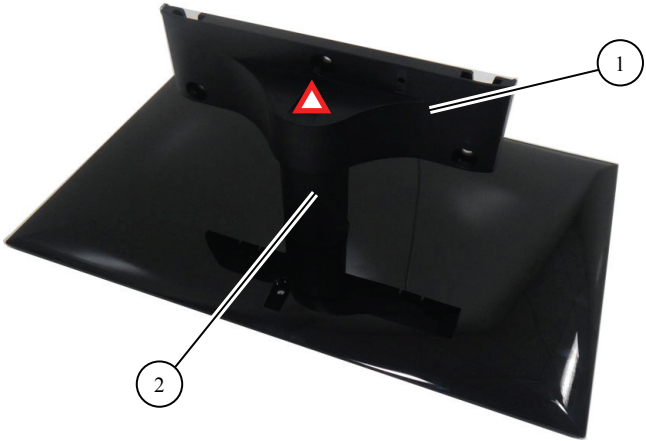
1-1. KLV-60EX640/KDL-60EX640

1-1-1. HEAD STAND, NECK AND BASE STAND

REF. No.	PART No.	DESCRIPTION	MARK
1	4-298-239-02	STAND, HEAD (ML9)	
2	4-444-067-01	NECK TP (60NK2)	
3	4-444-068-01	STAND, BASE TP (60NK2)	

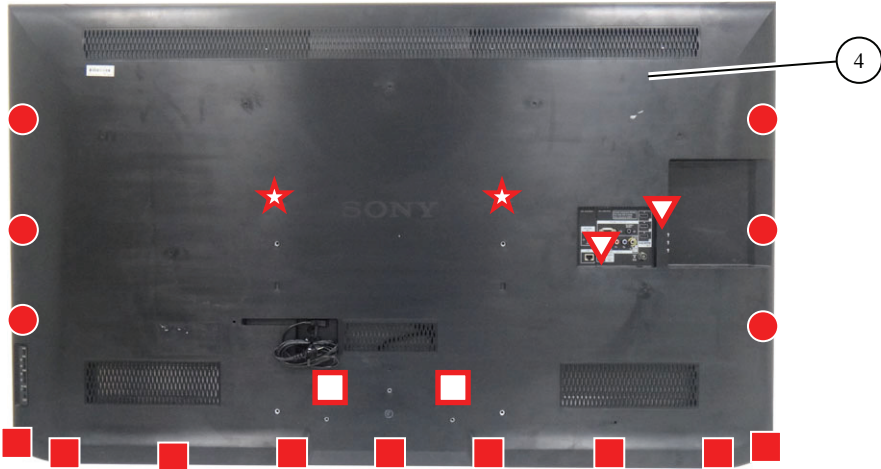


△ 4-421-427-01 SCREW, +PSW M5X16 LOCK



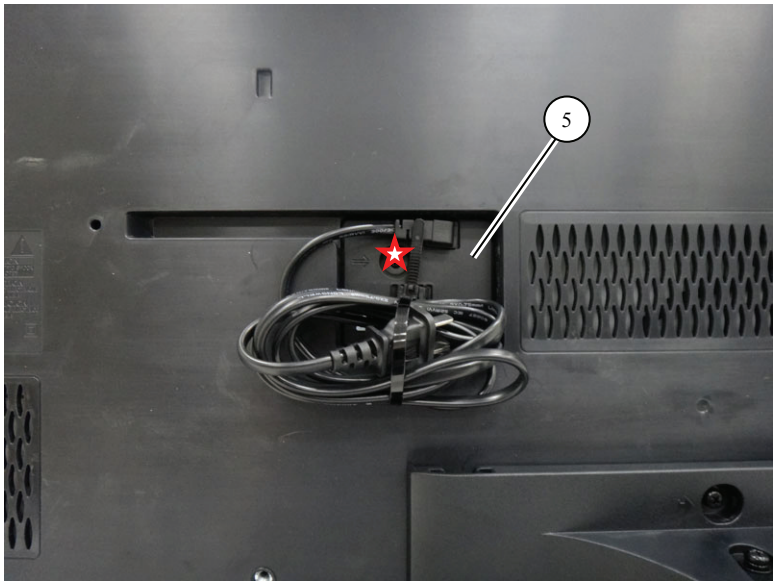
1-1. KLV-60EX640/KDL-60EX640

1-1-2. REAR COVER AND AC COVER



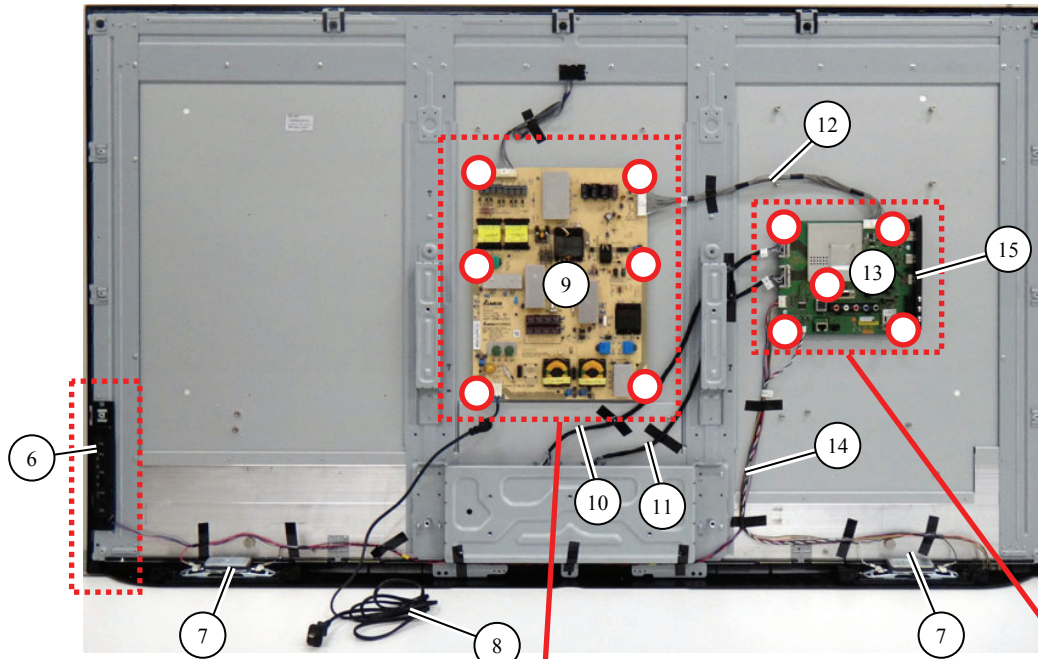
REF. No.	PART No.	DESCRIPTION	MARK
4	4-436-774-01	REAR COVER (60NK2)	
5	4-299-530-01	AC COVER	

