

SONY

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Test Instructions

- mechanical -



Xperia™ ZR

C5502, C5503, M36h

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

1 Pre-Test Preparations

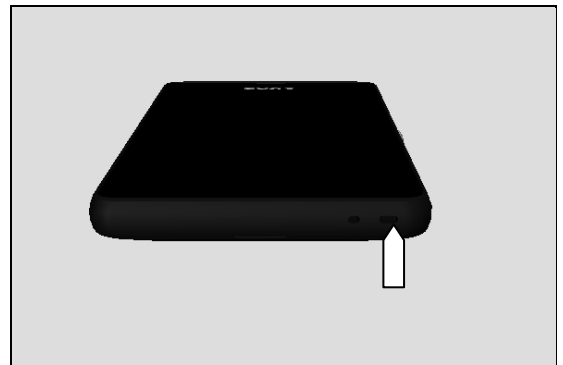
1.1 Process flow – Water Resistance Test (WRT) for incoming units

Follow the process according to 1269-3536 Water Resistant Test for PC - mechanical.

Remove the Panel Side L.



Tape the primary Mic hole on the lower right side ..



.. and 2nd Mic hole on the backside.
Replace the Cover Battery.



Install the *Vacuum Cup* and *WRT Inlay Plate* into the generic *WRT Generic Side Inlay* and attach the *Generic Clamp*.
Connect it according to 1269-3536 Water Resistant Test for PC – mechanical.



Pre-Test Preparations

1.2 Hardware

1.2.1 Water indicator inspection

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

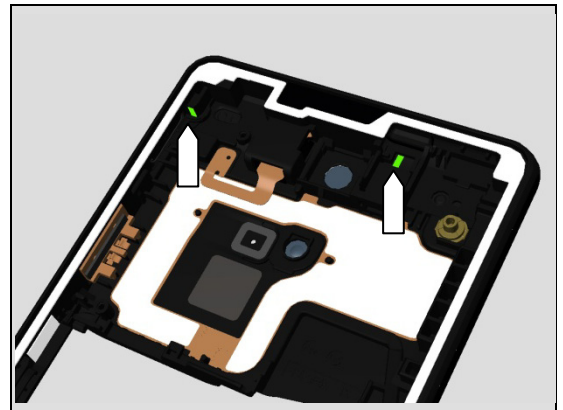
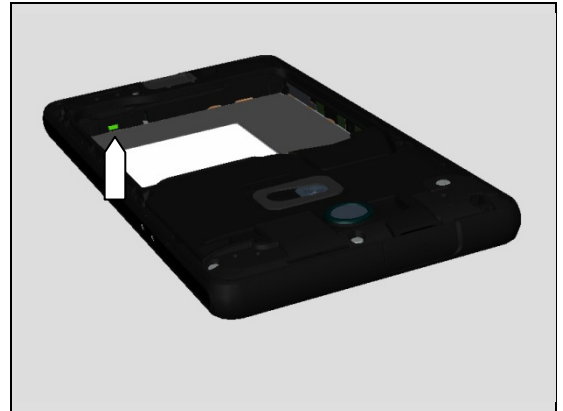
The Water Indicator is located as shown in these pictures.

1. The first is located in the Battery cavity (remove the Cover Battery and the Battery),
2. second one just inside the USB cap above the USB connector.
3. the third one is visible underneath the audio jack after the audio cap has been opened up.

All three can be observed without any major disassembly of the unit.

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

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



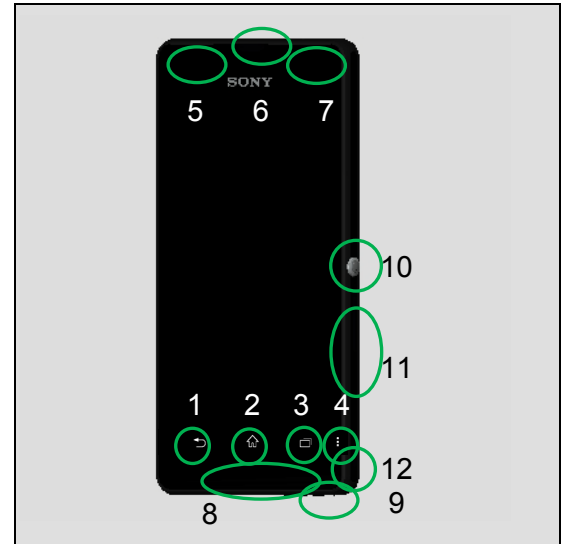
Pre-Test Preparations

1.2.2 10BTest 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. Menu key
5. Secondary Camera
6. Earphone
7. Ambient Light Sensor & Proximity Switch
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

1.3 Software

1.3.1 Software update

1.3.1.1 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

1.3.1.2 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

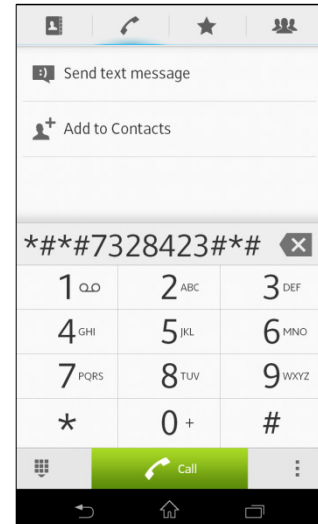
Note: Please make sure the phone is in call setup when pressing these touching keypads to get into the Service menu.

