

SONY

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Test Instructions

- mechanical -



Xperia™ Z2a
D6563

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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

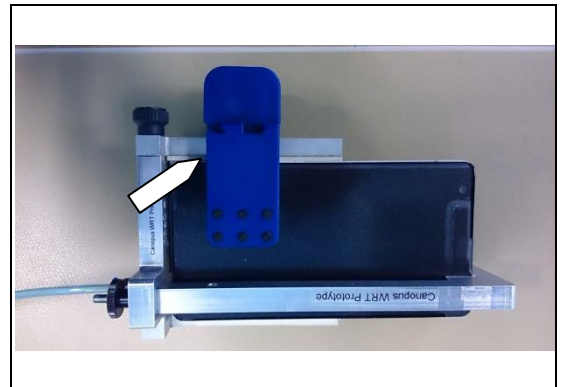
Follow the process according to 1269-3536 Water Resistant Test for PC - mechanical in the including document Test Instruction WRT.

Secondary microphone hole on the top need to be sealed!



Install the “WRT Inlay plate” into the generic “WRT Generic Side Inlay”
Make sure the arm is aligned to the side without gasket (arrow in picture)
Fix it in place with the red Generic Clamp.

Connect phone 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 1st indicator is located as shown in this picture beside the USB connector.



The 2nd indicator is located as shown in this picture beside the SIM card holder.



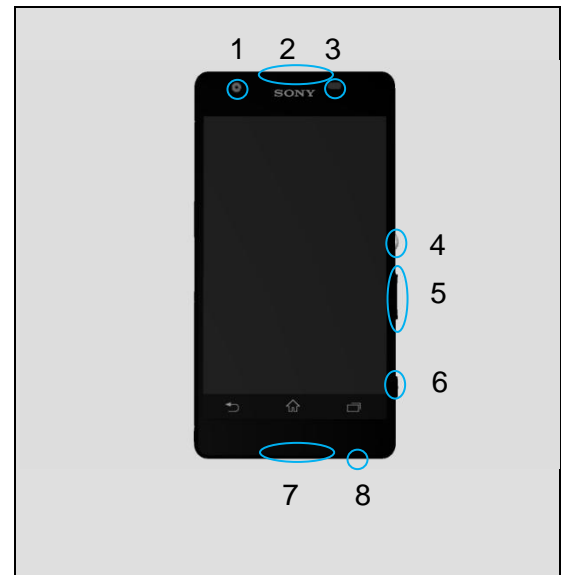
Pre-Test Preparations

1.3 Test Enablers

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

Front:

1. Secondary Camera
2. Earphone / Speaker and Notification LED.
3. Ambient Sensor, Proximity Switch
4. On/Off Key
5. Volume up/down Key
6. Camera key
7. Speaker
8. Microphone



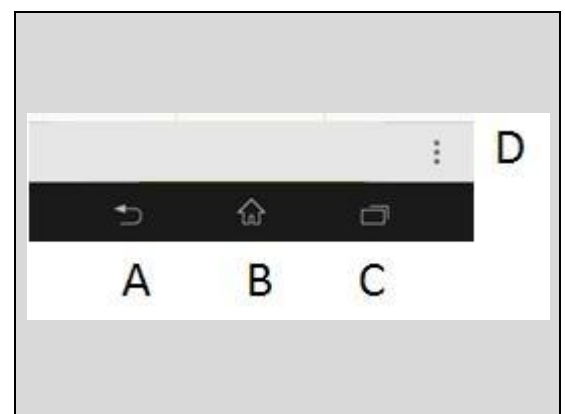
Back:

9. Audio Jack
10. Secondary Microphone
11. Camera
12. Flash LED
13. NFC
14. Magnetic connector (to dock)

6



- A. Back key
- B. Home key
- C. Task key
- D. Menu key



Pre-Test Preparations

1.4 Software

1.4.1 Software update

1.4.1.1 Software version verification

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

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

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

1.4.1.2 Software version update

Mandatory first repair action!

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

Ensure the phone is powered off and proceed as follows:

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

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

See also emma User Guide info.

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

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

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

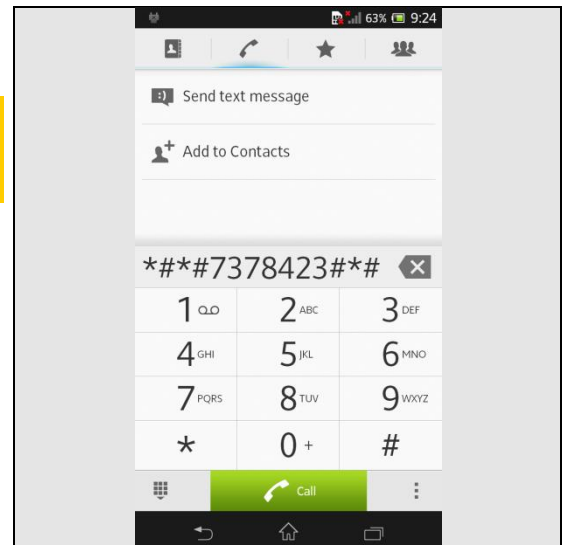
2 Tests

2.1 Service Test Mode

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

Settings -> Power management -> STAMINA mode

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



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

Service settings: Do not use

Service test: Follow instruction below

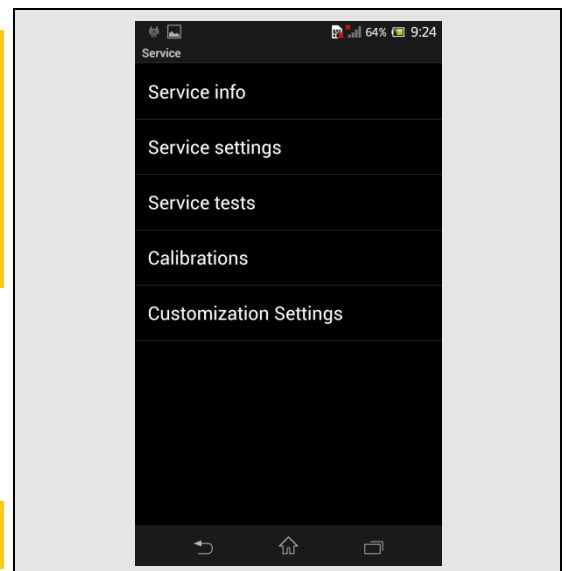
Calibration: Do not use

Customization Settings: Do not use.

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

For more information, refer to

1220-1333: Generic Repair Manual - mechanical



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

Tests

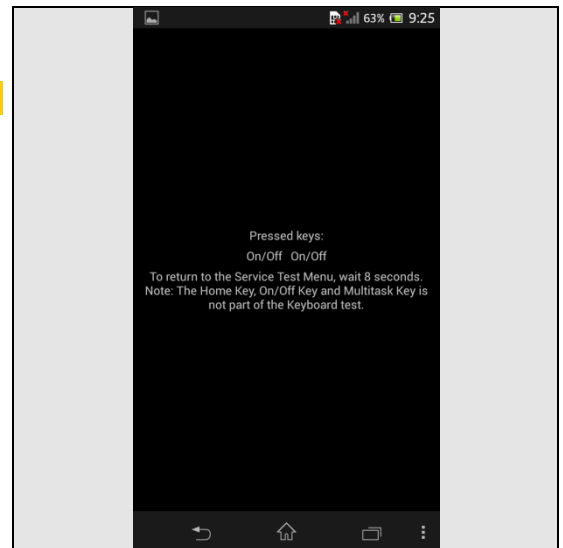
2.2 Service Tests

2.2.1 Keyboard & Switch

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,
- **Task navigation key:** taskbar will be shown, press Service Menu 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 / Camera key:** notification on screen