■	2-580-639-01	SCREW, +BVTP 4x12
●	4-445-507-01	SCREW, +PWH M3x8 W12
★	4-167-019-12	SCREW, +PSW M3x8
▽	7-685-646-79	SCREW, +BVTP 3x8 TYPE2 IT-3
□	4-400-043-01	JOINT SCREW

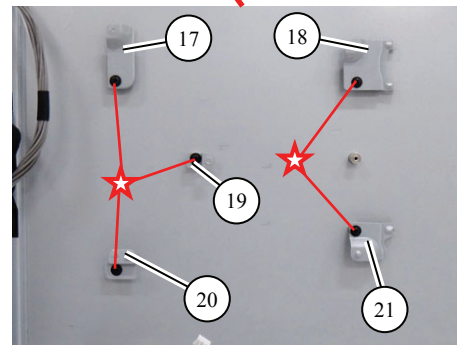
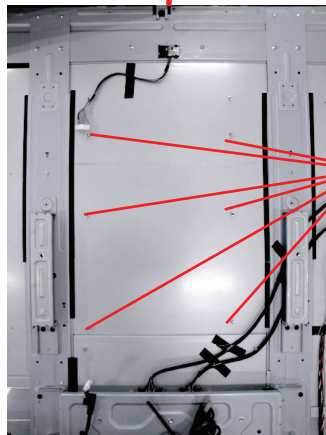
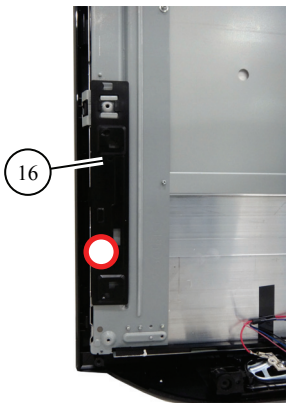


1-1. KLV-60EX640/KDL-60EX640

1-1-3. OVERALL

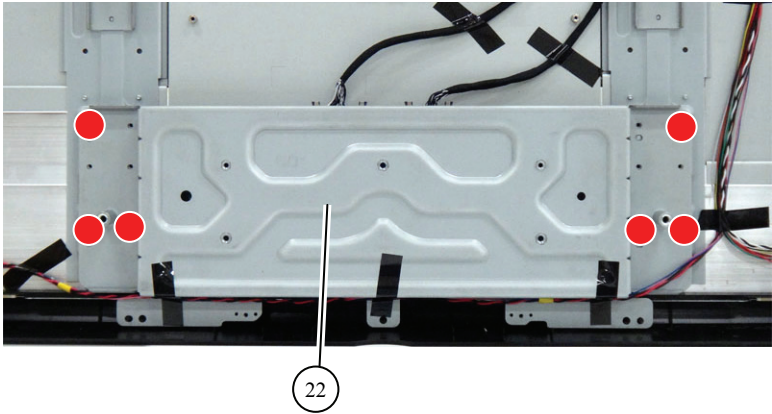


REF. No.	PART No.	DESCRIPTION	MARK
6	1-489-986-11	SWITCH UNIT	
7	1-858-715-11	LOUDSPEAKER (3X15CM)	
8	⚠ 1-846-307-11	POWER-SUPPLY CORD (WITH CONN.)	PA
	⚠ 1-846-308-11	POWER-SUPPLY CORD	AUS
9	⚠ 1-895-315-11	MOUNTED PWB GE60	
10	1-910-107-06	CONNECTOR ASSY 60 LVDS 51P	
11	1-910-107-05	CONNECTOR ASSY 60 LVDS 41P	
12	1-910-107-04	CONNECTOR ASSY 60 MB-PSU 15P	
13	🔒 1-895-307-41	MOUNTED PWB A	PA
	🔒 1-895-307-51	MOUNTED PWB A	AUS
14	1-910-107-03	CONNECTOR ASSY 60 MB-SP-IR-KEY	
15	4-428-235-01	BRACKET, SIDE JACK	
16	4-436-780-01	BRACKET, KEY (60NK2)	
17	4-436-785-01	BRACKET, MB RT (60NK2)	
18	4-436-782-01	BRACKET, MB LT (60NK2)	
19	4-436-784-01	BRACKET, MB M (60NK2)	
20	4-436-786-01	BRACKET, MB RB (60NK2)	
21	4-436-783-01	BRACKET, MB LB (60NK2)	
	○ 2-990-421-41	SCREW (+PSW) (M3x6)	
	★ 4-445-505-01	SCREW, +PSH M3x6 W12	
	◆ 4-445-506-01	SCREW, H M3x5 H6	



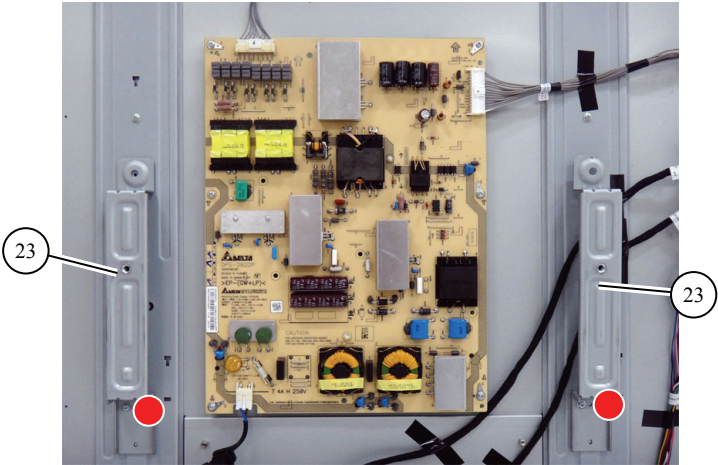
1-1. KLV-60EX640/KDL-60EX640

1-1-4. BOTTOM FRAME AND VESA BRACKET



REF. No.	PART No.	DESCRIPTION	MARK
22	4-436-779-01	FRAME, BOTTOM (60NK2)	
23	4-436-778-01	BRACKET, VESA (60NK2)	