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:

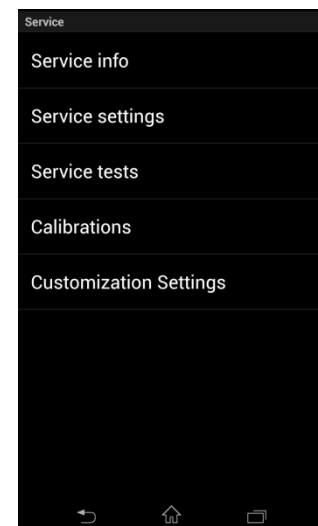
- Press the following keypad combination: ***##7378423##**



- 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

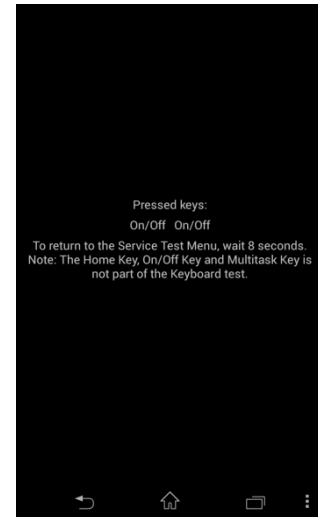
2.2 Service Tests

2.2.1 Keyboard & Switch

To return to the Service Test Menu, wait for 8 seconds.

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
- **Menu key:** notification on screen
- **Power key:** the screen will go black, press the Power key one more time
- **Volume up key:** notification on screen
- **Volume 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.

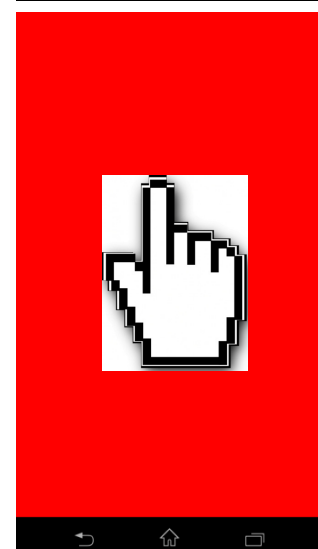
There may be tiny bright dots on the display, called defective pixels and which occur when individual dots have malfunctioned and cannot be adjusted.

Two defective pixels are considered to be acceptable.

Touch the display using a finger. With every touch, the display will show six test patterns of white, black, red, green, blue 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.



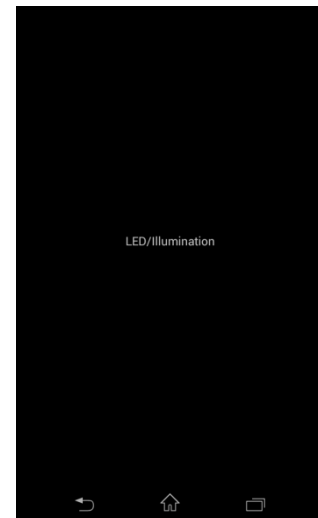
Tests: Service Tests

2.2.4 LED/Illumination

Check that the:

- Display backlight illumination should shift from low to high strength back to low again.
- Notification LED in the lower part of the display will show three different colors in the following sequence: red, green and blue. Each color will be shown twice.
- The illumination of back, home and multitask keys will follow the backlight illumination of the display.

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



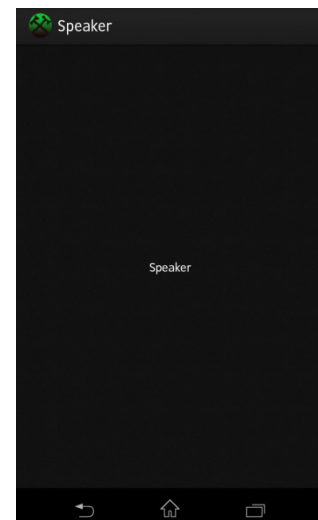
2.2.5 Speaker

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.

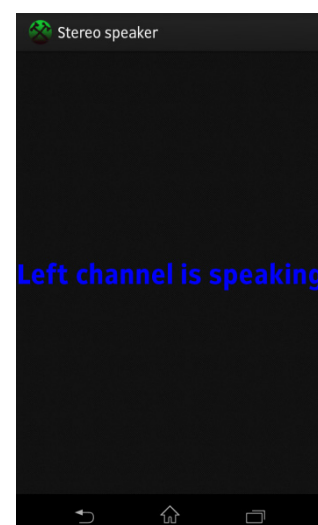
Press the Back key to return to the Service Test Menu.



2.2.6 Stereo speaker

Not applicable, do not use.

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



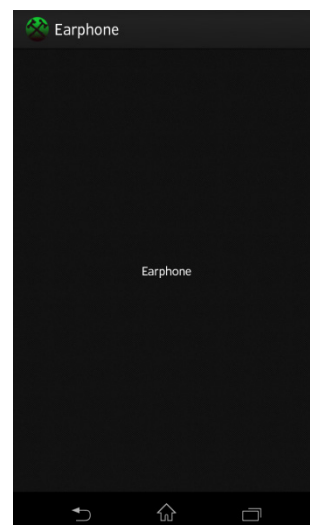
Tests: Service Tests

2.2.7 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.

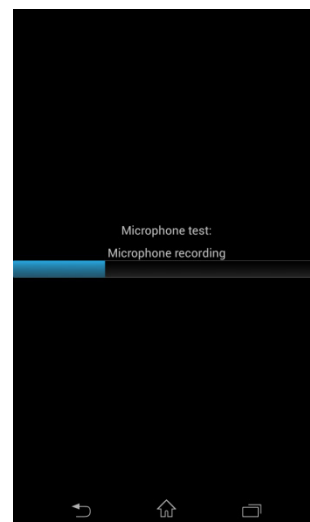
Press the Back key to return to the Service Test Menu.



