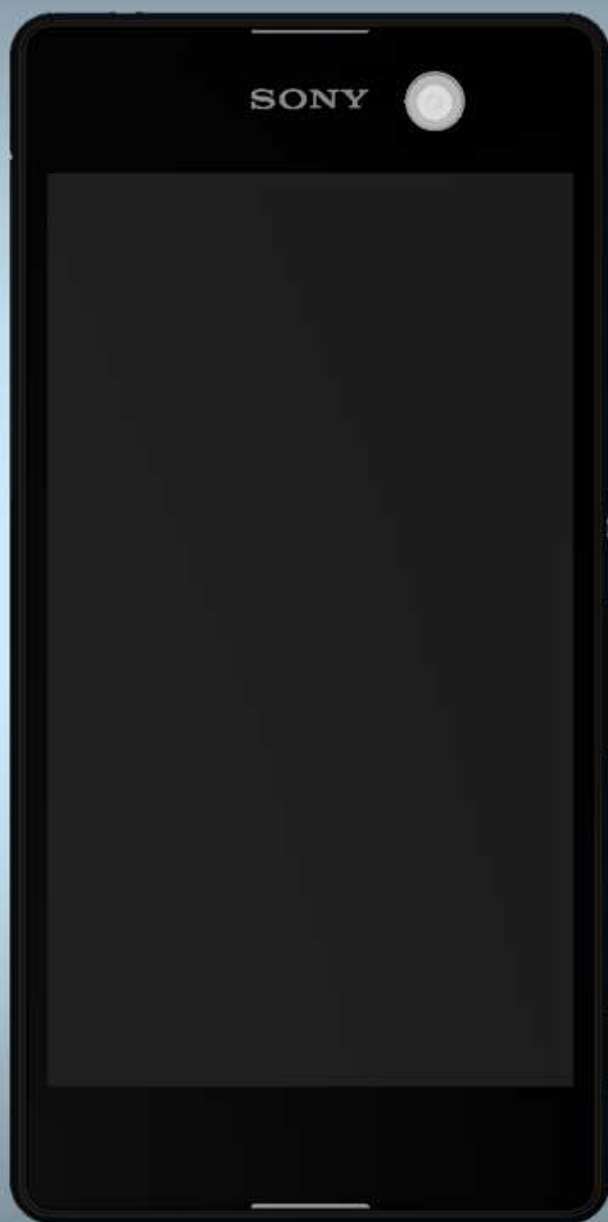


Test Instructions

- mechanical -



Xperia™ M5

E5603, E5606, E5633, E5643, E5653, E5663

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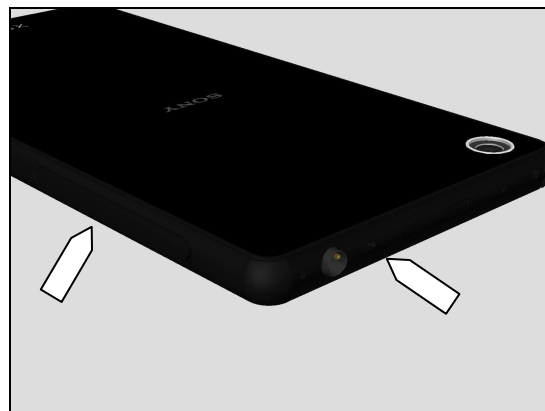
**For general information about test procedures, refer to
1220-1333: Generic Repair Manual – mechanical**

Pre-Test Preparation

1.1 Process flow – Water Resistance Test (WRT) for incoming units

Follow the process according to 1269-3536 Water Resistant Test for PC - mechanical in the including document Test Instruction WRT.

Note! Panel Deco Top must be removed and its adhesive residues must be cleaned before test.
Close the cap and seal the secondary microphone hole on the top of the phone before test.



Insert the unit in "WRT Inlay plate" and connect it to WRT test equipment.

Connect phone according to 1269-3536 Water Resistant Test for PC - mechanical in the including document Test Instruction WRT.

Note! The unit's back side should be up in the WRT fixture!
Make sure tighten the screws to secure proper position and good sealing of ventilation hole.
The black handle is for Liquid test.



Pre-Test Preparations

1.2 Hardware

1.2.1 Water indicator inspection

Before starting any tests the Liquid Indicator has to be checked.

The indicator is located as shown in picture in the Nano SIM and Memory card slot after Cap SIM/SD is opened.



Pre-Test Preparations

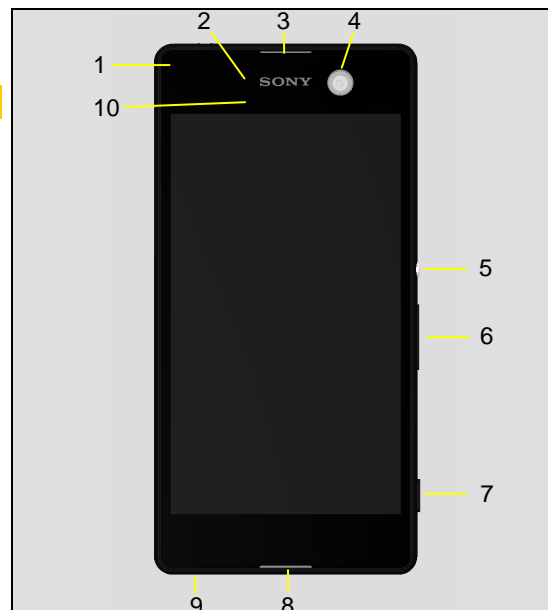
1.3 Test Enablers

These are items on the phone that are used during the test of the unit.

Note! The product supports only Nano SIM!

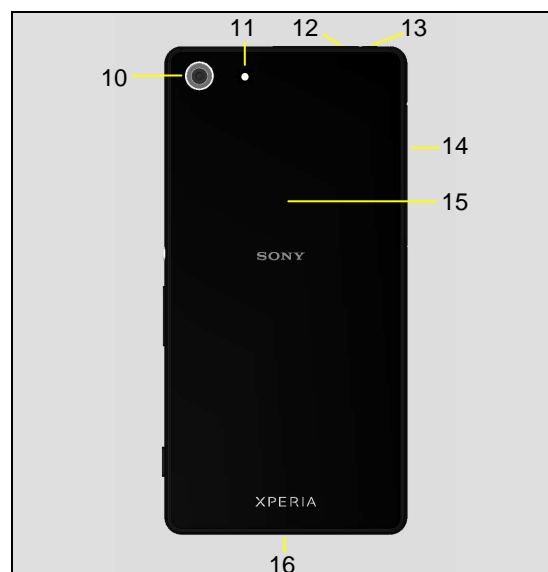
Front:

1. Notification LED
2. Light Sensor, Proximity Switch
3. Earphone port
4. Secondary Camera
5. On/Off Key
6. Volume up/down Key
7. Camera key
8. Microphone
9. Speaker bottom port
10. Hall sensor

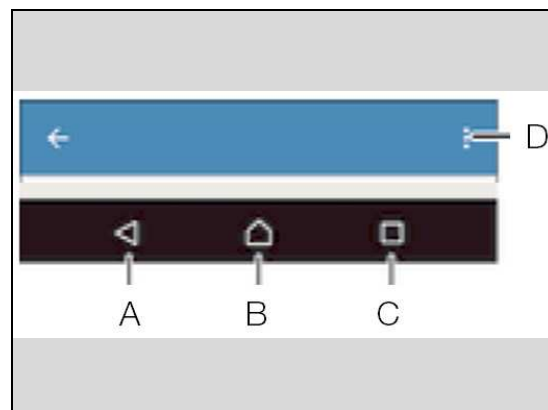


Back:

11. Camera
12. LED Flash
13. Secondary Microphone
14. Audio jack
15. Nano SIM and Memory card slot
16. NFC area
17. USB slot



- A. Back key
- B. Home key
- C. Recent Key
- D. Menu key



Pre-Test Preparations

1.4 Software

1.4.1 Software update

1.4.1.1 Software version verification

Check the software version of the phone for fault verification. The latest improvements are found on the support pages under the support news: <http://www.sonymobile.com/global-en/support/>.

- Start up the phone
- Make sure the phone is in call setup.
- Press the following keypad combination: *##7378423##* (i.e. *##service##*)
- Select 'Service info'
- Select 'Software info'
- Check the software file revisions and, if needed, update as described below:

For more information, refer to 1220-1333: Generic Repair Manual - mechanical

1.4.1.2 Software version update

Mandatory first repair action!

Use the USB cable to connect with the Micro USB connector of the phone for this purpose!

Ensure the phone is powered off and proceed as follows:

- Open the Emma application and log in.
- Press and hold the volume down key on the phone, connect the phone to the USB cable and then release the volume down key.
- Select the appropriate service and follow the on-screen instructions.

Note: For phones with eMMC flash memory (built in "SD card" memory), the only service which erase this eMMC memory is Service's "Refurbish" and "Customize".

See also emma User Guide info.

http://software.sonymobile.com/emma/documents/emma_user_guide.pdf

(see "Service Types" and "Aspects of large files")

In Swap flow, when change a phone from Customer A to Customer B, always use the service Customization script.

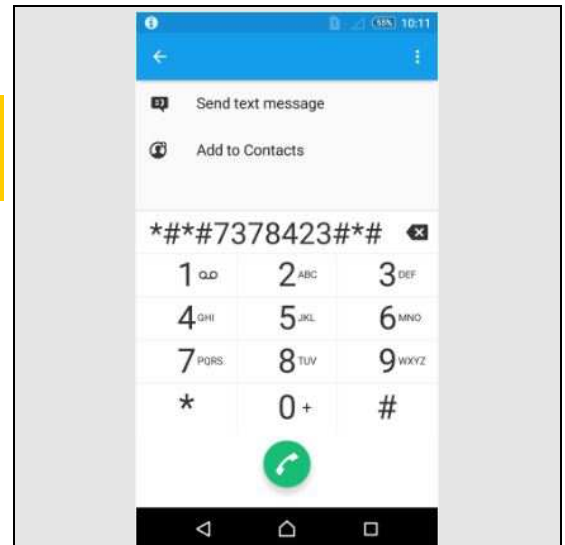
2 Tests

2.1 Service Test Mode

Stamina mode needs to be turned off before entering Service Test Mode

Settings -> Power management -> STAMINA mode

- Start up the phone, go to call setup.
- Press the following keypad combination: ***##7378423##** (i.e. ***##service##**)



Service info:

Information about Model, Software, Simlock, Configuration (IMEI, bands, codec's, Firmware), WLAN Mac address etc.