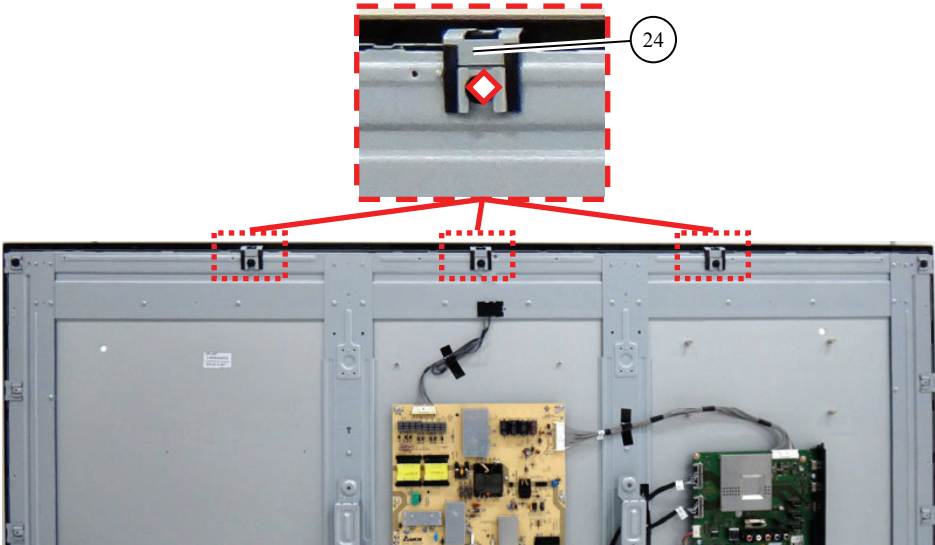
● 2-580-593-01 SCREW, +PSW M3x8



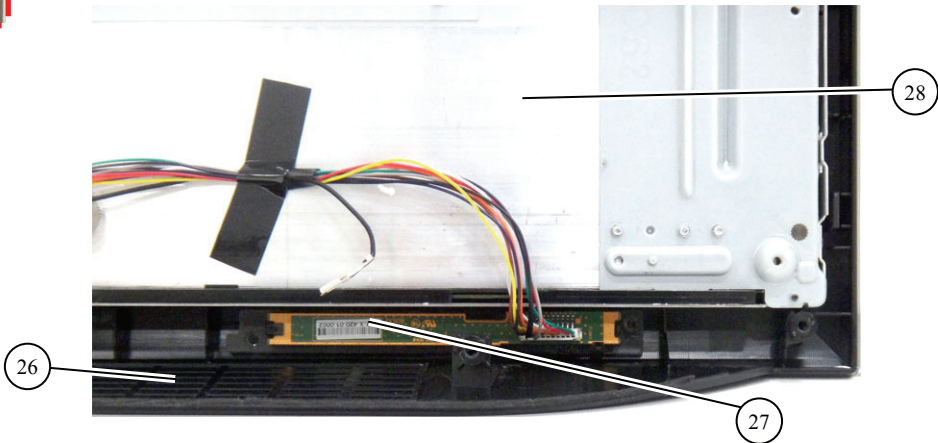
1-1. KLV-60EX640/KDL-60EX640

1-1-5. PANEL BRACKET, BEZEL, H BOARD AND LCD PANEL

REF. No.	PART No.	DESCRIPTION	MARK
24	4-436-776-01	BRACKET, PANEL H (60NK2)	
25	4-436-777-01	BRACKET, PANEL V (60NK2)	
26	4-436-773-01	BEZEL (60NK2)	
27	1-895-176-11	MOUNTED PWB H	PA
27	⚠ 1-895-176-21	MOUNTED PWB H	AUS
28	1-811-710-11	LCD PANEL	



4-256-393-01 SCREW, +PSW M3x6 W12



1-2. OTHER PART**1-2-1. MISCELLANEOUS**

PART No.	DESCRIPTION	MARK
1-490-490-11	REMOTE COMMANDER (RM-GA023)	PA
1-490-491-11	REMOTE COMMANDER (RM-GD024)	AUS
4-262-708-04	CLAMPER, CABLE	
4-436-791-11	MANUAL, INSTRUCTION (GB)	PA
4-436-791-31	MANUAL, INSTRUCTION (AR)	PA
4-436-791-41	MANUAL, INSTRUCTION (PR)	PA
4-436-791-51	MANUAL, INSTRUCTION (RU)	PA
4-436-791-61	MANUAL, INSTRUCTION (FR)	PA
4-436-792-11	MANUAL, INSTRUCTION (GB)	AUS
4-440-925-01	LABEL,HIGH VOLTAGE	AUS

1-2-2. PACKING

PART No.	DESCRIPTION	MARK
4-436-998-01	CARTON,INDIVIDUAL (IRS60)(S)	
4-440-421-01	CUSHION,UPPER (60NK2)(S)	
4-440-422-01	CUSHION,LOWER (60NK2)(S)	
4-440-423-01	CUSHION,SIDE CENTER L (60NK2)(S)	
4-440-424-01	CUSHION,SIDE CENTER R (60NK2)(S)	
4-440-426-01	TRAY (60NK2)(S)	