2.2.8 Microphone

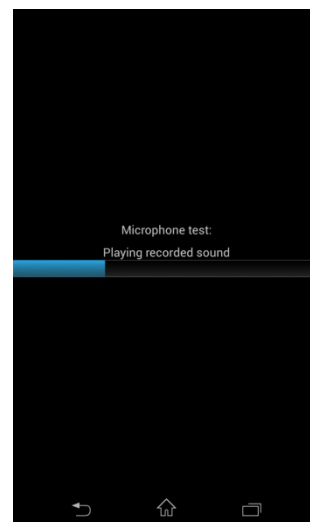
The previous 'Speaker' test must have been successfully carried out before doing this test.

The phone will start to record and after approximately ten seconds the sound is played back through the Speaker. Speak into the microphone during the 'Microphone Recording' phase.



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

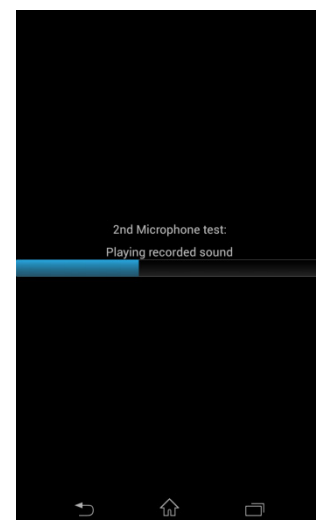
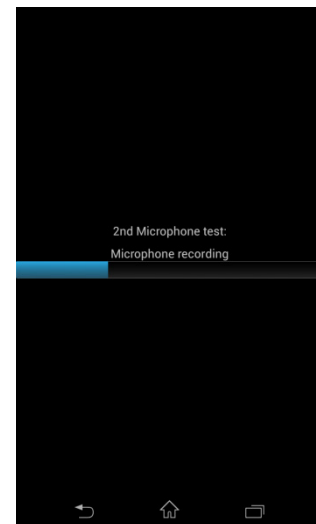
2.2.9 Secondary Microphone

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 Speaker. Speak into the secondary microphone during the 'Microphone Recording' phase.

Check the quality by listening to the recording from the Speaker during the 'Playing recorded sound' phase at maximum volume.

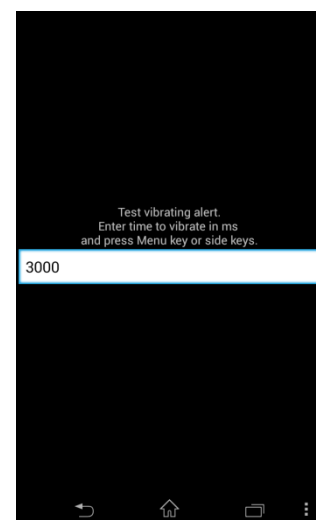
Press the Back key to return to the Service Test Menu.



2.2.10 Vibrator

Press the menu key or volume keys to start the vibrator test. It is possible to modify the duration of this test.

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



Tests: Service Tests

2.2.11 Camera

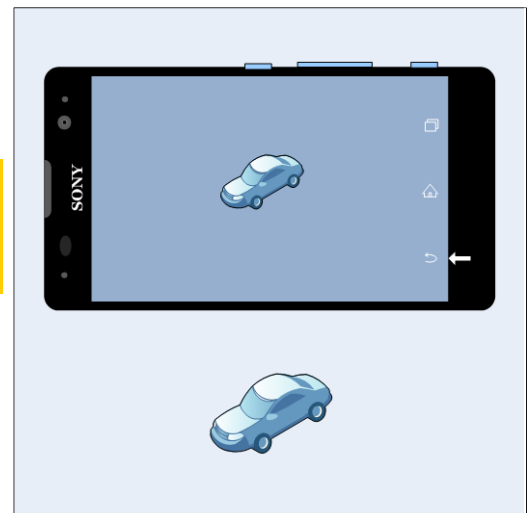
See Manual Test below: Camera.

2.2.12 Secondary 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 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.

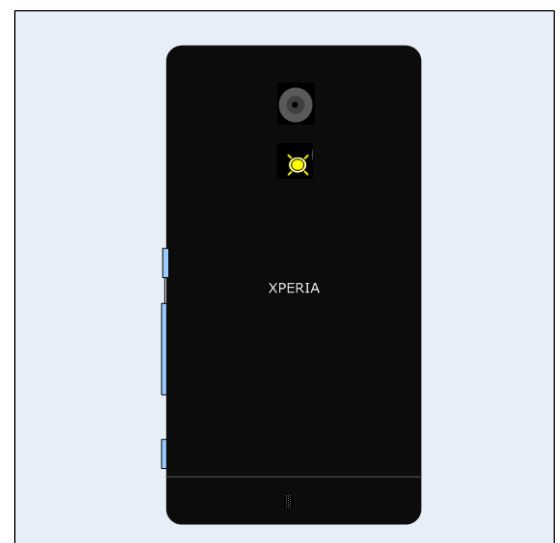


Only symbolic view

2.2.13 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.



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 'Yes'.

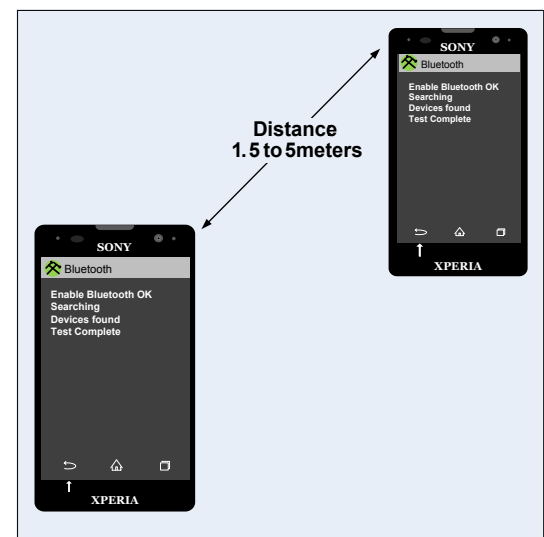
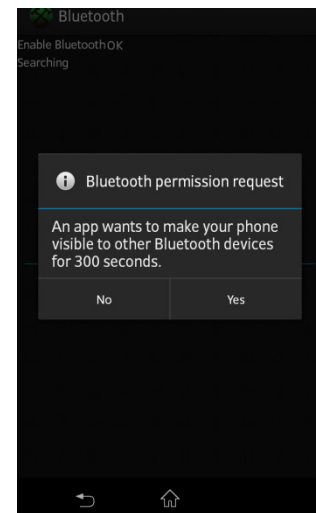
Step 2: Searching,

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.