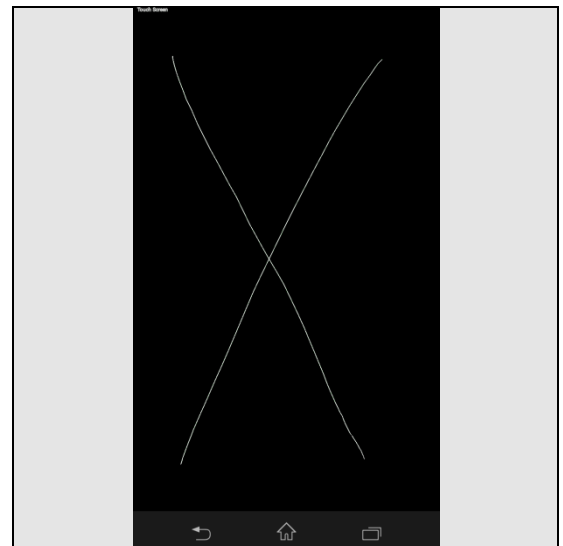


2.2.1 Touch Screen

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

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

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



2.2.2 Display

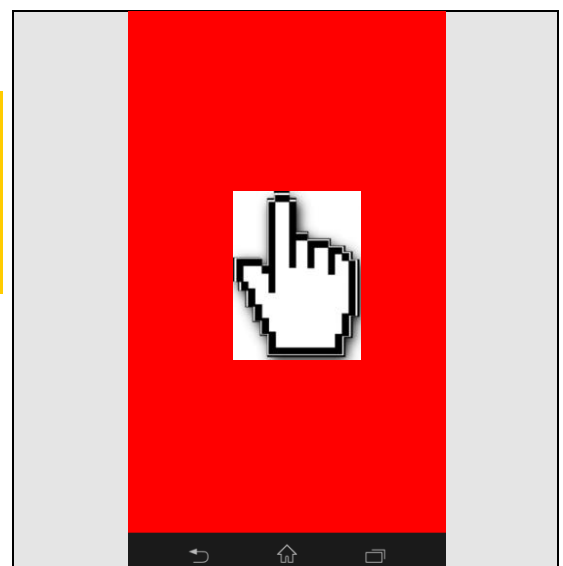
Minor variations in the display's brightness and color may occur between phones.

If any tiny bright dots on the display are found, this indicates defective pixels which occur when individual dots have malfunctioned and cannot be adjusted.

Two defective pixels are considered to be acceptable.

Touch the display using a finger. With every touch, the display will show Nine test patterns of White, Gray, Black, Red, Green, Blue, Rainbow Colors, Cross-Line, TV Pattern 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.



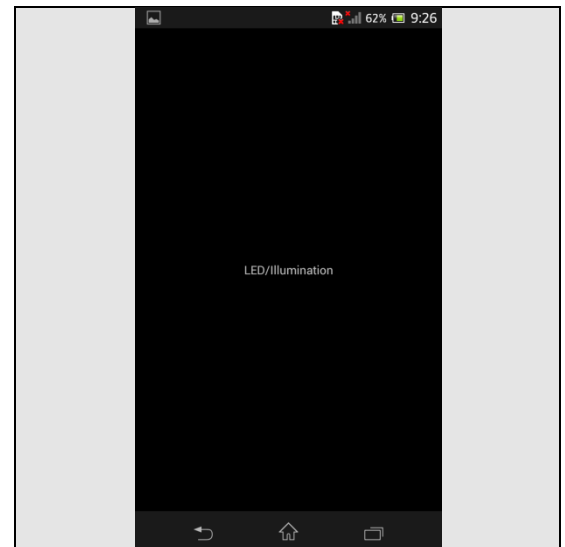
Tests: Service Tests

2.2.3 LED/Illumination

Check that the:

- Display Backlight illumination goes from low to high strength back to low again.
- Notification LED changes, showing four colors in the following sequence: green, blue, and red.

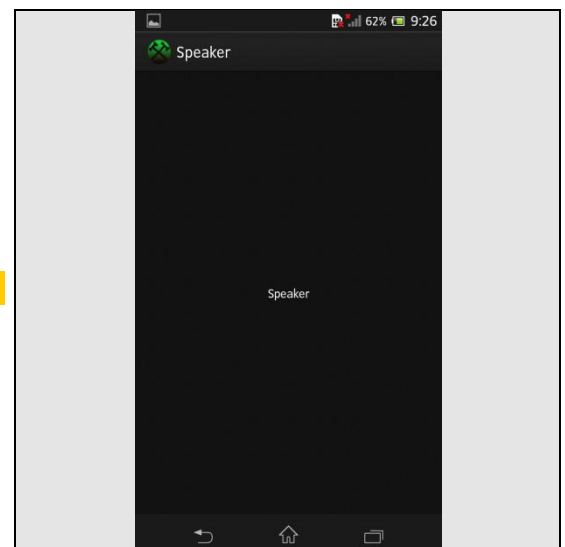
Press the Back key to return to the Service Test Menu.



2.2.4 Speaker

Do not use this test!

NA, use Stereo Speaker test below.



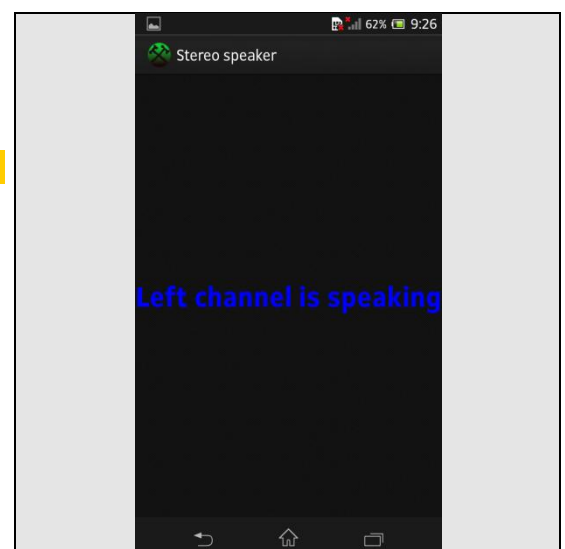
2.2.5 Stereo speaker

Do not hold the unit close to your ear during this test!

Make sure that the sound from the speaker port at top and bottom are emitted loud and clear and that the test include maximum volume.

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

Press Back key to return to Service Test Menu.



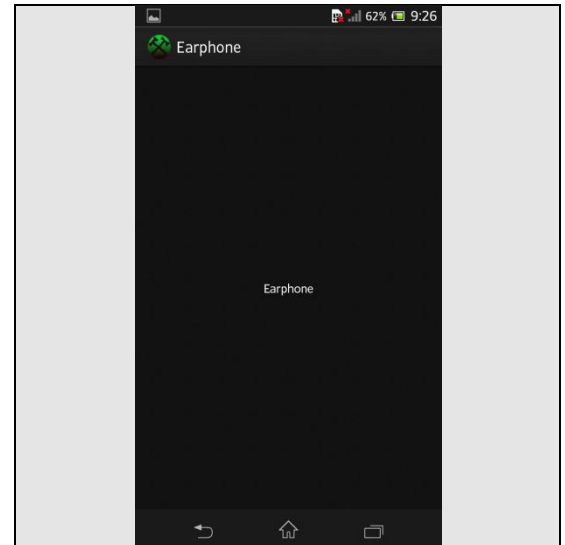
Tests: Service Tests

2.2.6 Earphone

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

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

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

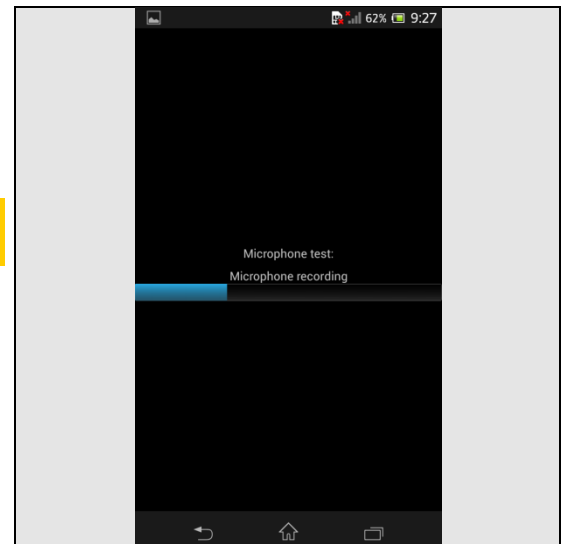


2.2.7 Microphone

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

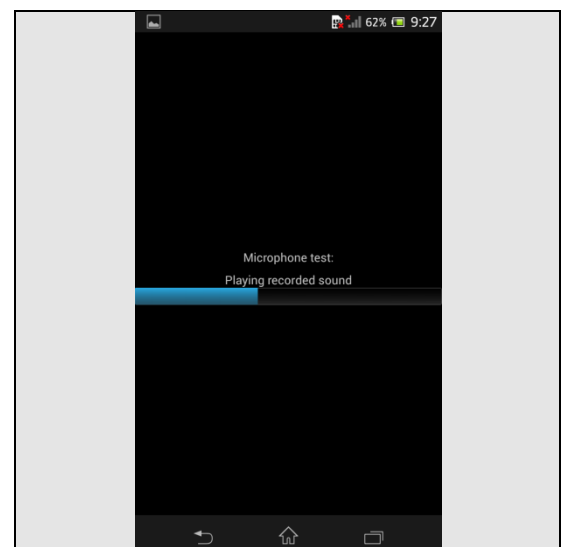
The phone will start to record and after approximately ten seconds the sound is played back through the speaker.

