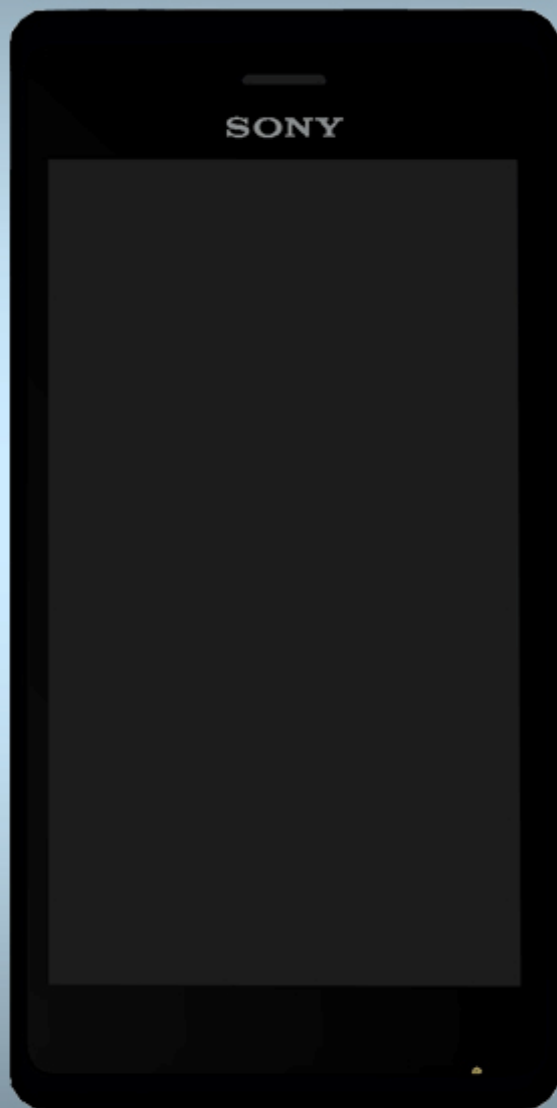


Test Instructions

- mechanical -



Xperia™ M, Xperia™ M Dual
C1904, C1905, C2004, C2005

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

1 Pre-Test Preparations

Pre-Test Preparations

1.1 Hardware

1.1.1 Water indicator inspection

Before starting any tests the liquid intrusion indicator has to be checked.

The Water Indicator is located as shown in these pictures.

1. The first is located as shown in the picture after removing Battery Cover Assy



2. The second one is located on the ANT Board as shown after removing Rear Cover.

If affected (red color) - handle the phone according to the local directives.

If not affected by liquid, proceed to the 'Pre-Test Preparation' below.



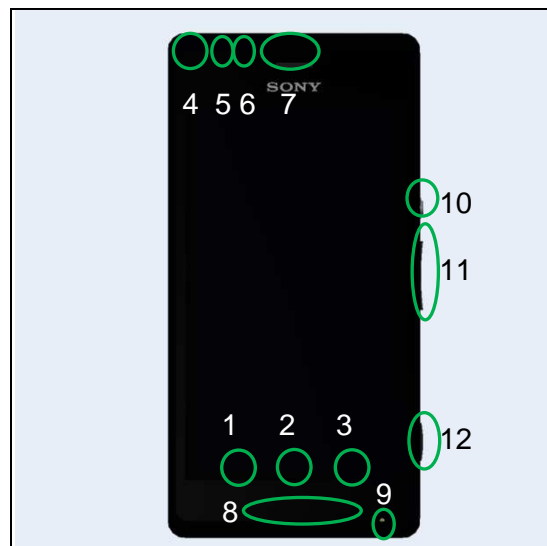
Pre-Test Preparations

1.1.2 Test Enablers

The tests in this document will refer to following items on the phone.

Front & side keys:

1. Back Key
2. Home Key
3. Multitask key
4. Secondary Camera
5. Ambient Light Sensor
6. Proximity Switch
7. Earphone
8. Notification LED
9. Microphone
10. On/Off Key
11. Volume up/down Key
12. Auto Focus / Camera Key



Back:

13. Camera
14. Flash LED & Secondary Microphone
15. NFC
16. Speaker



Pre-Test Preparations

1.2 Software

1.2.1 Software update

1.2.1.1 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
 - 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 update as described below:

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

1.2.1.2 Software version update

Mandatory first repair action!

Use the Micro USB to USB cable for this purpose.

Fully charged battery first, 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 internal storage (built in "SD card" user memory), the only service which erase all user data in the internal memory and update the customization in the internal storage (MS CDF) are the Services "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")

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

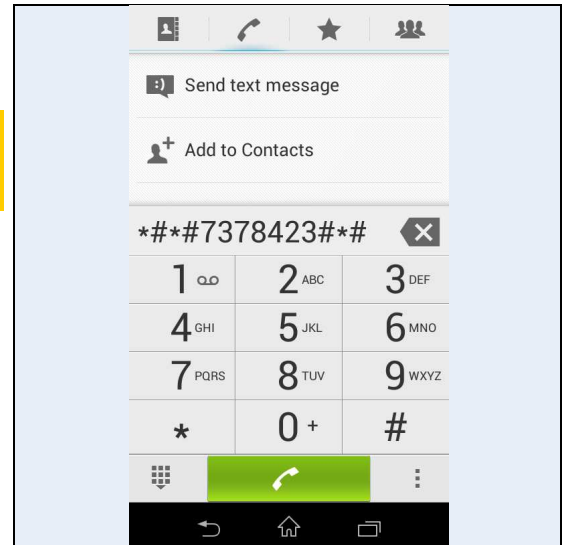
Note: Please make sure the phone is in call setup when pressing these touching keypads to get into the Service menu.