Only symbolic view

Tests: Service Tests

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, wait 4-5 seconds, shows OK

Step 2: Searching

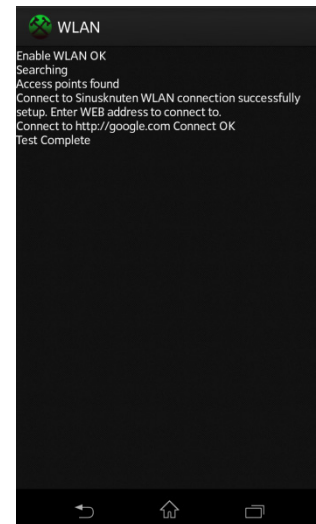
Step 3: Access points Found list

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.



2.2.16 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:

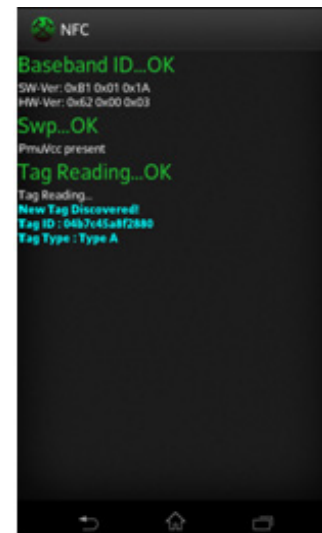
Step 1: Select "NFC"

Step 2: NFC Diag Test

Step 3: After "Tag Reading...Enabled" can be seen on the display, bring a NFC Tag close to the Label NFC on the Cover Battery.

Step 4: 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.



2.2.17 GPS

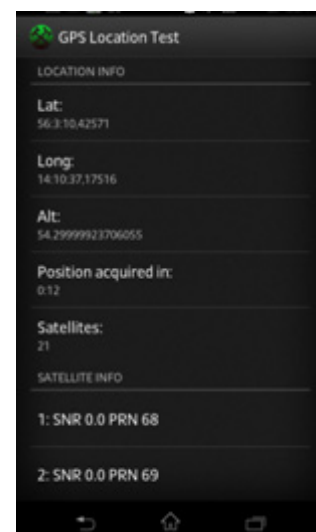
Enter the GPS Location Test, and wait for the GPS location data.

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

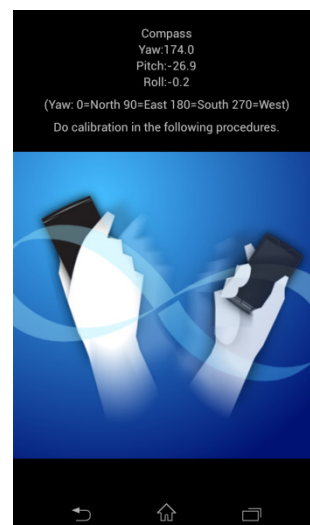


Tests: Service Tests

2.2.18 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.



2.2.19 Accelerometer

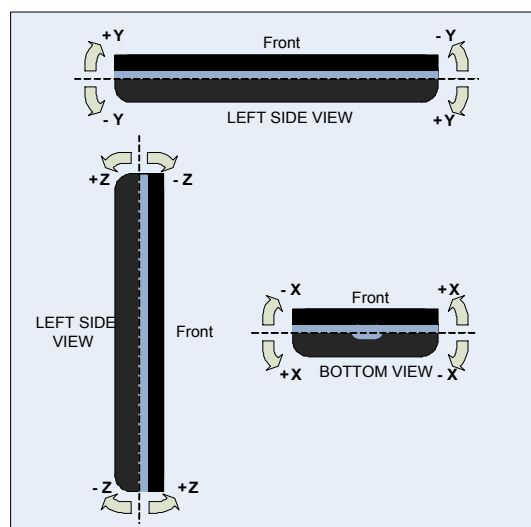
The accelerometer test displays the actual position of the phone as a 3D coordinate X: Y: Z.



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.

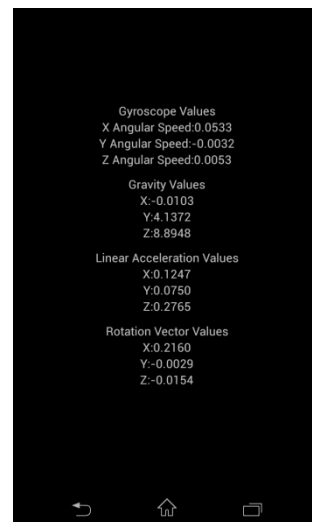


Tests: Service Tests

2.2.20 Gyroscope

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

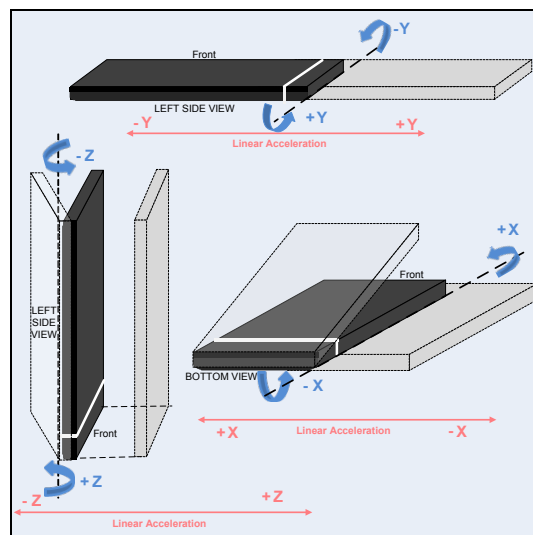
Check by moving the phone that the X: Y: Z values shown in the display are in accordance with the moving.