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



Step 2: 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.



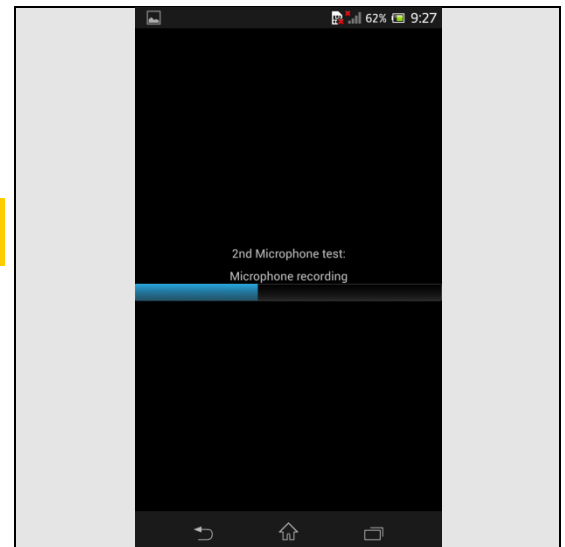
Tests: Service Tests

2.2.8 Secondary Microphone

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

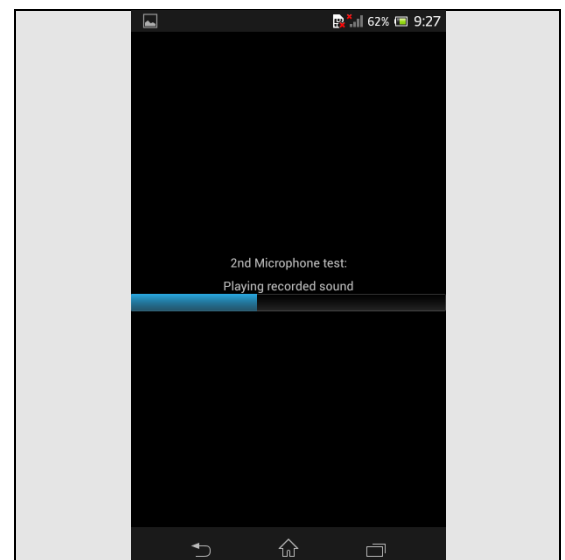
The phone will start to record and after approximately ten seconds the sound is played back through the speaker.

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



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

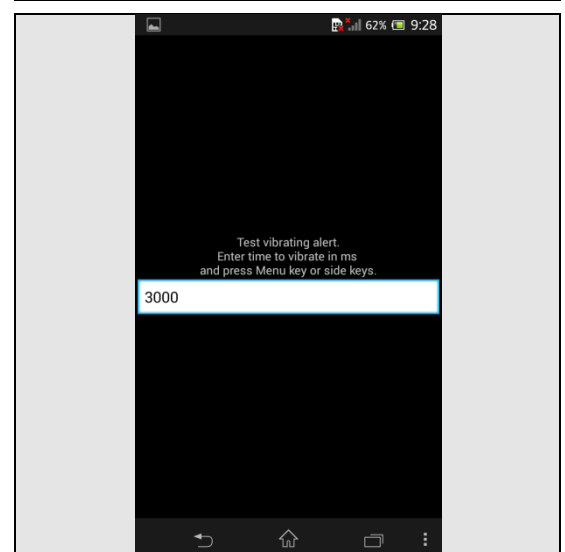
Press the Back key to return to the Service Test Menu.



2.2.9 Vibrator

Press the Menu key or side 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

2.2.10 Camera

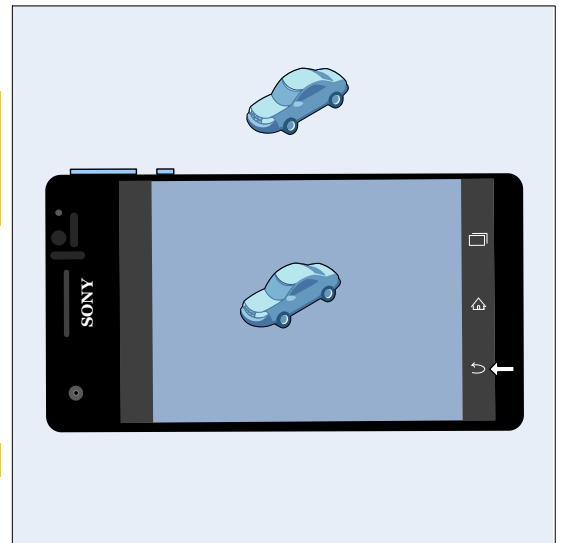
Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

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

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

Photos are taken but not saved during this test!

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



Only symbolic view

2.2.11 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 (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.



Only symbolic view

2.2.12 Flash LED

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

Press Back key to return to Service Test Menu.



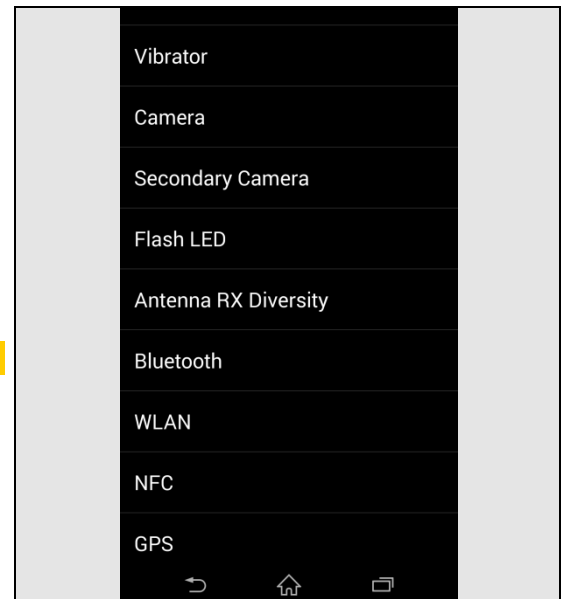
Only symbolic view

Tests: Service Tests

2.2.13 Antenna RX Diversity

N/A.

Do not use this test!



2.2.14 Bluetooth

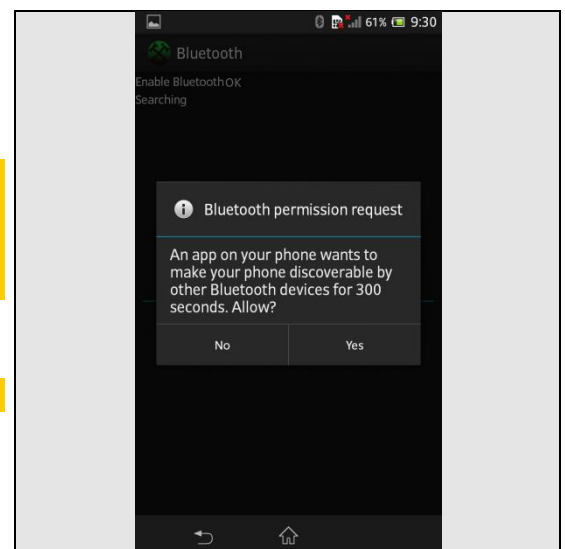
During this test, the distance between the phone and the target Bluetooth device must be 1.5 to 5 meters! Make sure the target Bluetooth device is enabled and visible always!

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'.

