

Test Instructions

- mechanical -



Xperia™ M4 Aqua

E2303, E2306, E2312, E2333, E2353, E2363

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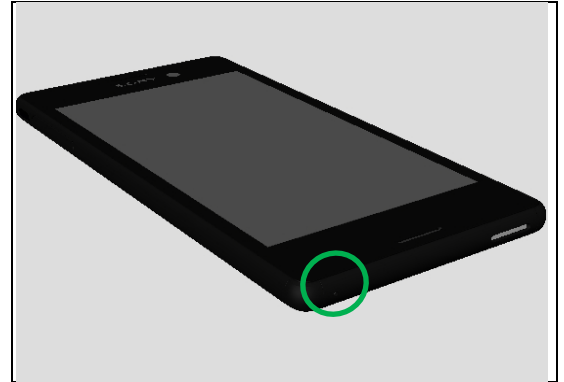
For general information about test procedures, refer to
1220-1333: Generic Repair Manual – mechanical

1 Pre-Test Preparation

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

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

The WRT Vent hole is shown as photo.



Install the “WRT Inlay plate” into the generic “WRT Generic Side Inlay”

Note! Place the phone Display side up.

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



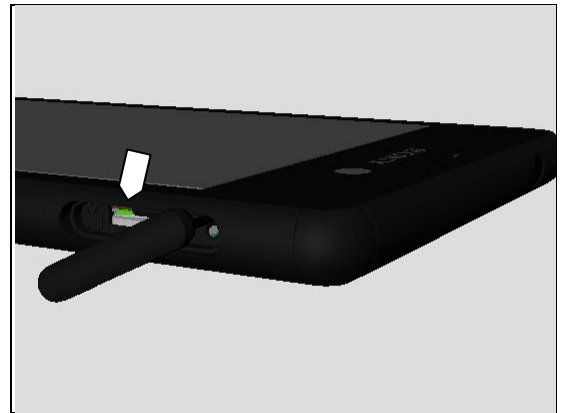
Pre-Test Preparations

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 this picture after the Cap USB is opened.



Another indicator is located as shown in this picture after the Cap SIM is opened.



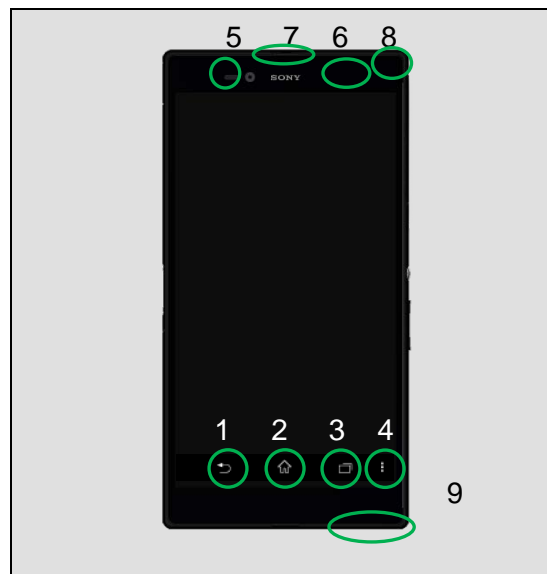
Pre-Test Preparations

1.3 Test Enablers

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

Front:

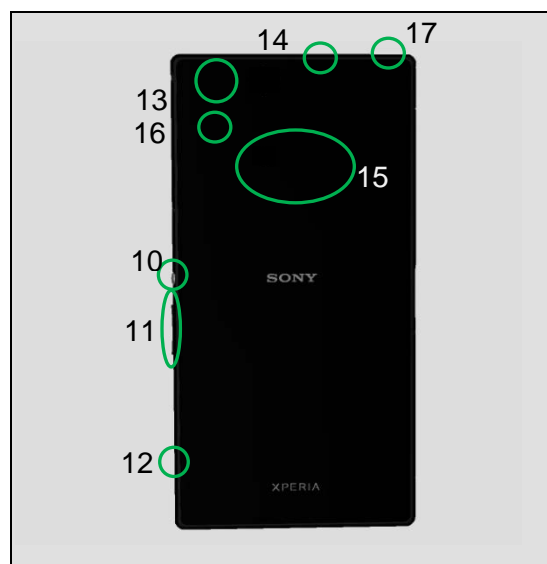
1. Back Key
2. Home Key
3. Recent Key
4. Menu key
5. Light Sensor and Proximity Sensor
6. Secondary Camera
7. Ear Speaker
8. Notification LED
9. Microphone and Loudspeaker



Back:

10. On/Off Key
11. Volume up/down Key
12. Camera key
13. Camera
14. Secondary Microphone
15. NFC
16. LED Flash
17. Audio Jack

6



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.sonyericsson.com/cws/marketingurlportal?pageid=key.SupportZone.Overview>

- Start up the phone
 - Note: Make sure the phone is in call setup.
- Press the following keypad combination: *##7378423#*#*
- 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://emma.extranet.sonyericsson.com/documents/emma_user_guide.pdf (see "Service Types" and "Aspects of large files")

2 Tests

2.1 Service Test Mode

Note: Make sure the phone is in call setup when pressing these touching keypads to get into the Service menu!

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

Settings -> Battery -> STAMINA

Start up the phone and enter the service menus:

- Press the following keypad combination: ***##7378423##**

- 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

Service info: information about Model, Software, Simlock, Configuration (IMEI, bands, codec's), Firmware, WLAN Mac address etc.

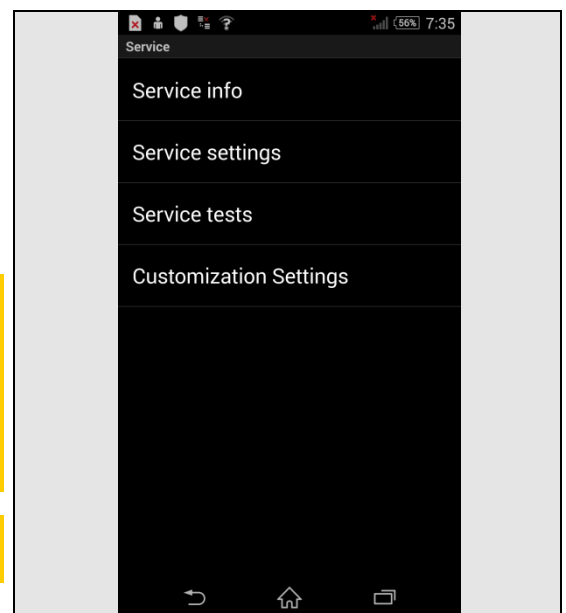
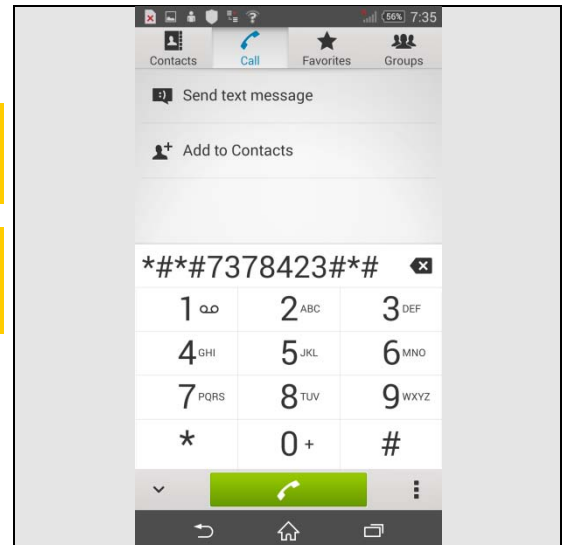
Service settings: Do not use

Service test: Follow instruction below

Customization Settings: Do not use.