Check “Gravity Values” “Linear Acceleration Values” “Rotation Vector Values” and “Gyroscope Values” by moving the phone:

“Gravity Values” can be refer to Accelerometer;
 “Linear Acceleration Values” and “Rotation Vector Values” are in accordance with the action shown in the picture.
 “Gyroscope Values” are updated while moving the phone.

Press Back key to return to the Service Test Menu.

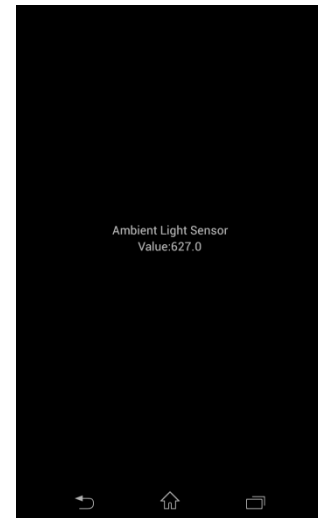


Tests: Service Tests

2.2.21 Ambient Light Sensor

The Ambient light 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.



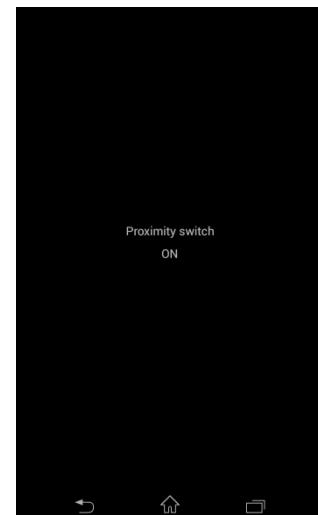
2.2.22 Proximity switch

***The previous '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 'Proximity switch OFF' and a tone is emitted.

When covering the proximity switch area, the screen will show 'Proximity switch ON' with a different type of tone.

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



Tests: Service Tests

2.2.23 Pressure Sensor

Not applicable, do not use.

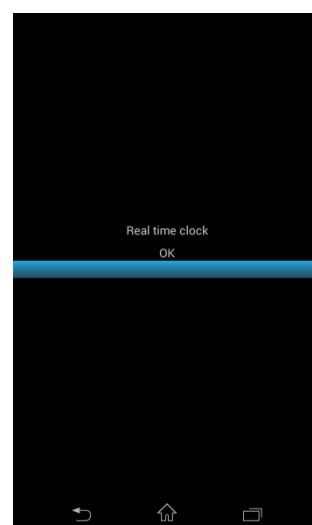
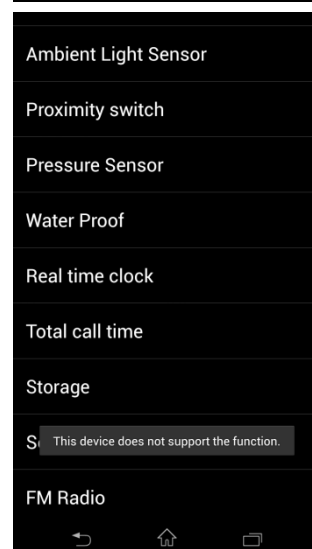
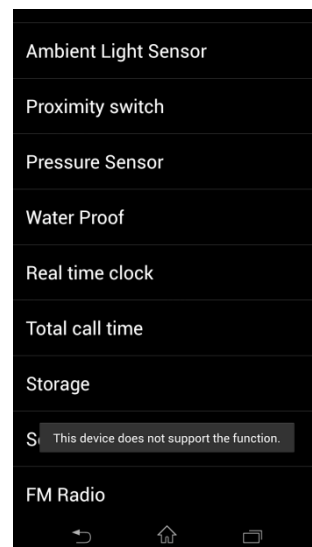
2.2.24 Water Proof

Not applicable, do not use.

2.2.25 Real time clock

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

2.2.26 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.

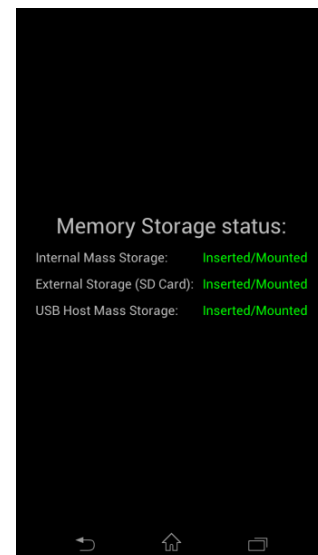


2.2.27 Storage

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

- Internal Mass Storage is 'Inserted/Mounted' as shown on the screen.
- External Storage (SD Card) is 'Inserted/Mounted' as shown on the screen.
- The USB Host Mass Storage is 'Inserted/Mounted' as shown on the screen.

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



2.2.28 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.



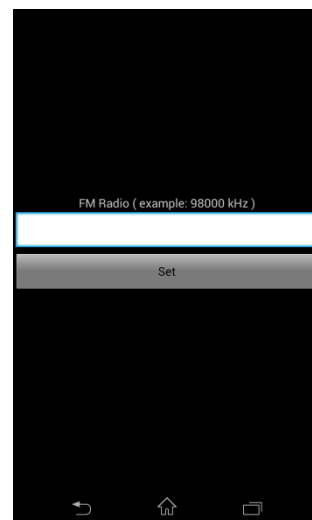
Tests: Service Tests

2.2.29 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.