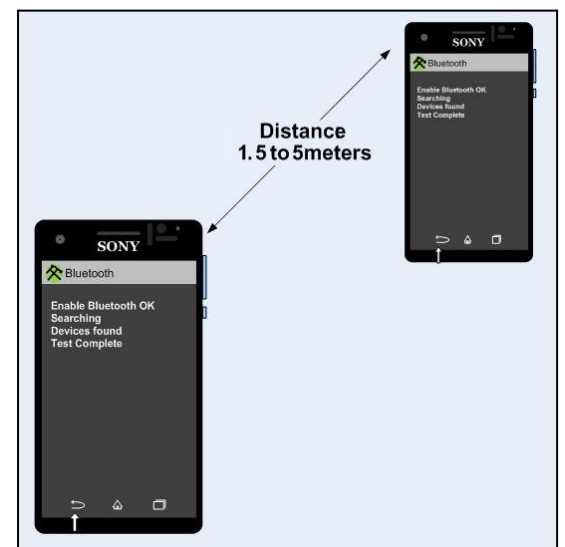
Step 2: Searching;

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 unit, press Pair on both, when succeeded, it shows "Test Complete".

Press Back key to return to Service Test Menu.



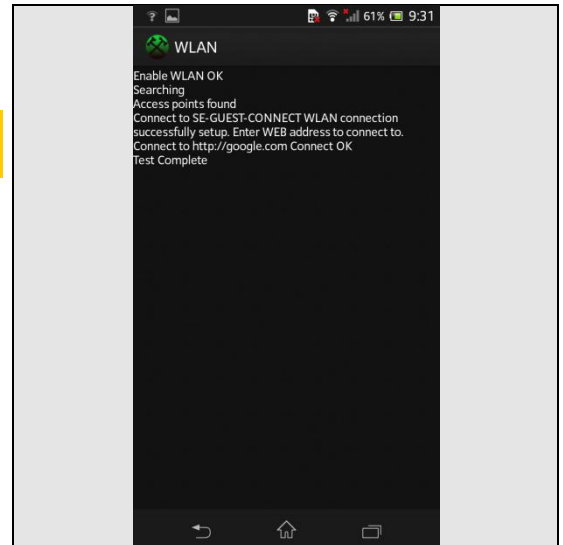
Only symbolic view

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 succeed, it shows 'Test Complete'.
 Press the Back key to return to the Service Test Menu.

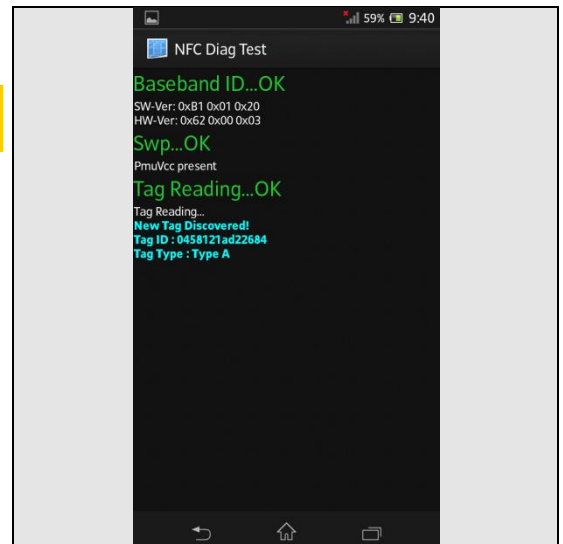


2.2.16 NFC

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: Select 'NFC Diag Test';
 Step 3: After 'Tag Reading...Enabled' can be seen on the display, bring a NFC Tag close to NFC icon in the middle of the Rear Cover Assy.
 Step 4: When Tag is identified, a sound will be made and an OK message will be displayed.

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

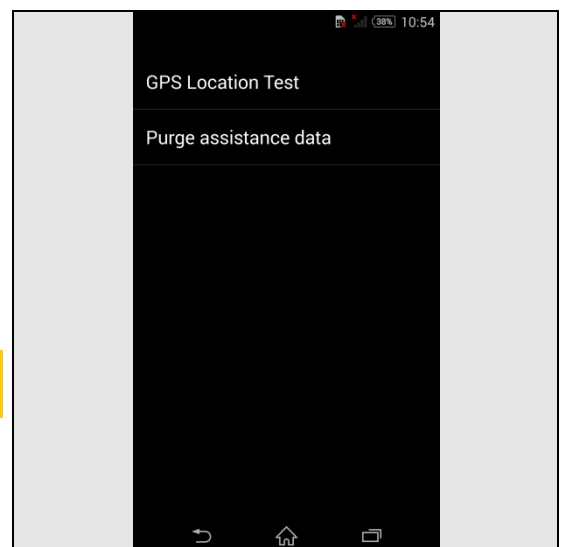


2.2.17 GPS

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

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

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

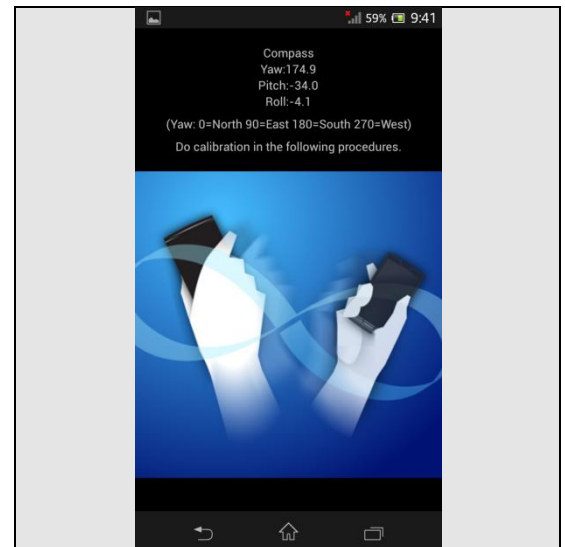


Tests: Service Tests

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)

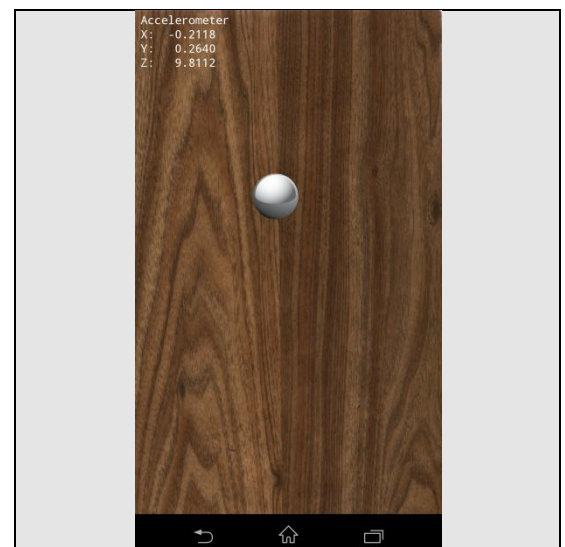
Press the Back key to return to the Service Test Menu.



2.2.19 Accelerometer

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

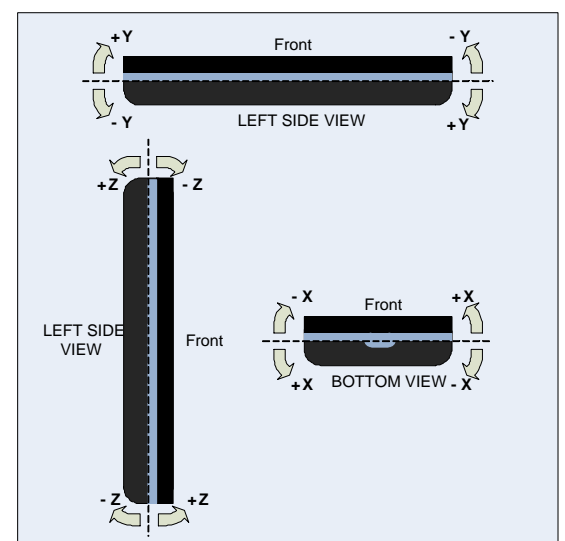
Press the Back key to return to the Service Test Menu.



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.



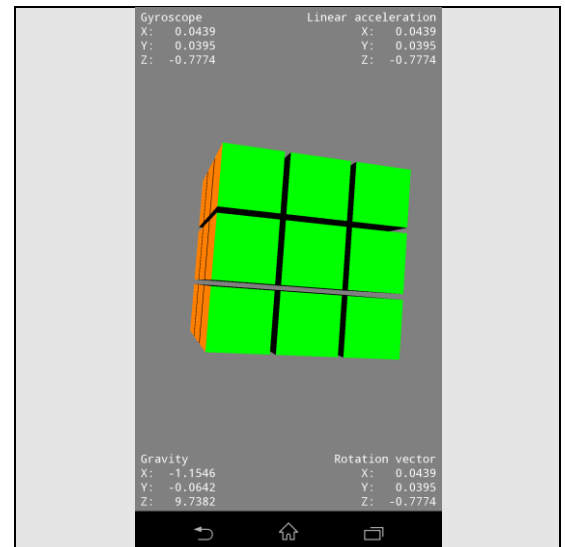
Tests: Service Tests

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.