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

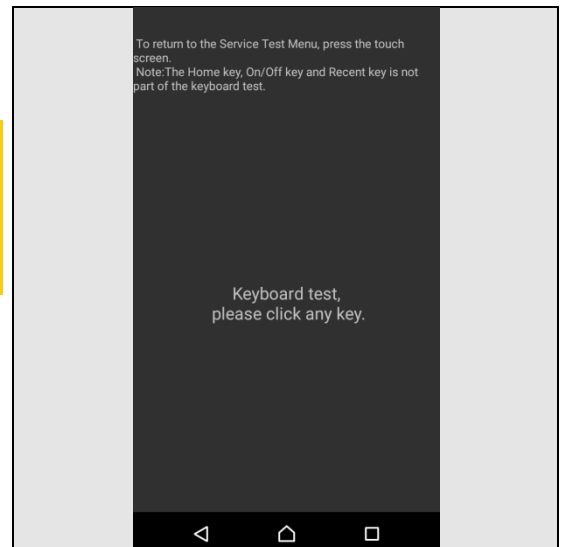
2.2.1 Keyboard & Switch

Text Note: The Home Key, On/Off key and Recent Key are not part of the keyboard test, but are in the Manual tests.

To return to the Service Test Menu, Press the touch screen and select "Yes".

Press all keys on the:

- Back key
- Volume up key
- Volume down key
- Auto Focus/Camera key

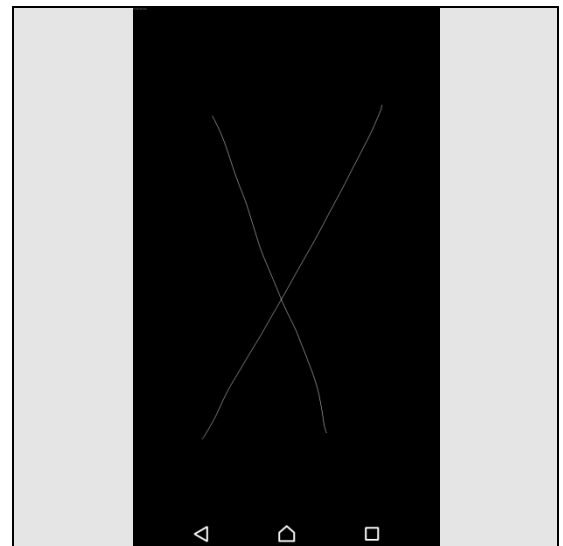


2.2.1 Touch Screen

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

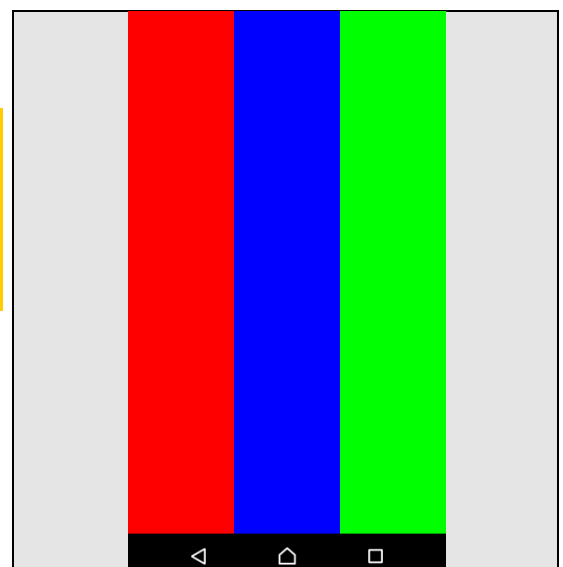
Minor variations in the display's brightness and color may occur between phones.

There may be tiny bright dots on the display, called defective pixels and 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 by every 3 seconds 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.



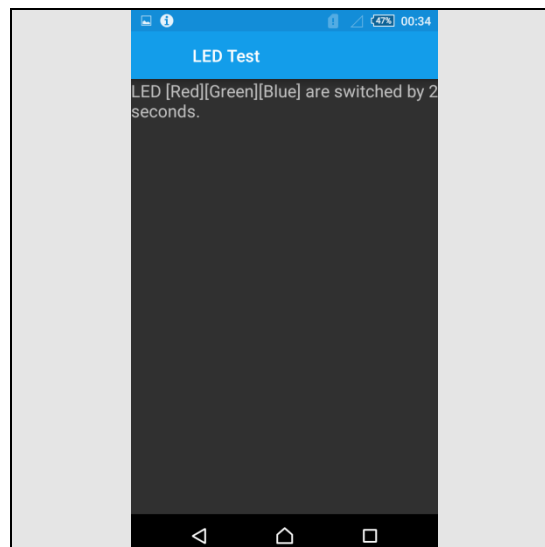
Tests: Service Tests

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.

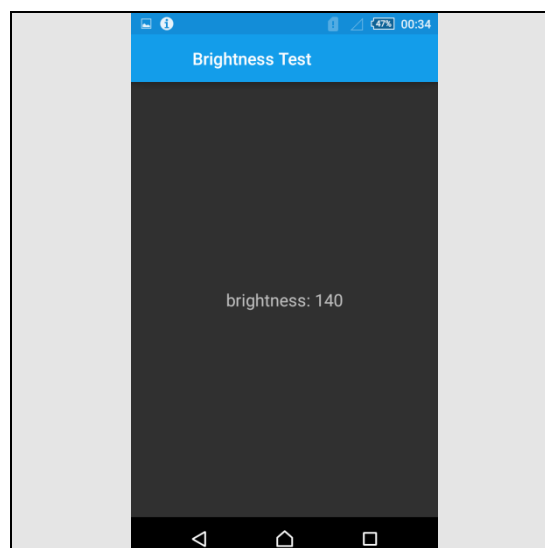


2.2.4 Illumination

Check that the:

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

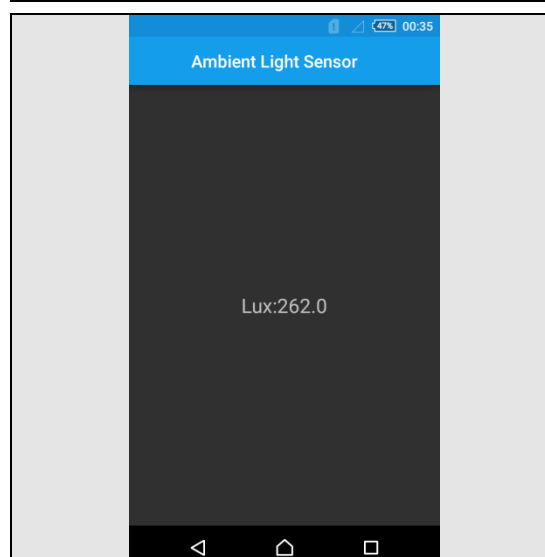
Press the Back key to return to the Service Test Menu.



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

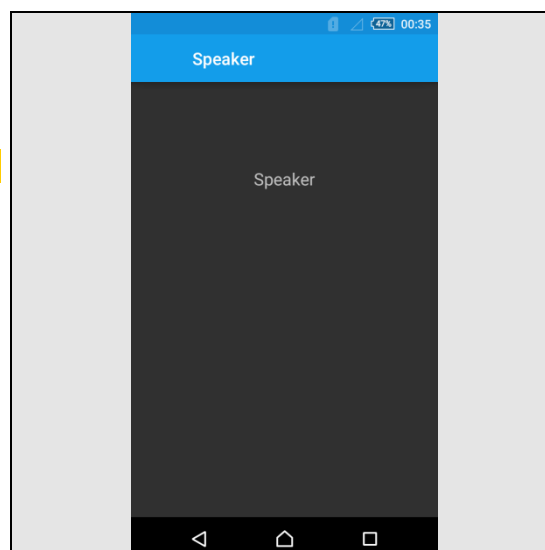
2.2.6 Speaker

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.