Service settings: Do not use

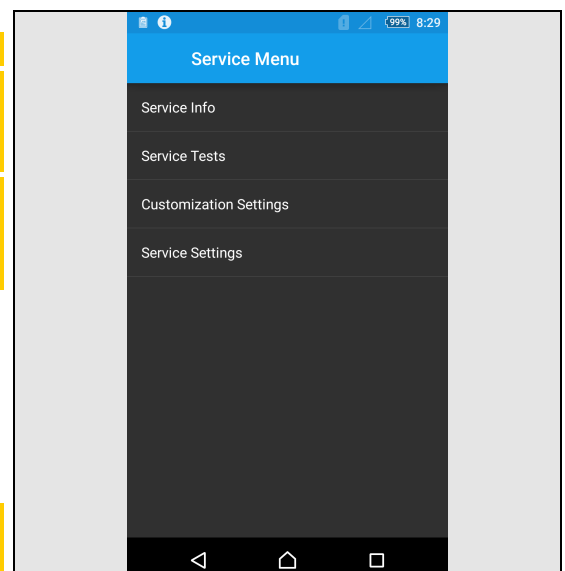
Service test: Follow instruction below

Customization Settings: Do not use.

- Select 'Service tests'
- Select one of the tests and follow the test instructions as described below
- To stop the test and return to the 'Service tests' menu, press the Back key

For more information, refer to

1220-1333: Generic Repair Manual - mechanical



The following pictures will show a simplified basic phone for a general visualization of the service tests!

Tests

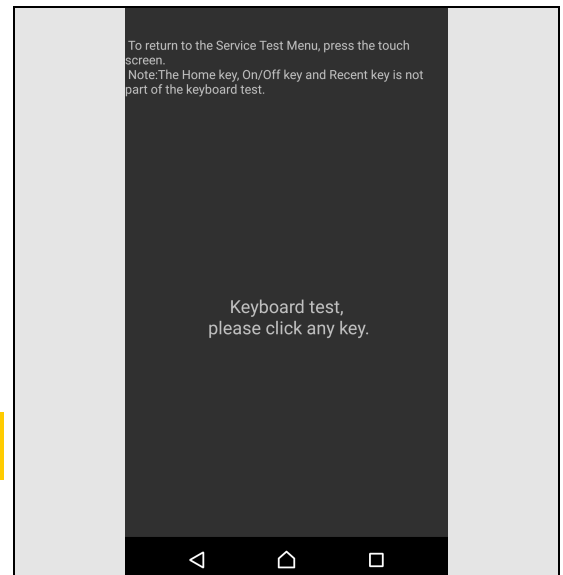
2.2 Service Tests

2.2.1 Keyboard & Switch

Press below keys:

- **Back key:** notification on screen.
- **Volume up key:** notification on screen.
- **Volume down key:** notification on screen.
- **Auto Focus key (short press) / Camera key (long press):** notification on screen.

To return to the Service Test Menu, press the touch screen.

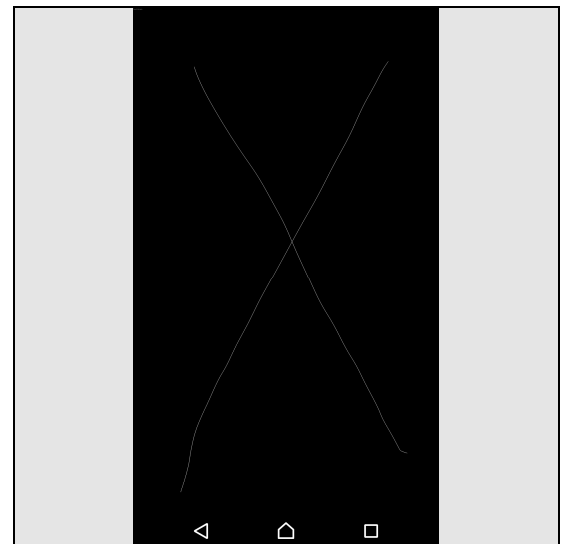


2.2.1 Touch Screen

Move a finger across the touch screen, a line will be drawn as it touches.

Check all area of the touch screen as indicated by the two lines.

Press the Back key to return to the Service Test Menu.

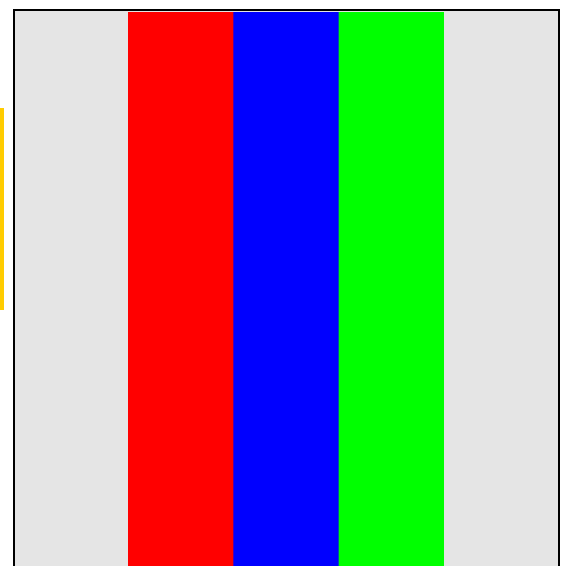


2.2.2 Display

Minor variations in the display's brightness and color may occur between phones.
If any tiny bright dots on the display are found, this indicates defective pixels which occur when individual dots have malfunctioned and cannot be adjusted.
Two defective pixels are considered to be acceptable.

The display will show Seven test patterns of White, Black, Blue, Green, Red, TV Pattern, and Rainbow Colors in sequence on the full screen. Make sure that there are no missing segments and that the colors and contrast are OK.

Press the Back key to return to the Service Test Menu.



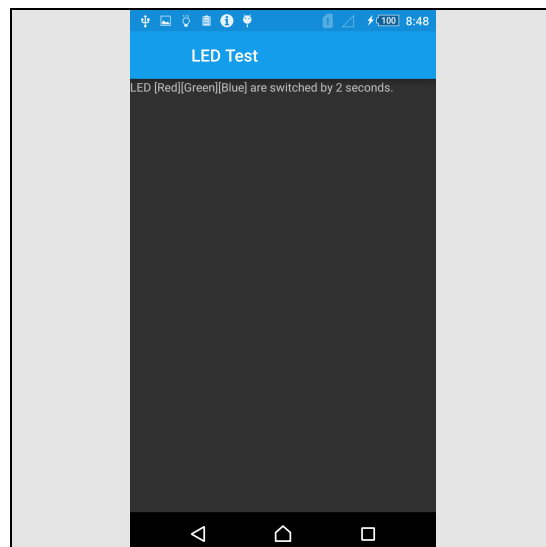
Tests: Service Tests

2.2.3 LED

Check that the:

- Notification LED changes, showing three colors in the following sequence: red, green, blue by every 2 seconds.

Press the Back key to return to the Service Test Menu.

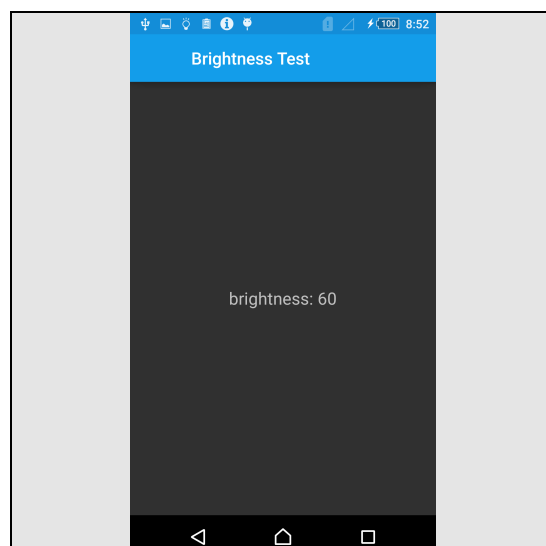


2.2.4 Illumination

Check that the:

- Display Backlight illumination goes from low to high strength with brightness volume shown.

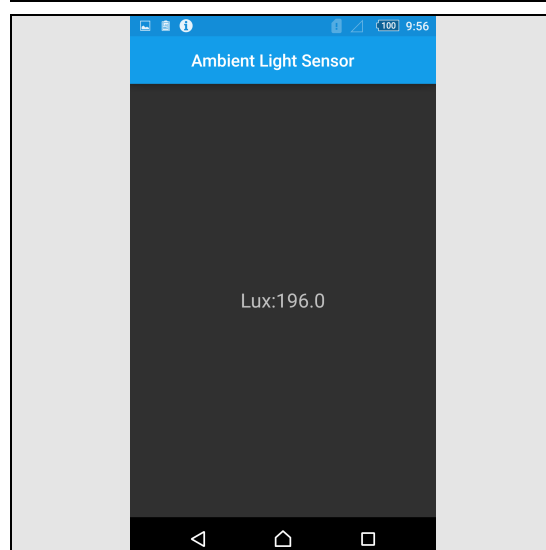
Press the Back key to return to the Service Test Menu.



2.2.5 Light Sensor

The Light Sensor test states a value. The value should increase when the window gets more light and decrease when the window gets less light.

Press the Back key to return to the Service Test Menu.



Tests: Service Tests

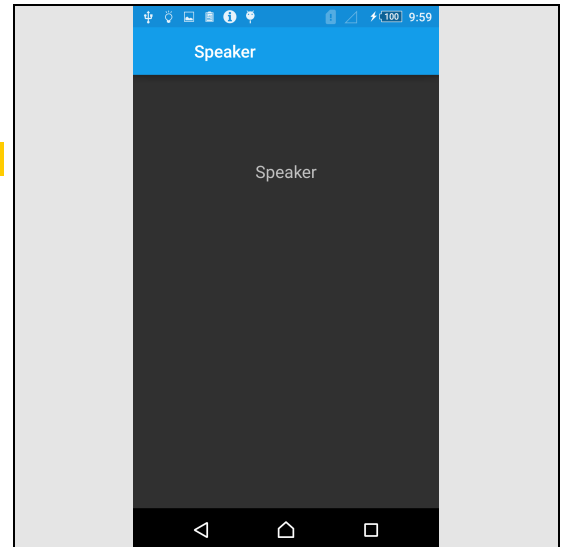
2.2.6 Speaker

Do not hold the phone close to an ear during this test!

Make sure that the sound from the Loudspeaker port is emitted loud and clear and that the test includes maximum volume.

