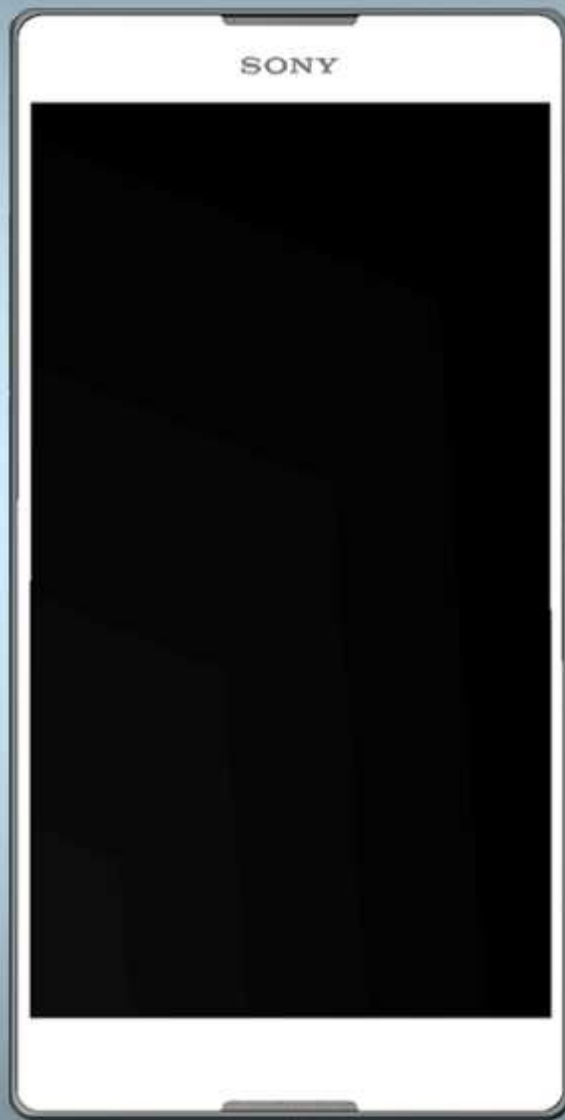


Test Instructions

- mechanical -



Xperia™ T2 Ultra Dual D5322, XM50h
Xperia™ T2 Ultra D5303, D5306, XM50t

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

1 Pre-Test Preparations

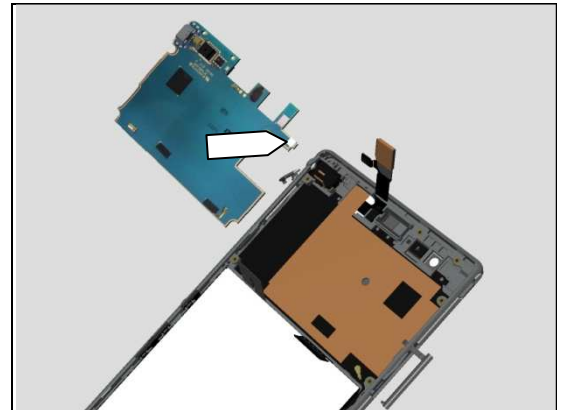
1.1 Hardware

1.1.1 Water indicator inspection

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

The Water indicator located on Main PBA as shown:

- If affected (red color) - handle the phone according to the local directives.
- If not affected by liquid, proceed to the 'Pre-Test Preparation' below.

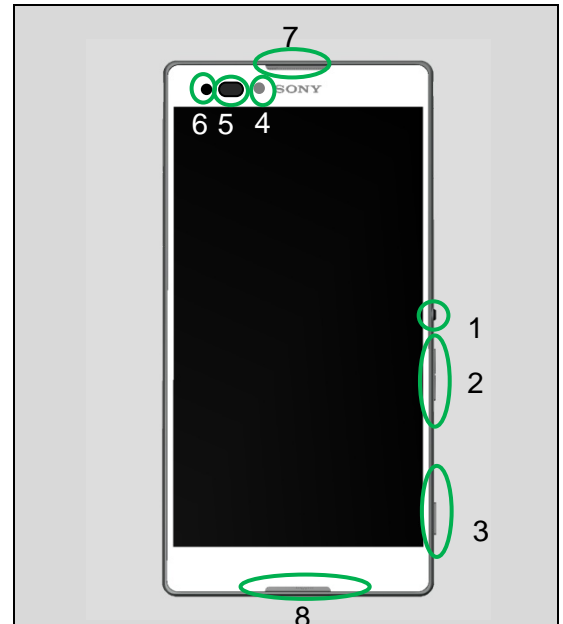


1.1.2 Test Enablers

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

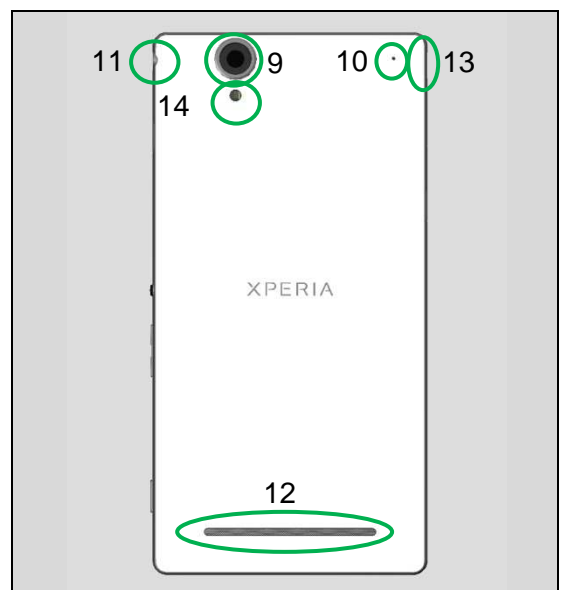
Front:

1. On/Off Key
2. Volume up/down Key
3. Camera Key
4. Notification Led
5. Ambient Light Sensor& Proximity Switch
6. Secondary Camera
7. Earphone
8. Main Microphone hole



Back:

9. Camera
10. Second Microphone hole
11. Audio Jack
12. Speaker
13. USB connector
14. Flash LED



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

Step 1: Start up the phone;

Note: Make sure the phone is in call setup.

Step 2: Press the following keypad combination: ***##7378423##***;

Step 3: Select 'Service info';

Step 4: Select 'Software info';

Step 5: Check the software file revisions and, if needed, 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 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.

Step 1: Open the Emma application and log in;

Step 2: Press and hold the Volume Down key on the phone, connect the phone to the USB cable and then release the Volume Down key.

Step 3: Select the appropriate service and follow the on-screen instructions.

Note: For phones with eMMC flash memory (built in "SD card" memory), the only service which erase this eMMC memory is Service's "Refurbish" and "Customize". See also emma User Guide info. http://emma.extranet.sonyericsson.com/documents/emma_user_guide.pdf (see "Service Types" and "Aspects of large files").

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

Start up the phone and enter the Service Menu.

Step 1: Press the following keypad combination:

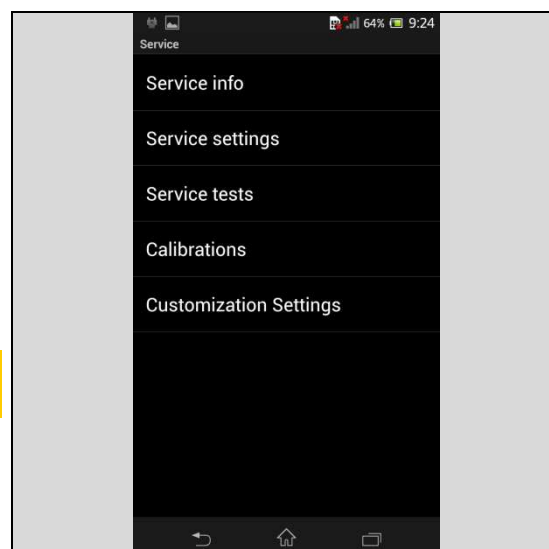
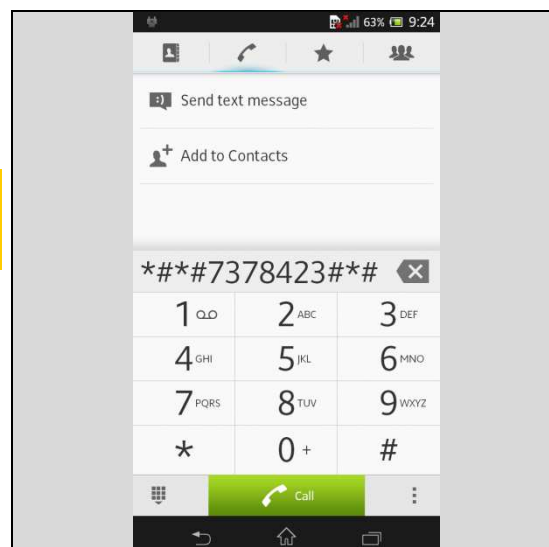
***##7378423##**;