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

Settings -> Power management -> STAMINA

Start up the phone and enter the service menus:

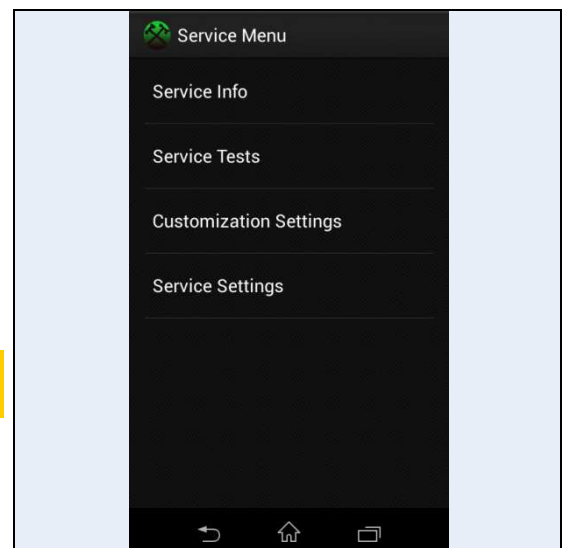
- Press the following keypad combination: ***##7378423##**



- 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

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

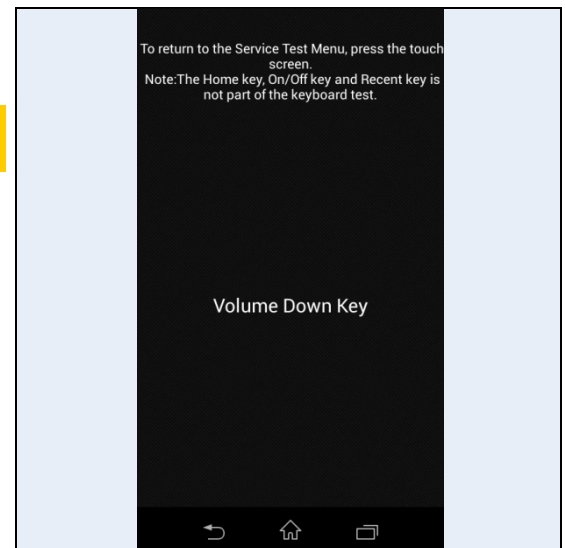
2.2 Service Tests

2.2.1 Keyboard & Switch

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

Press all keys:

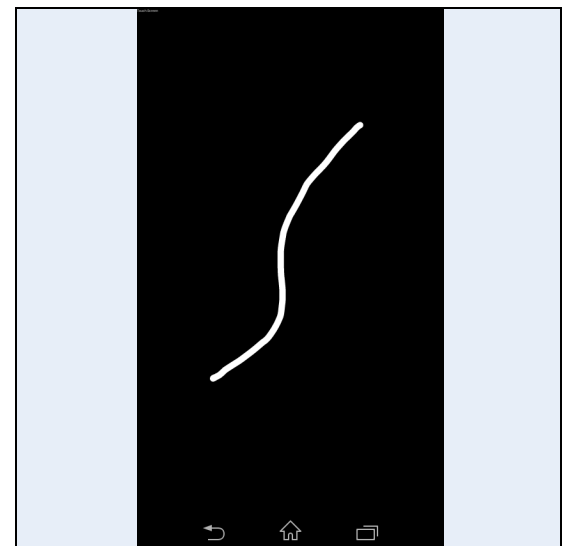
- **Back key:** notification on screen
- **Home key:** will leave the Service tests menu, unlock the unit and reenter the Service tests
- **Multitask key:** taskbar will be shown, press back key to return
- **Power key:** the screen will go black, press the Power key one more time
- **Volume up/ down key:** notification on screen
- **Auto Focus key** and **Camera key:** notification on screen



2.2.2 Touch Screen

Move a finger across the Display, a line will be drawn as you touches the Display.

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



2.2.3 Display

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

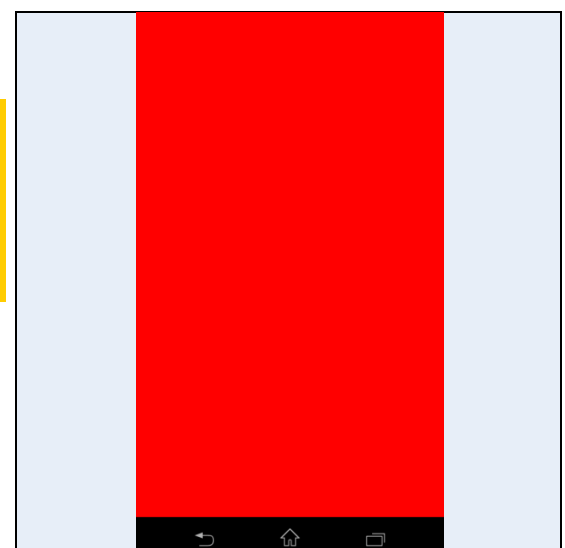
There may be tiny bright dots on the display, called defective pixels and which occur when individual dots have malfunctioned and cannot be adjusted.

Two defective pixels are considered to be acceptable.

The display will show six test patterns of white, black, blue, green, red, and rainbow colors 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.



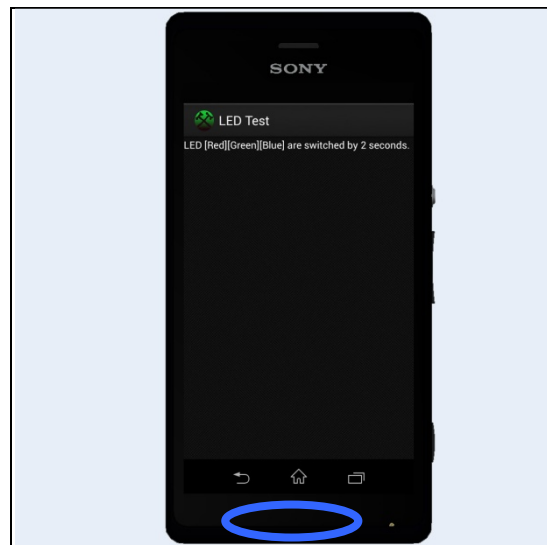
Tests: Service Tests

2.2.4 LED

Check that the:

- Notification LED as shown position by blue circle will show three different colors in the following sequence: red, green and blue. Each color will be shown for two seconds.