Press the volume up/volume down key to adjust the Loudspeaker volume.

Press the Back key to return to the Service Test Menu.

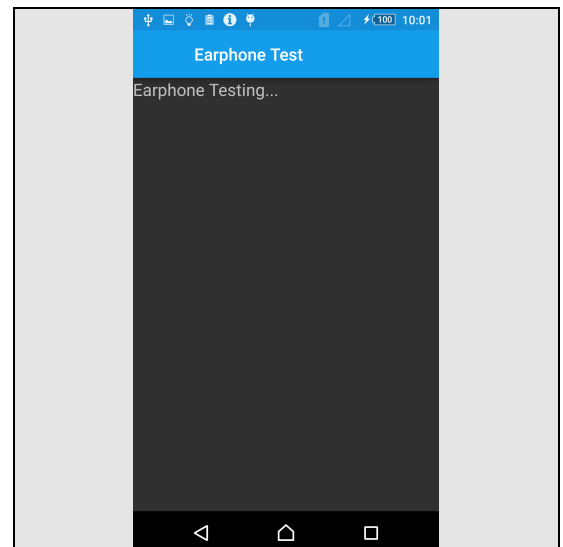


2.2.7 Earphone

Make sure that the sound from the Earphone port is emitted loud and clear and the test includes maximum volume.

Press the volume up/volume down key to adjust the Top speaker volume.

Press the Back key to return to the Service Test Menu.

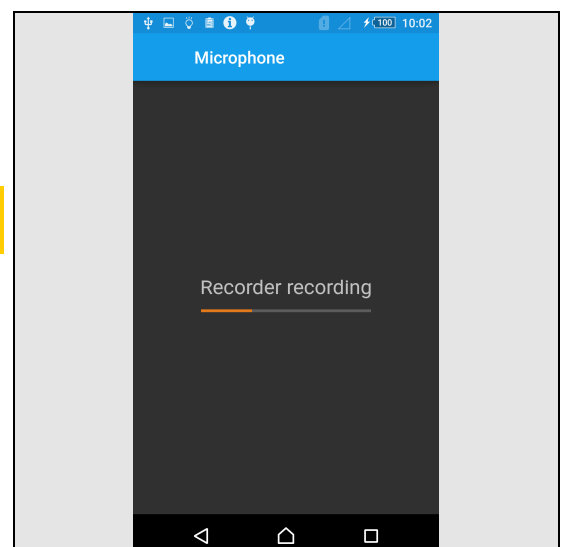


2.2.8 Microphone

The previous 'Speaker' test must have been successfully carried out before doing this test!

The phone will start to record and after approximately ten seconds the sound is played back through the loudspeaker.

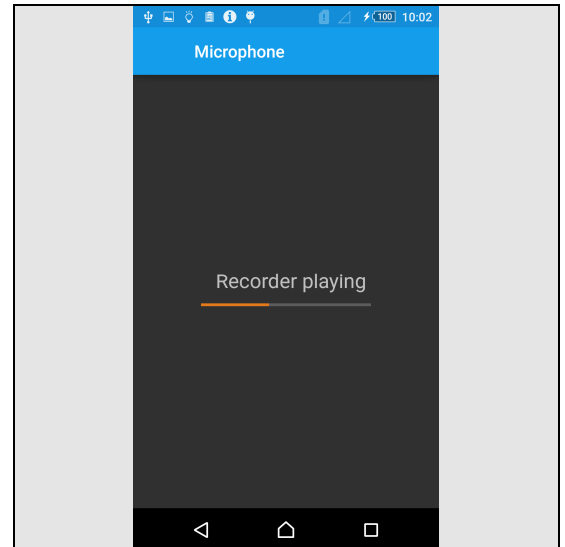
Step 1: Speak into the microphone during the 'Microphone Recording' phase;



Tests: Service Tests

Step 2: Check the quality by listening to the recording from the loudspeaker during the 'Playing recorded sound' phase at maximum volume.

Select "Yes" to return to Service Test Menu after "Test Complete" shown on the screen.

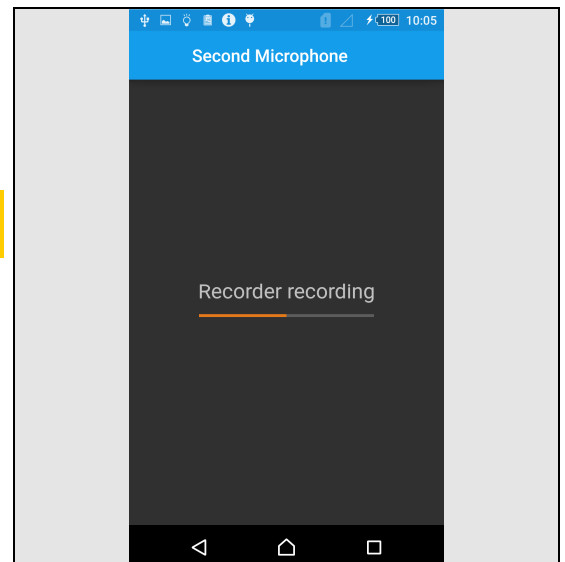


2.2.9 Secondary Microphone

The previous 'Speaker' test must have been successfully carried out before doing this test!

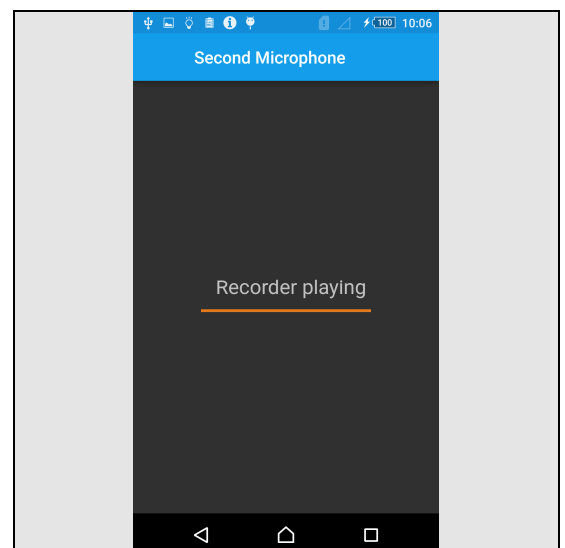
The phone will start to record and after approximately ten seconds the sound is played back through the loudspeaker.

Step 1: Speak into the secondary microphone during the 'Microphone Recording' phase;



Step 2: Check the quality by listening to the recording from the loudspeaker during the 'Playing recorded sound' phase at maximum volume.

Select "Yes" to return to Service Test Menu after "Test Complete" shown on the screen.

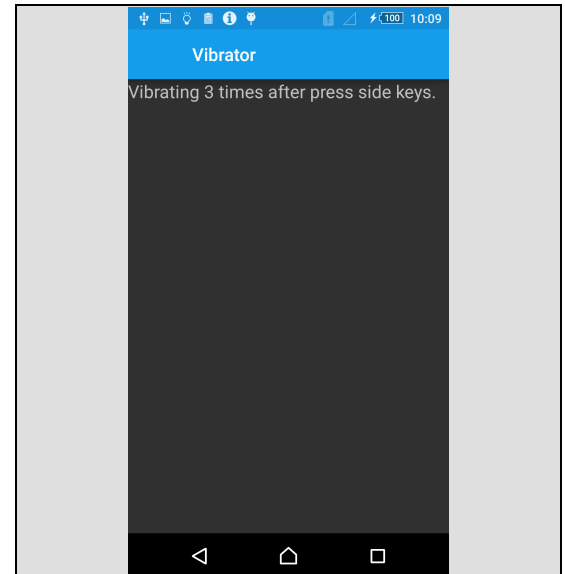


Tests: Service Tests

2.2.10 Vibrator

Press the side keys to start the vibrator test.
The Vibrator will vibrate 3 times after press volume up/down keys.

Press the Back key to return to the Service Test Menu.



2.2.11 Camera

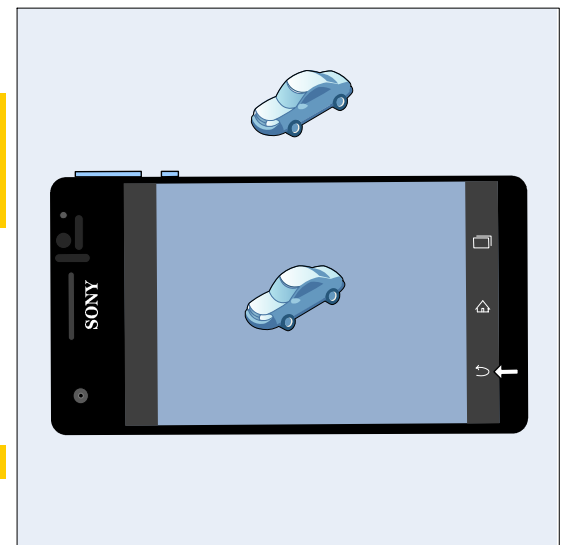
Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

Aim the camera (located at the back of the phone) at an object and check the quality of the image shown in the display.

Touch the screen to take picture and preview the photo's auto focus quality.

Photos are taken but not saved during this test!

Press the Back key to return to the Service Test Menu.



Only symbolic view

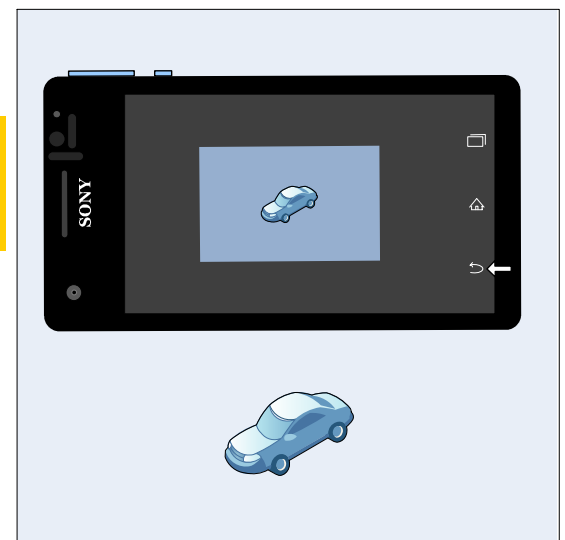
2.2.12 Front Camera

Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

Aim the camera (located in front of the phone) at an object and check the quality of the image shown in the display.

Touch the screen to take picture and preview the photo's auto focus quality.

Press the Back key to return to the Service Test Menu.