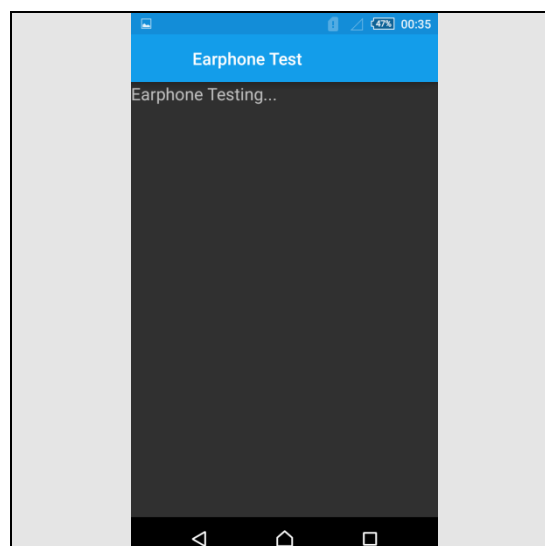


2.2.7 Earphone

Make sure that the sound from the Top speaker 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.

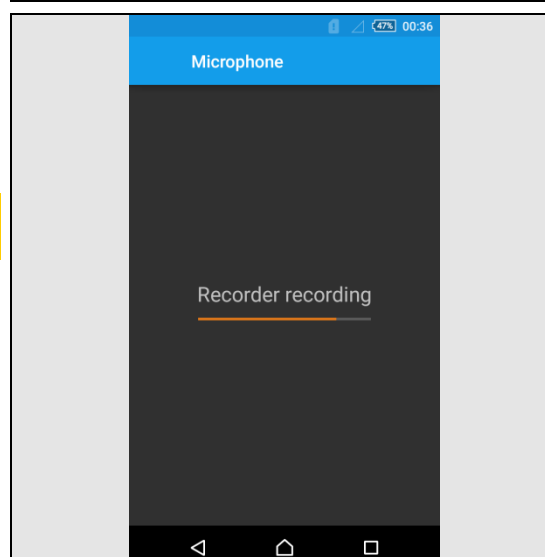


2.2.8 Microphone

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.

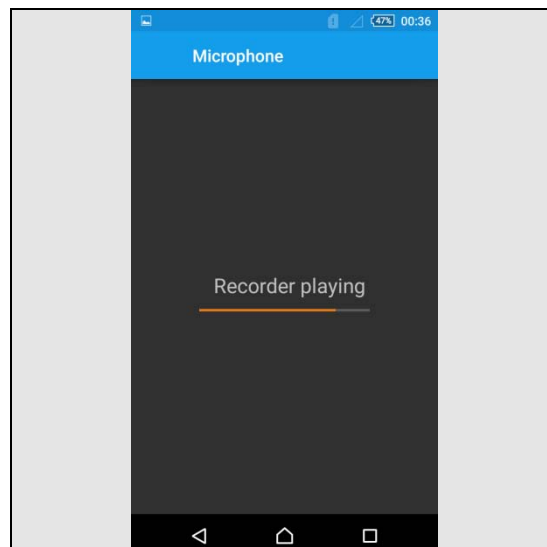
Step 1: Speak into the microphone during the 'Microphone Recording' phase;



Tests: Service Tests

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

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

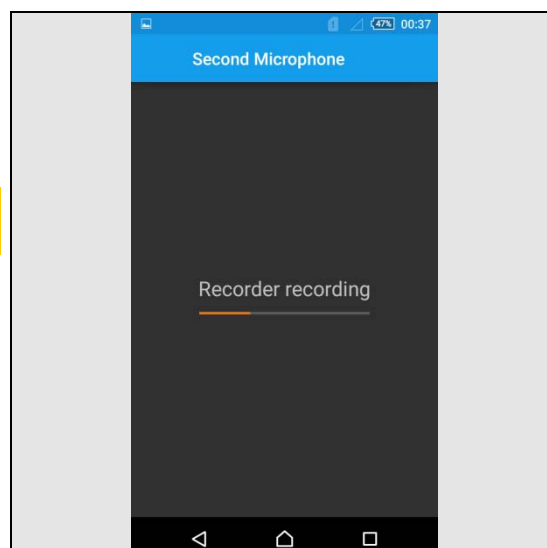


2.2.9 Secondary Microphone

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

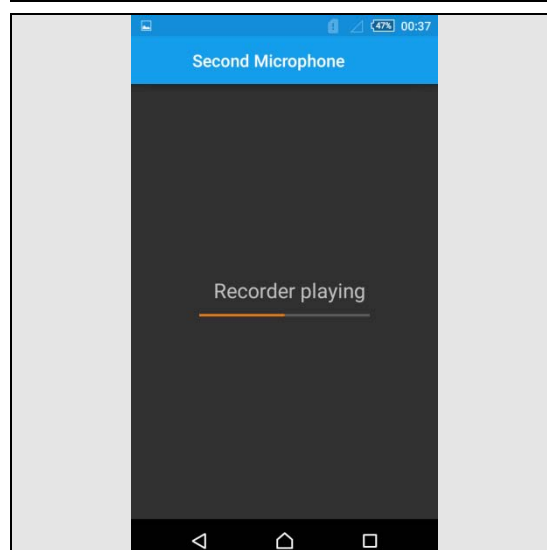
The phone will start to record and after approximately ten seconds the sound is played back through the loudspeaker.

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 and top speaker during the 'Playing recorded sound' phase at maximum volume.

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

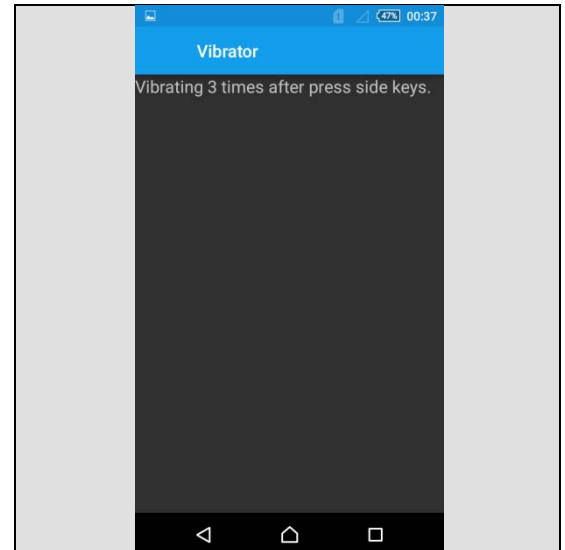


Tests: Service Tests

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.



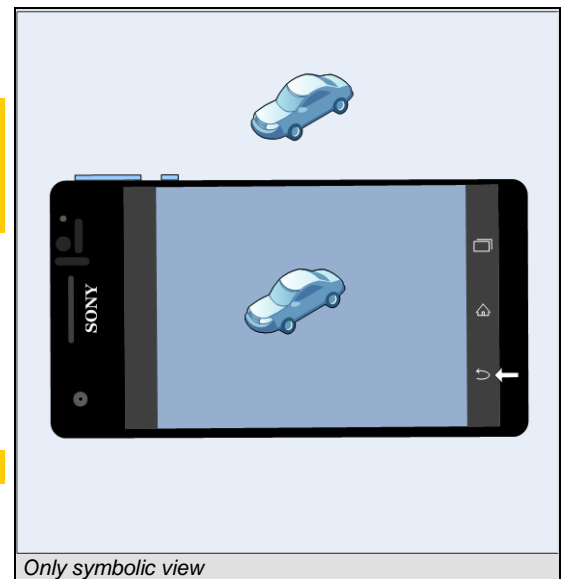
2.2.11 Camera

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.