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

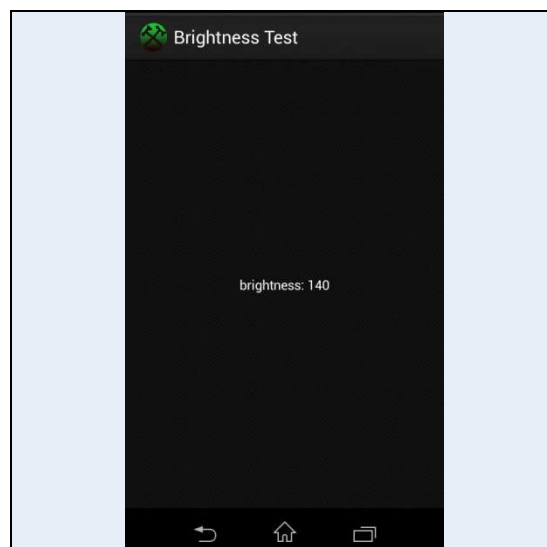


2.2.5 Illumination

Check that the:

- Display backlight illumination should shift from low to high strength back to low again.

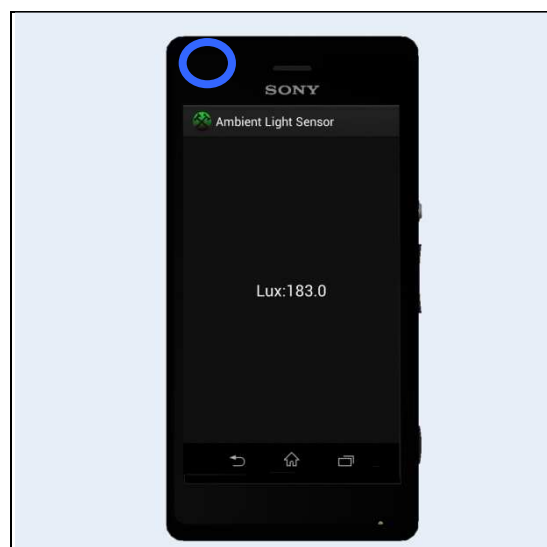
Press the Back key to return to the Service Test Menu.



2.2.6 Light Sensor

The Ambient 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

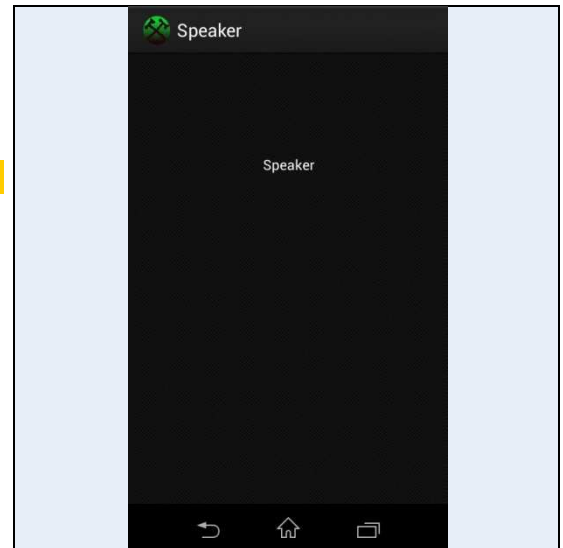
2.2.7 Speaker

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

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

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

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

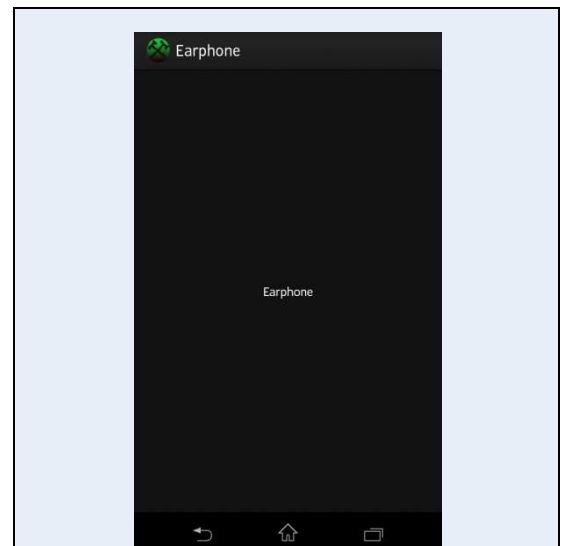


2.2.8 Earphone

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

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

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

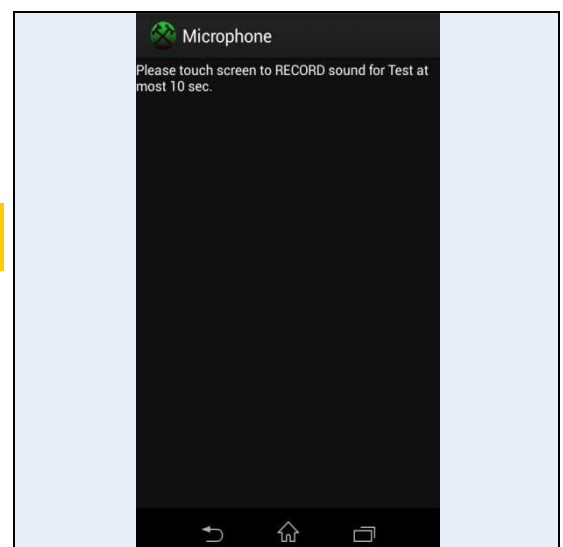


2.2.9 Microphone

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

Step 1: Touch the screen to start recording approximately ten seconds. Speak into the microphone during the 'Microphone Recording' phase.

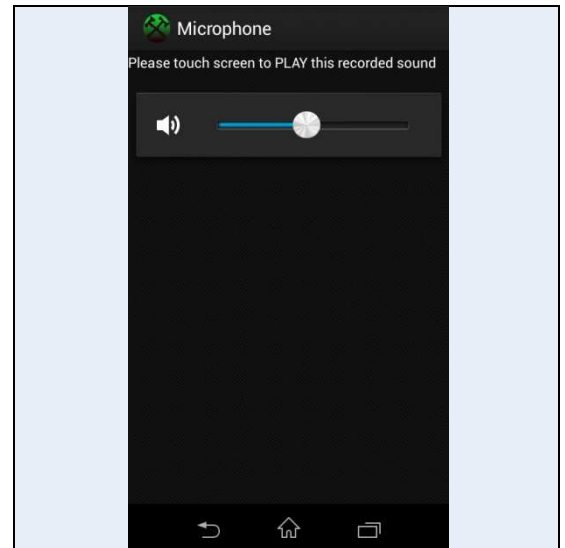
Step 2: Touch the screen to stop recording.