Only symbolic view

Tests: Service Tests

2.2.13 Bluetooth

During this test, the distance between the phone and the target Bluetooth device must be 1.5 to 5 meters! Make sure the target Bluetooth device is enabled and visible always!

The Bluetooth test will be done in following sequences:

Step 1: Enable Bluetooth; wait 4-5 seconds;

There is a permission request, select 'Allow'.

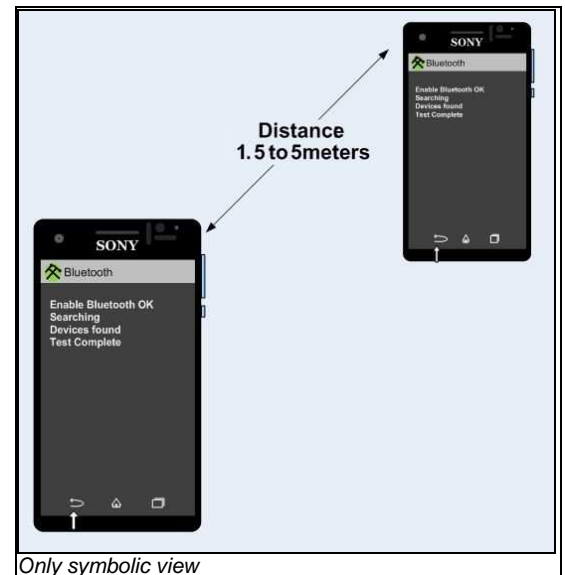
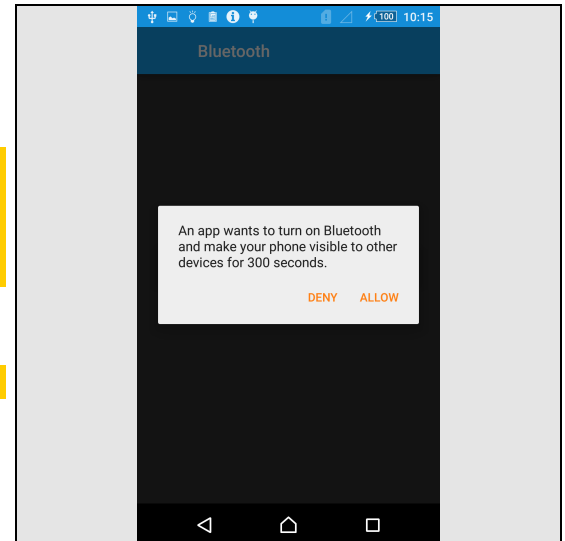
Step 2: Searching;

Step 3: Show the Device Found list;

Step 4: Select the Target Bluetooth Device, and type the PIN code to pair;

Step 5: Type the Pairing PIN code on the Target Bluetooth Device also, when successful, it shows 'Test Complete'.

Press the Back key to return to the Service Test Menu.



2.2.14 WLAN

Make sure there's a WLAN network before performing this test.

The WLAN test will be done in following sequences:

Step 1: Enable WLAN; wait 4-5 seconds, shows OK;

Step 2: Searching;

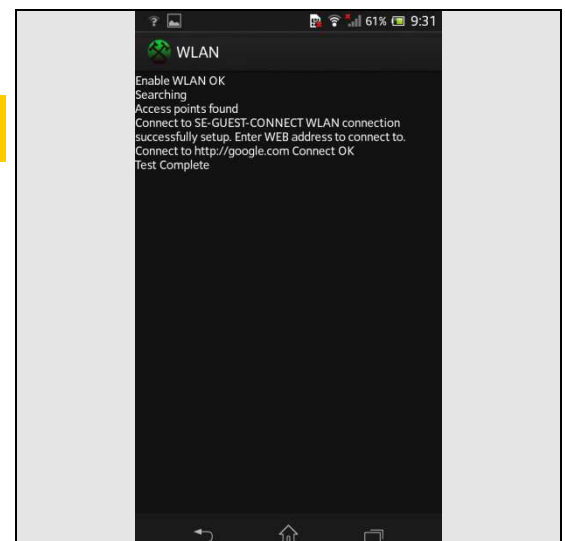
Step 3: Access points found list;

Step 4: Select the Target WLAN network, and type the password to get connected;

Step 5: Enter a web address (e.g. Google.com);

Step 6: When connection succeeded, it shows 'Test Complete'.

Press the Back key to return to the Service Test Menu.



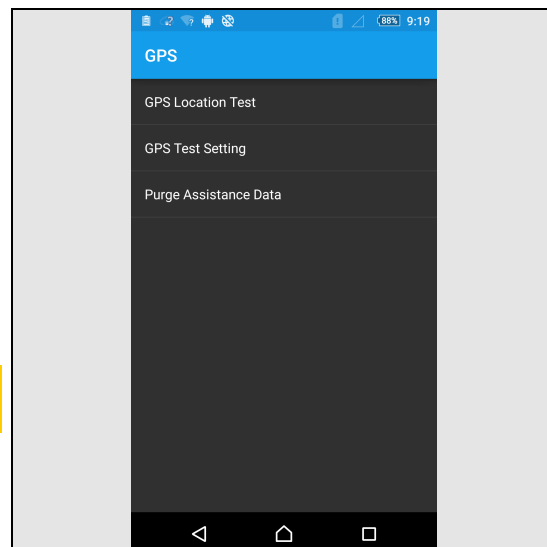
Tests: Service Tests

2.2.15 GPS

Enter the GPS Location Test and wait for the GPS location data.

Press the Back key to return to the Service Test Menu.

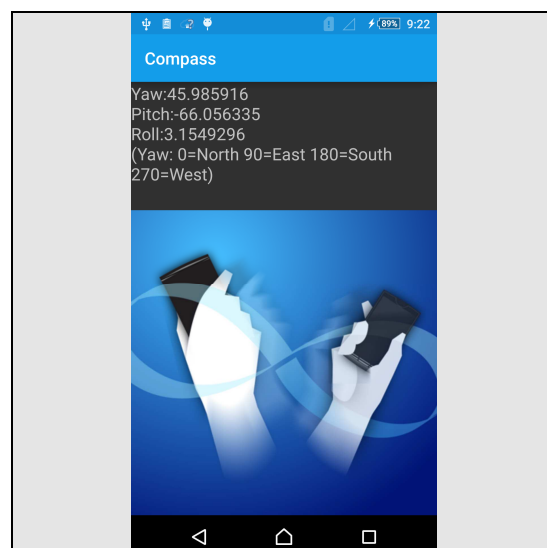
**For GPS testing, refer to
1220-1333: Generic Repair Manual – mechanical**



2.2.16 Compass

Do calibration with hand movements as shown in the phone, and then check the actual direction with measured value.
(Yaw:0=North, 90=East, 180=South, 270=West)

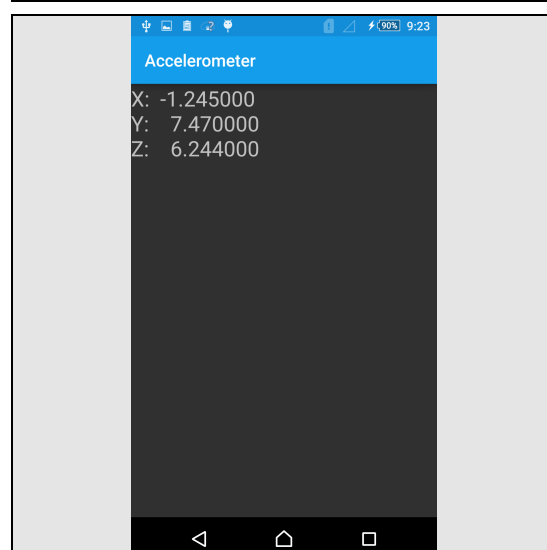
Press the Back key to return to the Service Test Menu.



2.2.17 Accelerometer

The accelerometer test displays the actual position of the phone as a 3D coordinate X: Y: Z.

Press the Back key to return to the Service Test Menu.

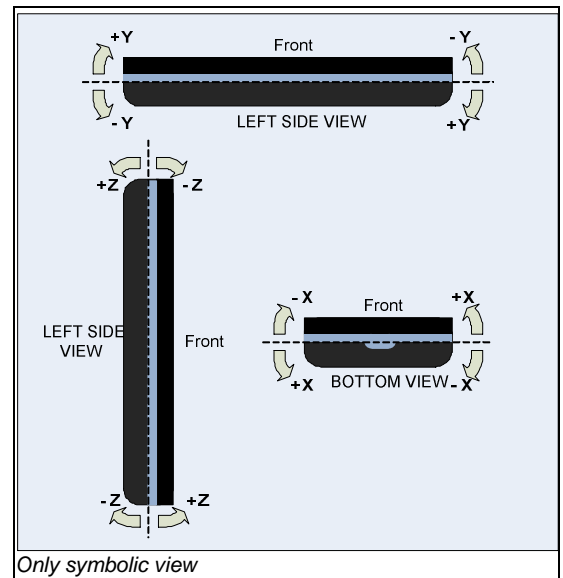


Tests: Service Tests

By tilting the phone in various directions, the X: Y: Z values will change in size and polarity depending on the angle and direction as shown in the adjacent picture.

Check by tilting the phone that the X: Y: Z values shown in the display are in accordance with the tilting shown in the picture.

Press the Back key to return to the Service Test Menu.



2.2.18 Proximity Sensor

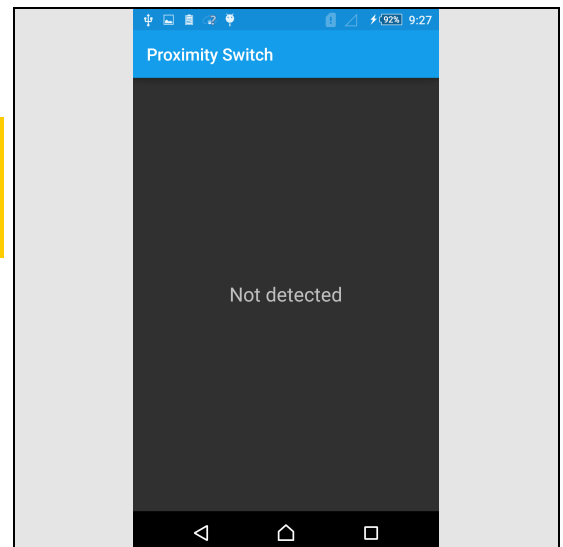
The previous Chapter 'Speaker' test should have been successfully carried out before doing this test!

Make sure the phone is not in 'silent mode' before performing this test.