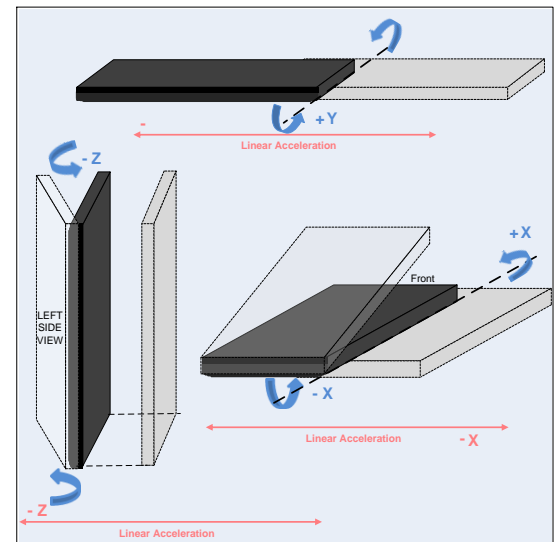
Press the Back key to return to the Service Test Menu.



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.

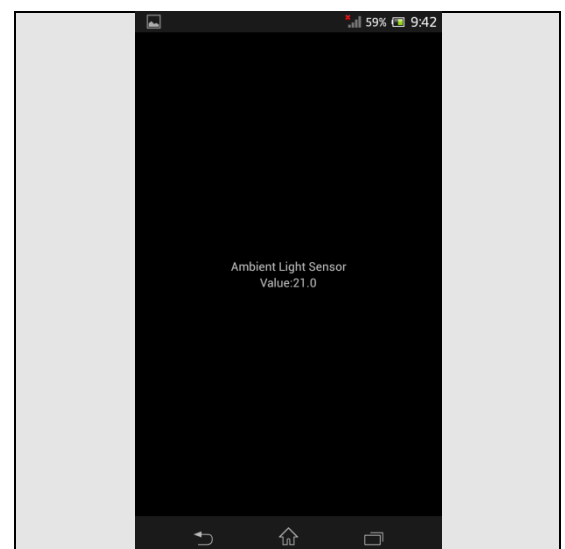
Press the Back key to return to the Service Test Menu.



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. The Ambient light sensor is placed next to the Secondary Camera.

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



Tests: Service Tests

2.2.22 Proximity switch

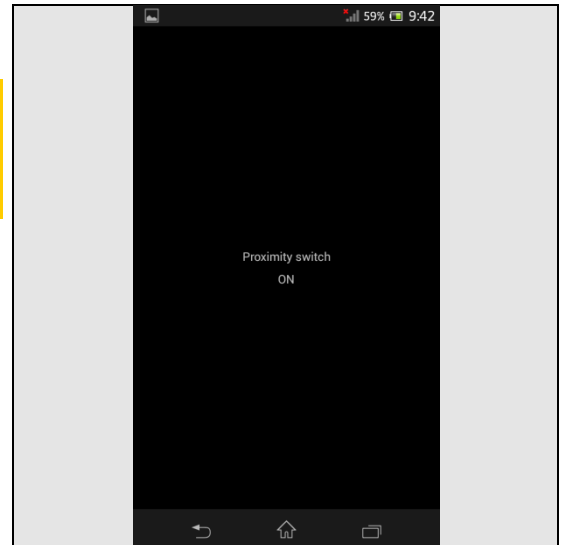
The previous Chapter 2.2.4 'Speaker' test should have been successfully carried out before doing this test! Make sure the phone is not in 'silent mode' before performing this test.

The Proximity sensor is placed next to the SONY logo on front cover.

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.

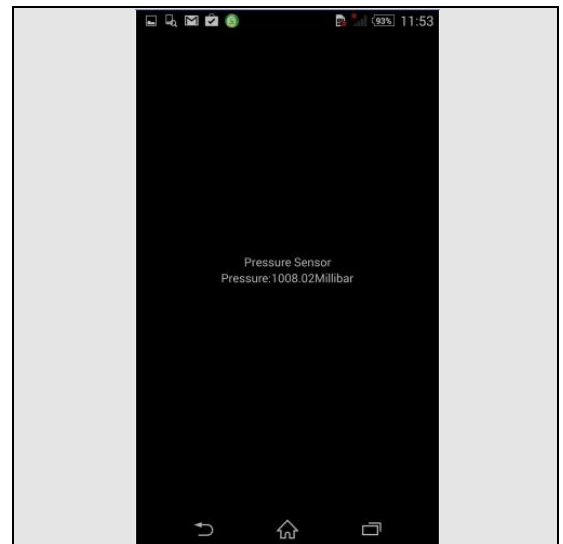


2.2.23 Pressure Sensor

The Pressure Sensor test will check the atmospheric pressure around the phone and states a value. When you put the phone on the floor, read the value. When you raise the phone up as high as you can, the value should decrease about approx 0.2 to 0.3 Millibar.

The value shouldn't be static.

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

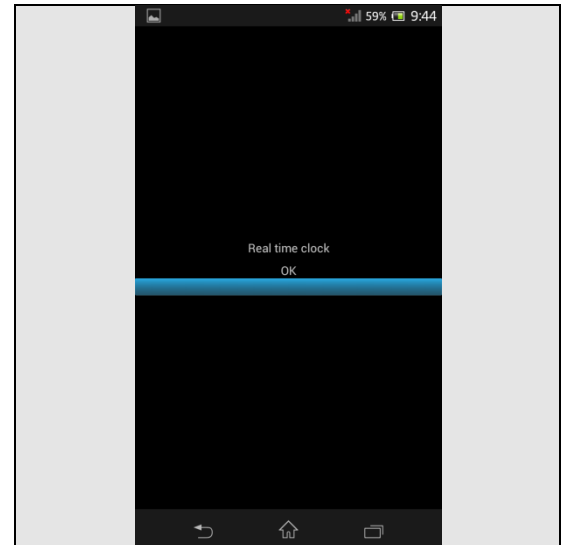


Tests: Service Tests

2.2.24 Real time clock

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

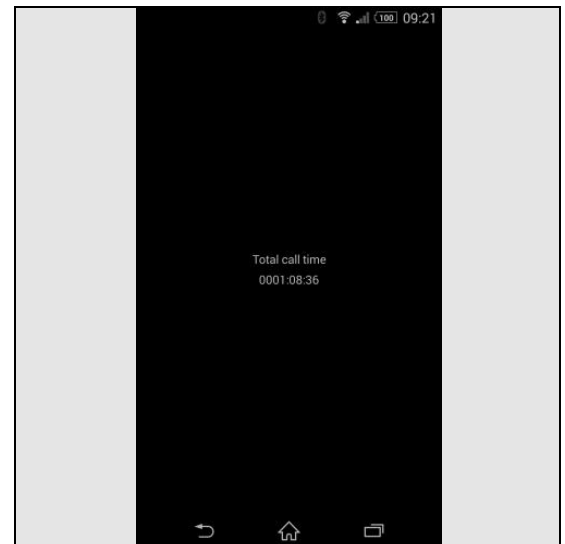
Press the Back key to return to the Service Test Menu.



2.2.25 Total call time

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

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



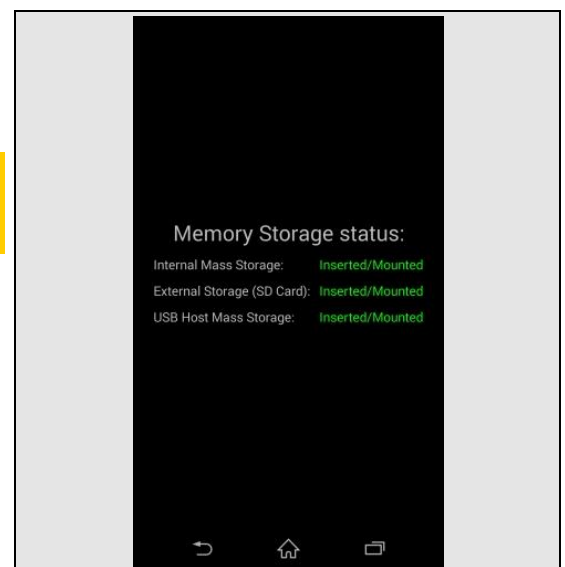
2.2.26 Storage

Memory Storage status:

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

- 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.

