

Test Instructions

- mechanical -



Xperia™ XA1

G3112, G3116, G3121, G3123, G3125

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2.3.8 On-the-air call to mobile (G3112/G3116)..... 28

3 Revision History 29

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

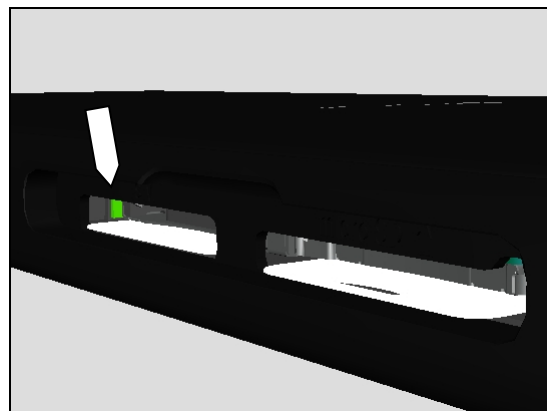
Pre-Test Preparation

1.1 Hardware

1.1.1 Water indicator inspection

Before starting any tests the Water indicator has to be checked.

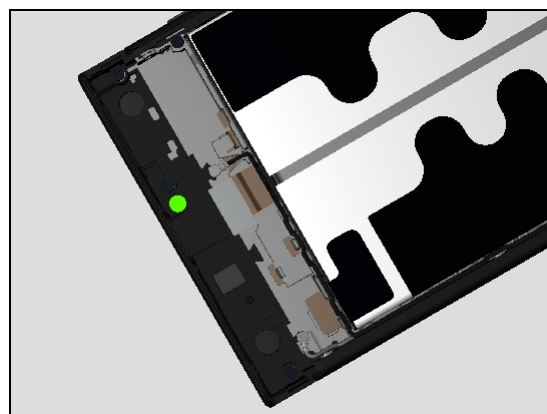
The indicator is located as shown in picture after Cap Tray is removed.



Another liquid indicator is located as shown in picture after Sub PBA is disassembled (following Working Instruction).

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

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



Pre-Test Preparations

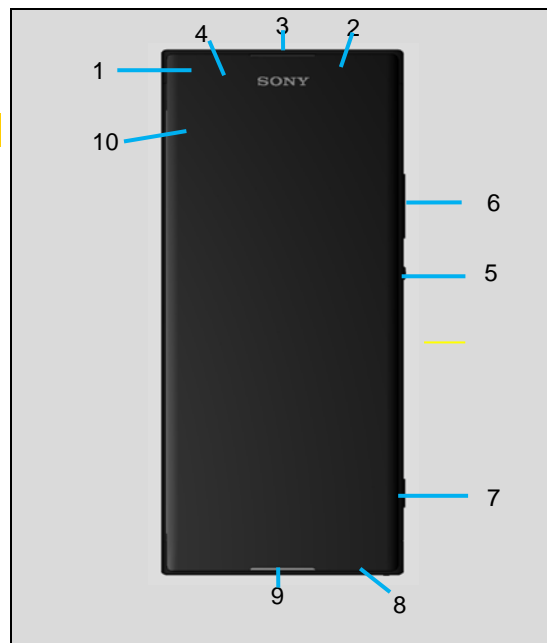
1.2 Test Enablers

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

Note! The product supports only Nano SIM!

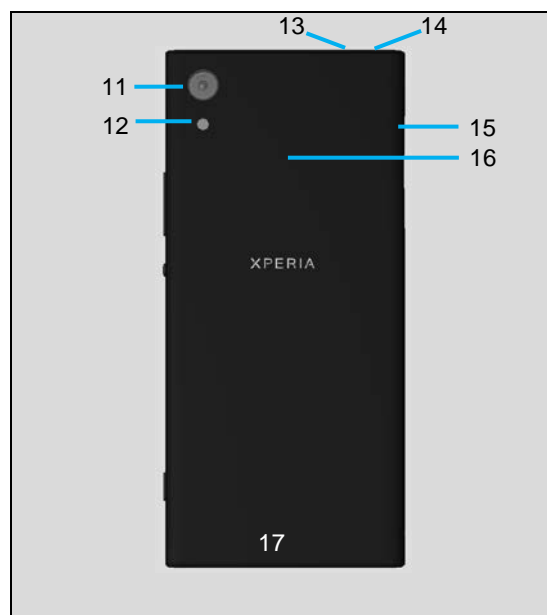
Front:

1. Notification LED
2. Light Sensor, Proximity Switch
3. Earphone port
4. Secondary Camera
5. Power Key
6. Volume up/down Key
7. Camera key
8. Speaker bottom port
9. Microphone
10. Hall sensor