When entering into the test, the screen shows 'Not Detected' and a tone is emitted.

When covering the proximity sensor area, the screen will show 'Detected'.

Press the Back key to return to the Service Test Menu.

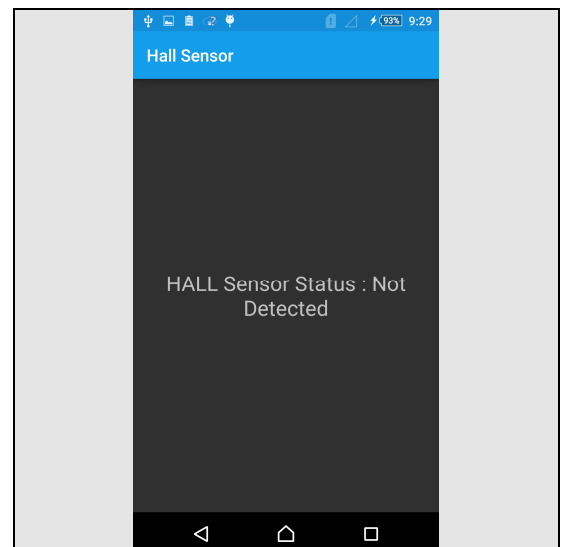


2.2.19 Hall

Enter this test and press power key to enter sleep mode!

Put the magnet beneath the area of Light Sensor and Proximity Switch, remove the magnet, the phone will wake up.

Press the Back key to return to the Service Test Menu.

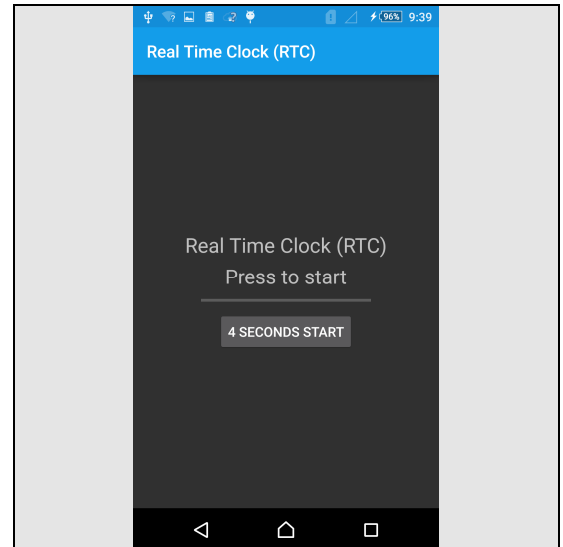


Tests: Service Tests

2.2.20 Real time clock

During the actual test the text 'Real time clock' is displayed, and then followed by a message stating whether the test was OK or not.

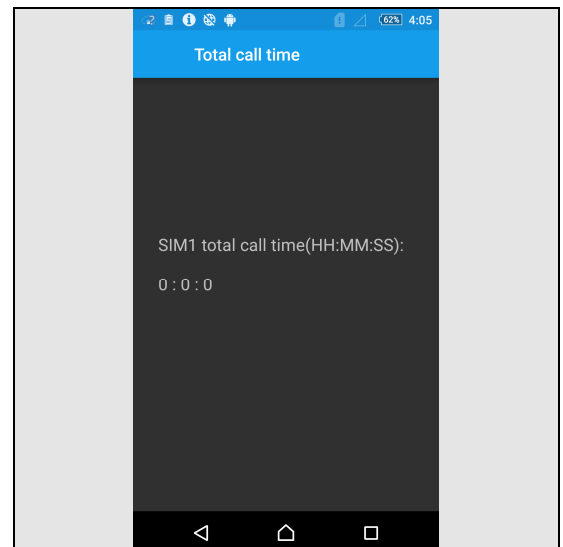
Press the Back key to return to the Service Test Menu.



2.2.21 Total call time (E5603, E5606, E5653)

The total call time is displayed in the format HH:MM:SS (hours: minutes: seconds).

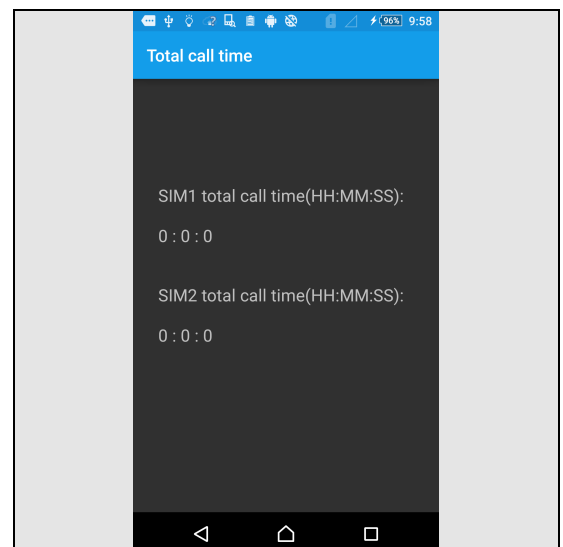
Press the Back key to return to the Service Test Menu.



2.2.22 Total call time (E5633, E5643, E5663)

The total call time of SIM1 and SIM 2 are displayed in the format HH:MM:SS (hours: minutes: seconds).

Press the Back key to return to the Service Test Menu.



Tests: Service Tests

2.2.23 External Memory

Memory Storage status:

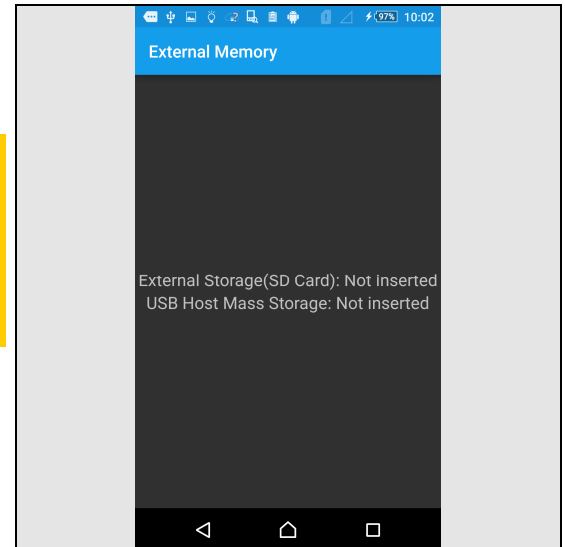
A memory card should be inserted in the phone and attach USB Adaptor between phone and a USB disk before starting this test.

USB disk needs to be detect before test:

Settings -> Xperia Connectivity -> USB Connectivity -> Detect USB device

- External Storage (SD Card) status is shown on the screen.
- The USB Host Mass Storage status is shown on the screen.

Press the Back key to return to the Service Test Menu.

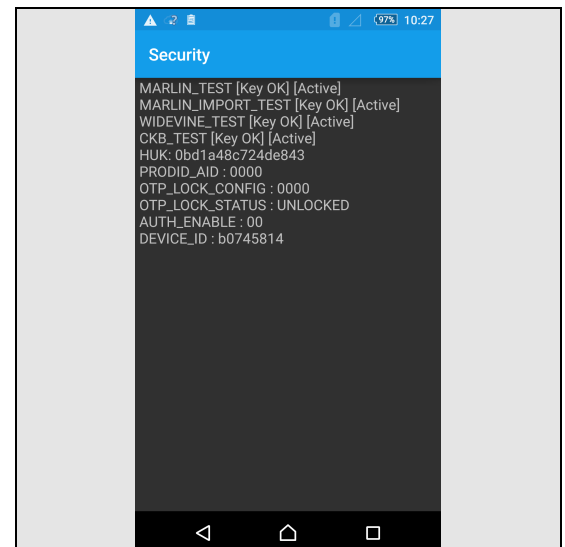


2.2.24 Security

The DRM keys are shown in the display.

There may be different content shown based on different market software versions.

Press the Back key to return to the Service Test Menu.



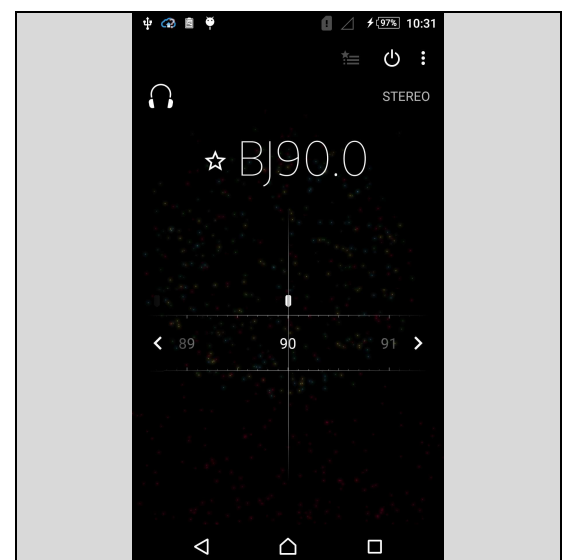
2.2.25 FM Radio

Verify that the phone can detect a radio station:

Connect a headset and then set your local radio station in Hz.

Verify that the reception and sound quality is normal.

Press the Back key to return to the Service Test Menu.



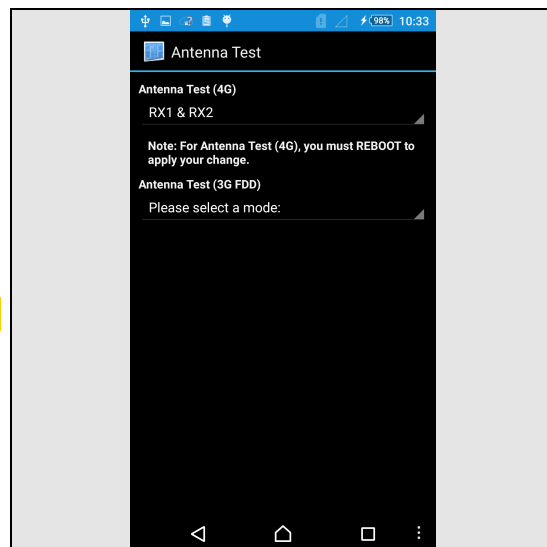
Tests: Service Tests

2.2.26 Antenna

N/A

Do not use this test!

Press the Back key to return to the Service Test Menu.