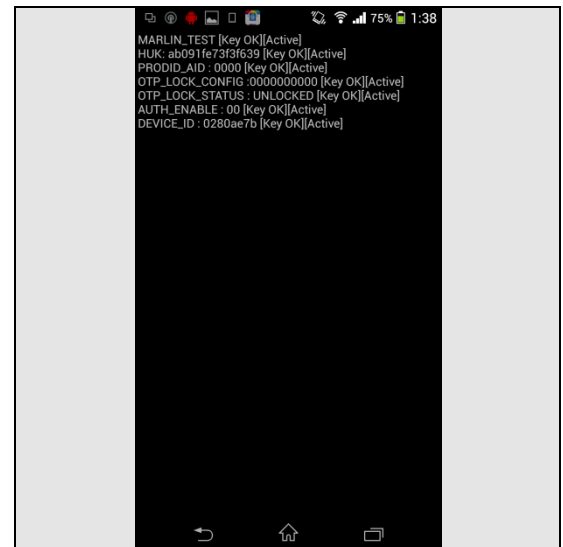


Tests: Service Tests

2.2.27 Security

The DRM keys are shown in the display.
There may be different content shown based on different market software versions.

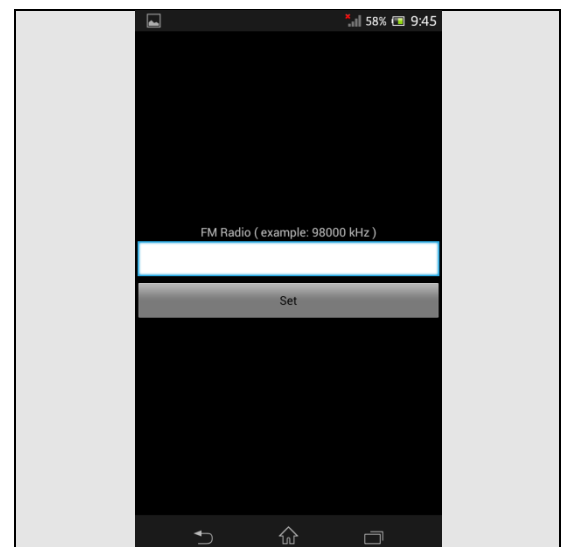
Press the Back key to return to the Service Test Menu.



2.2.28 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.

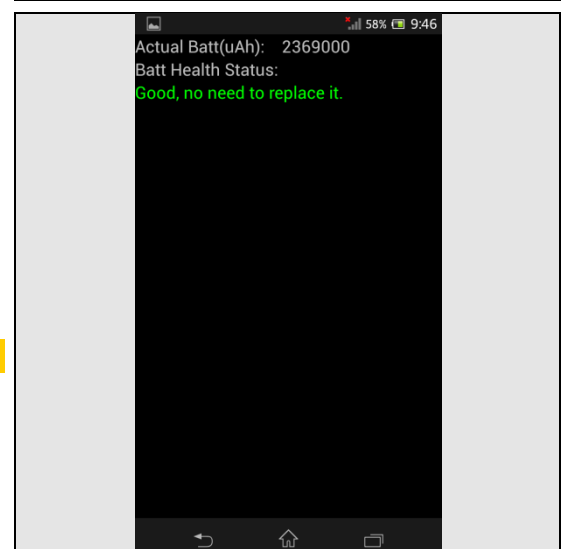
Press the Back key to return to the Service Test Menu.



2.2.29 Battery Health test

N/A.

Do not use this test!



Tests: Service Tests

2.2.30 Verify certificates

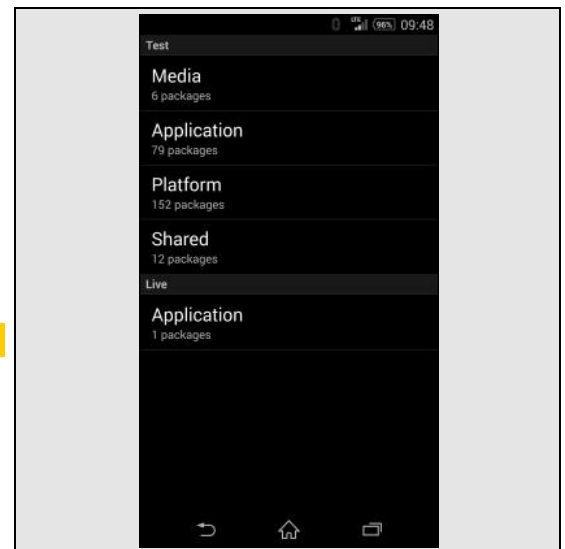
When entering the test, five information categories will be shown;

Test: Media, Application, Shared, Platform

Live: Application.

Do not use this test!

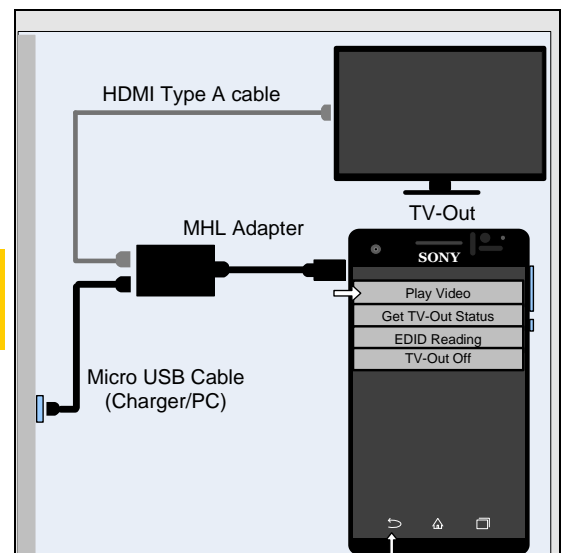
Press the Back key to return to the Service Test Menu.



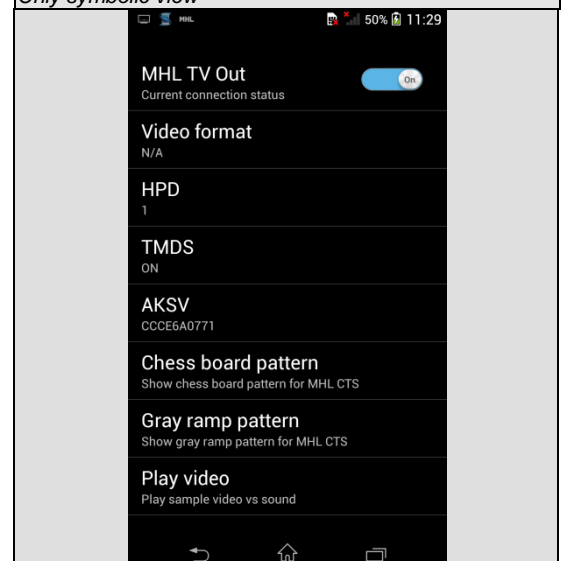
2.2.31 TV-Out Test

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

Step 1: Attach cable between phone and TV-Out as shown in picture;



Only symbolic view



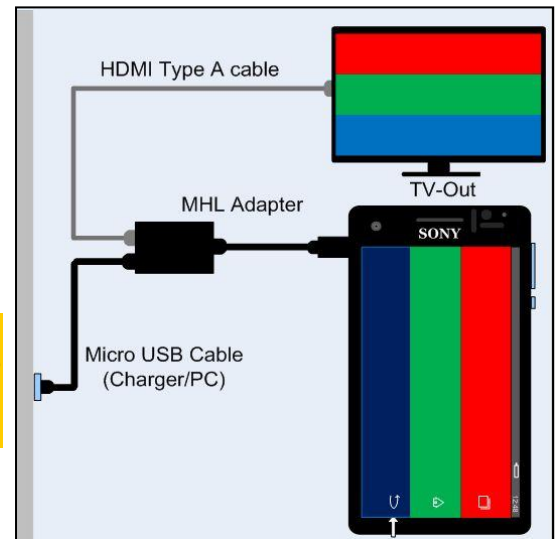
MHL TV Out is turned on after connection.

Tests: Service Tests

Step 2: Press 'Play Video'.