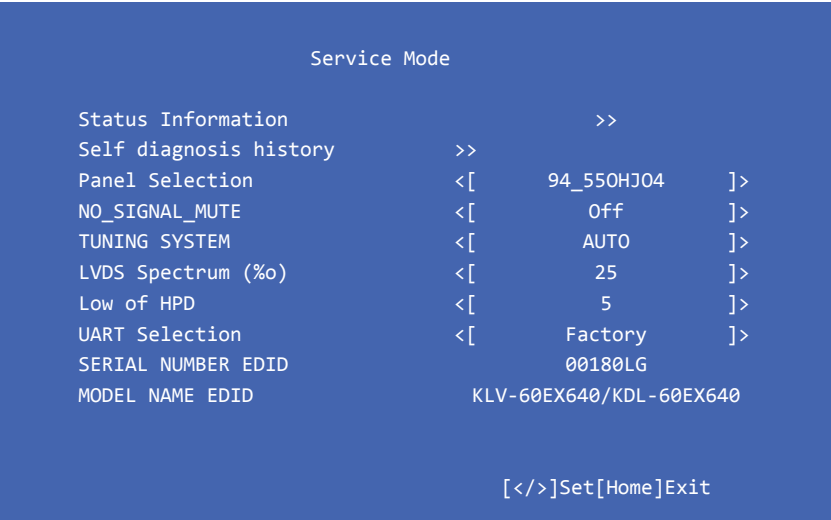
SEC 2. ADJUSTMENT

HOW TO ENTERING SERVICE MODE

- 1) Turn on the main power switch to place this set in standby mode.
- 2) Press the buttons on the remote commander as follows, and entering service mode.



- 3) Service mode display.



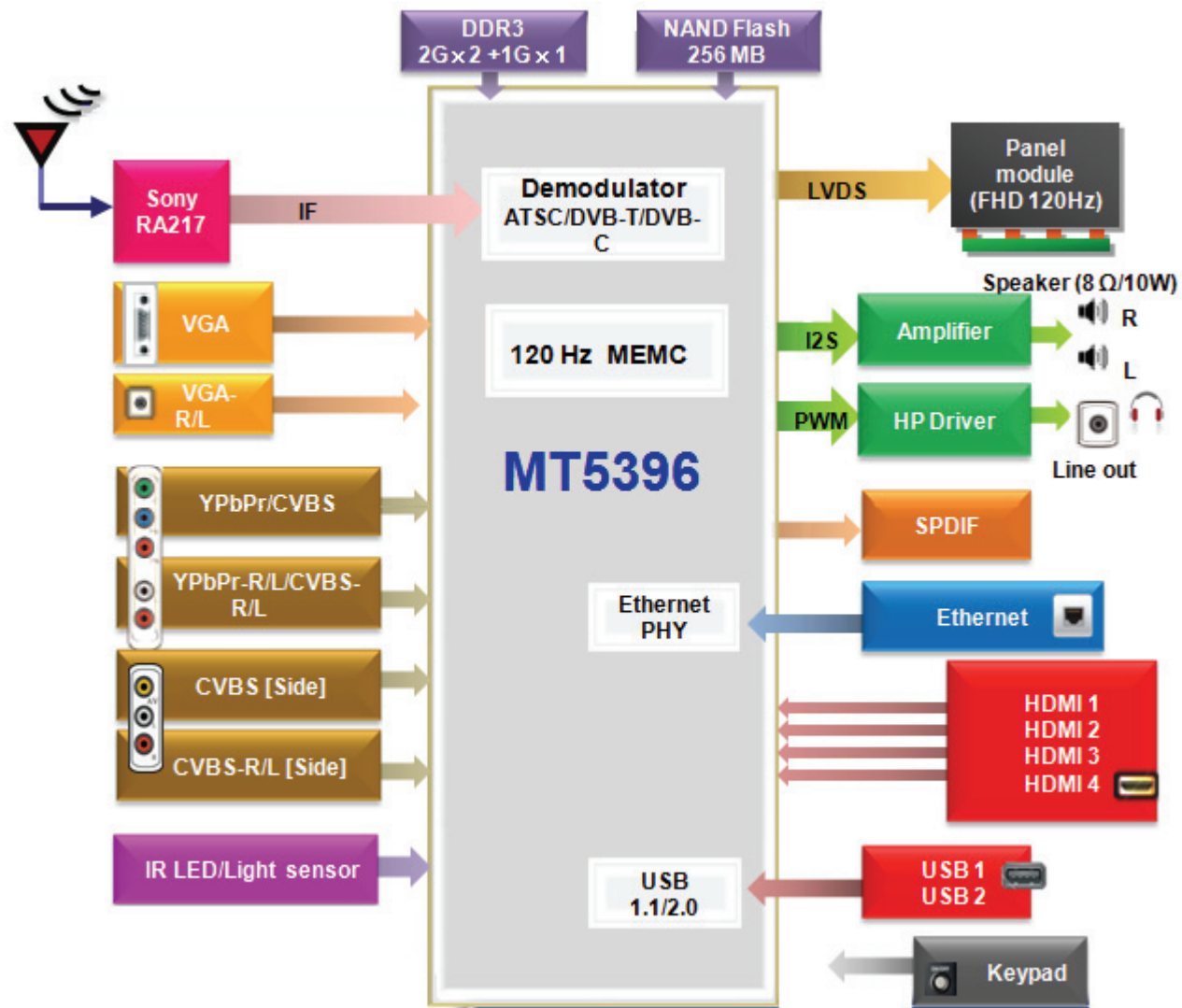
- 4) How to use the remote commander.