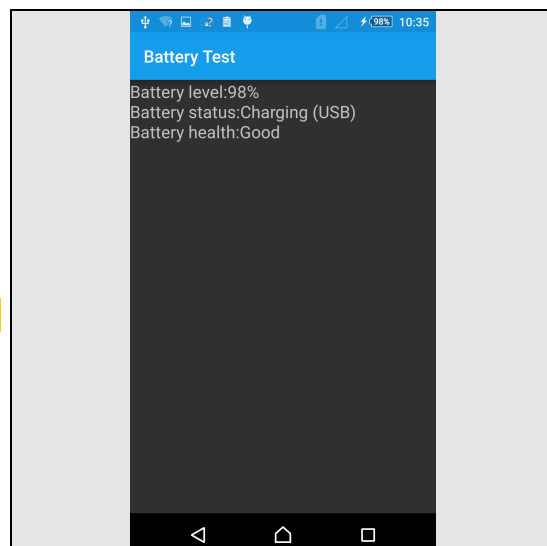


2.2.27 Battery Status Check

N/A

Do not use this test!

Press the Back key to return to the Service Test Menu.

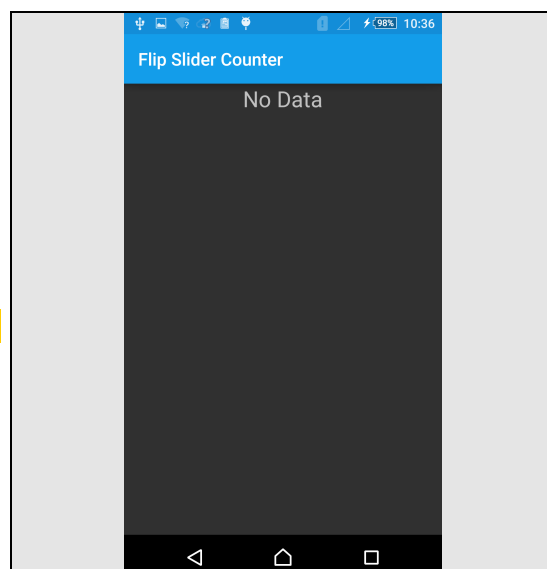


2.2.28 Flip Slider Counter

N/A

Do not use this test!

Press the Back key to return to the Service Test Menu.



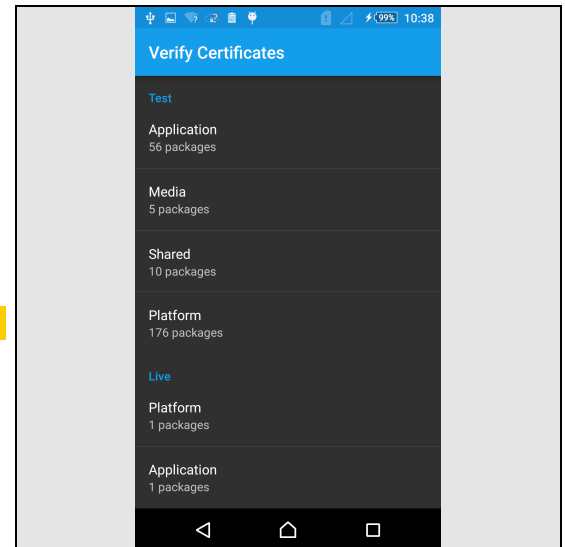
Tests: Service Tests

2.2.29 Verify certificates

When entering the test, four information categories will be shown: Application, Platform, Shared and Media.

Do not use this test!

Press the Back key to return to the Service Test Menu.

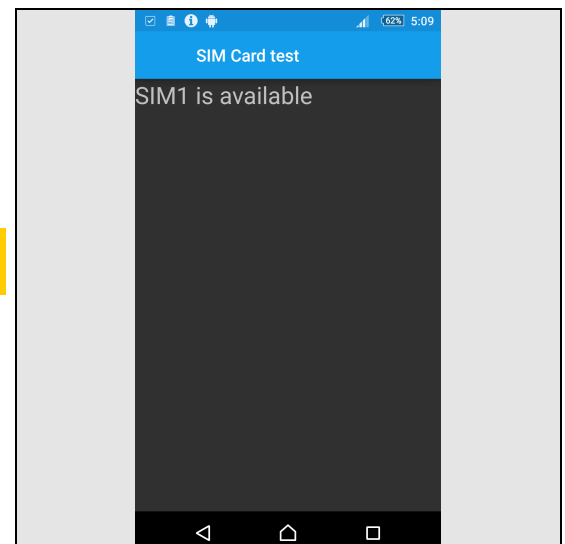


2.2.30 SIM Card Test (E5603, E5606, E5653)

Nano SIM should be inserted in the phone before the start of this test!

SIM1 should shows "Available";

Press the Back key to return to Service Test Menu.



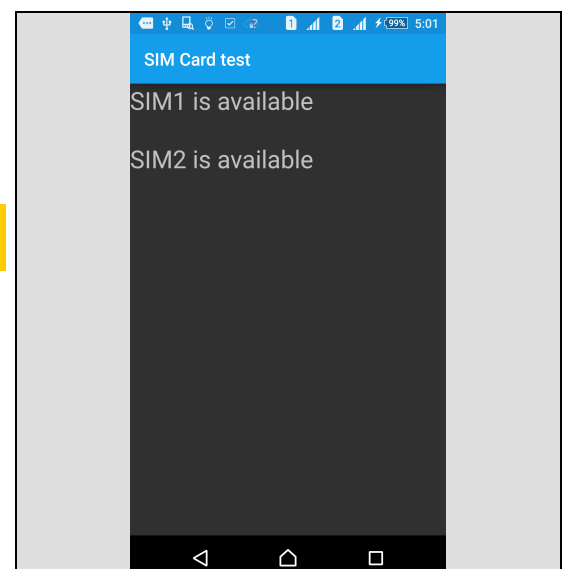
2.2.31 SIM Card Test (E5633, E5643, E5663)

Nano SIM1 and Nano SIM2 should be inserted in the phone before the start of the test!

SIM1 should shows "Available";

SIM2 should shows "Available";

Press the Back key to return to Service Test Menu.



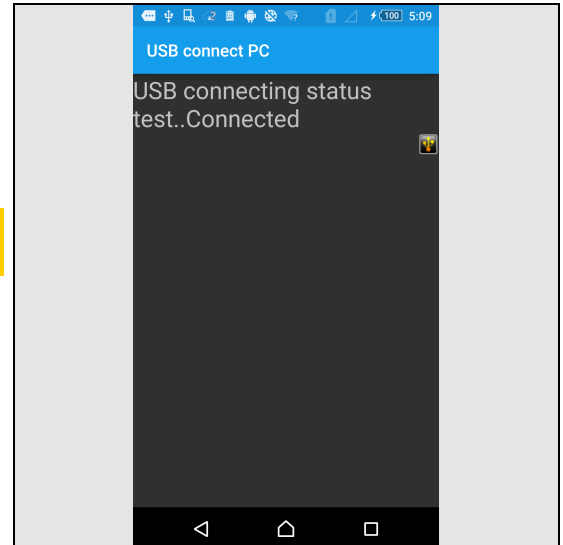
Tests: Service Tests

2.2.32 USB Test

Micro USB cable should be inserted in the phone with PC before the start of this test!

USB connecting status should shows “Connected”;

Press the Back key to return to the Service Test Menu.

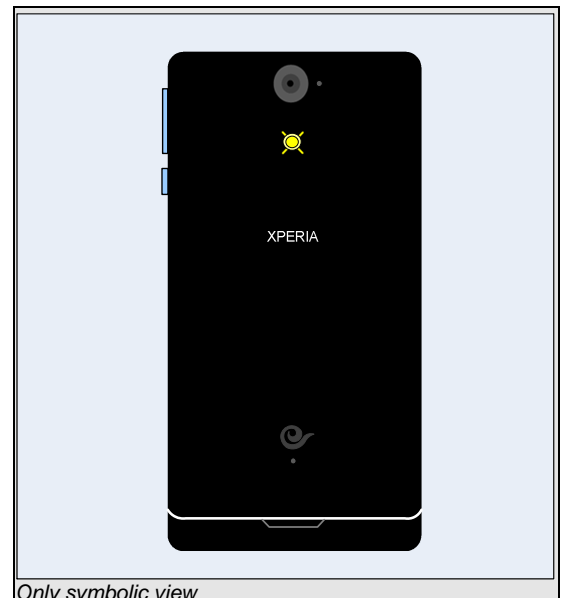


2.2.33 Flash LED

Click the on/off to start this test.

Check the Flash LED at the back side of phone whether it's turned on.

Press Back key or “LEAVE THIS PAGE” to return to Service Test Menu.



Only symbolic view

2.2.34 NFC

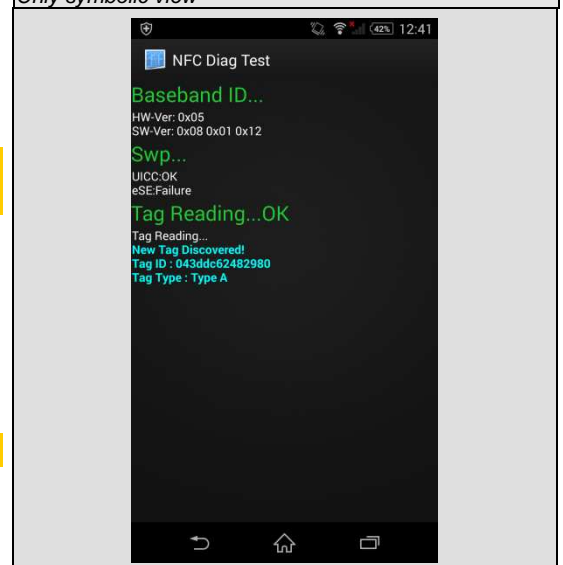
A NFC SIM card 3FF should be inserted in the phone before the start of this test!

The NFC test will be done in following sequences:

- Step 1: Select 'NFC';
- Step 2: Select 'NFC Diag Test';
- Step 3: After 'Tag Reading...Enabled' can be seen on the display, bring a NFC Tag close to middle of Rear Cover Assy.

Don't touch each other to avoid Window Back scratch.

Press the Back key two times to return to Service Test Menu.



Tests: Manual Tests

2.3 Manual Tests

2.3.1 SIM test (E5603, E5606, E5653)

Verify that the phone can detect a SIM card:

Step 1: Insert a SIM card, and start the phone;

If the SIM card is detected by the phone, the start-up procedure will continue.

Step 2: The operator's name is displayed at the top left corner of the locked screen.

If not detected, the message 'No SIM card-Emergency call only' will be displayed instead.

If operator is not detected, the message 'No service' will be displayed instead.

Press Back key to return to Standby Menu.