Step 2: Select 'Service Tests';

Step 3: 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

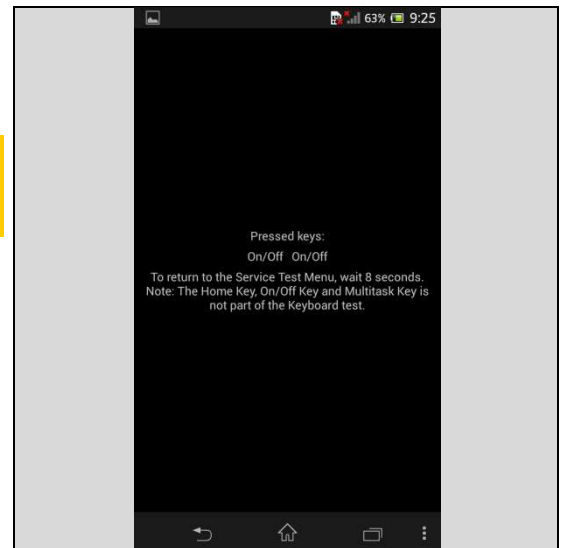
2.2.1 Keyboard & Switch

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

Press all keys on the:

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

Wait 8 seconds to return to the Service Test Menu.

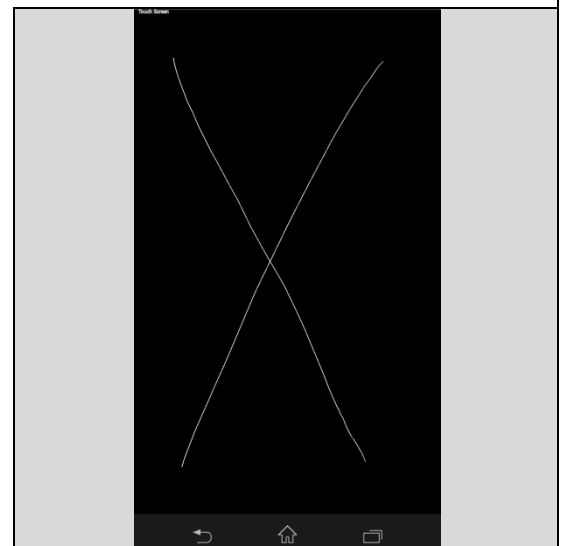


2.2.2 Touch Screen

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.



2.2.3 Display

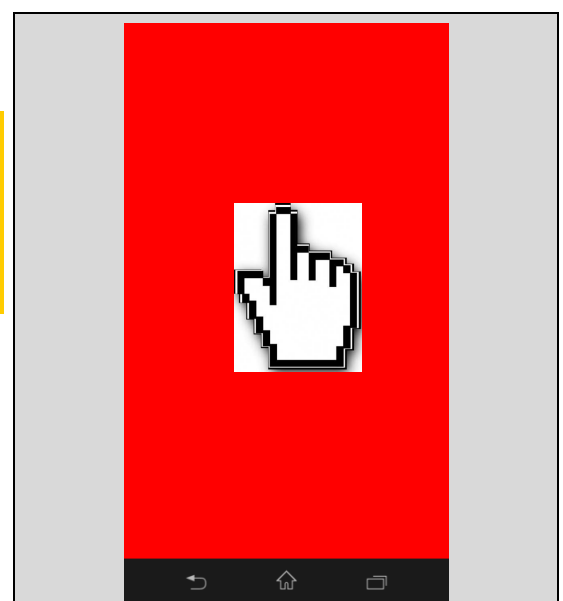
Minor variations in the display's brightness and color may occur between phones.

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 the 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

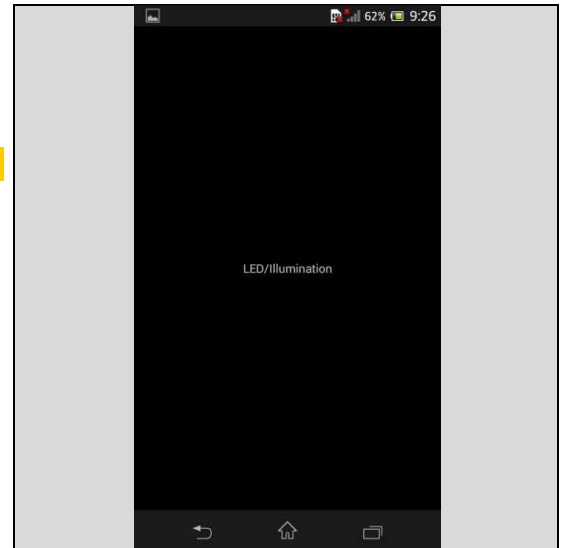
2.2.4 LED/Illumination

Note: Please un-plug USB cable during this test!

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: red, red, green, green, blue, blue and off. Check commercial SW!

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



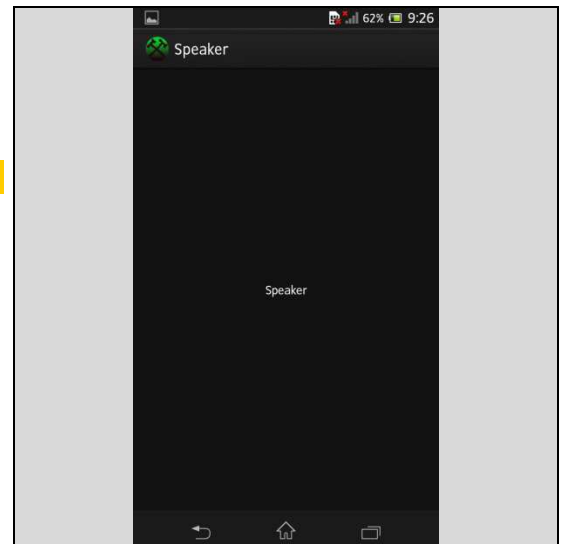
2.2.5 Speaker

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.

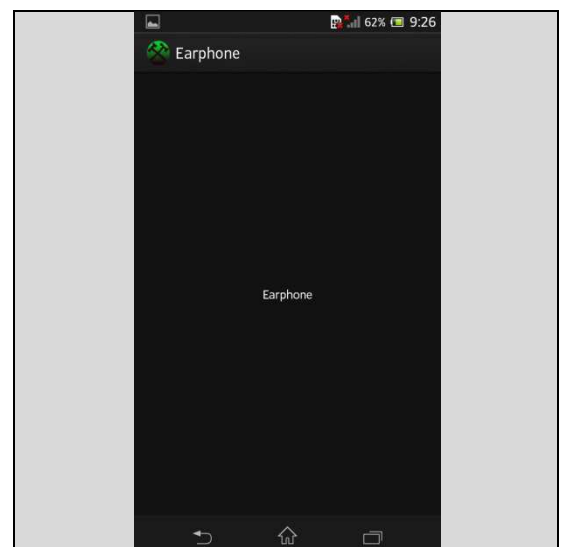


2.2.6 Earphone

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.



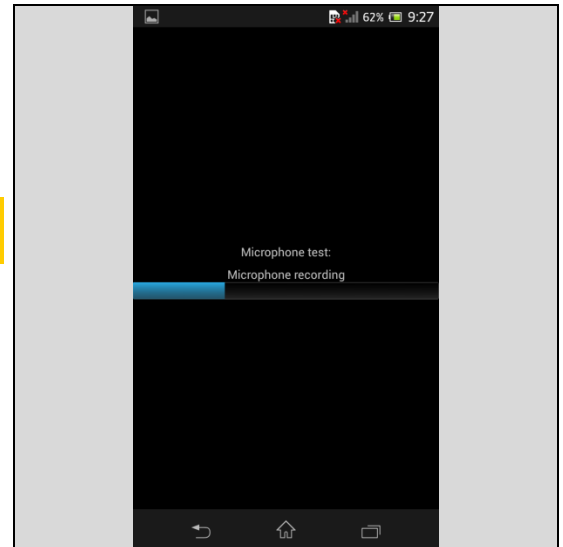
Tests: Service Tests

2.2.7 Microphone

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

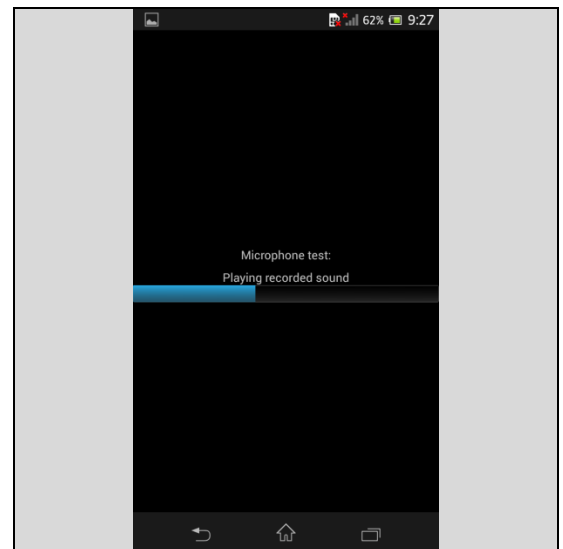
The phone will start to record and after approximately ten seconds the sound is played back through the speaker.