Tests: Service Tests

Step 3: Touch the screen to play the recording. The sound is played back through the Speaker.
Check the quality by listening to the recording from the Speaker during the 'Playing recorded sound' phase at maximum volume.

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

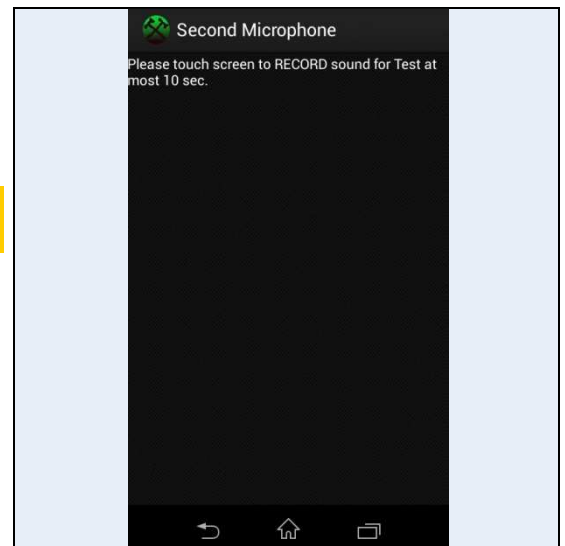


2.2.10 Secondary Microphone

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

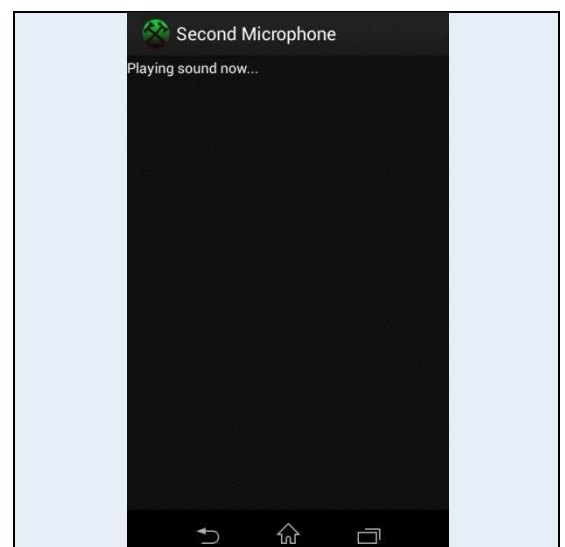
Step 1: Touch the screen to start recording approximately ten seconds. Speak into the microphone during the 'Microphone Recording' phase.

Step 2: Touch the screen to stop recording.



Step 3: Touch the screen to play the recording. The sound is played back through the Speaker.
Check the quality by listening to the recording from the Speaker during the 'Playing recorded sound' phase at maximum volume.

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

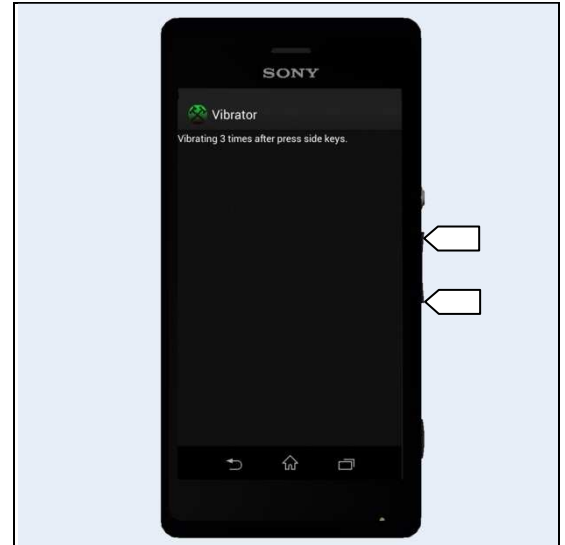


Tests: Service Tests

2.2.11 Vibrator

Press the volume keys and the vibrator gets activated three times.

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



2.2.12 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!

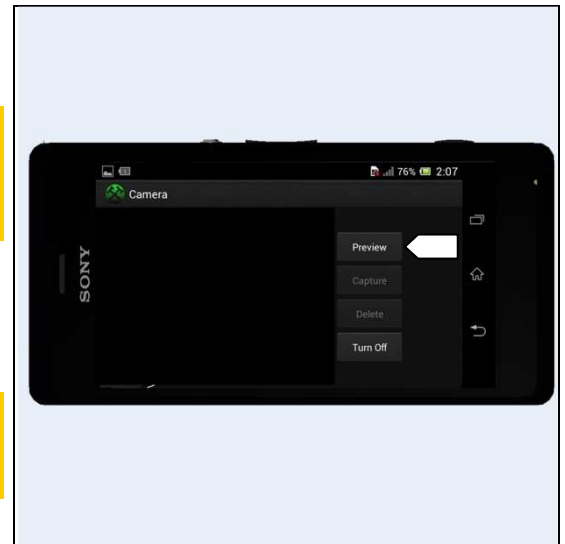
Press Preview to view an object and check the quality of the image shown in the display.

Press Capture to preview the photo's quality about autofocus.

Do the same thing at an object on a different distance to secure that autofocus works!

Photos is taken but not saved during this test!

Press Back key to return to Service Test Menu.



2.2.13 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!

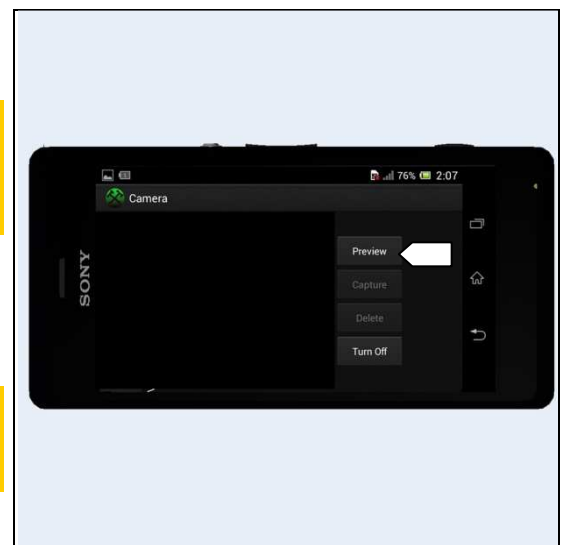
Press Preview to view an object and check the quality of the image shown in the display.