2.3.2 SIM test (E5633, E5643, E5663)

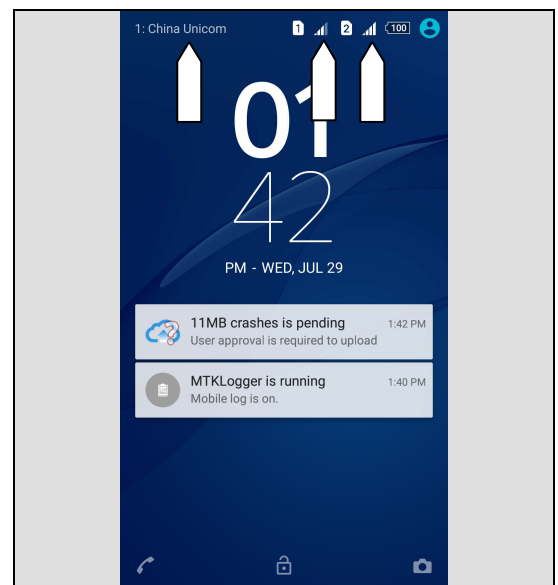
Verify the phone can detect a SIM 1 and a SIM 2:

Step 1: Insert a SIM 1 and a SIM 2, and start the phone; If the SIM 1 and SIM 2 is detected by the phone, the start-up procedure will continue.

Step 2: The SIM 1 and SIM 2 operator names will be displayed at the top left corner of the locked screen by turns.

If SIM card is not detected, the message 'No SIM card-Emergency call only' will be displayed instead. If operator is not detected, the message 'No service' will be displayed instead.

Press Back key to return to Standby Menu.



2.3.3 On/Off key test

Press the on/off key for a long time to turn the phone on or off.

Press the on/off key for a short time to enter Sleep mode or to wake it up from Sleep mode.



Only symbolic view

Tests: Manual Tests

2.3.4 Home key test

Whatever the phone shows now during operation, press the Home key for the phone go directly back to the Standby screen.



2.3.5 Recent key test

Whatever the phone shows now during operation, press the Recent key to show the programs used recently.

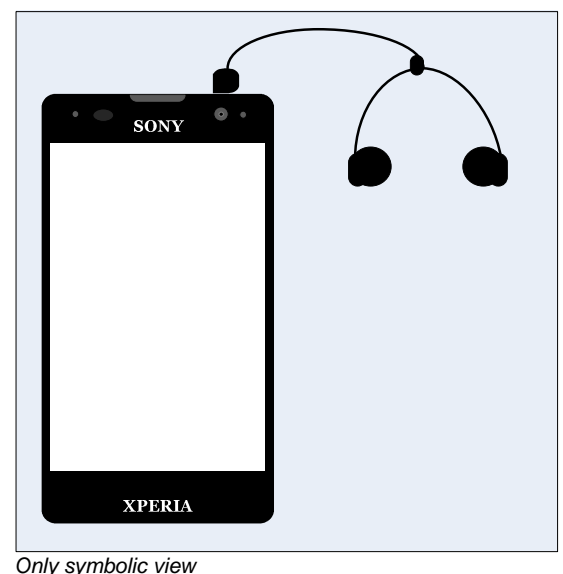


2.3.6 Audio Jack test

Connect a Sony CTIA headset (with microphone).
(see www.sonymobile.com go to the product and then Accessories)

Repeat the test of "Speaker", "Earphone" and "Microphone".

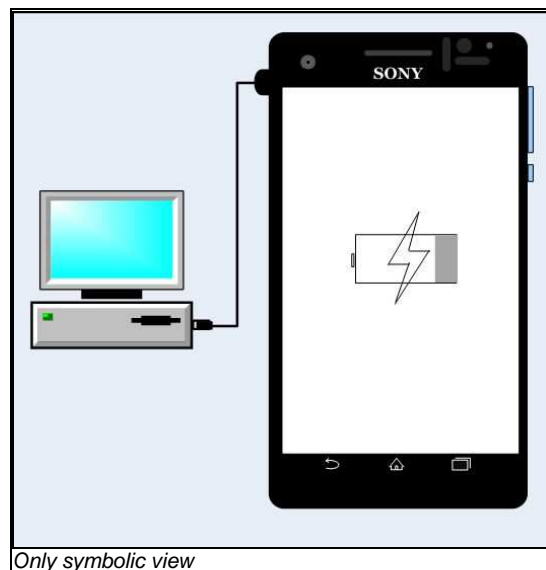
Make sure that the sound to and from Headset is emitted loud and clear.



Tests: Manual Tests

2.3.7 Data Communication test

- Connect a USB cable from a computer to the started phone.
- Verify that Data Communication works by transferring a file from Computer to phone
- Erase the file



2.3.8 DTV (E5643)

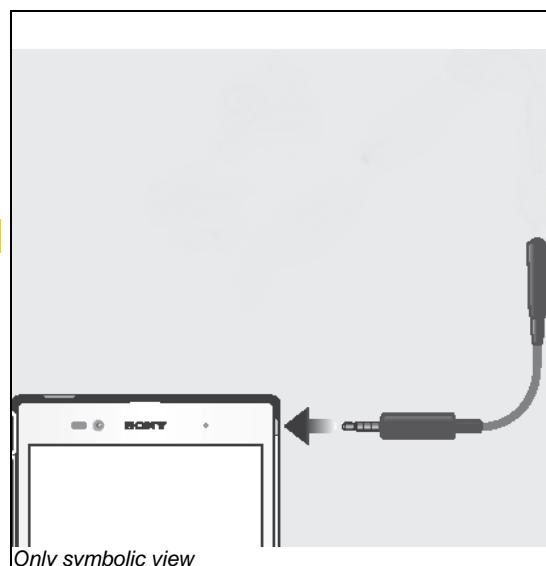
This function test only be used for E5643.

Start the phone.

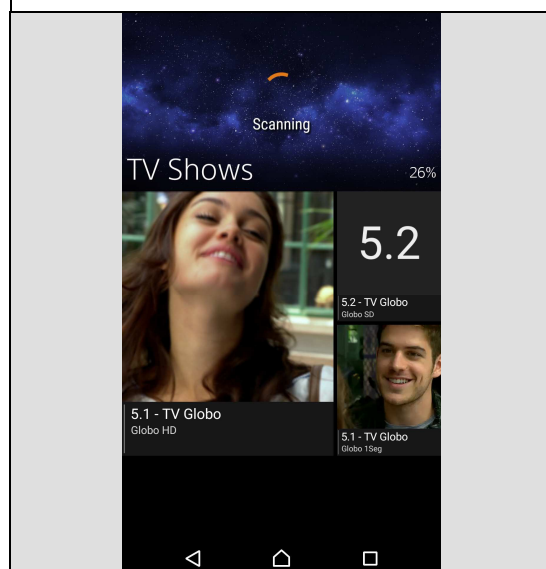
Verify that the phone can detect DTV channels:

Plug the male connector of the Mobile TV antenna cable into the audio jack of the unit.

Open the APK of [Mobile TV].



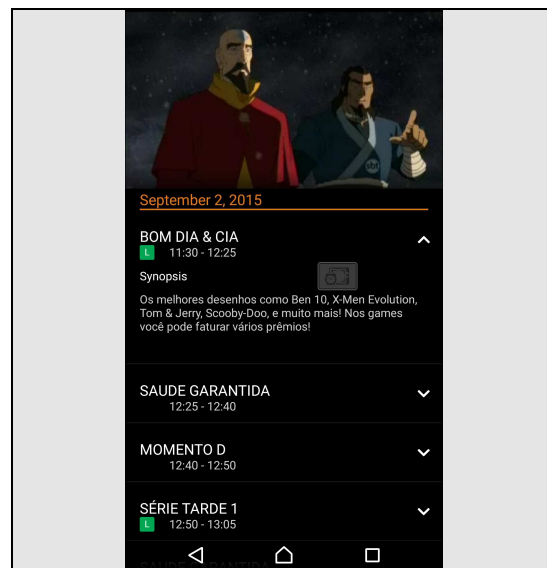
While entering Mobile TV APK, it will scan all channels available automatically.



Tests: Manual Tests

Snapshot will be shown while channel is scanned.
Click snapshot to play video.

Press Back key to return.



Tests: Manual Tests

2.3.9 Charging via USB (Charger or Computer)

Verify that the phone can charge the battery by a USB port:

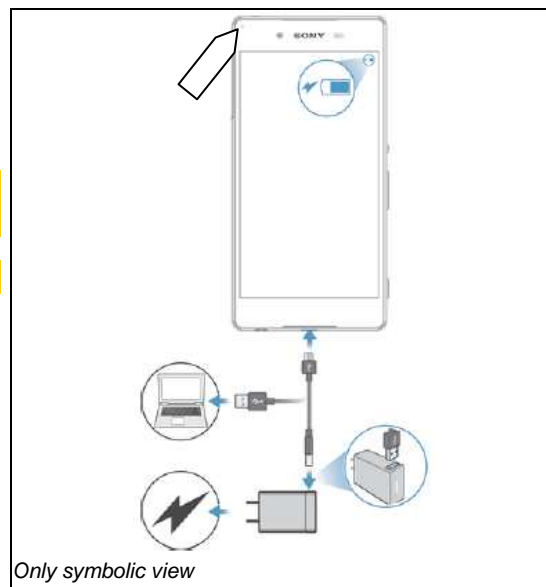
Ensure that no computer application, such as PC Suite or Emma, is active!

Do not start the phone.

Connect a USB cable from a computer or charger to the phone.

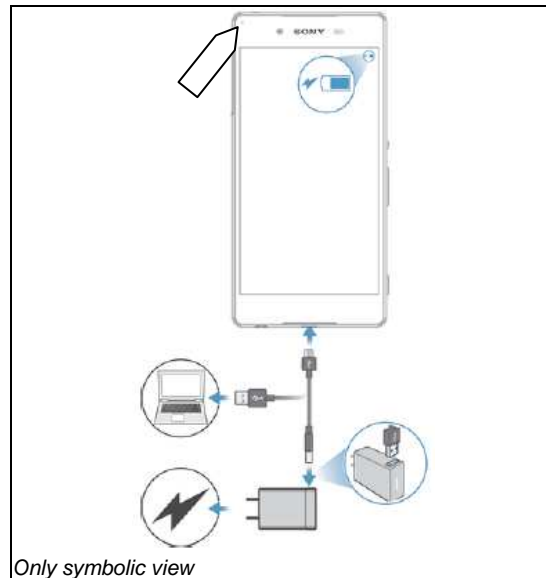
Verify that the phone is being charged by the notification LED and Battery icon in the display can take up to 10 min before LED starts.