2.2.30 Battery Health test

Not applicable, do not use.

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



2.2.31 Flip slider counter

Not applicable, do not use.

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



Tests: Service Tests

2.2.32 Verify certificates

Not applicable, do not use.

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

```
Using dummy applications.
Category: Media
Pkg name: com.sonyericsson.
verifycertificatesdummyapp.media
Subject:
CN=Sony_Ericsson_E_Media_Signing_Li
ve_864f,O=Sony Ericsson Mobile
Communications AB,C=SE
Thumbprint: 82 36 68 49 c1 38 35 8a
1b 8e 72 6f 0b 19 f9 6f 7f 85 d9 3f

Category: Shared
Pkg name: com.sonyericsson.
verifycertificatesdummyapp.shared
Subject:
CN=Sony_Ericsson_E_Shared_Signing_L
ive_864f,O=Sony Ericsson Mobile
Communications AB,C=SE
Thumbprint: 1b a0 df de 6f 7e e2 99 7b
b2 36 00 b6 7c 28 bf b5 00 e8 44

Category: Platform
Pkg name: com.sonyericsson.
verifycertificatesdummyapp.platform
```

2.2.33 IrDA Test

Not applicable, do not use.

```
Total call time
Storage
Security
FM Radio
Battery Health test
Flip slider counter
Verify certificates
IrDA Test app doesn't exist
TV-Out Test
```

Tests: Service Tests

2.2.34 TV-Out Test

MHL adapter, HDMI Type A Cable, charger and TV should be connected with the phone before the start of this test!

Press 'TV-Out On'.

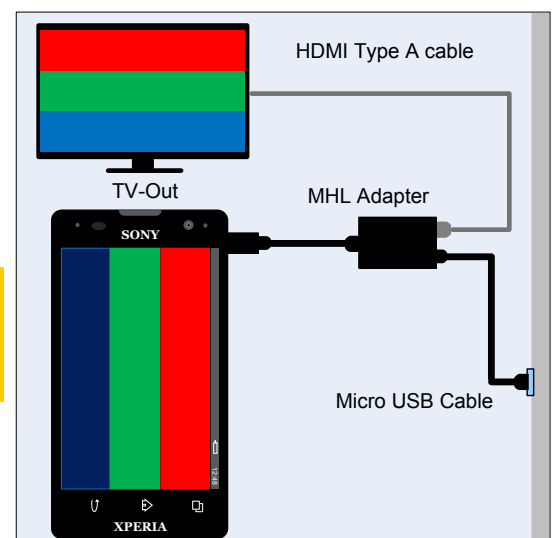
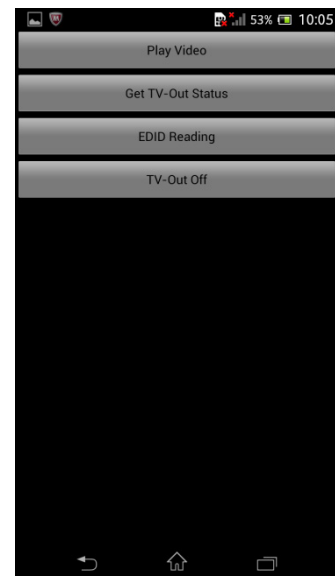
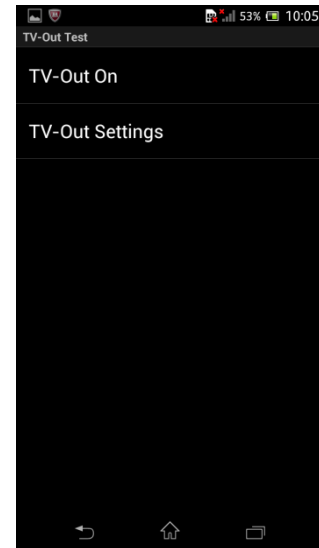
(TV-Out Settings is usually not needed since the unit should be in automatic resolution and the TV-Out monitor should set the resolution automatic. If you get no picture on the TV-Out monitor you can try different resolutions under TV-Out Settings.)

Step 1: Attach cable between phone and TV-Out;

Step 2: Press 'Play Video'.

Receive a test tone and a red-green-blue test picture in the TV-Out Monitor and phone.

Note: If the TV-Out Monitor doesn't automatically indentify the picture, the Monitor may require to set the TV-Out port chosen as source manually in the Monitors menus.



Tests: Service Tests

Press 'Get TV-Out Status':

You should now get:

Power Status: Active

HPD Status: H

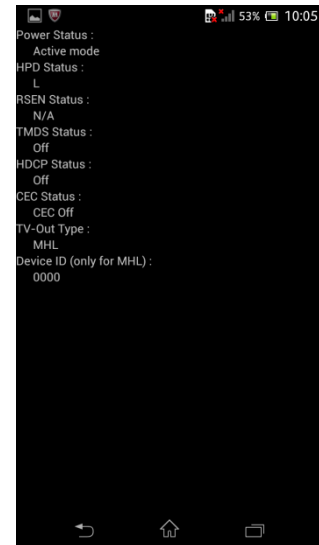
RSEN Status: L or H (Might differ between TVs)

TDMS Status: On

HDCP Status: On

CEC Status: Active

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

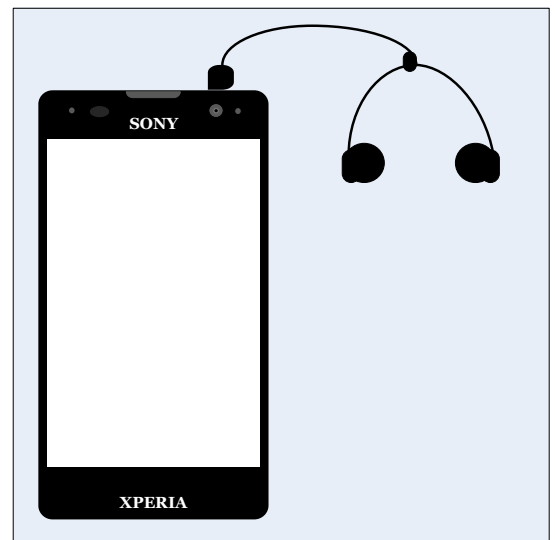


2.2.35 Audio Jack test

Connect a Sony CTIA headset.