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.

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



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'.

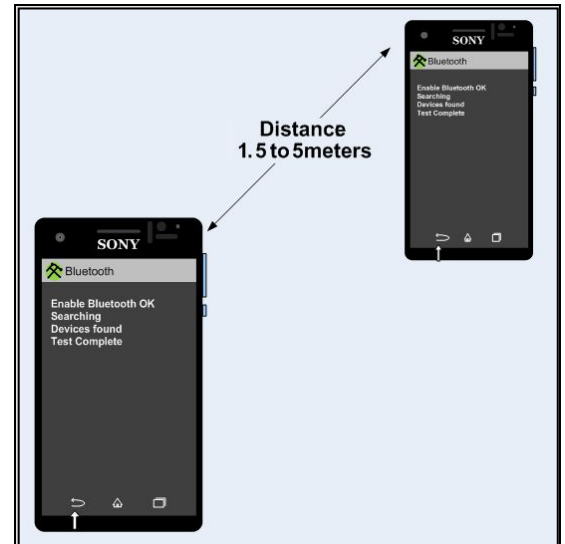
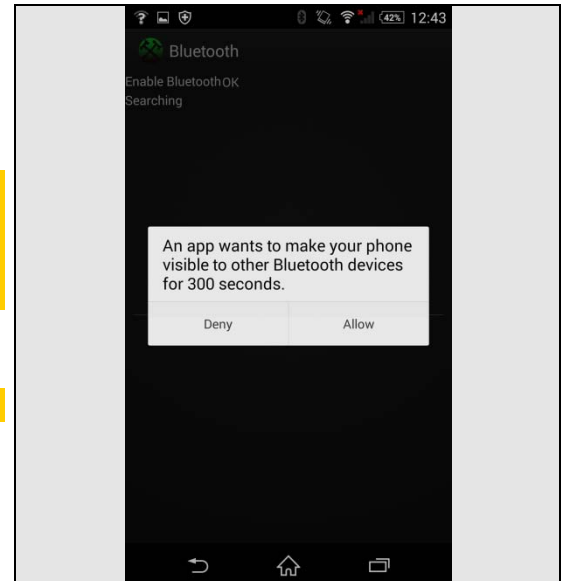
Step 2: Searching;

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;

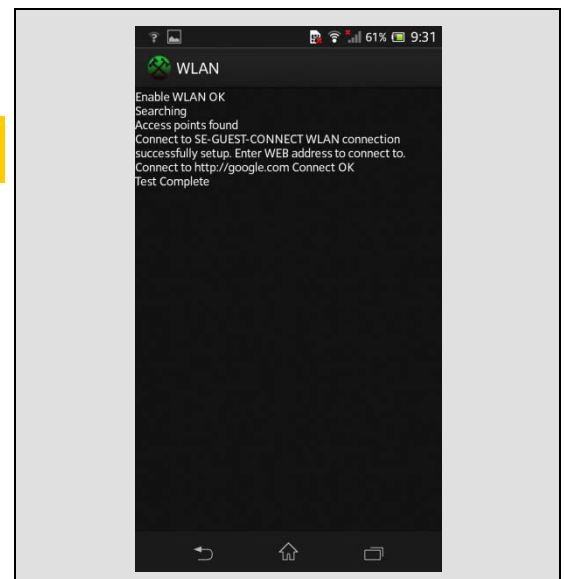
Step 3: Access points found list;

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.



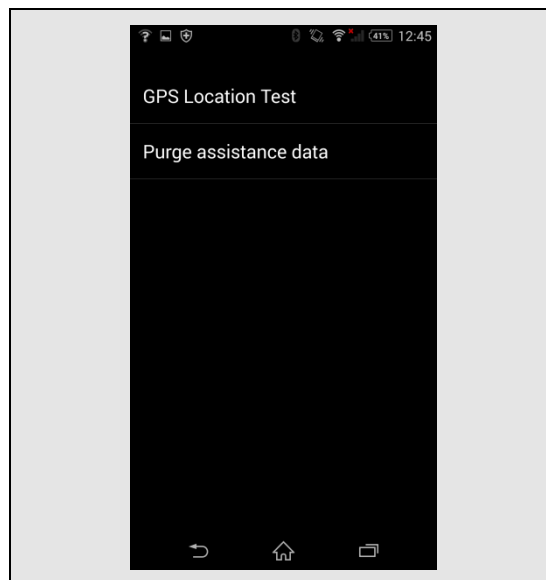
Tests: Service Tests

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.

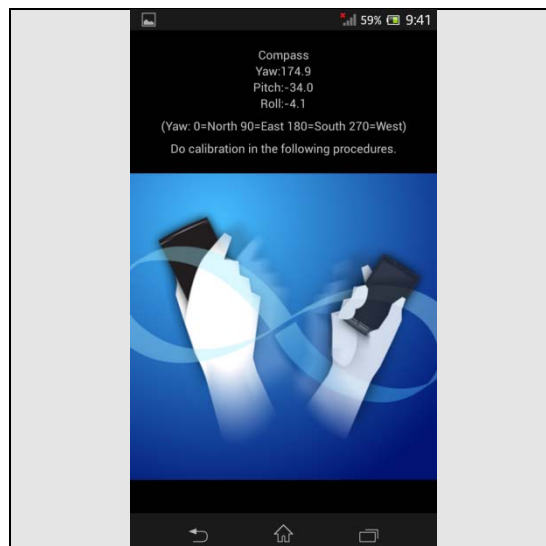
**For GPS testing, refer to
1220-1333: Generic Repair Manual – mechanical**



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)

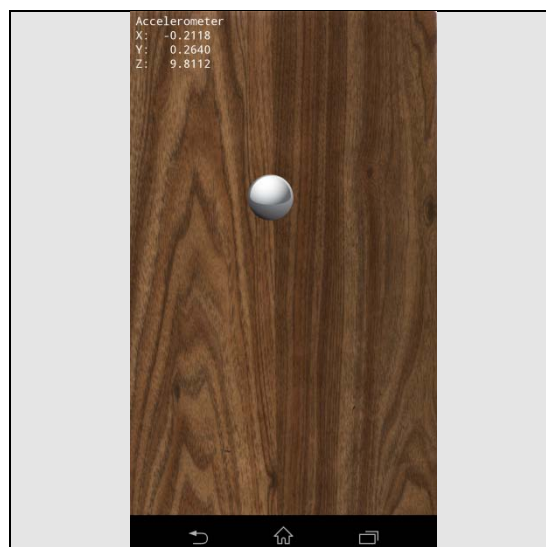
Press the Back key to return to the Service Test Menu.



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.

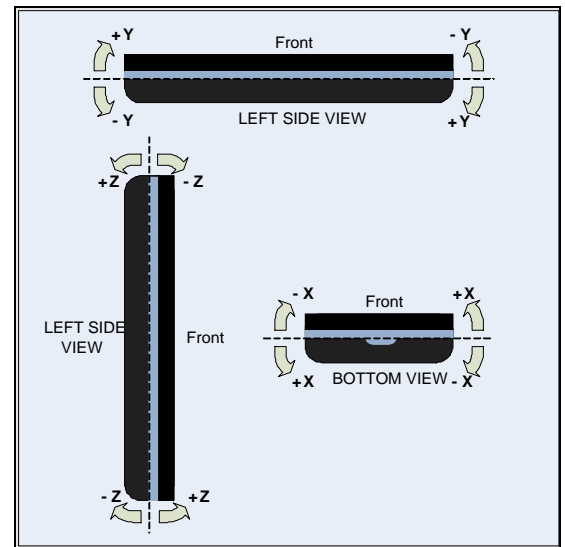


Tests: Service Tests

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.