Remove the USB cable from the connector and verify that the Notification LED (see 1.3 Test Enablers) and Battery icon no longer indicates charging.



The Notification LED (see 1.3 Test Enablers) colour status is depended on battery remaining capacity:

- Red: Battery level is between 1% and 10%;
- Orange: Battery level is between 11% and 89%;
- Green: Battery is between 90% and 100%;

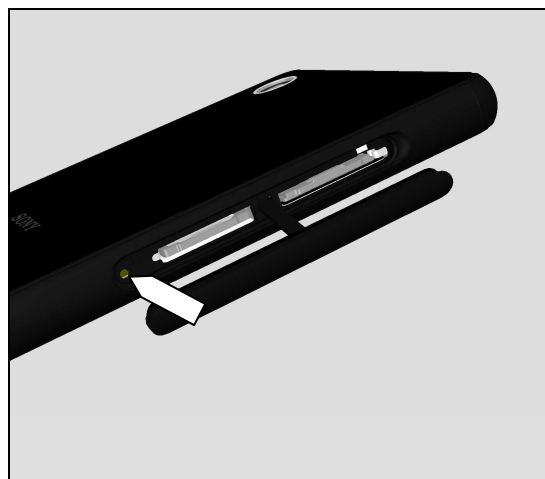


Tests: Manual Tests

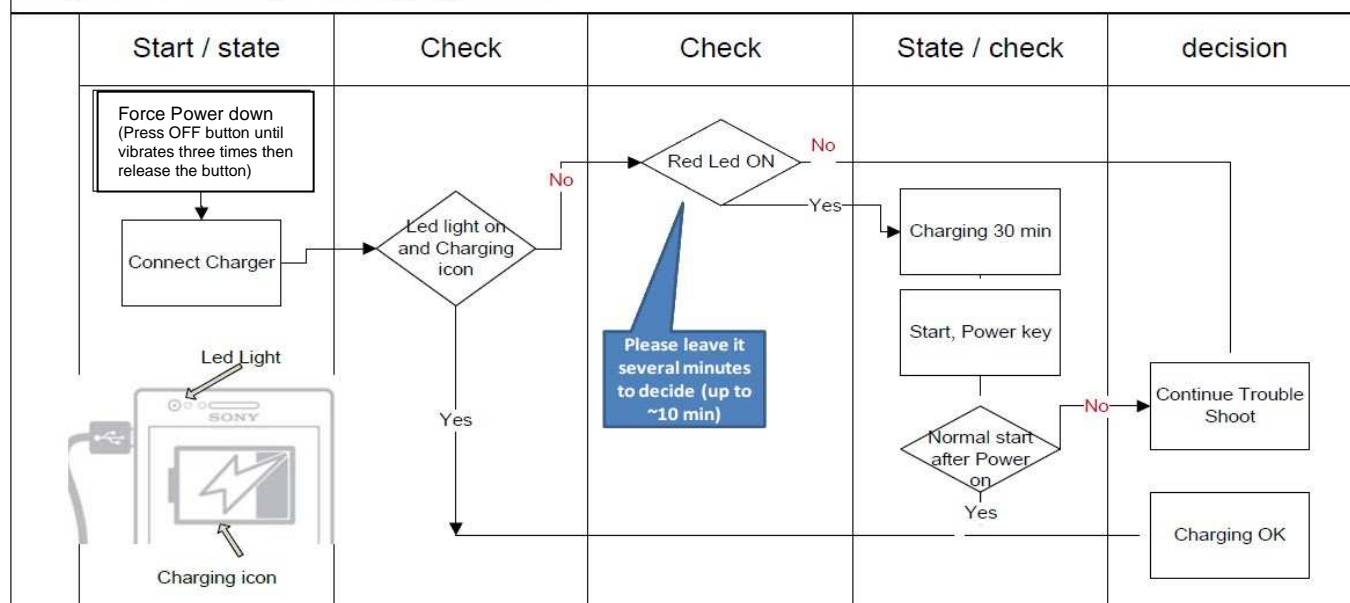
If above fails, perform below Diagnostic battery / Charging Status check.

Perform a force shut down by pressing the OFF button next to SD holder (for 10 seconds), as shown in picture, until the unit vibrates three times then release the button. Then the phone will shut down.

If you do not get any vibration and you can continue to press the HW reset, then after 2 minutes (120s) the phone will perform a very deep HW reset without any notification! This can solve some rare cases without having to open the unit and re-connect the battery connector.



Diagnostic Battery / Charging Status



The picture in above flow chart is only symbolic view.

Tests

2.3.10 Battery Test

If bad battery performance or capacity problem is claimed, the battery and charging function can be tested by using an application designed for this purpose.

By using this application the battery is tested in a fast and controlled environment.

This is especially convenient when units with embedded batteries should be checked, to avoid unnecessary work to disassembly the unit to access the battery.

This test is designed to identify a faulty battery or a hardware issue in the unit or with the charger. The guide will describe different procedures depending on the battery level when the battery test is initiated.

The test is downloaded to the unit using cable and executed.

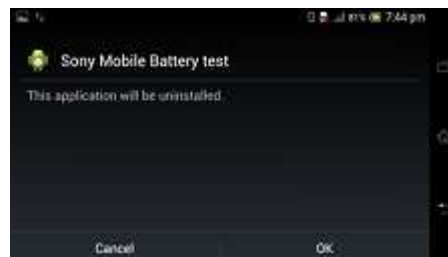
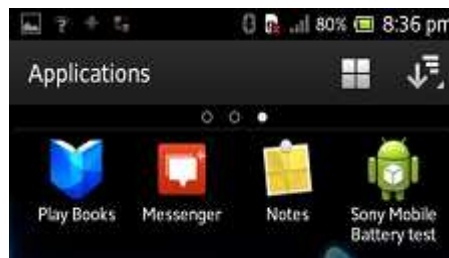
The test is available in CSPN at Level: Mechanical,

Title: **Sony Mobile Repair Application 1289-2983**

Unzip this file, where you find the application, installation and user guide content.

Installation / un-installation and log reading are now included in Sony Mobile Repair Application 1289-2983.

Error messages are described in the user guide for the Sony Mobile Battery test.



Tests

2.4 Network Test

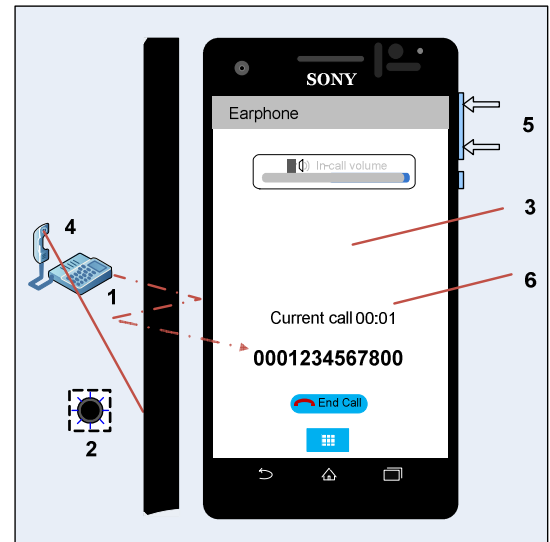
This test can only be performed if the phone has got an activated Nano SIM card (no Test Nano SIM) and an available network signal!

There are different versions of the test depending on whether a LTE, UMTS network is available or not!

If a LTE or UMTS network is available, the network test has to be done separately for GSM, UMTS or LTE!

2.4.1 Procedure (GSM & UMTS)

- Step 1: Set up a call from a landline phone (PSTN).
- Step 2: Check that there is a ring signal.
- Step 3: Check that the display backlight illuminates.
- Step 4: Answer the call and check the sound quality in both phones.
- Step 5: Adjust the volume up and down with the side keys and verify that the sound level is altered.
- Step 6: End the call and check that the elapsed time is displayed and that the termination is done properly.



Only symbolic view

Tests: Network Test

2.4.2 On-the-air call to mobile (E5603, E5606, E5653)

GSM

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Preferred network type ⇒ GSM only

Ensure that the Network Status icon show signal strength and show no symbol or E at the top of the display.

To verify the radio functions (GSM) of the phone, follow the '2.4.1 Procedure (GSM & UMTS)' above.

UMTS

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Preferred network type ⇒ WCDMA only

Ensure that the Network Status icon show signal strength and show 3G or H+ (HSPA) at the top of the display.

To verify the radio functions (UMTS) of the phone, follow the '2.4.1 Procedure (GSM & UMTS)' above.

LTE (if available)

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Preferred network type ⇒ LTE (preferred)/WCDMA/GSM

Ensure that the Network Status icon show signal strength and show LTE at the top of the display.

To verify the radio functions (LTE) of the phone, download data package by for ex. Accessing the web.

Network Type can be checked in ⇒ settings⇒ about phone⇒status⇒ Mobile Network Type

Tests: Network Test

2.4.3 On-the-air call to mobile (E5633, E5643, E5663)

SIM 1 or SIM 2

GSM

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ SIM 1 or SIM 2 ⇒ Preferred network type ⇒ GSM only

Ensure that the Network Status icon show signal strength and show no symbol or E at the top of the display.

To verify the radio functions (GSM) of the phone, follow the '2.4.1 Procedure (GSM & UMTS)' above.

UMTS

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ SIM 1 or SIM 2 ⇒ Preferred network type ⇒ WCDMA only

Ensure that the Network Status icon show signal strength and show 3G or H+ (HSPA) at the top of the display.

To verify the radio functions (UMTS) of the phone, follow the '2.4.1 Procedure (GSM & UMTS)' above.

LTE (if available)

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ SIM 1 or SIM 2 ⇒ Preferred network type ⇒ LTE (preferred)/WCDMA/GSM

Ensure that the Network Status icon show signal strength and show LTE at the top of the display.

To verify the radio functions (LTE) of the phone, download data package by for ex. Accessing the web.

Network Type can be checked in ⇒ settings⇒ about phone⇒status⇒ Mobile Network Type

If one of the SIM is selected to be LTE (preferred)/WCDMA/GSM or WCDMA only, the other SIM only support GSM.

3 Revision History

| Rev. | Date | Changes / Comments |
|------|--------------|---|
| 1 | 2015-Aug-16 | Initial Release |
| 2 | 2015-Sept-16 | Added picture to show the note info in chapter 1.1 Changed pictures in chapter 2.3.8 |