Function	The flow of control
Service mode on	<Info><5><Vol Up><Power>
Service mode off	<Other> / <Power off + on>
Adjustment Item up / down	↑ / ↓
Data Value up / down	← / →

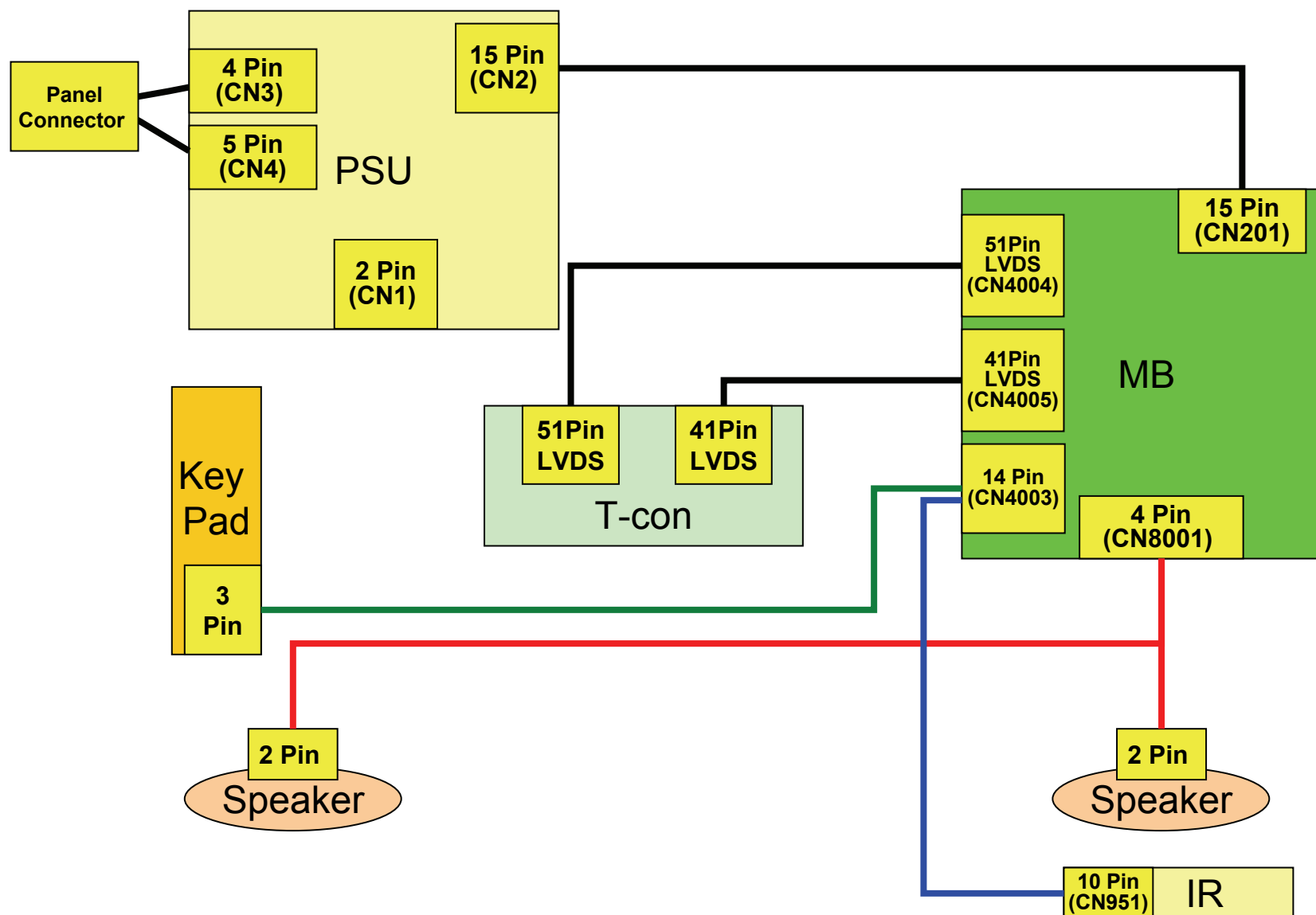
- 5) After entering service mode, then turn off the power switch.