Repeat the test of "2.2.5 Speaker", "2.2.7 Earphone" and "2.2.8 Microphone".

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



Tests

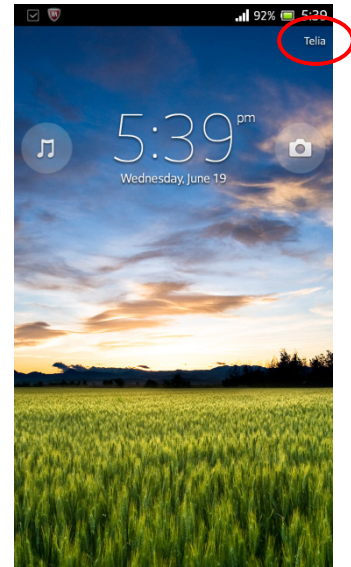
2.3 Manual Tests

2.3.1 SIM

Verify that the phone can detect a SIM card:

- Insert a Micro SIM card, and start the phone.
- If the SIM card is detected by the phone, the start-up procedure will continue.
- Pull down the Status Bar (put finger next to the receiver and drag the menu down from the Status Bar) to see SIM card operator name displayed in the lower part of the Status Bar.
- The SIM card operator name will also be displayed in the upper right corner when phone is in Lock status.
- If not detected, the message 'Emergency call only' will be displayed instead in the pull down Status Bar.

Press Back key to return to Standby Menu.

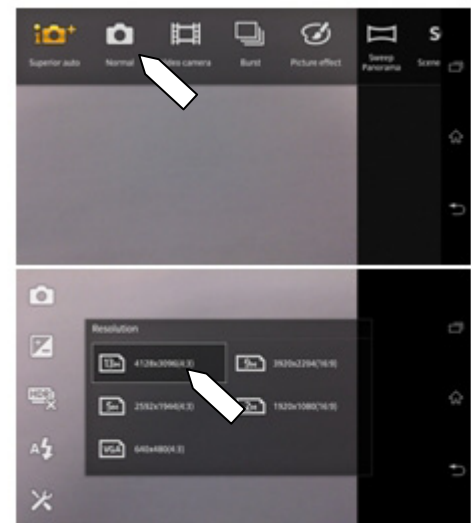


Tests: Manual Tests

2.3.2 Camera

Start the Camera app.

1. Tap Camera icon top left corner and chose Normal
2. Tap Settings icon in bottom left corner set Resolution to the highest available resolution in 4:3 format.

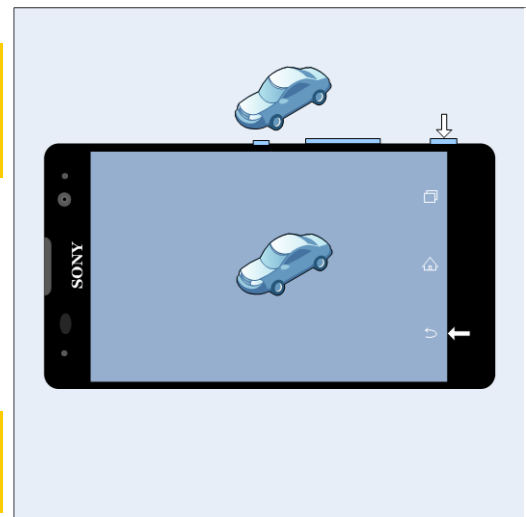


Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

Test 1: Aim the camera (located back of the phone) at an object and check the quality of the image shown in the display.

Take photo, tap the picture icon top right corner and check the quality of the image shown in the display, zoom in to check any suspected problems

Do the same thing at an object on a different distance to secure that autofocus works! Verify if any indicated problem appear in the same position in the picture.



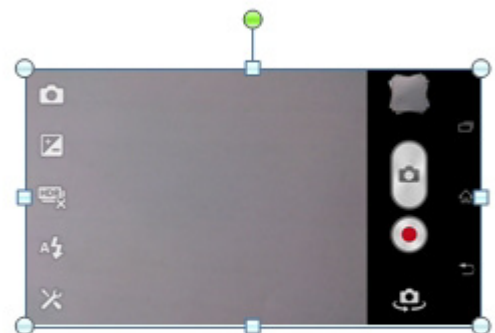
Only symbolic view

Test 2: Aim the camera at a white paper in good light conditions and take photo.

Tap the picture icon top right corner and check the quality of the image shown in the display, zoom in to check any suspected problems.

If a bad pixel etc. is indicated, check lens and paper and take second picture to verify the problem is in the same position in the picture and not due to external conditions.

Delete photos taken during this test!



Tests: Manual Tests

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

Verify that the phone can charge the battery via 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.

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 system connector and verify that the notification LED and Battery icon no longer indicates charging.

Attach the phone to Easy Charger.