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.

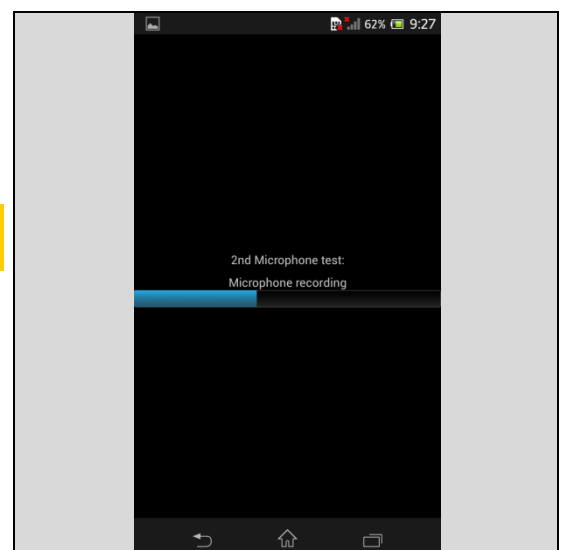


2.2.8 Secondary Microphone

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.

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

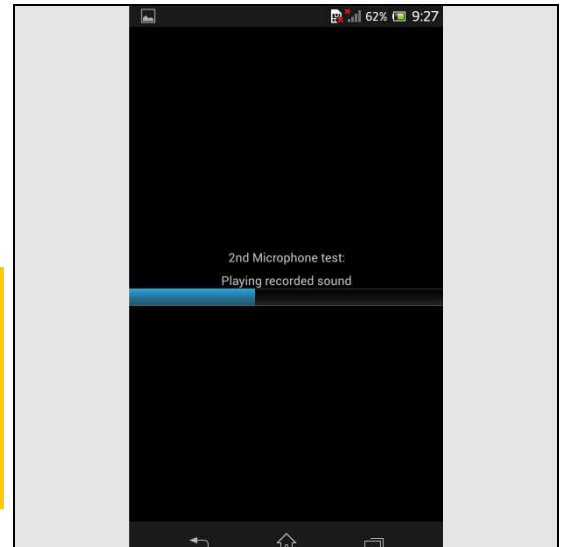


Tests: Service Tests

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.

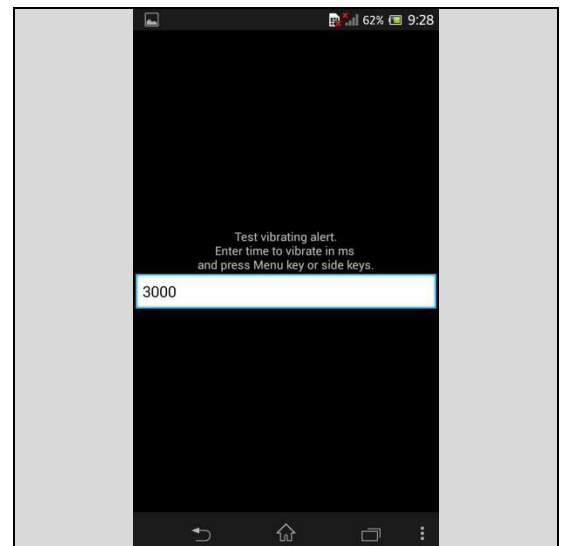
Notice! Covering the secondary microphone hole accidentally will greatly affect voice quality when making a call by using hands free function mode the first microphone does not function and only the secondary microphone in working operation. Refer to Test Enablers for the secondary microphone location.



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.



2.2.10 Camera

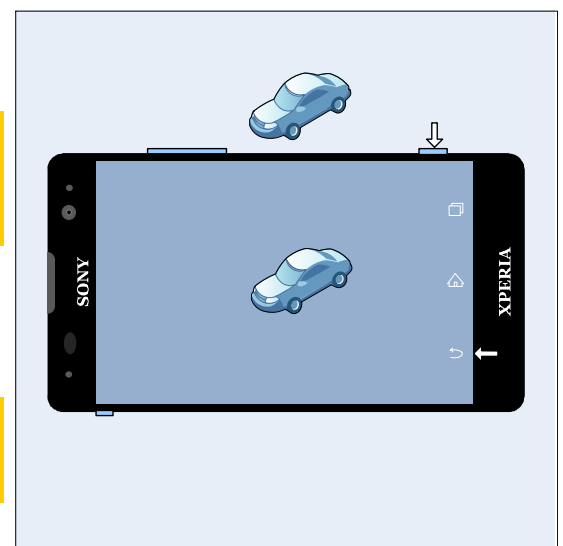
Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

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



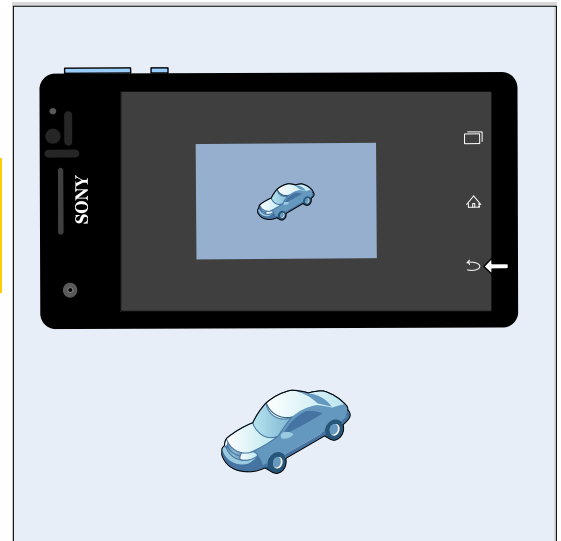
Tests: Service Tests

2.2.11 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.



2.2.12 Flash LED

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

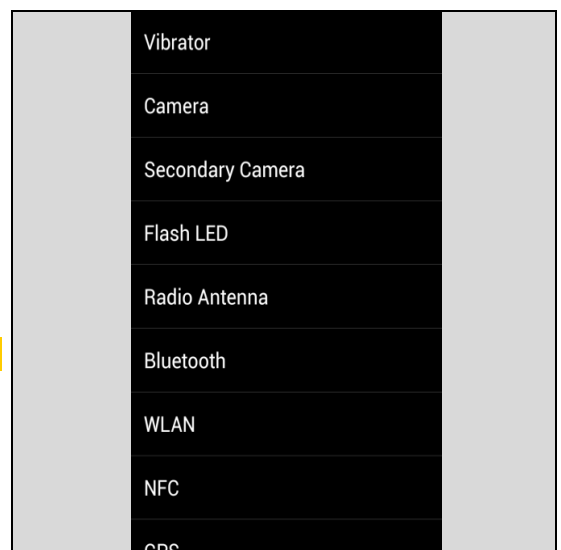
Press Back key to return to Service Test Menu.



2.2.13 Radio Antenna

N/A.

Do not use this test!



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'.