Press Capture to preview the photo's quality about autofocus.

Do the same thing at an object on a different distance to secure that autofocus works!

Photos is taken but not saved during this test!

Press Back key to return to Service Test Menu.



Tests: Service Tests

2.2.14 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, shows OK,

There is a permission request, select 'Allow'.

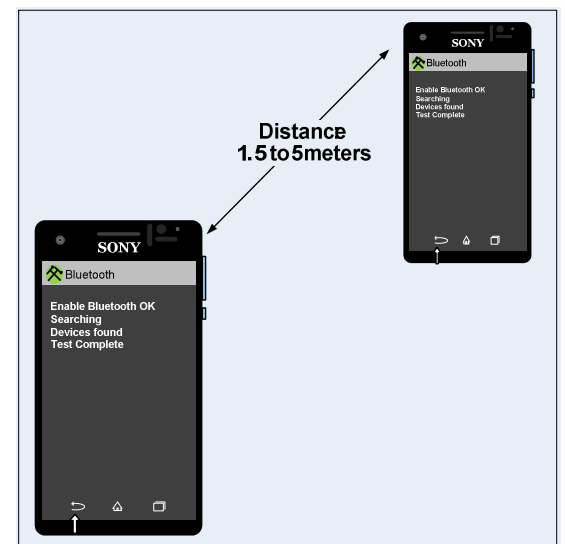
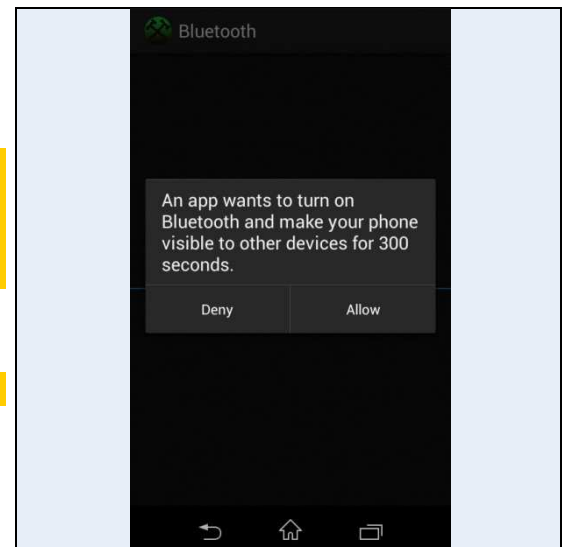
Step 2: Searching

Step 3: Show the Device Found list

Step 4: Select the Target Bluetooth Device,

Step 5: Check the Pairing PIN code on both Target Bluetooth Device and phone, press Pair on both, when succeeded, it shows "Test Complete".

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



2.2.15 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, start searching

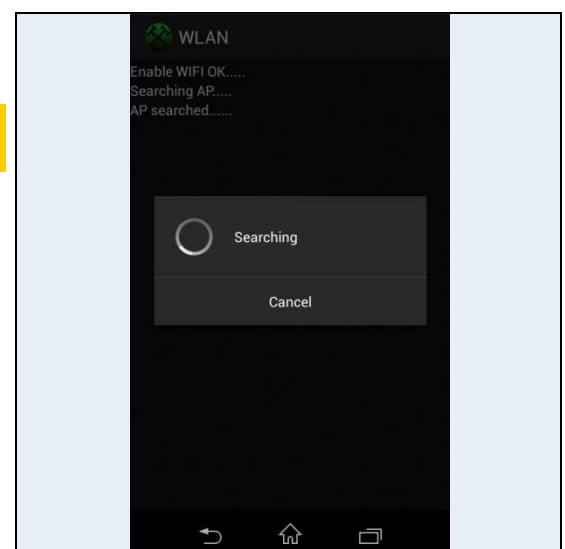
Step 3: Access points Found list

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

2.2.16 GPS

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

If permission is requested, select 'Agree'.

Note: You may have to tap the screen the first time to prevent the screen to go in off mode, since turning screen on with Power key will end the test.

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

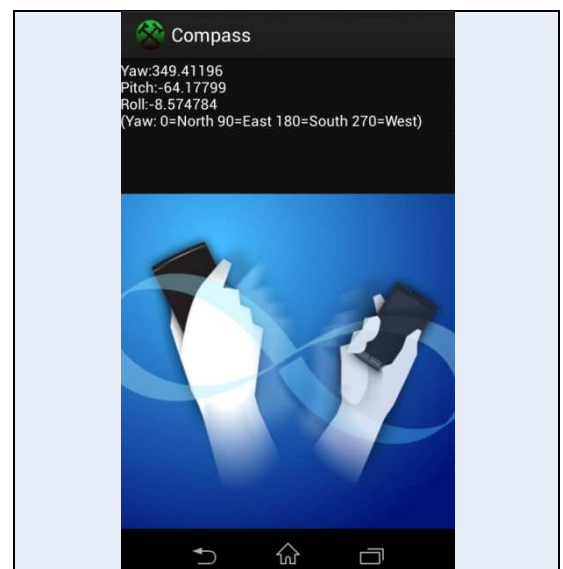
**For GPS testing, refer to
1220-1333: Generic Repair Manual – mechanical**



2.2.17 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.



2.2.18 Accelerometer

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



Tests: Service Tests

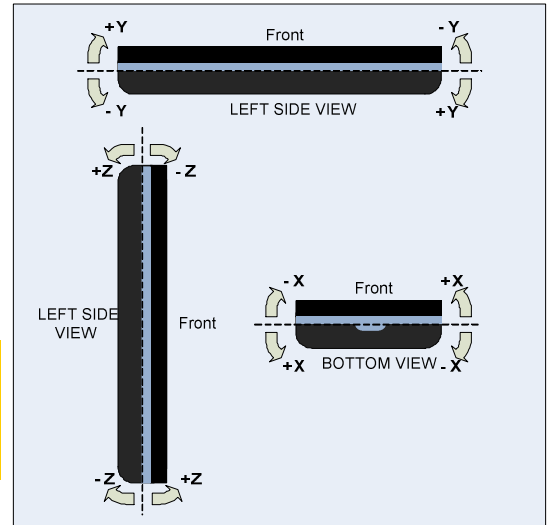
By tilting the phone in various directions, the X: Y: Z values will change in size and polarity depending on the angle and direction as shown in the adjacent picture.