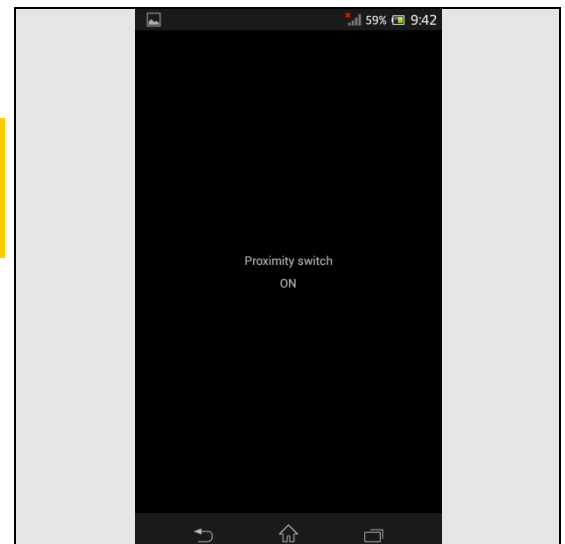
2.2.18 Proximity Sensor

The previous Chapter 2.2.4 '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'.

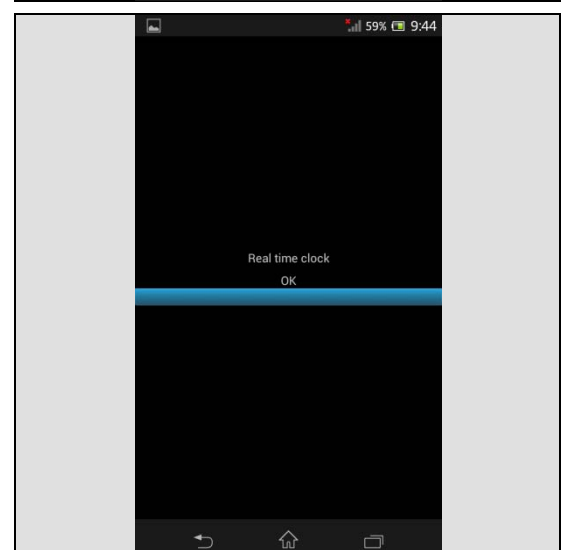
Press the Back key to return to the Service Test Menu.



2.2.19 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.

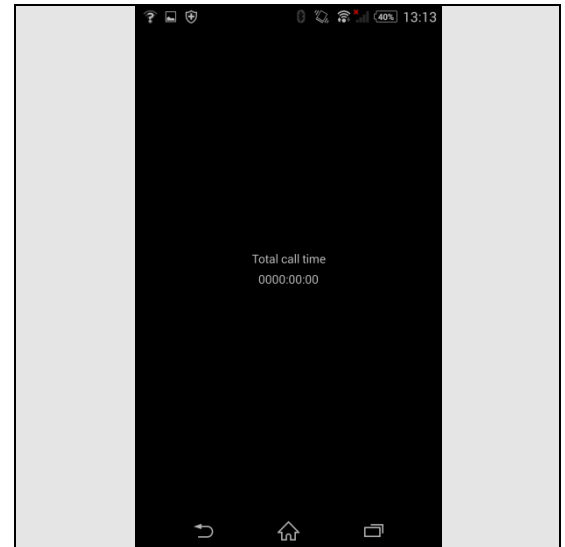


Tests: Service Tests

2.2.20 Total call time

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.

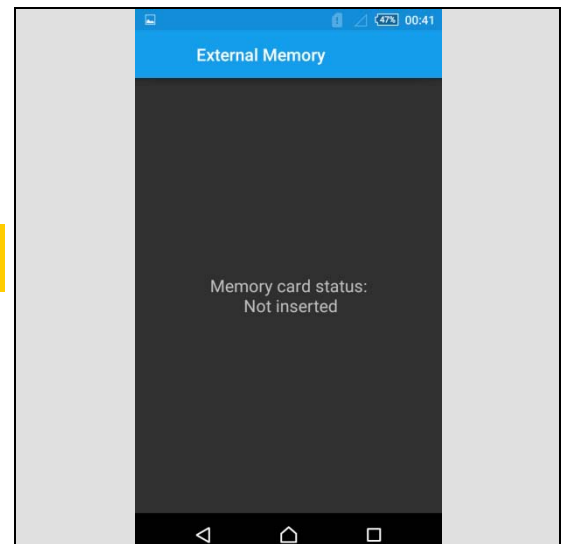


2.2.21 External Memory

A memory card should be inserted in the phone before starting this test!

The External Storage (SD Card) status is shown on the screen.

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

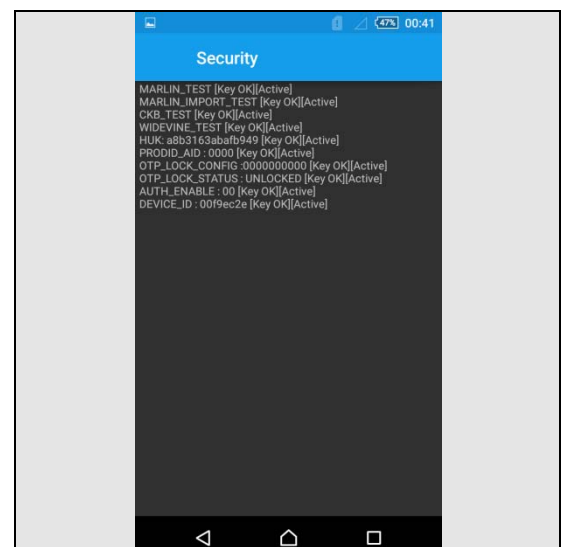


2.2.22 Security

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.



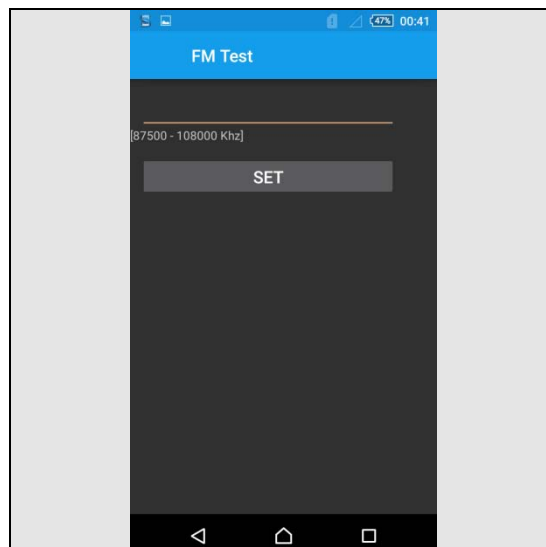
Tests: Service Tests

2.2.23 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.

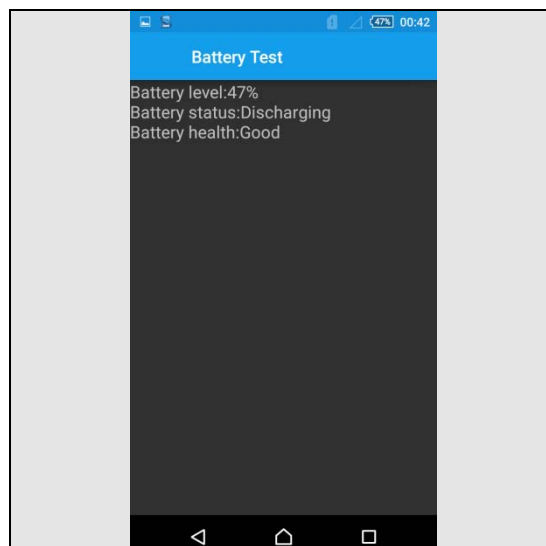
Press the Back key to return to the Service Test Menu.