SEC 3. DIAGRAMS

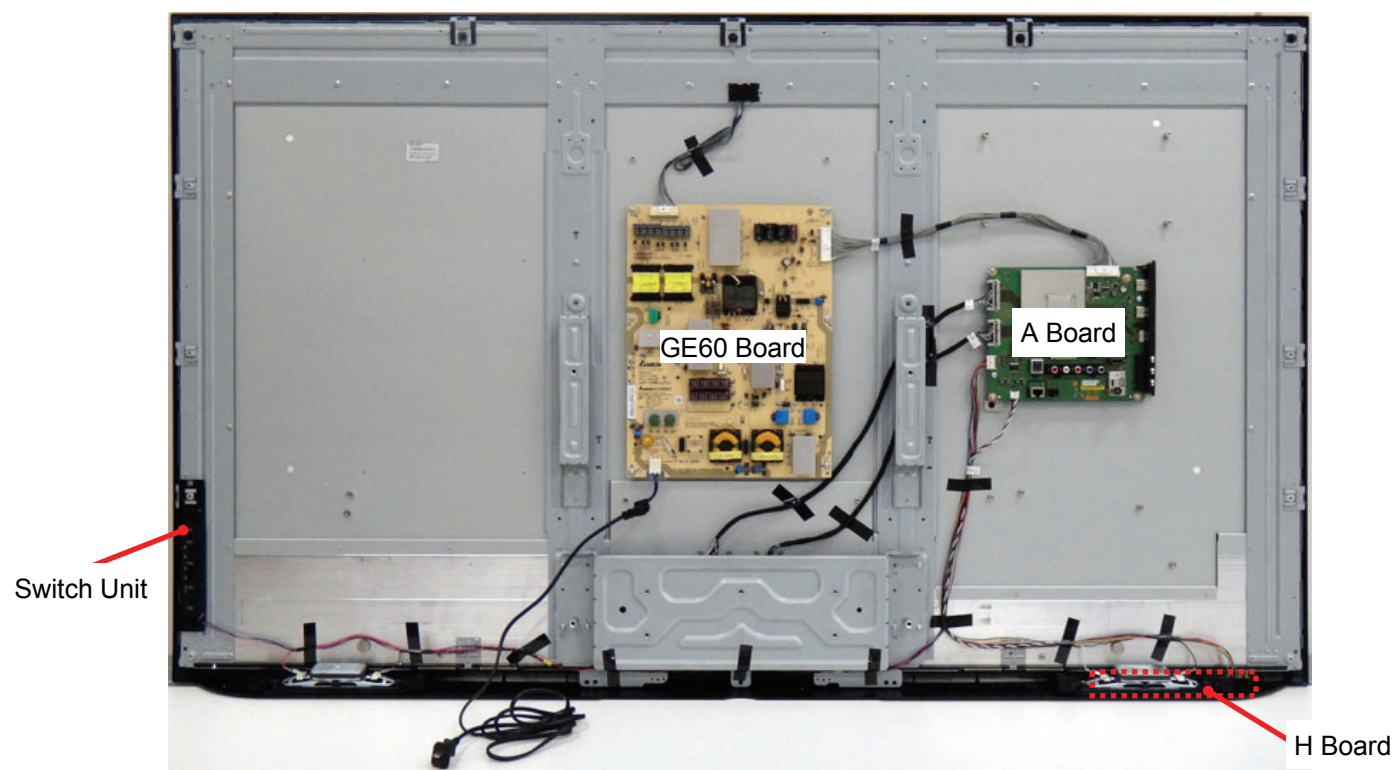
3-1. BLOCK DIAGRAM



3-2. CONNECTOR DIAGRAM



3-3. CIRCUIT BOARDS LOCATION



END

9-888-516-02

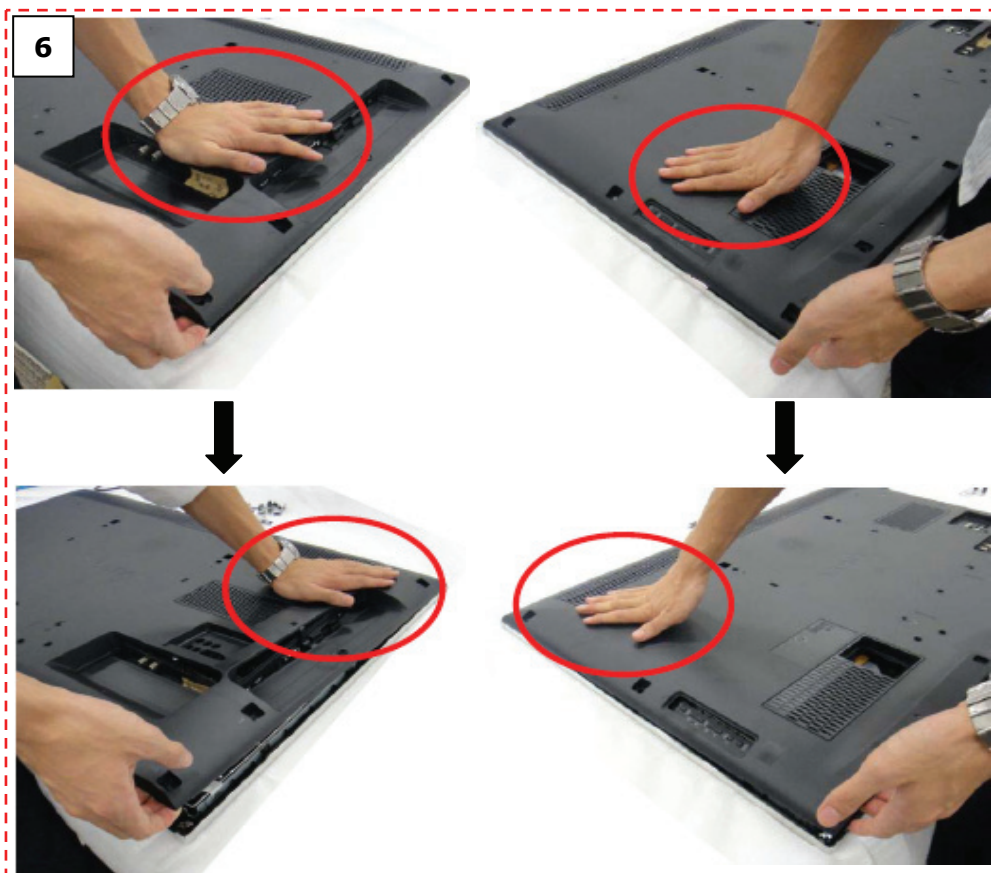
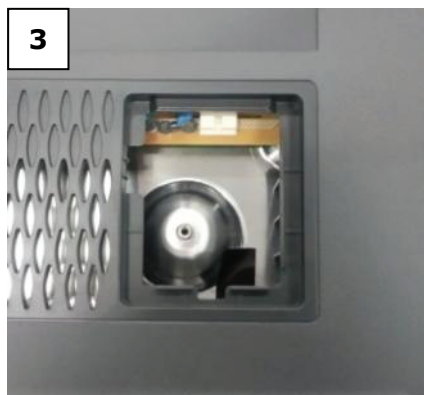
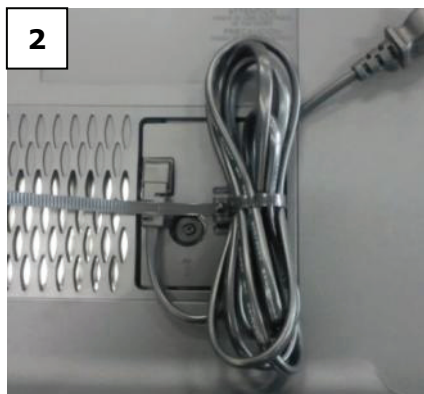
**Sony Corporation
Home Entertainment & Sound
Business Group**

English
2012HL08-Data
Made in Japan
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APPENDIX-1

PROCEDURE TO DISASSEMBLY REAR COVER

1. Remove all screws to disassemble Rear Cover.
2. Remove the AC cover with using screw driver or other thin tool.
Be careful not to give damage to AC code.
3. Remove the AC code from TV set.
4. Create clearance between Bezel and Rear Cover with holding Rear Cover.
5. Insert finger between Bezel and Rear Cover at bottom corner.
6. Disassemble side hook with holding Rear Cover to avoid to move Rear Cover.