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.

Make sure perform Accelerometer test after G-sensor Calibration.

For G-sensor Calibration, refer to 1277-8589 Trouble Shooting Application

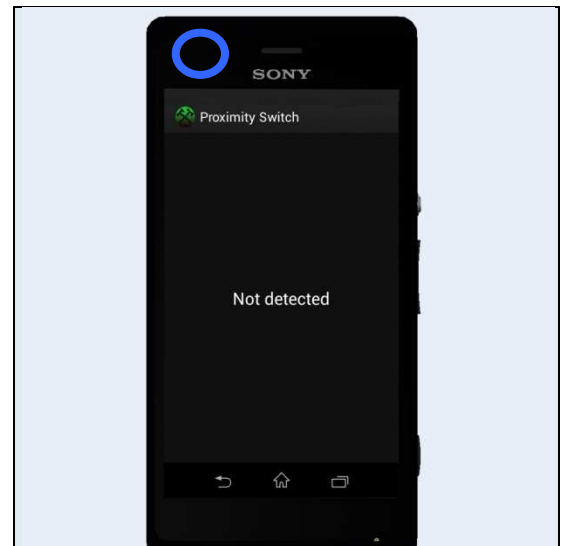


2.2.19 Proximity switch

When entering into the test, the screen shows 'Not detected'

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

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

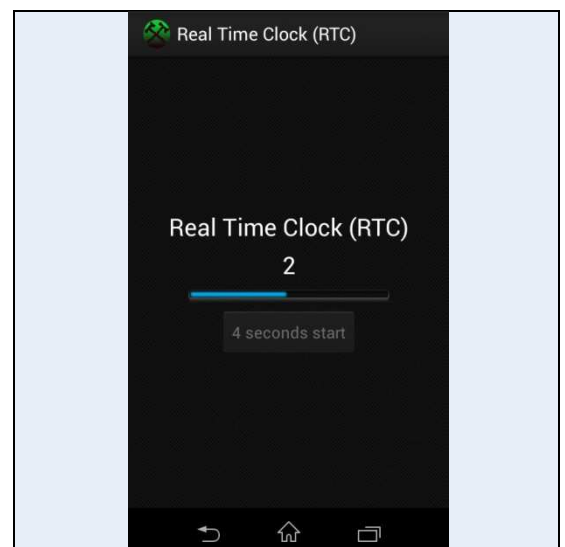


2.2.20 Real time clock

Press the screen to start.

During the actual test the text 'Real time clock test' 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

2.2.21 Total call time

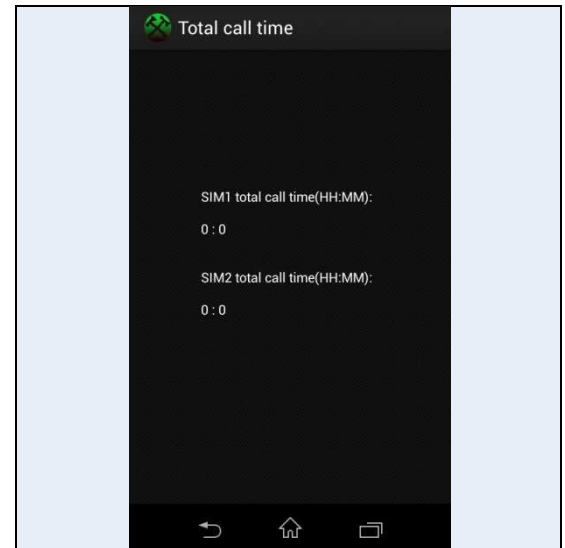
Single SIM:

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

Dual SIM :

Both two SIM Card's total call time are displayed in the format HH:MM:SS (hours: minutes: seconds).

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

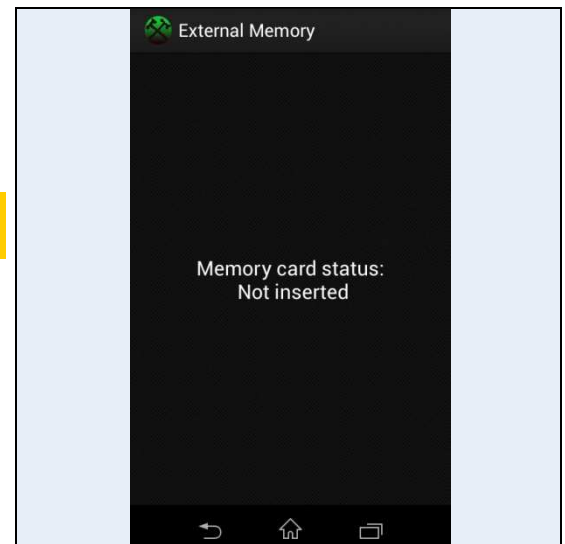


2.2.22 External Memory

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

External Storage (SD Card) is 'Inserted' as shown on the screen.