2.2.24 Battery Status Check

Do not use this test!

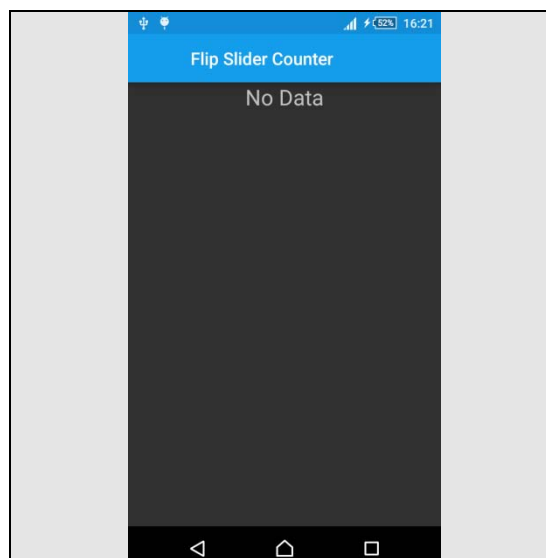
Press the Back key to return to the Service Test Menu.



2.2.25 Flip Slider Counter

Do not use this test!

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



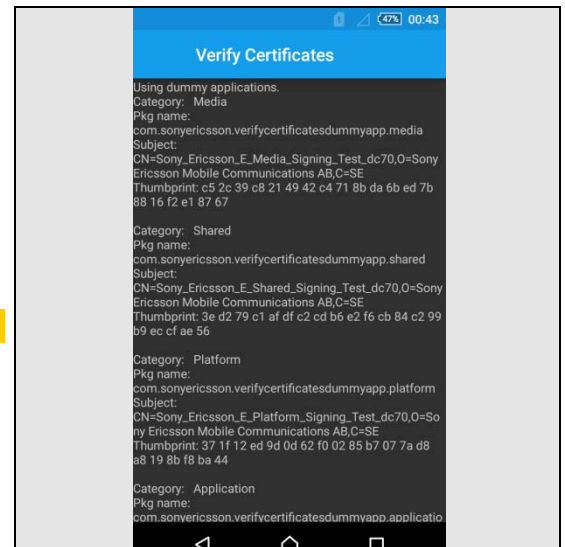
Tests: Service Tests

2.2.26 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.



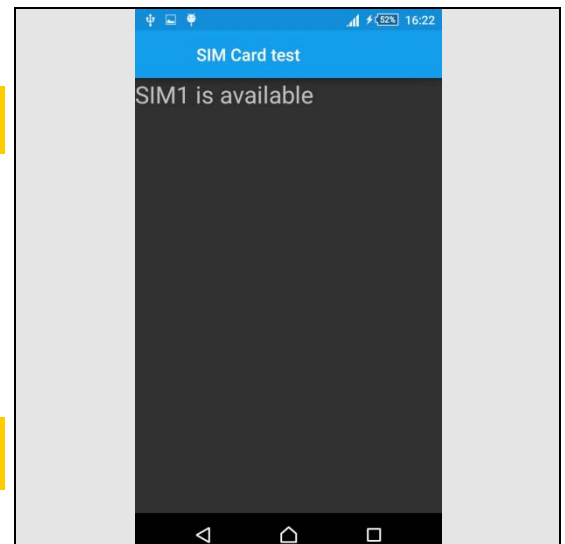
2.2.27 SIM Card Test

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

SIM1 should shows "Available";
SIM2 should shows "Available";

Press the Back key to return to Service Test Menu.

**Note: SIM1 is for WCDMA/GSM;
SIM2 is for GSM only;**

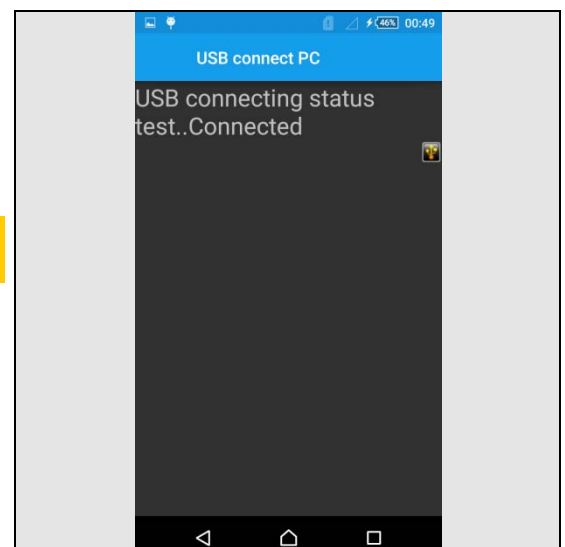


2.2.28 USB Test

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.



Tests: Service Tests

2.2.29 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.



2.2.30 NFC

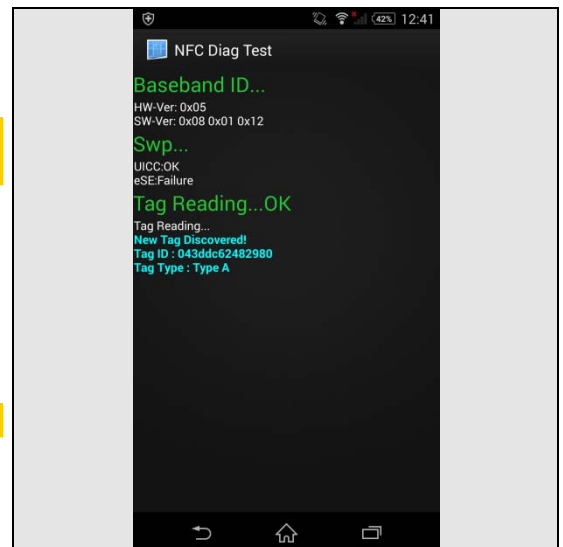
A NFC SIM card 3FF should be inserted in the phone before the start of this test!

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 On/Off key test

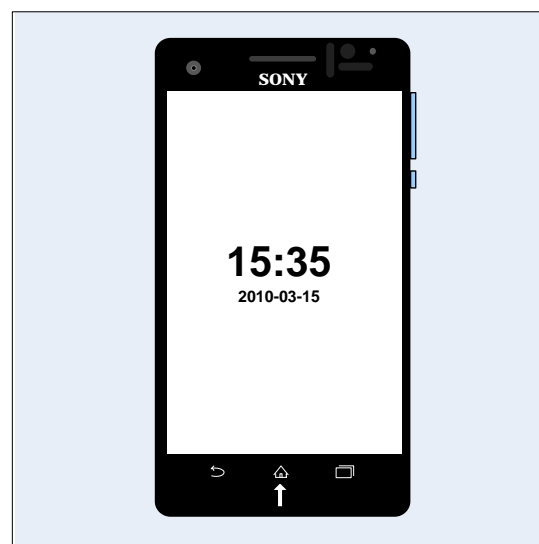
Press the on/off key for a long time to turn the phone on or off.