PROCEDURE TO DISASSEMBLY REAR COVER

7. Open Rear Cover to disassemble top and corner hook.



Note: Should disassemble Rear Cover with pushing as pic1.
Should not disassemble Rear Cover with pulling as pic2.

pic1

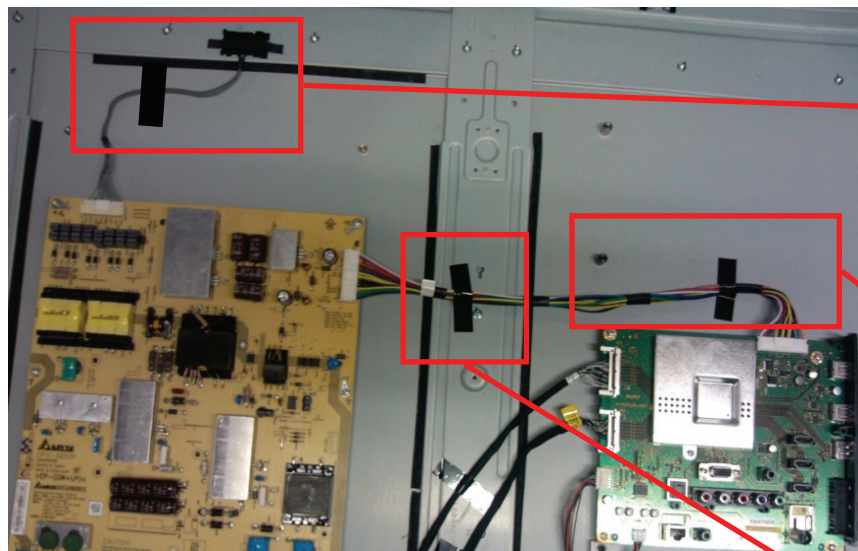


pic2

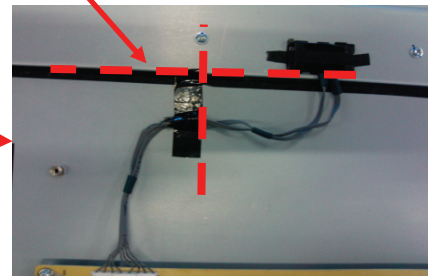


APPENDIX-2

WIRE DRESSING-1

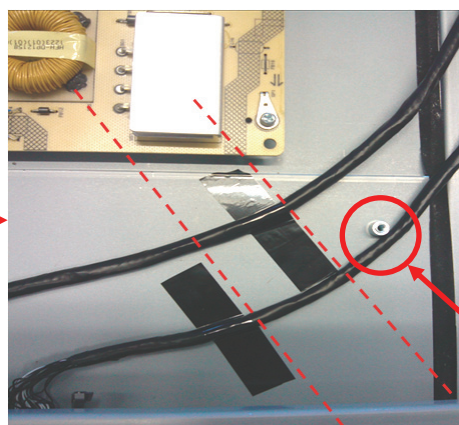
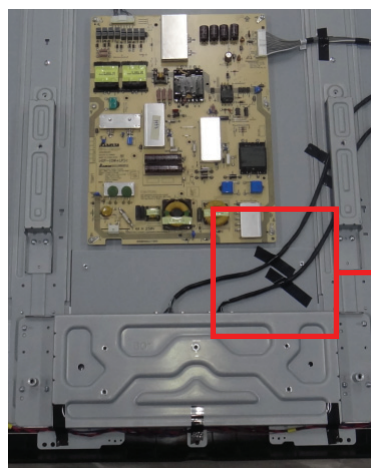
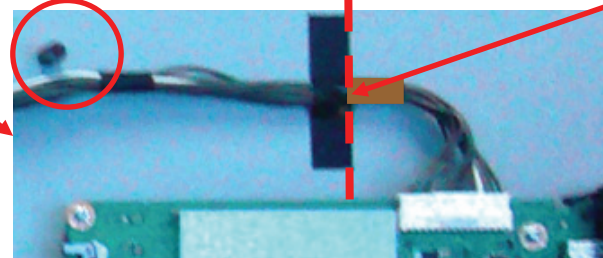


Use the upper edge screw and boss as reference.



The wire is laid below the screw terminal.

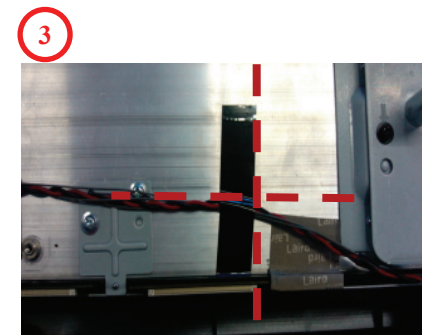
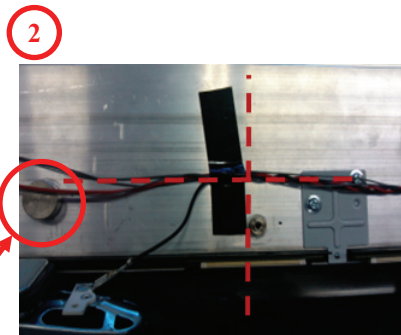
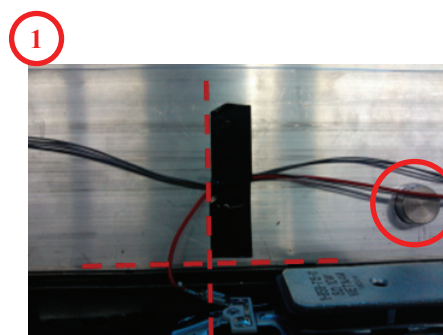
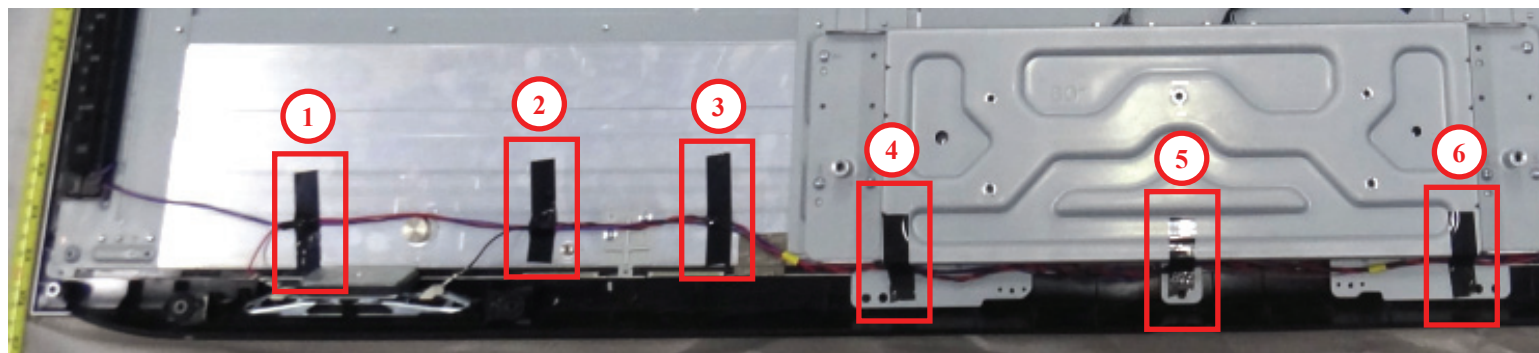
With the edge of the wire tie as reference, adhere perpendicularly to the wire.