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

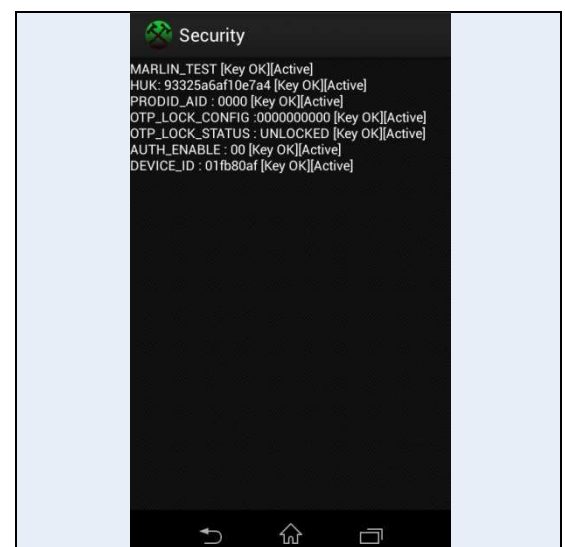


2.2.23 Security

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

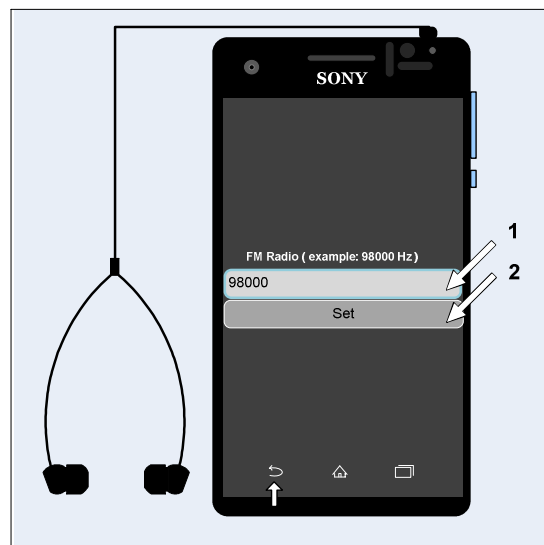
2.2.24 FM radio

Verify that the phone can detect a radio station:

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

Verify that the reception and sound quality is normal.

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



2.2.25 Battery Status Check

Not applicable, do not use.

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

2.2.26 Flip slider counter

Not applicable, do not use.

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

Tests: Service Tests

2.2.27 Verify certificates

Not applicable, do not use.

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

2.2.28 SIM Card Test

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

Single SIM:

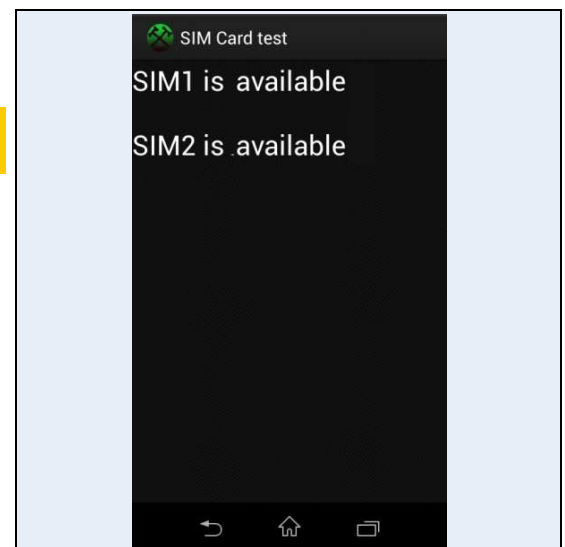
SIM1 should shows "available";

Dual SIM:

SIM1 should shows "available";

SIM2 should shows "available";

Press the Back key to return to Service Test Menu.

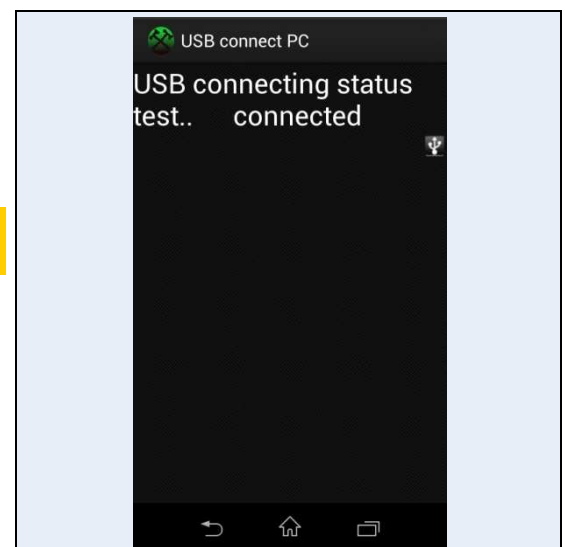


2.2.29 USB Test

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

USB connecting status should shows "Connected";

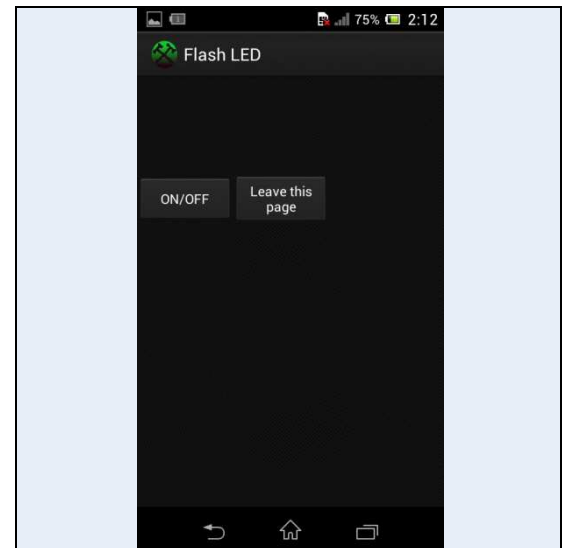
Press the Back key to return to the Service Test Menu.



Tests: Service Tests

2.2.30 Flash LED

Press ON/OFF to turn on/off the Flash LED



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

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



2.2.31 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: After "Tag Reading...Enabled" can be seen on the display, bring a NFC Tag put close to the Label NFC on the Battery Cover.

Step 3: When Tag is identified, a sound will be made and an OK message will be displayed.

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



Tests

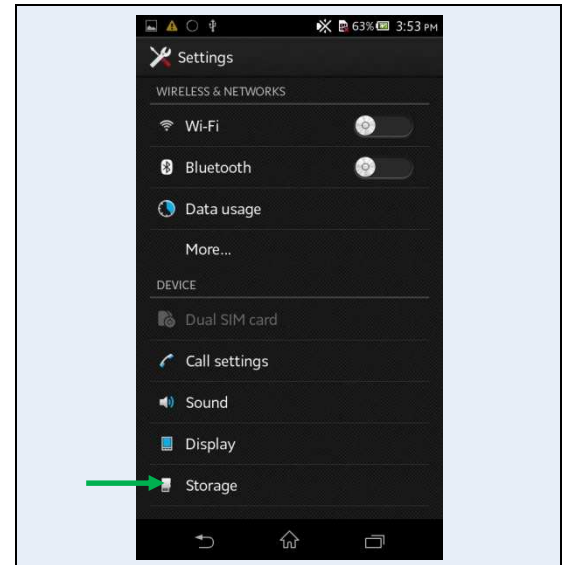
2.3 Manual Tests

2.3.1 Internal Memory Test

Verify that the internal memory performs properly:

Step 1: Press Menu key and go to *Settings*;

Step 2: Press *Storage* and check the storage information;

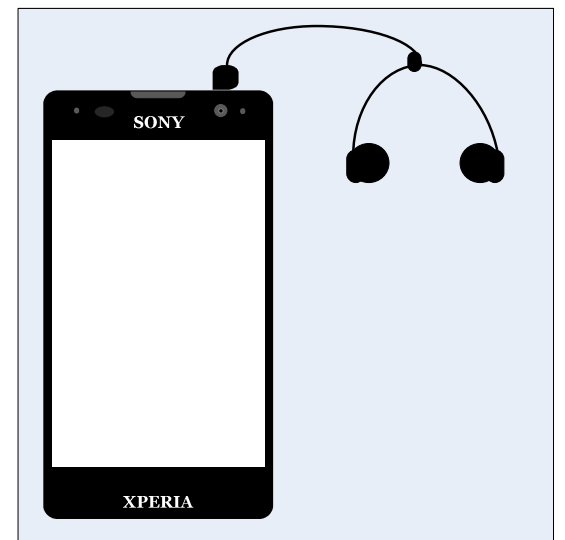


2.3.2 Audio Jack test

Connect a Sony CTIA headset.

Repeat the test of “2.2.7 Speaker”, “2.2.8 Earphone” and “2.2.9 Microphone”.

Make sure that the sound from Headset earphone ports are emitted loud and clear.



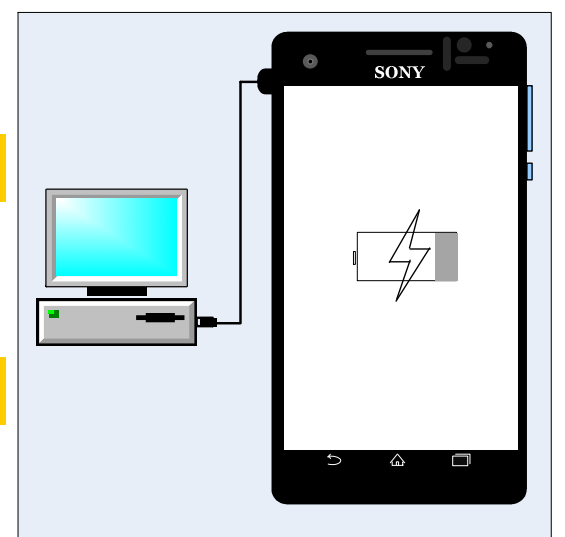
2.3.3 Charging via USB and Easy Charger (Charger or Computer)

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

- 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.

If the battery level is low the icon is not shown until the battery is reaching a certain charging level.

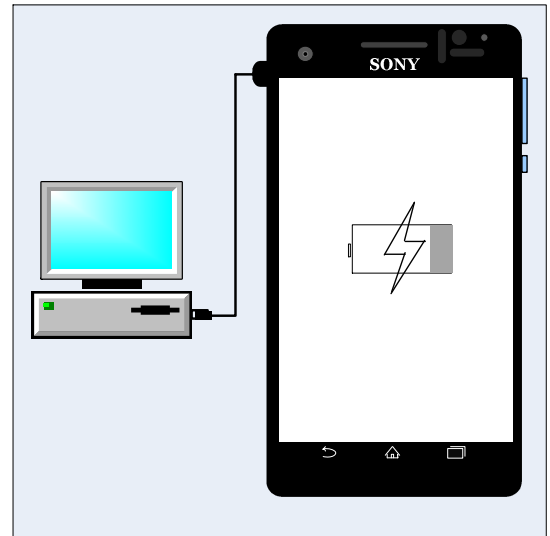
Remove the USB cable from the USB connector and verify that the notification LED and Battery icon no longer indicates charging.



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



Tests: Manual Tests

2.4 Network Test

2.4.1 On-the-air call to mobile (Single SIM)

2.4.1.1 On-the-air call to mobile

GSM

Go to the Setting app:

Settings ⇒ More.. ⇒ Mobile networks ⇒ Network Mode ⇒ 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 '2.4.4 Procedure (GSM & UMTS)' below.

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 '2.4.4 Procedure (GSM & UMTS)'.

2.4.2 On-the-air call to mobile (Dual SIM – SIM1)

GSM

Go to the Setting app:

Step1: *Settings ⇒ Dual SIM setting ⇒ enable SIM1 and disable SIM2*

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 '2.4.4 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 '2.4.4 Procedure (GSM & UMTS)' above.

Tests: Manual Tests

2.4.3 On-the-air call to mobile (Dual SIM – SIM2)

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 '2.4.3 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 '2.4.3 Procedure (GSM & UMTS)' above.

Tests: Manual Tests

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

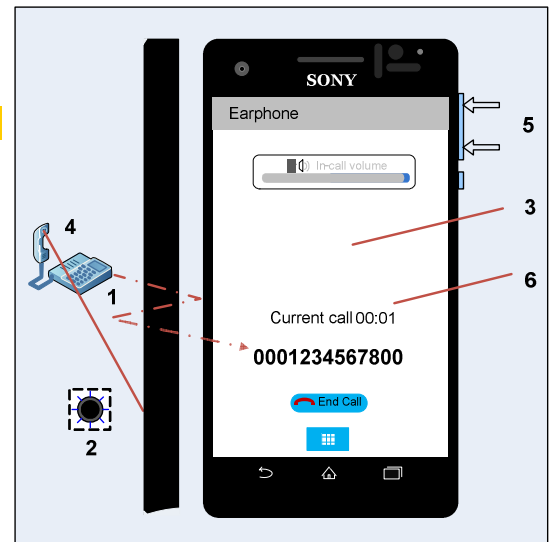
There are different versions of the test depending on whether GSM / UMTS network is available or not!

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

2.4.4 Procedure (GSM & UMTS)

Do the same for both SIMs for Dual SIM phone!

- 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.



3 Revision History

Rev.	Date	Changes / Comments
1	2013-Aug-09	Initial release
2	2013-Sep-11	Update chapter 2.2.18 Accelerometer with reference document 1277-8589