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



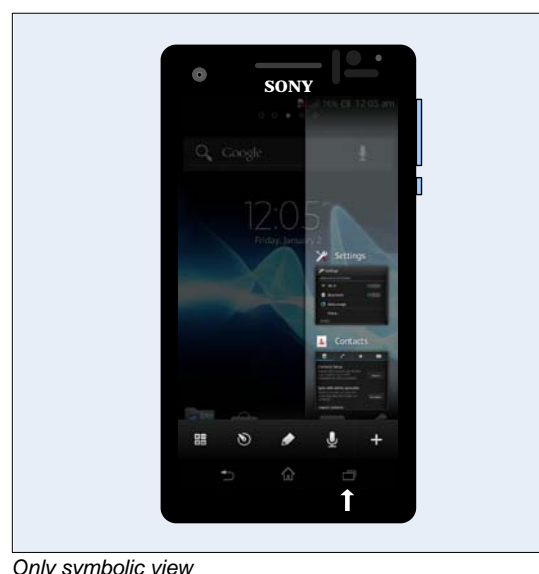
2.3.2 Home key test

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



2.3.3 Recent key test

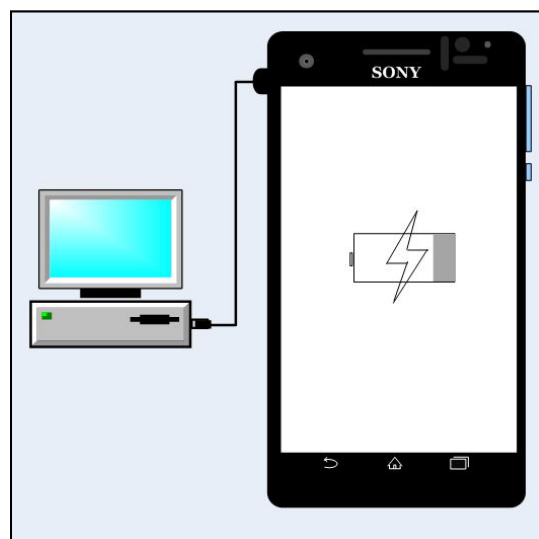
Whatever the phone shows now during operation, press the Multitask key to show the programs used recently.



Tests: Manual Tests

2.3.4 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



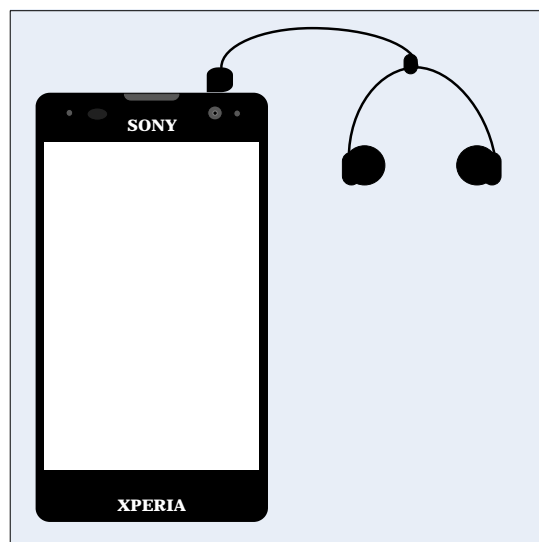
Only symbolic view

2.3.5 Audio Jack test

Connect a Sony Noise canceling headset (see www.sonymobile.com go to the product and then Accessories for applicable headset)

Repeat the test of “2.2.6 Earphone”

Make sure that the sound to and from Headset is emitted loud and clear and that the units Notification panel at the top show “5-pin audio accessory connected” briefly when you attach the headset.

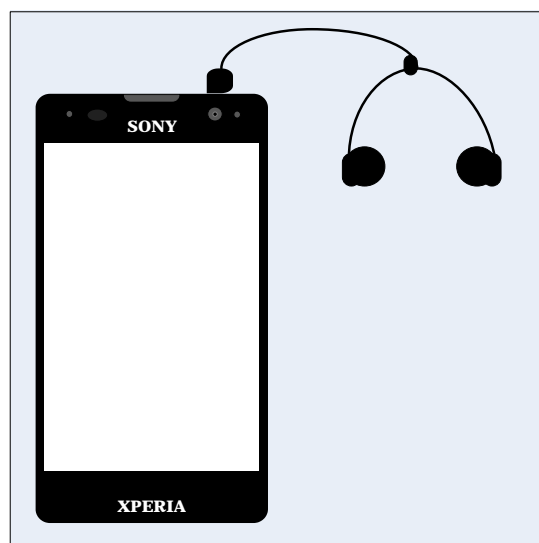


Only symbolic view

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

Repeat the test of “2.2.7 Microphone”.

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



Only symbolic view

Tests: Manual Tests

2.3.6 Charging via Computer

2.3.6.1 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.

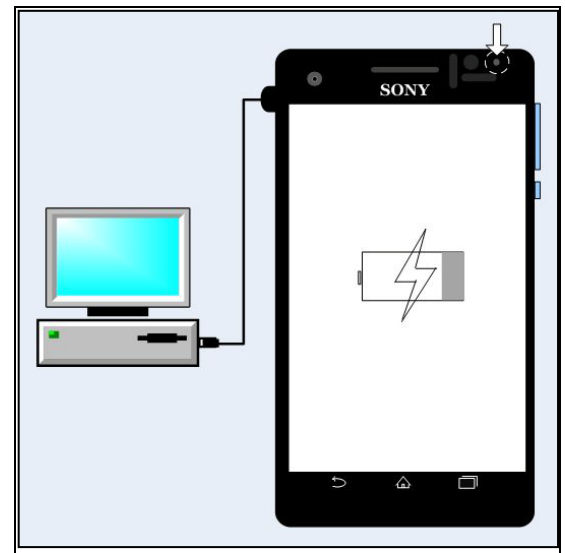
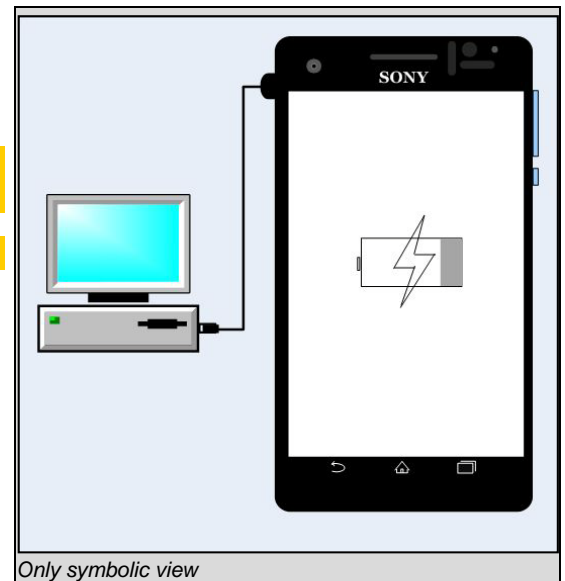
Connect a USB cable from a computer or charger to the phone.

Verify that the phone is being charged by the notification LED and Battery icon in the display.

Remove the USB cable from the connector and verify that the notification LED and Battery icon no longer indicates charging.