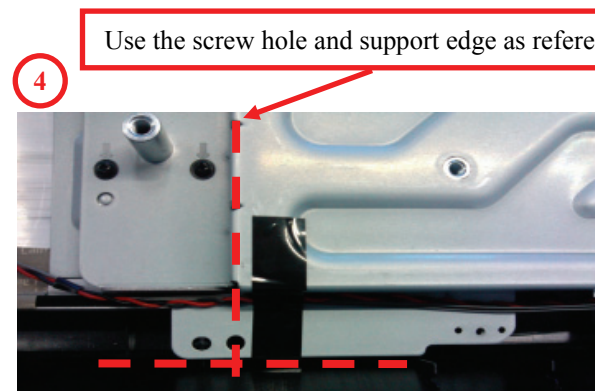
The wire is between the T-shaped hole and the screw.

Organize the wires below the screw terminal.

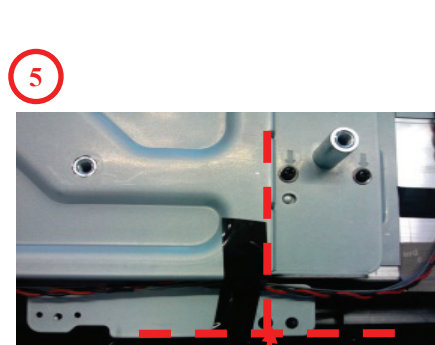
WIRE DRESSING-2



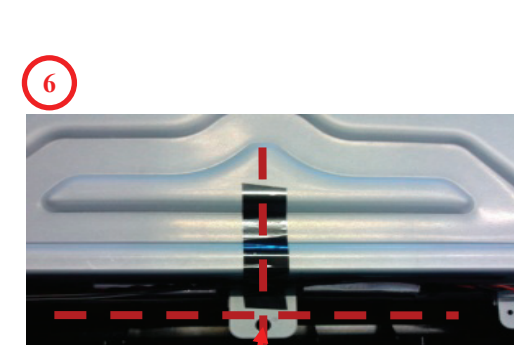
Organize the wires above the screw terminal.



Use the screw hole and support edge as reference.



Use the screw hole and support edge as reference.



Use the screw hole and support edge as reference.

APPENDIX-3

SOFTWARE DATA UPDATE

■ THE CONFIRMATION OF THE SOFTWARE VERSION OF THE TV SET

Entering product information of setting menu.

Please use the latest software.

[HOME] - [Settings] - [Set-up] - [Product Information]

Model Name:	KLV-60EX640/KDL-60EX640
Serial Number:	0123450
Software Version:	v7.000-1.206
Device ID:	FF:FF:FF:FF:FF:FF

Note: When changing Main board, Model Name and Serial Number will not be displayed.

■ SOFTWARE DOWNLOAD

Store the software package to USB memory. (Applicable USB memory : Format by FAT32, USB2.0 type)

For USB, please store **only one file** for software update.

P-2 (PA) : KLV-60EX640	sony_fw_2012_xxxx_chpaipf_2h.pkg
P-2 (AUS) : KDL-60EX640	sony_fw_2012_xxxx_chpaipf_2h.pkg

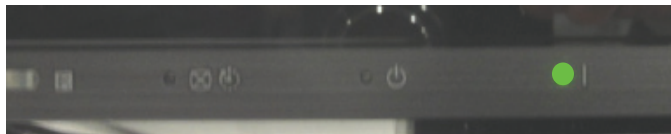
SOFTWARE UPDATE BY USB MEMORY

1. Turn on the TV.
2. Unplug the AC power code.
3. Connect the USB memory.

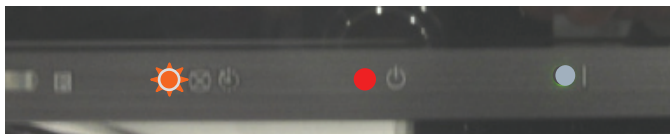


Note: Do not connect USB memory in standby mode.

4. Plug the AC power cord then update starts automatically.

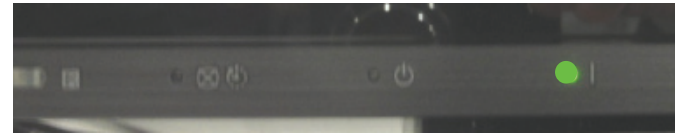


Lights up Green LED. (no picture)



Starting update

Lights up Red LED and Orange LED is flashing. (1-2min)



Finish update

Lights up Green LED again and TV is turned on.

5. Unplug AC power cord and disconnect USB memory.
6. Plug the AC power cord then turn on the TV.

CONFIRM SOFTWARE VERSION

Please confirm whether it is the latest software.

Product information of setting menu.

[HOME] - [Settings] - [Set-up] - [Product Information]