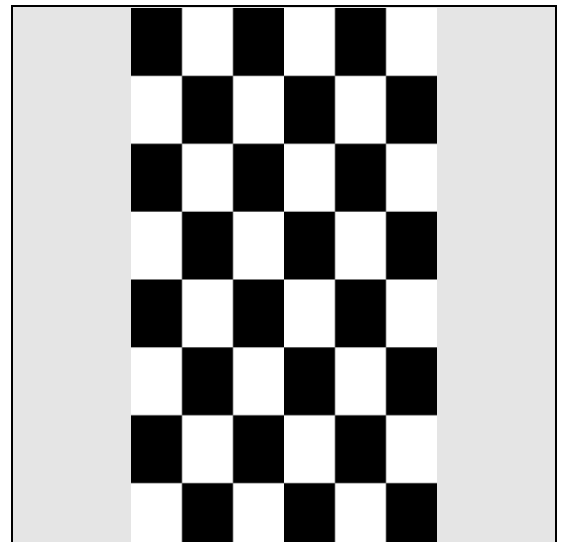
Receive a test tone and a red-green-blue test picture in the TV-Out Monitor and phone.

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



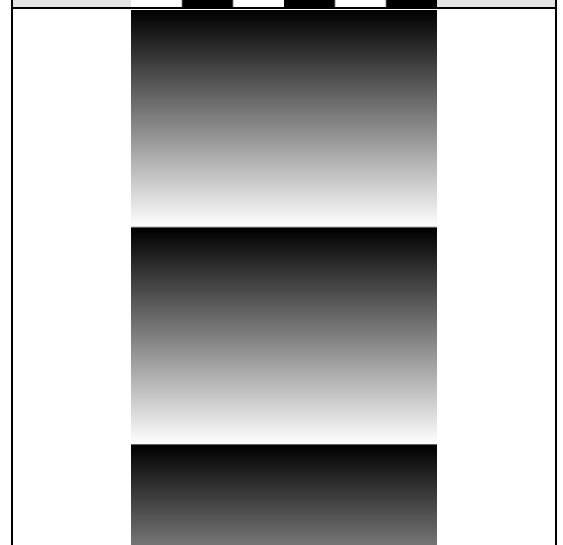
Only symbolic view

Step3: Press 'Chess board pattern' to do the same test as the 'Play video'.



Step4: Press 'Gray ramp pattern' to do the same test as the 'Play video'.

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



Tests: Manual Tests

2.3 Manual Tests

2.3.1 SIM test

Verify that the phone can detect a SIM card:

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

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

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

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

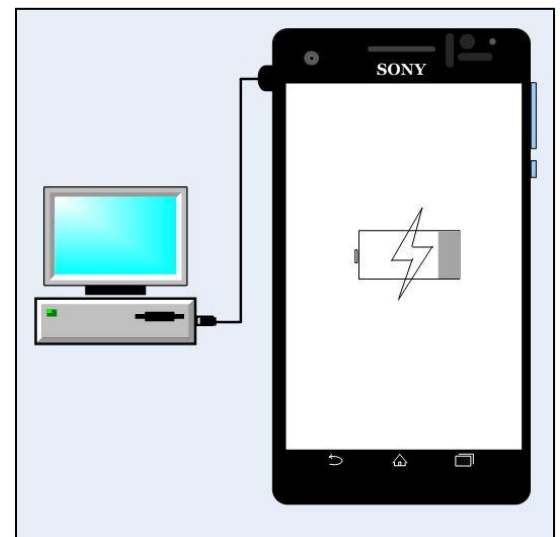
If operator is not detected, the message 'No service' will be displayed instead.

Press Back key to return to Standby Menu.



2.3.2 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



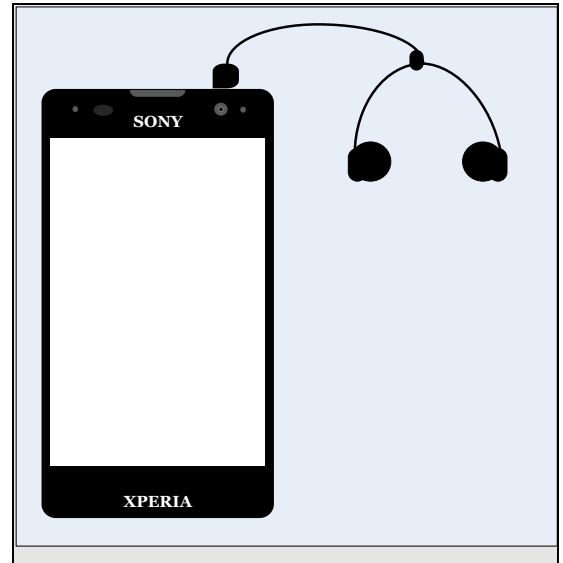
Only symbolic view

Tests: Manual Tests

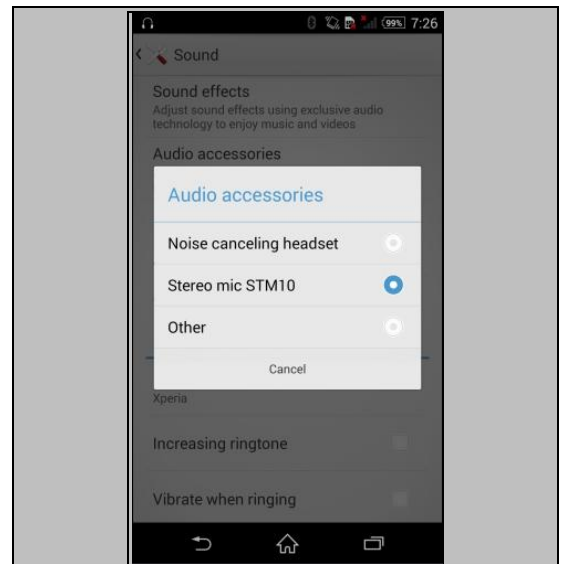
2.3.3 Audio Jack test

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.

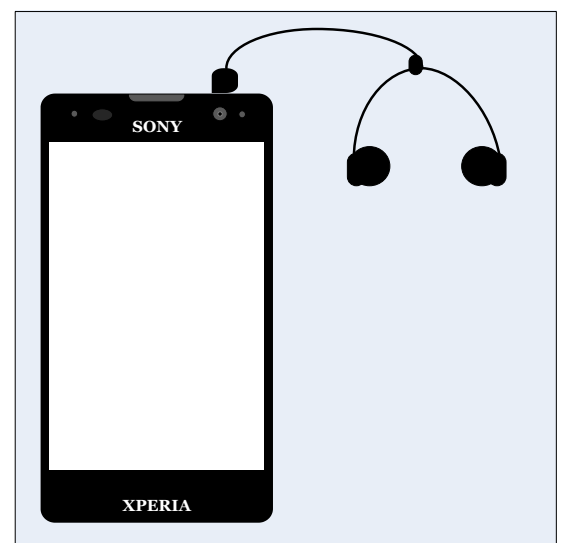


Go to Setting app, Sound / Audio Accessories
Tic the Stereo mic STM10, the faint white noise in the
Headset should disappear.
Remove the Sony Noise canceling headset and press task
key and chose the Service test again.



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.



Manual Tests

2.3.4 Charging (Charger or Computer)

2.3.4.1 Charging via Magnetic connector (Charger or Computer)

Verify that the phone can charge the battery by using a Magnetic connector:

Connect a DK44 Magnetic Charging Dock 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 DK44 Magnetic Charging Dock from the connector and verify that the notification LED (see 1.3 Test Enablers) and Battery icon no longer indicates charging.



2.3.4.2 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!

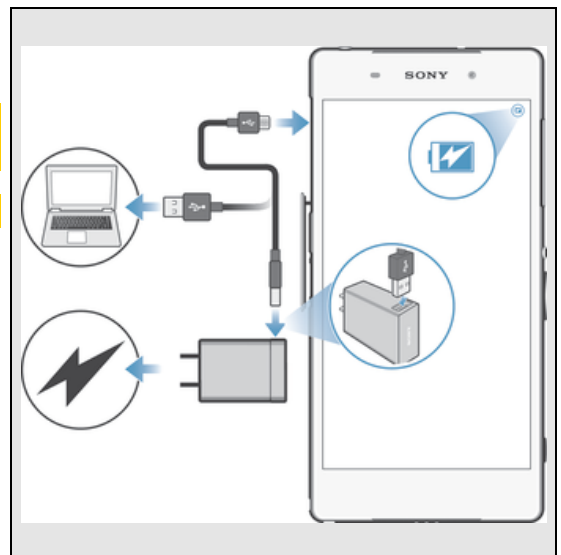
Do not start the phone.