The Notification LED color 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

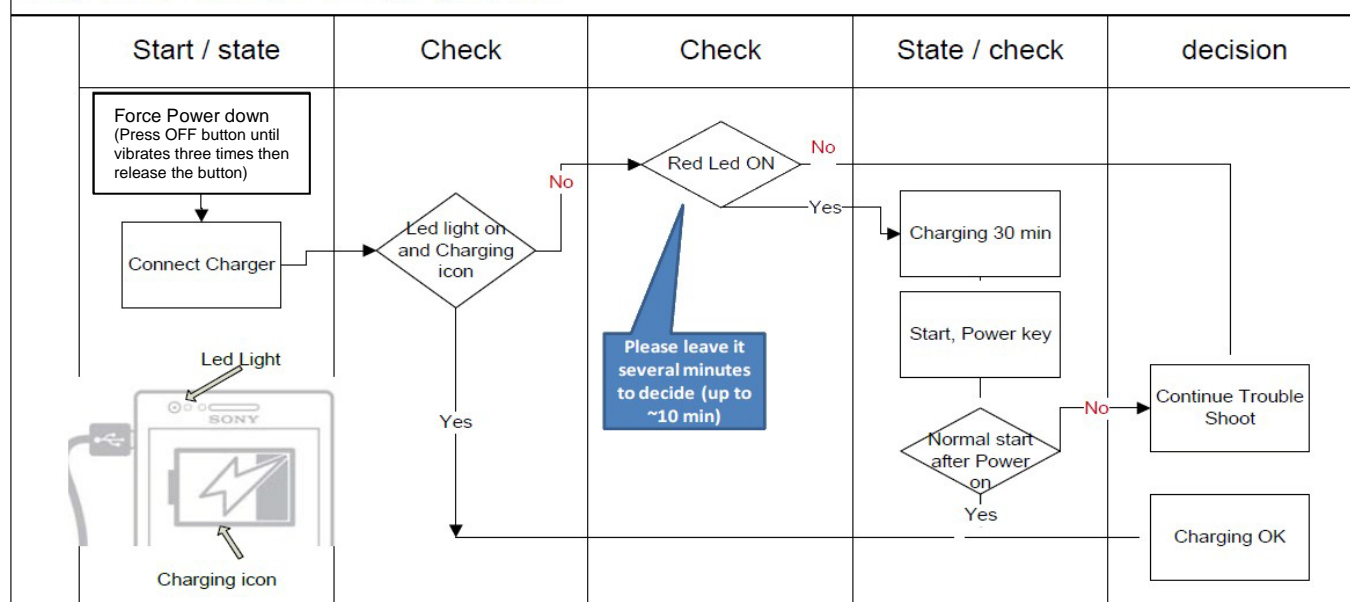
If above fails, perform below Diagnostic battery / Charging Status check.

Perform a force shut down by pressing the OFF button as shown in picture, until the unit vibrates three times then release the button. Then the phone will shut down.

If no vibration is detected, the battery might be discharged.



Diagnostic Battery / Charging Status



The picture in above flow chart is only symbolic view.

If the phone doesn't seem to charge,

- **Disconnect the USB cable from the phone and then plug it into the Micro USB port on the phone again.**
- **It may take a few minutes before the battery light lights up when you connect the phone to a power source. If the battery is drained, it may take up to 30 minutes for the phone to respond to the charging. During this time, the screen may stay completely dark, not showing a charging icon.**
- **Make sure you use the Sony™ USB cable and power adapter that come with your phone, and that the cable is properly connected to the phone and the power adapter.**
- **Charge the phone using another USB cable, or charge the phone from a computer USB port, to rule out whether there is something wrong with the cable or the power adapter.**

Tests

2.4 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 phones with embedded batteries should be checked, to avoid unnecessary work to disassembly the phone to access the battery.

This test is designed to identify a faulty battery or a hardware issue in the phone 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 phone, using cable or Bluetooth, and executed.

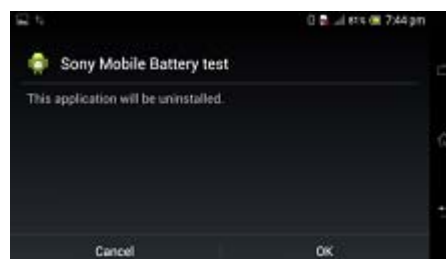
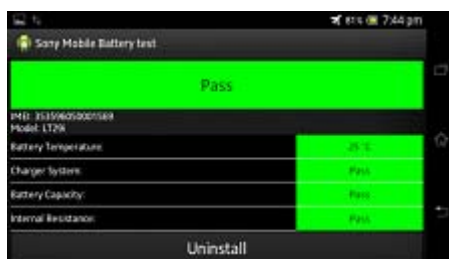
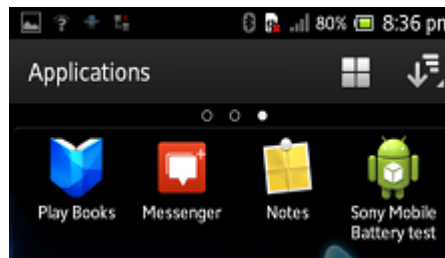
The test is available in CSPN at Level: Mechanical,

Title: **Sony Mobile Battery test Application 1266-2711.**

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

After the test the Sony Mobile Battery test.apk shall be removed by tap "Uninstall" "OK" in the application.

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



Tests

2.5 Network Test

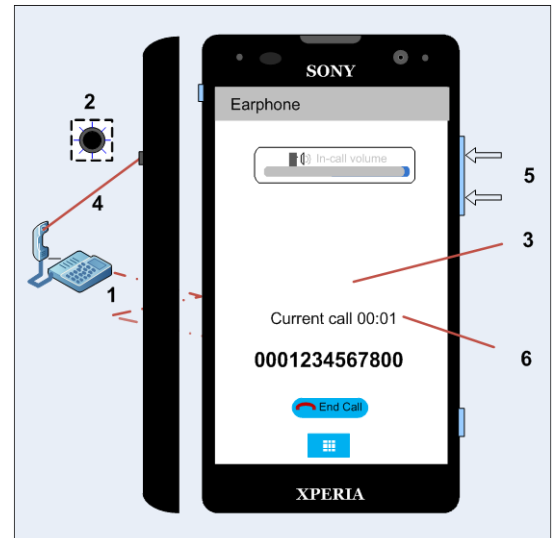
This test can only be performed if the phone has an activated SIM/USIM/UIM card (no Test SIM/USIM/UIM) and an available network signal!

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

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

2.5.1 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

2.5.2 On-the-air call to mobile (SIM 1 – GSM/ WCDMA/ LTE)

GSM

Go to the Setting app:

Step1: Settings ⇒ Dual SIM card ⇒ enable SIM1 (WCDMA/GSM) and disable SIM2 (GSM)

Ensure that the Network Status icon show SIM1 signal strength and show no symbol for SIM2 at the top of the display.

Step2: Settings ⇒ More... ⇒ Mobile Networks ⇒ Select SIM card⇒SIM1⇒Network mode ⇒ GSM only

To verify the radio functions (GSM) of the phone, follow the '2.5.1 Procedure (GSM & UMTS)' above.

WCDMA

Go to the Setting app:

Step1: Settings ⇒ Dual SIM card ⇒ enable SIM1 (WCDMA/GSM) and disable SIM2 (GSM)

Ensure that the Network Status icon show SIM1 signal strength and show no symbol for SIM2 at the top of the display.

Step2: Settings ⇒ More... ⇒ Mobile Networks ⇒ Select SIM card⇒SIM1⇒Network mode ⇒ WCDMA only

To verify the radio functions (WCDMA) of the phone, follow the '2.5.1 Procedure (GSM & UMTS)' above.

UMTS (if available)

Go to the Setting app:

Settings ⇒ More.. ⇒ Mobile networks ⇒ Network Mode ⇒ 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 '2.5.1.2 Procedure (GSM & UMTS)'.

LTE (if available)

Go to the Setting app:

Settings ⇒ More.. ⇒ Mobile networks ⇒ Network Mode ⇒ 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

2.5.3 On-the-air call to mobile (SIM2 - GSM)

GSM

Go to the Setting app:

Step1: Settings ⇒ Dual SIM card ⇒ disable SIM1 (WCDMA/GSM) and enable SIM2 (GSM)

Ensure that the Network Status icon show SIM2 signal strength and show no symbol for SIM1 at the top of the display.

Step2: Settings ⇒ More... ⇒ Mobile Networks ⇒ Select SIM card⇒SIM2

To verify the radio functions (GSM) of the phone, follow the '2.5.1 Procedure (GSM & UMTS)' above.

3 Revision History

Rev.	Date	Changes / Comments
1	2015-May-06	Initial release
2	2015-May-13	Update WRT fixture's picture