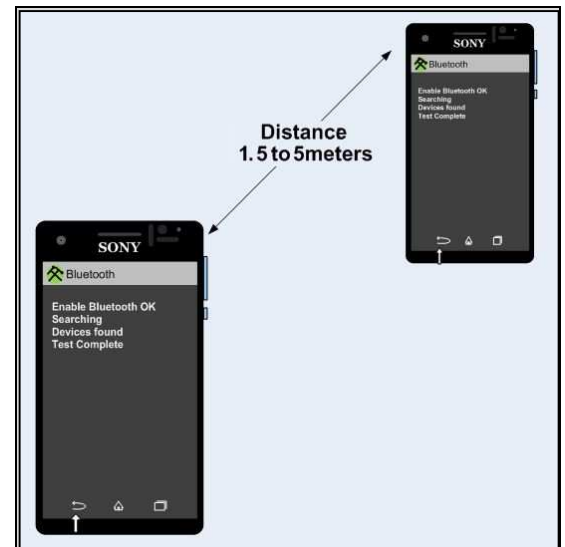
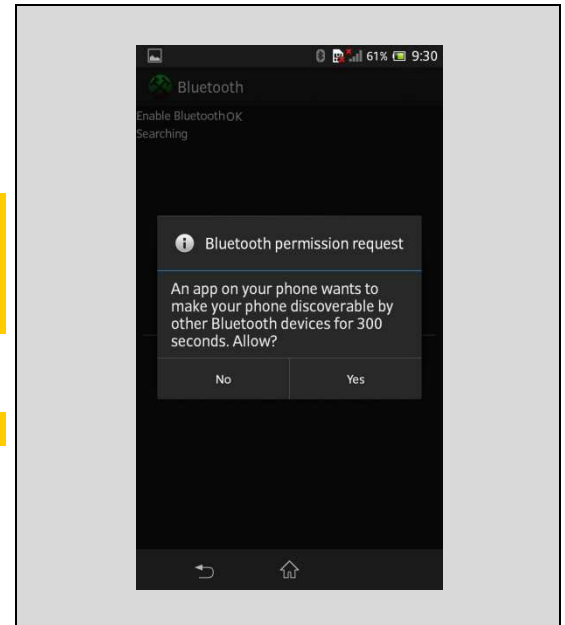
Step 2: Searching;

Step 3: Show the Device Found list;

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

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

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



2.2.15 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;

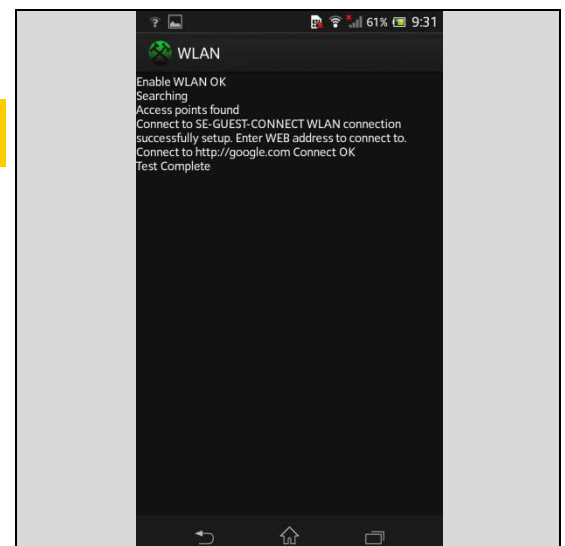
Step 3: Access points found list;

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.



Tests: Service Tests

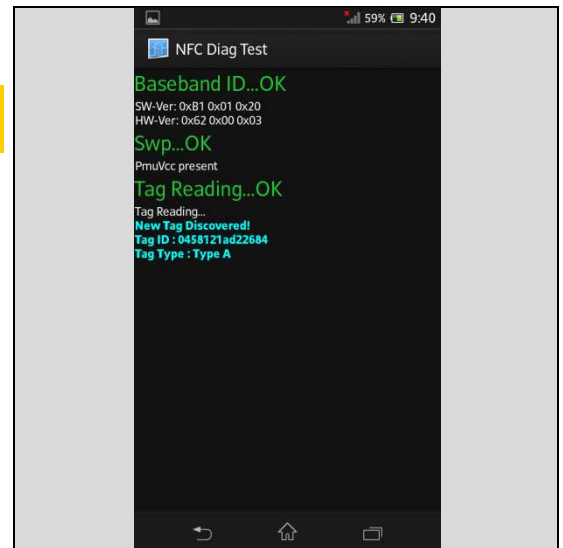
2.2.16 NFC

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 middle of 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.

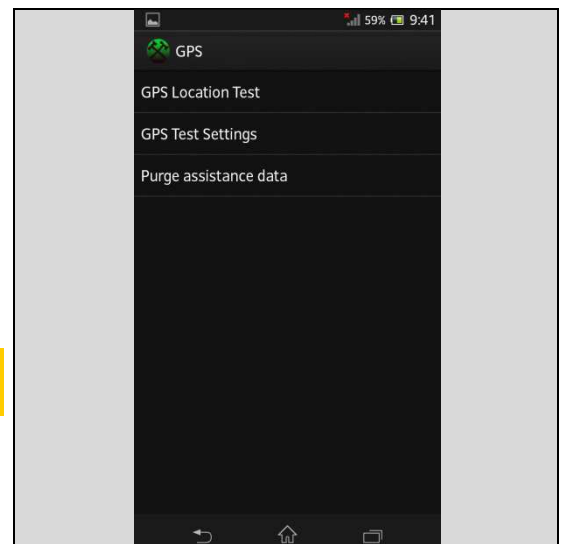


2.2.17 GPS

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

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

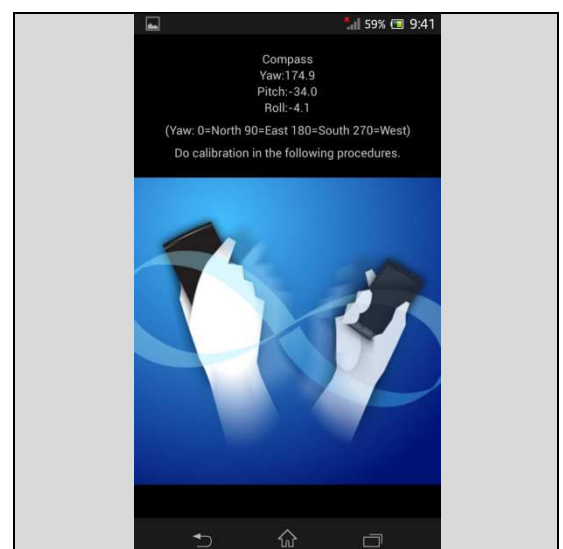
For GPS testing, refer to 1220-1333: Generic Repair Manual – mechanical



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.

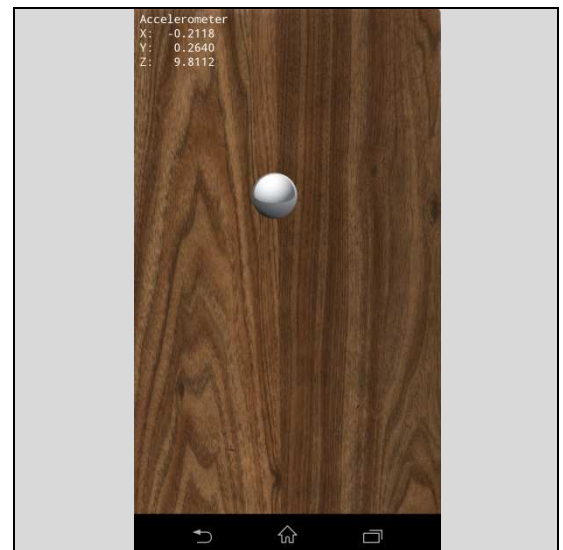


Tests: Service Tests

2.2.19 Accelerometer

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

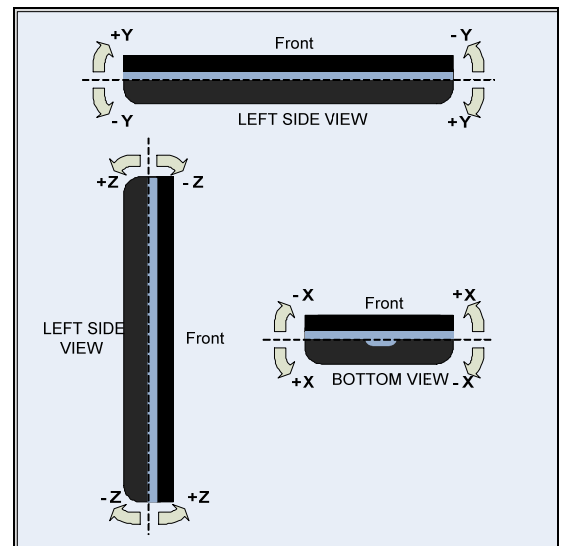
Press the Back key to return to the Service Test Menu.



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.