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.

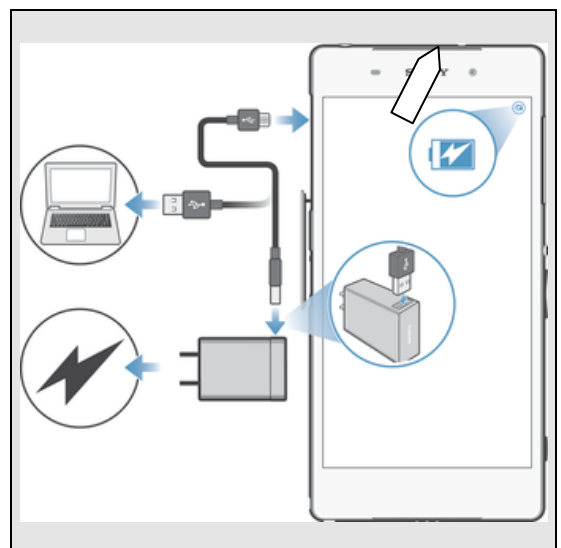
Remove the USB cable from the connector and verify that the notification LED and Battery icon no longer indicates charging.

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



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

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

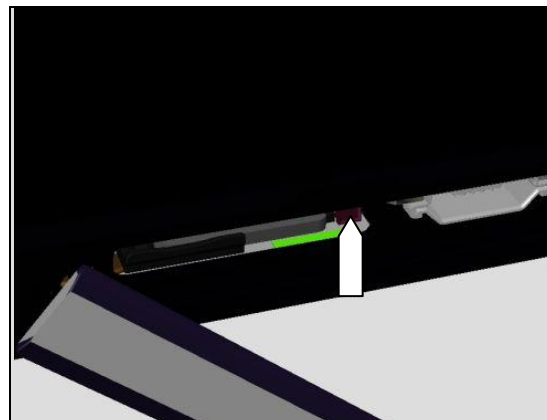


Tests: Manual Tests

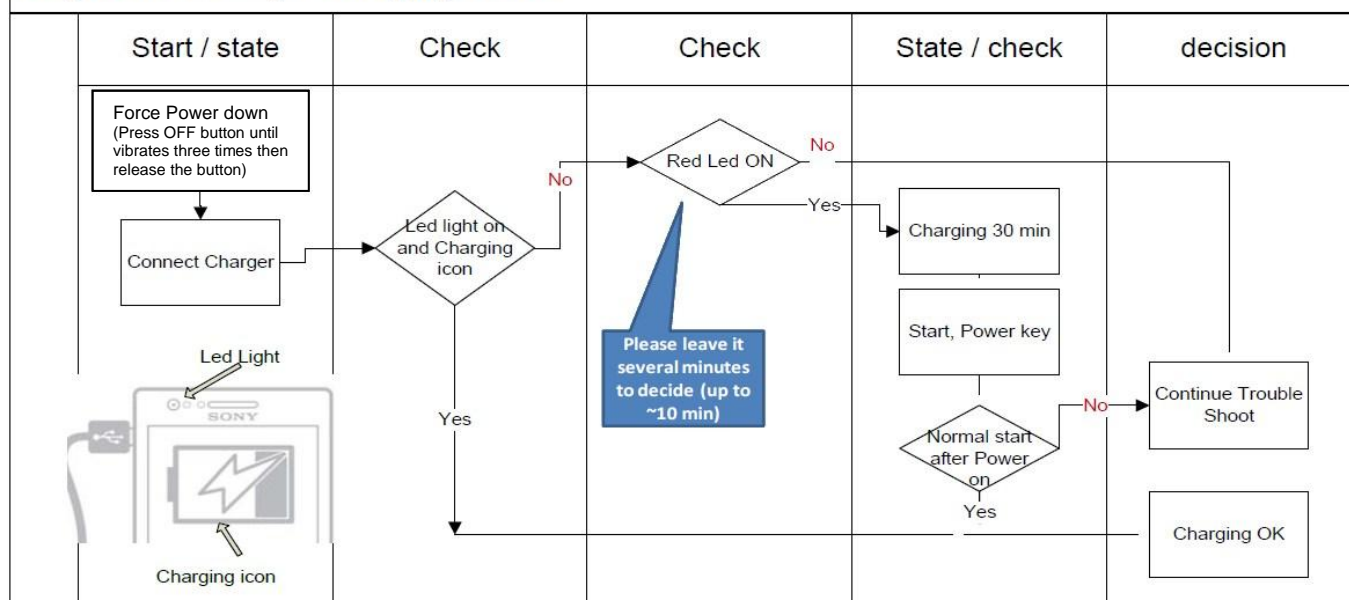
If above fails, perform below Diagnostic battery / Charging Status check.

Perform a force shut down by pressing the OFF button next to SIM holder, 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.

Tests

2.3.5 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.

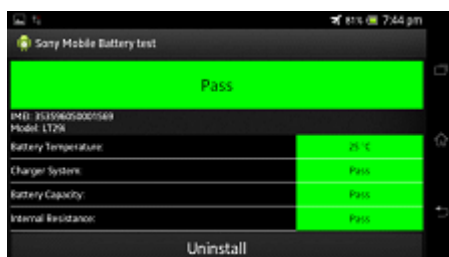
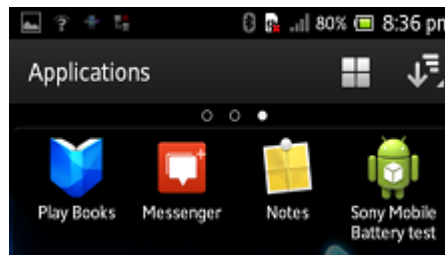
The test is available in CSPN at Level: Mechanical,

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: Network Test

2.3.6 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 three versions of the test depending on whether a UMTS or LTE network is available or not!

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

2.3.6.1 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 '2.3.6.2 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 '2.3.6.2 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*

2.3.6.2 Procedure (GSM & UMTS)

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

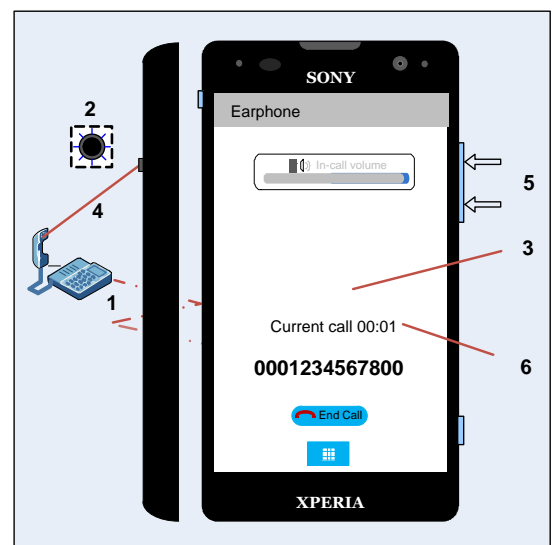
Step 2: Check that there is a ring signal.

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.

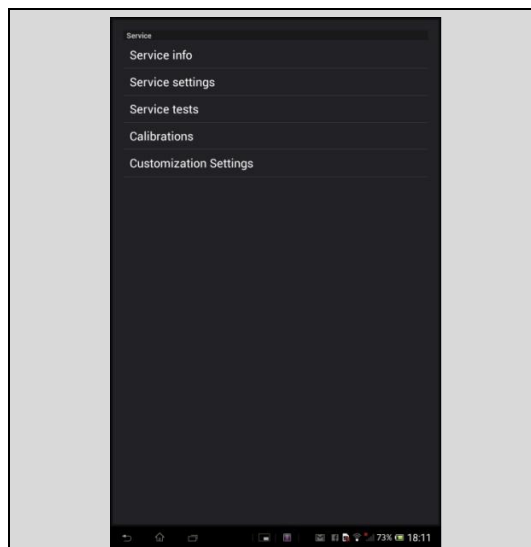


Only symbolic view

3 Calibrations

Service Menu, Calibrations, do not use!

See the products Working Instruction for Calibration instruction.



4 Revision History

Rev.	Date	Changes / Comments
1	2014-Jun-27	Initial Release