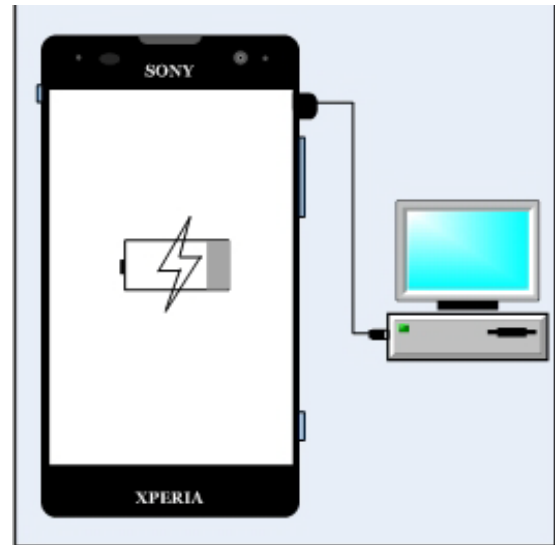
- Verify that the phone is being charged by the notification LED and Battery icon in the display.

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

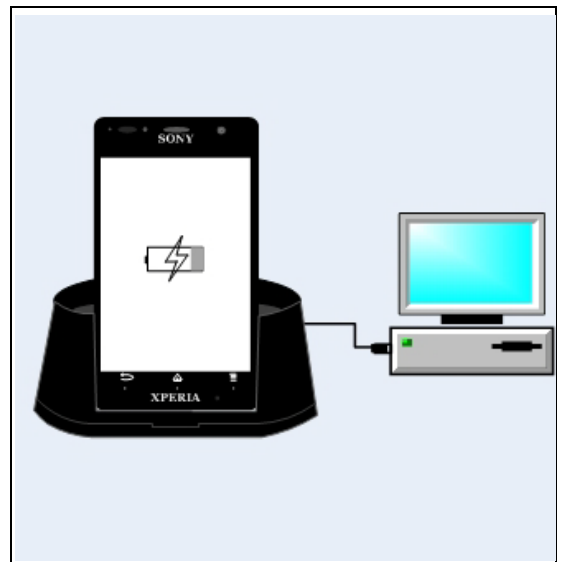
The Notification LED color status is depended on battery remaining capacity:

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

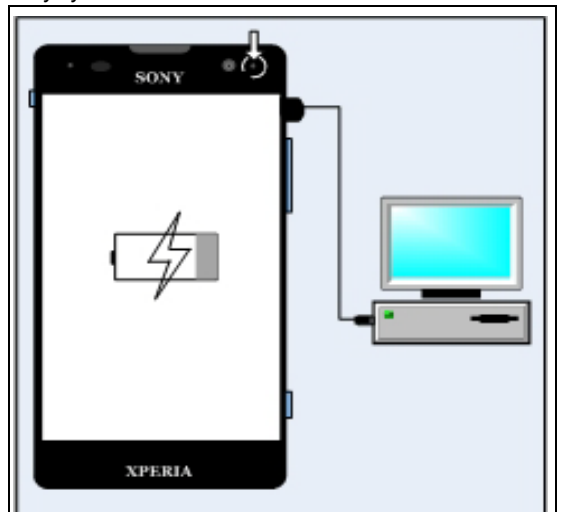
If above fails, perform below Diagnostic Battery/ Charging Status check.



Only symbolic view



Only symbolic view

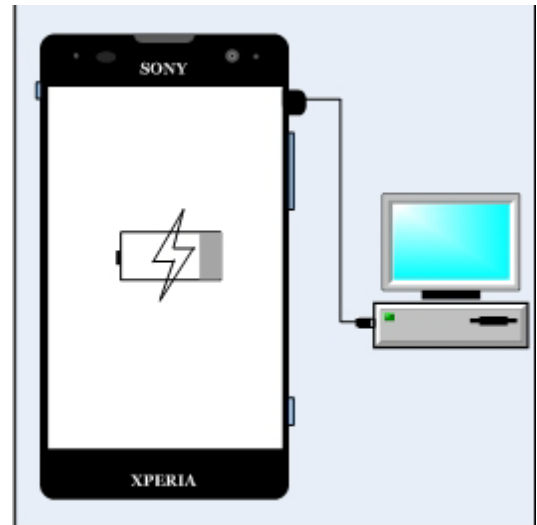


Only symbolic view

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

Tests: Manual Tests

2.3.5 Network Test

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

**There are two versions of the test depending on whether a UMTS network is available or not!
If a UMTS network is available, the network test has to be done separately for GSM and UMTS!**

2.3.5.1 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 '2.3.5.2 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 '2.3.5.2 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*

2.3.5.2 Procedure (GSM & UMTS)

Step 1: Set up a call from a landline phone (PSTN).

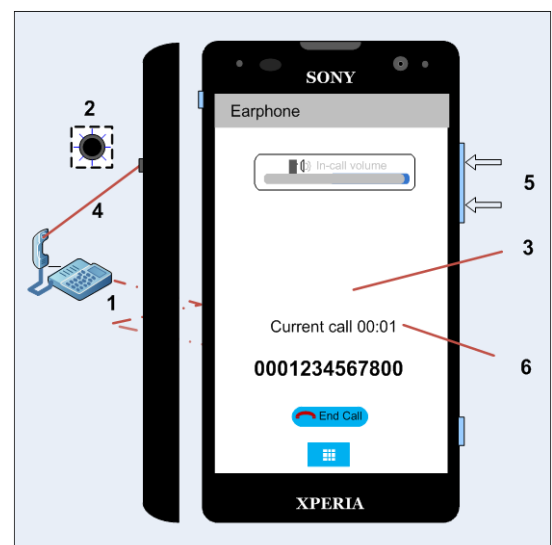
Step 2: Check that there is a ring signal.

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

3 Revision History

Rev.	Date	Changes / Comments
1	2013-June-14	Initial release
2	2013-June-19	Updated due to system failure.