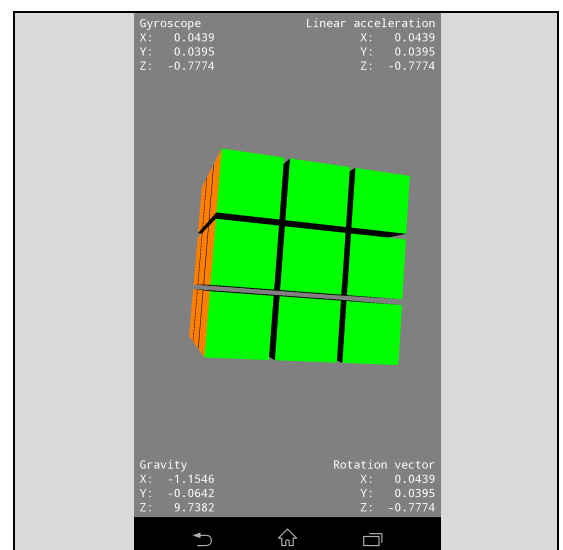


2.2.20 Gyroscope

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.

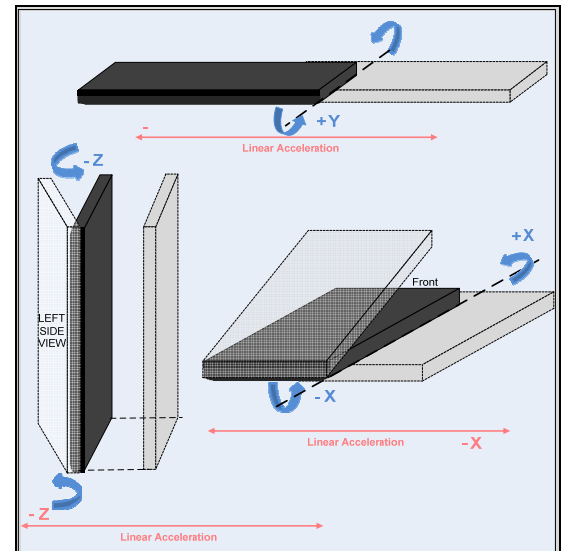


Tests: Service Tests

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.

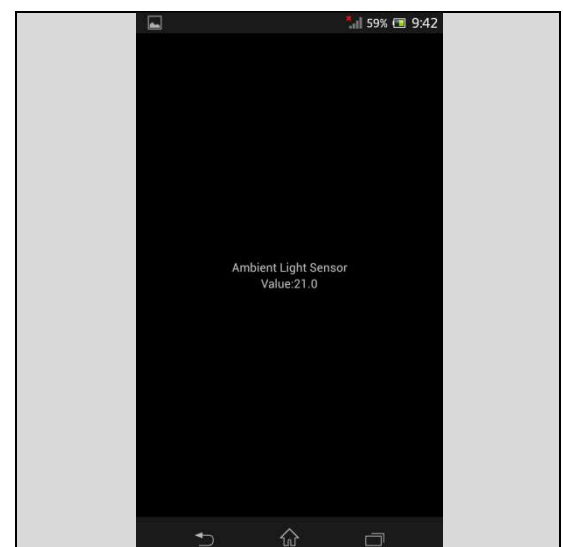
Press the Back key to return to the Service Test Menu.



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.

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



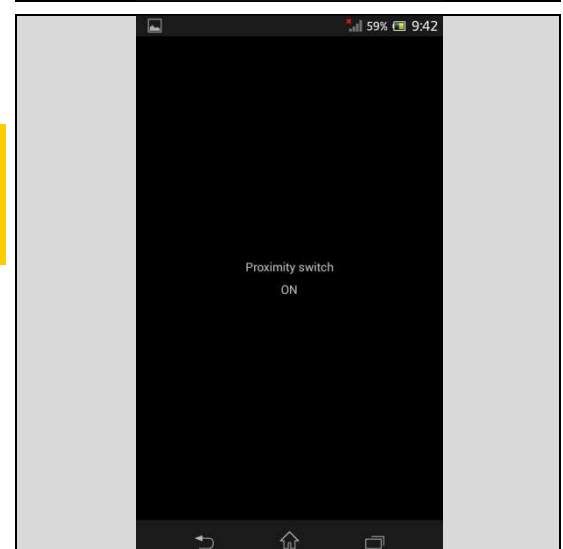
2.2.22 Proximity switch

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.

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.

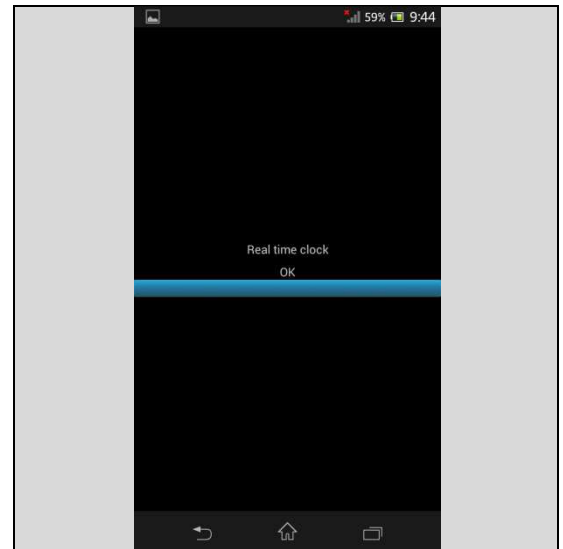


Tests: Service Tests

2.2.23 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.

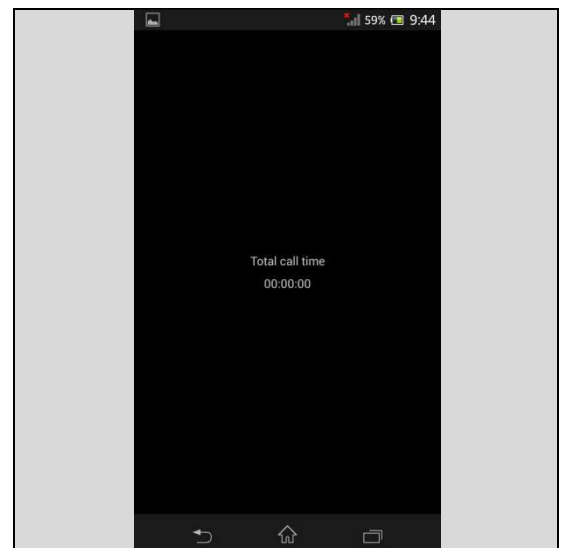
Press the Back key to return to the Service Test Menu.



2.2.24 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.



2.2.25 Storage

Memory Storage status:

- Internal Mass Storage is 'Inserted/Mounted' as shown on the screen.

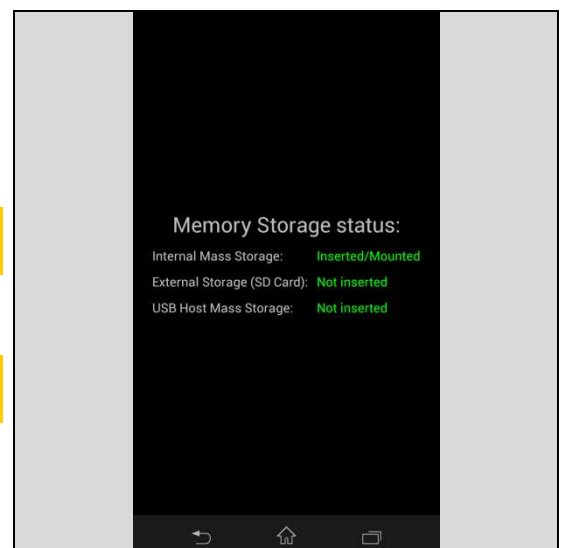
A memory card should be inserted in the phone before starting this test!

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

Attach USB Adaptor between phone and an USB disk before starting this test!

- The USB Host Mass Storage status is shown on the screen.

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

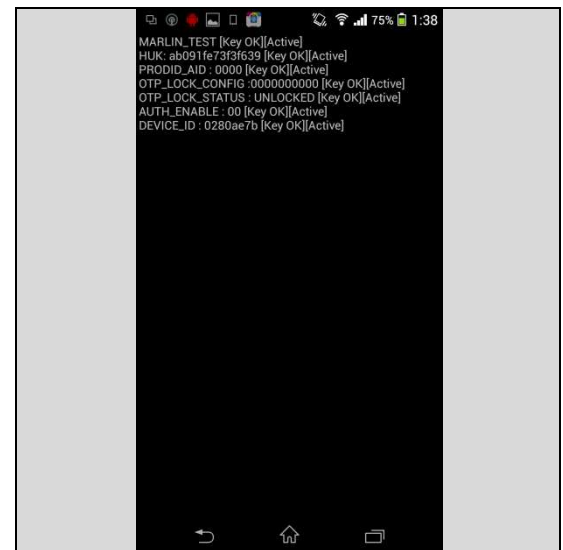


Tests: Service Tests

2.2.26 Security

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

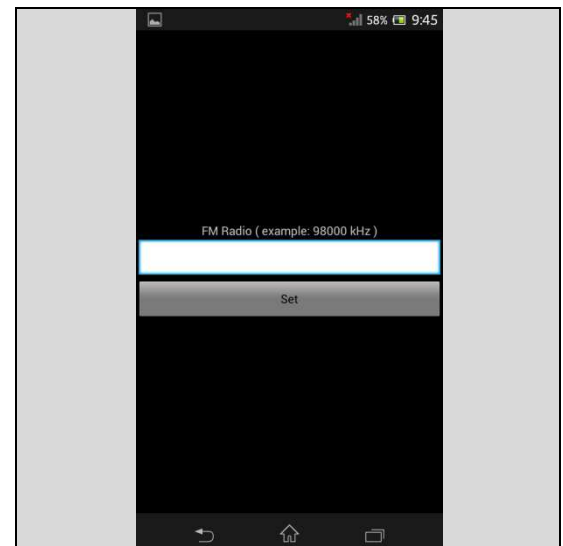
Press the Back key to return to the Service Test Menu.



2.2.27 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.

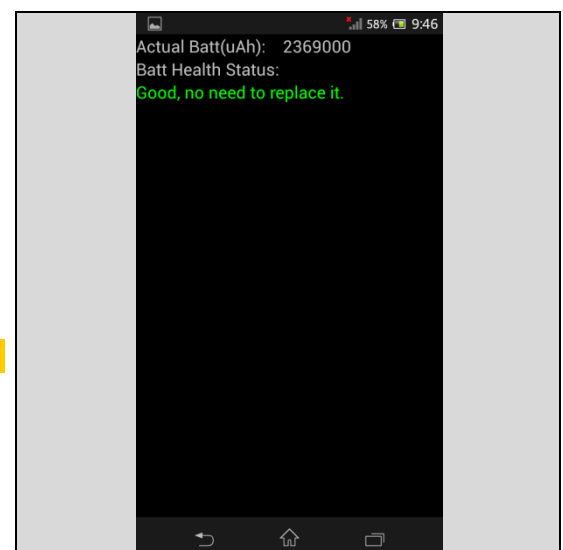
Press the Back key to return to the Service Test Menu.



2.2.28 Battery Health test

N/A.

This test is not available for this product!

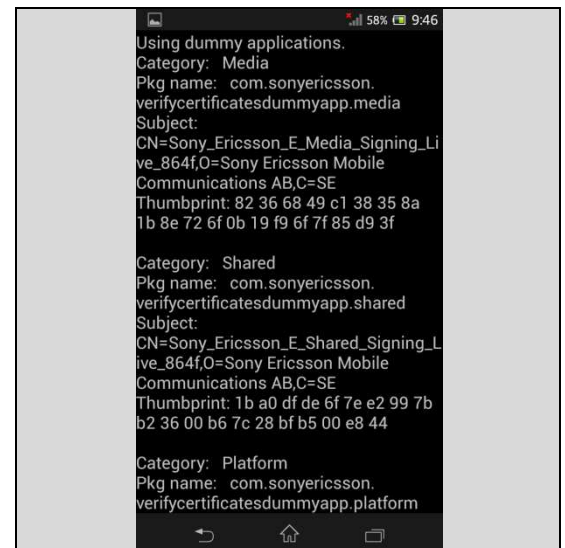


Tests: Service Tests

2.2.29 Verify certificates

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

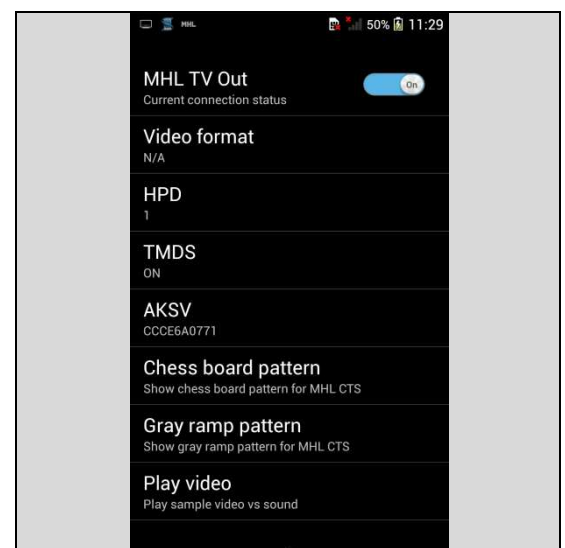
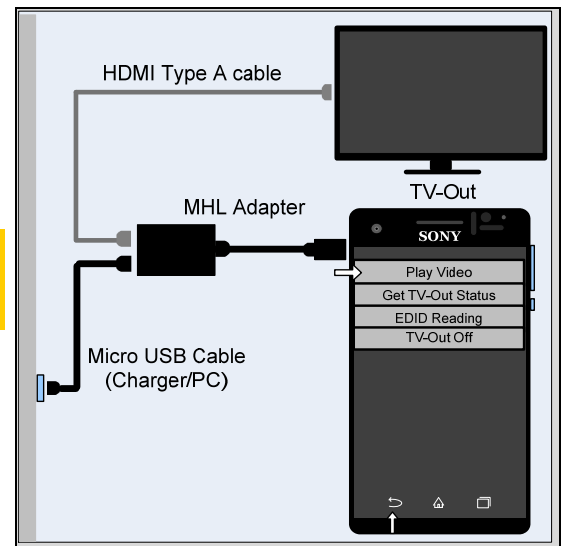
Press the Back key to return to the Service Test Menu.



2.2.30 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;



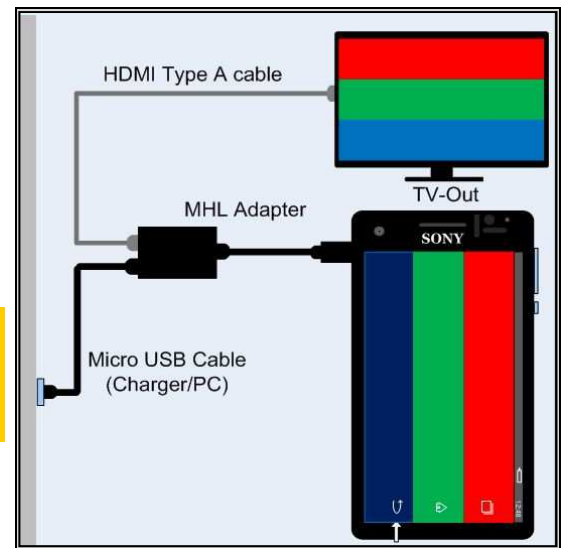
MHL TV Out is turned on after connection.

Tests: Service Tests

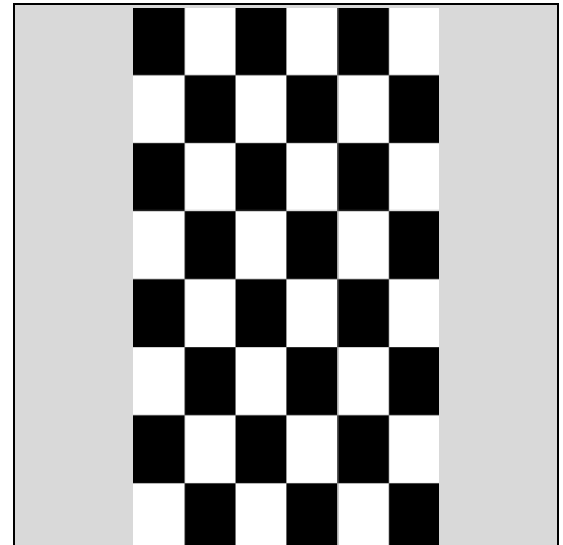
Step 2: Press 'Play Video'.

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 to set the TV-Out port chosen as source manually in the Monitors menus.

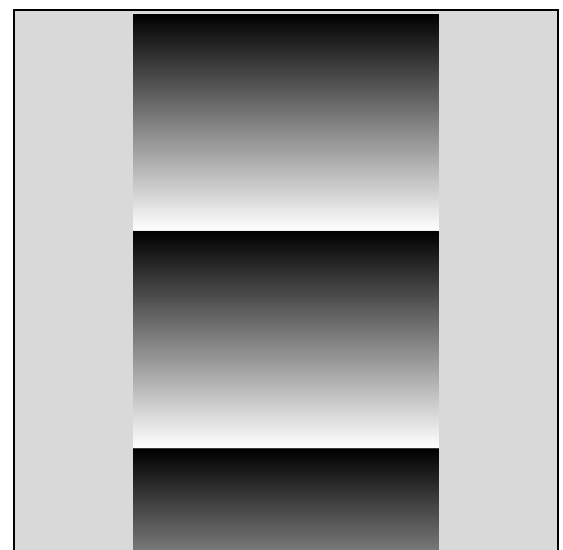


Step3: Press 'Chess board pattern' to do the same test as the 'Play video'.



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

2.3 Manual Tests

2.3.1 SIM test (D5303, D5306, XM50t)

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.

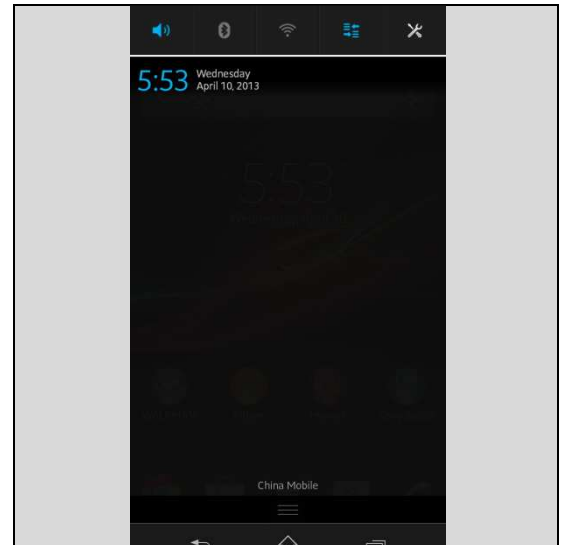
Step 2: Pull down the Status Bar (put finger next to the receiver and drag the menu down from the Status Bar);

Step 3: See SIM card operator name.

The SIM card operator name will be displayed above the Time Clock 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.



2.3.2 SIM test (D5322, XM50h)

Verify that the phone can detect both SIM cards:

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

If the SIM cards are detected by the phone, the start-up procedure will continue.

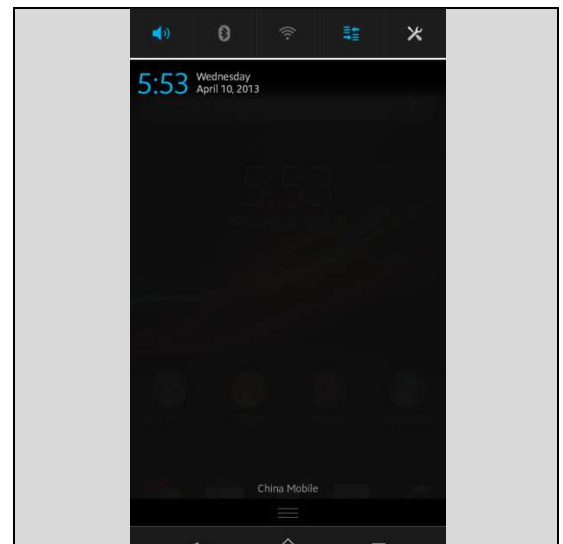
Step 2: Pull down the Status Bar (put finger next to the receiver and drag the menu down from the Status Bar);

Step 3: See SIM cards operator names.

The SIM card operator name will be displayed above the Time Clock 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.



2.3.3 On/Off key test

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

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



Tests

2.3.4 Home key test

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



2.3.5 Multitask key test

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

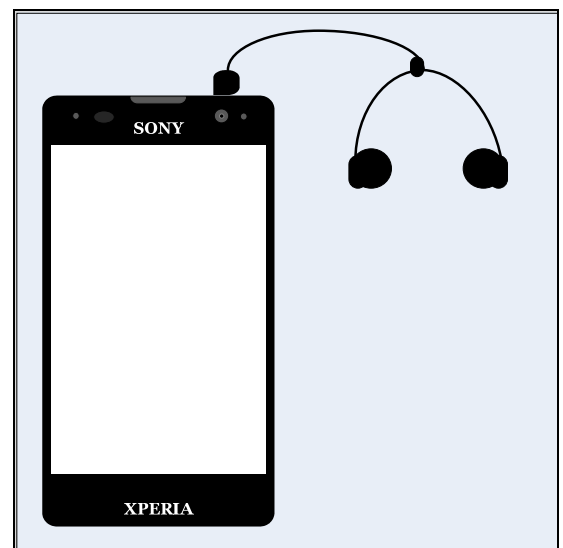


2.3.1 Audio Jack test

Connect a Sony CTIA headset.

Repeat the test of “2.2.5 Speaker”, “2.2.6 Earphone”, “2.2.7 Microphone” and “2.2.8 Secondary Microphone”.

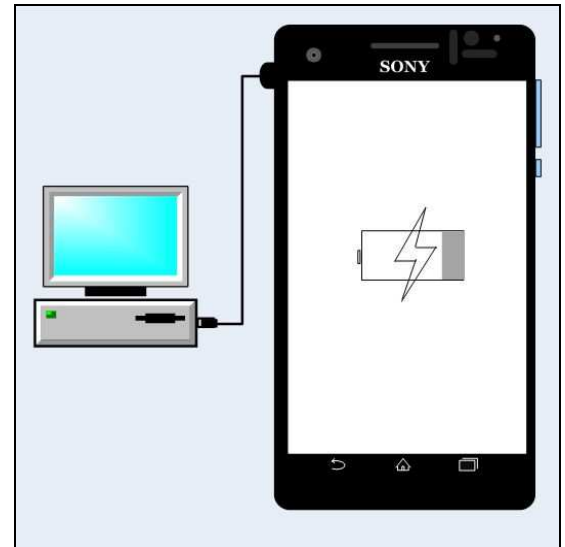
Make sure that the sound from Headset earphone ports are emitted loud and clear.



Tests: Manual Tests

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

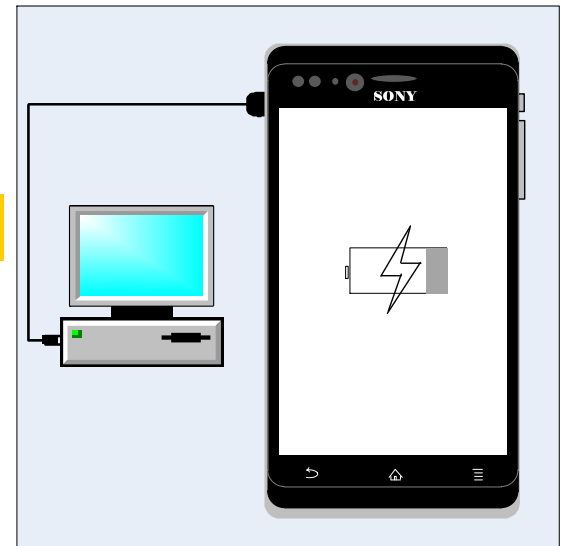


2.3.3 Charging via USB (Charger or Computer)

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!

- Step 1: Insert a battery, but do not start the phone;
- Step 2: Connect a USB cable from a computer or charger to the phone;
- Step 3: Verify that the phone is being charged by the notification LED and the Battery icon in the display;
- Step 4: Remove the USB cable from the connector and verify that the notification LED and Battery icon no longer indicates charging.

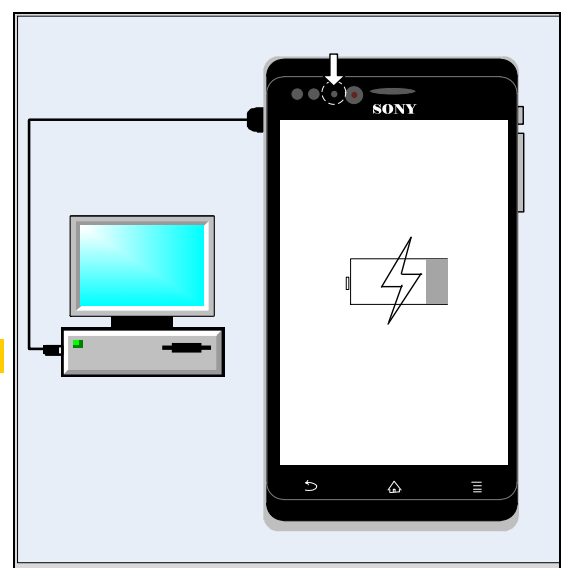


The Notification LED color status is depended on battery remaining capacity:

- Red: Battery level is between 1% and 14%;
- Orange: Battery level is between 15% and 89%;
- Green: Battery level is between 90% and 100%.

Sample phone are used in picture as reference only.

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

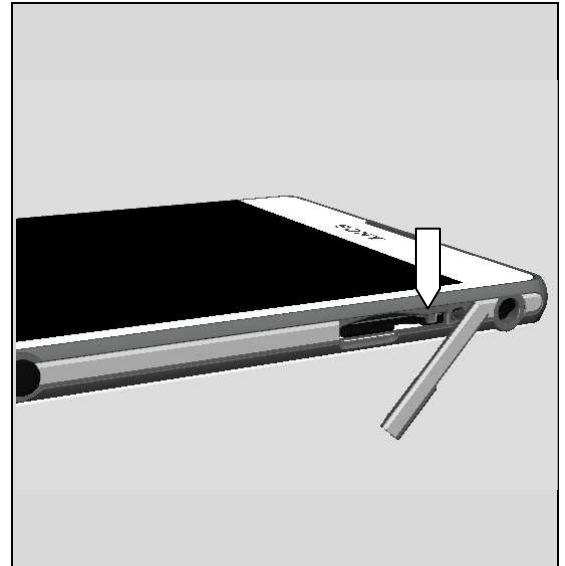


Tests: Manual Tests

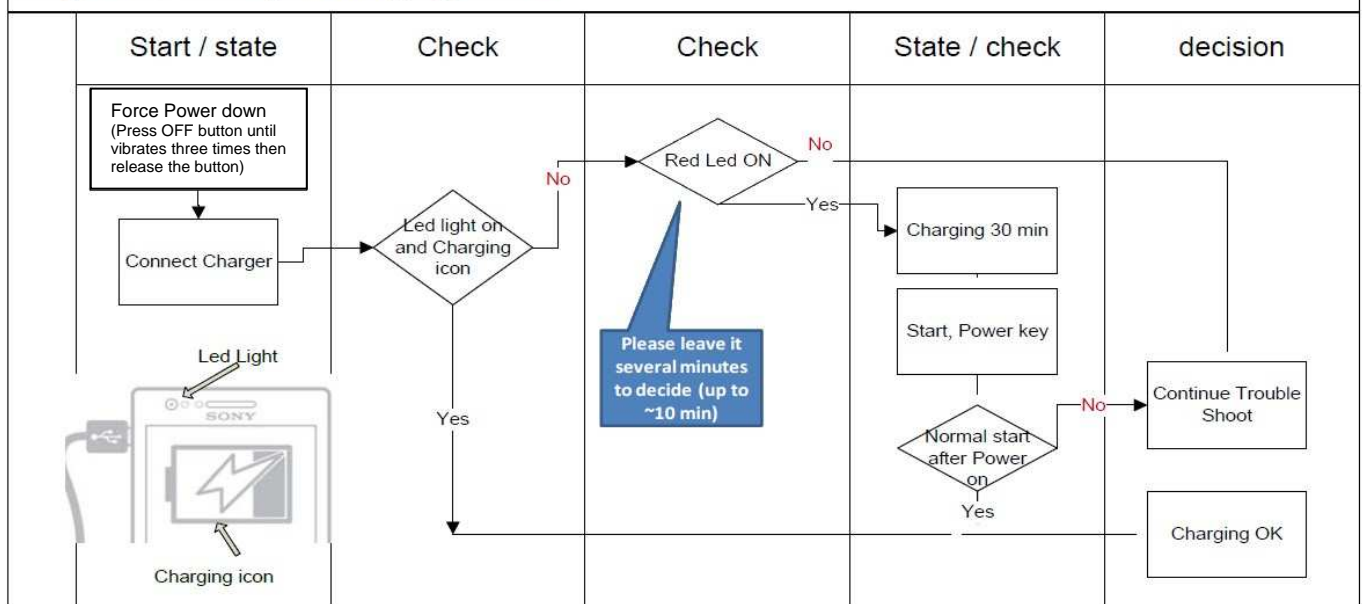
If above fails, perform below Diagnostic battery / Charging Status check.

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

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



Diagnostic Battery / Charging Status



The picture in above flow chart is only symbolic view.

Tests

2.4 Battery Test

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

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

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

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

The test is downloaded to the phone, using cable or Bluetooth, and executed.

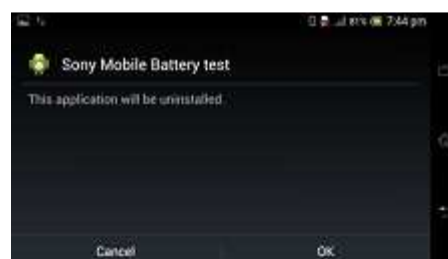
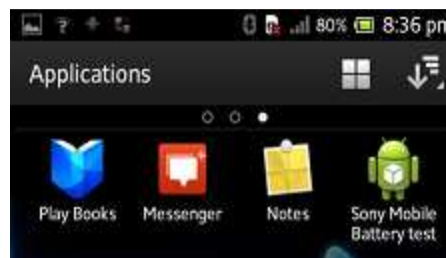
The test is available in CSPN at Level: Mechanical,

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

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

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

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



Tests

2.5 Network Test

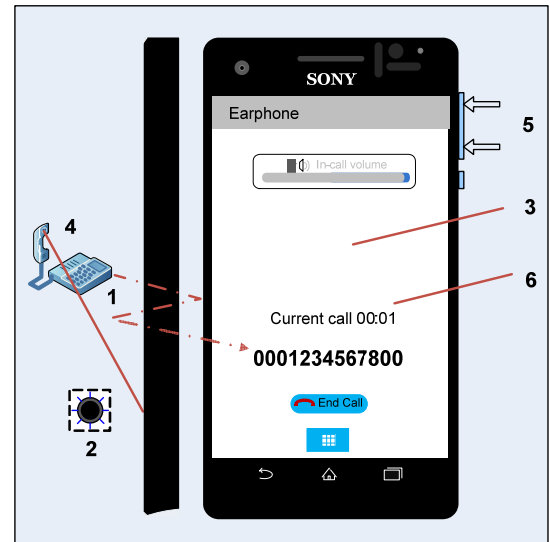
This test can only be performed if the phone has an activated SIM/USIM card (no Test SIM/USIM/UIM) and an available network signal!

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!

2.5.1 Procedure (GSM & UMTS)

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



Tests: Network Test

2.5.2 On-the-air call to mobile (D5322, XM50h--Dual SIM Cards)

GSM

Go to the Setting app:

Step1: Settings ⇒ *Dual SIM settings* ⇒ *SIM CARDS ENABLE* ⇒ *select Slot 1 only or Slot 2 only*

Ensure that the Network Status icon show SIM1 or SIM2 signal strength at the top of the display.

Step2: Settings ⇒ *More...* ⇒ *Mobile Networks settings* ⇒ Network mode ⇒ GSM only

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

WCDMA

Go to the Setting app:

Step1: Settings ⇒ *Dual SIM settings* ⇒ *SIM CARDS ENABLE* ⇒ *select Slot 1 only or Slot 2 only*

Ensure that the Network Status icon show SIM1 or SIM2 signal strength at the top of the display.

Step2: Settings ⇒ *More...* ⇒ *Mobile Networks settings* ⇒ Network mode ⇒ WCDMA only

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

Tests: Network Test

2.5.3 On-the-air call to mobile (D5303, D5306, XM 50t)

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 '2.5.1 Procedure (GSM & UMTS & CDMA)' above.

UMTS

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Network mode ⇒ WCDMA only

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

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

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.

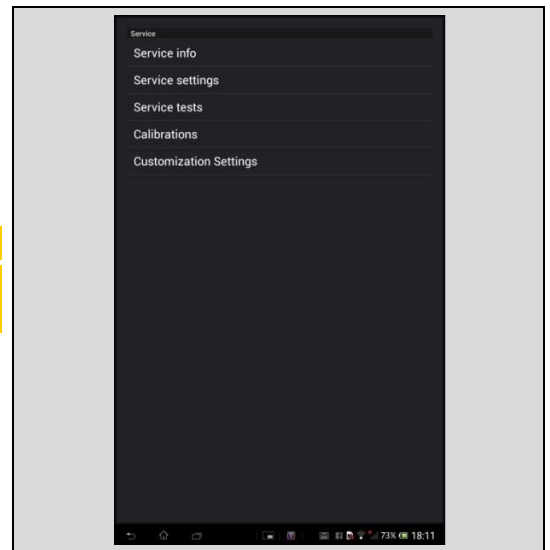
To verify the radio functions (LTE) of the phone, download data package by for ex. accessing the web.

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

3 Calibrations

Service Menu Calibrations, do not use!

Please refer to Test and Calibration Application 1257-2706, for calibrations!



3.1 Gyroscope

N/A

3.2 Accelerometer

N/A

3.3 Proximity Sensor

N/A

4 Revision History

Rev.	Date	Changes / Comments
1	2014-Mar-07	Initial release