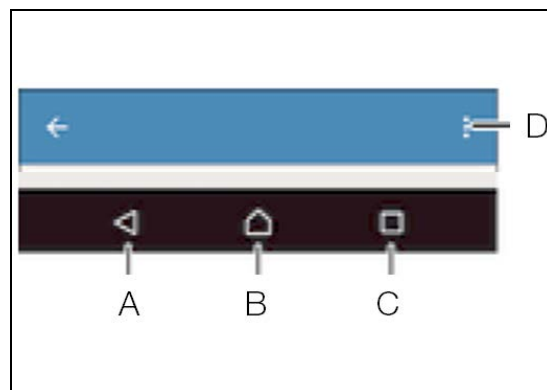


Back:

11. Camera
12. LED Flash
13. Secondary Microphone
14. Audio jack
15. Nano SIM and Memory card slot
16. NFC area
17. USB slot



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



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
- 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

1.3.1.2 Software version update

Mandatory first repair action after verification of fault!

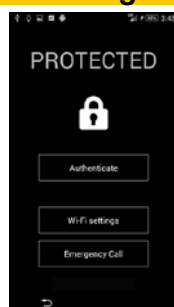
Use the USB cable to connect with the Micro USB connector of the phone for this purpose!

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: If a unit is locked by "theft protection", run the online Service in emma "theft protection unlock" for the model, before the customization script. USB DONGLE is required. (same as for "activation")

Service center must verify the customer's proof of purchase (with IMEI) to verify ownership before agreeing to unlock the unit!



Run Unlock script in emma, verify fault and then Customization script in emma.

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.

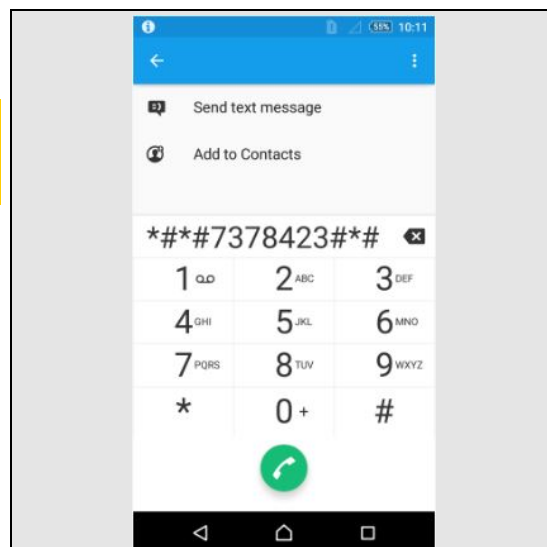
2 Tests

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, SIM lock, Configuration (IMEI, bands, codec's), Factory charging, DTCP-IP, Firmware, WLAN Mac address etc.

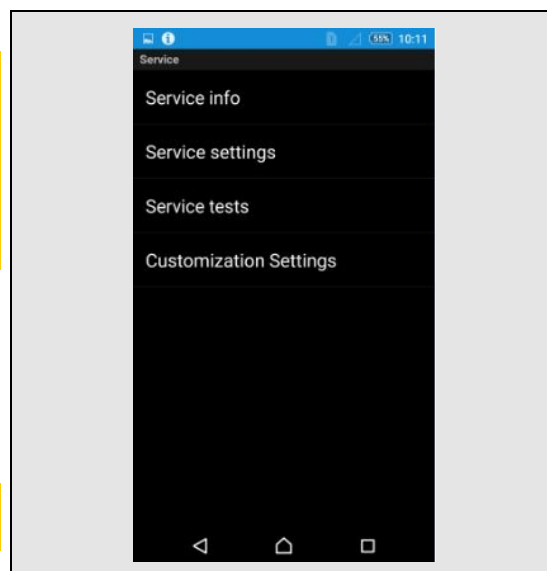
Service settings: Do not use

Service test: Follow instruction below

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

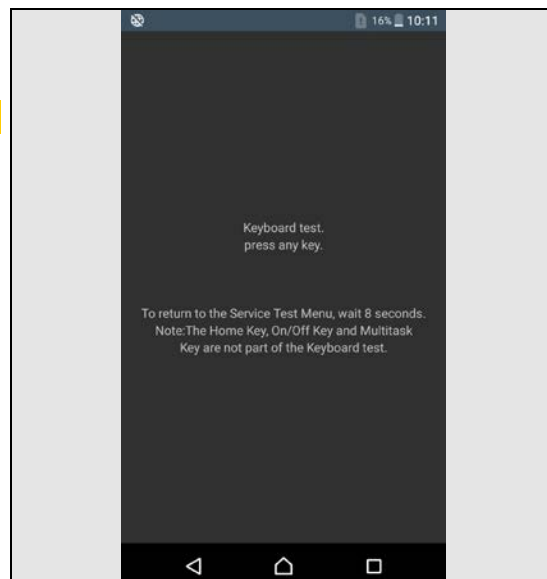
2.2 Service Tests

2.2.1 Keyboard & Switch

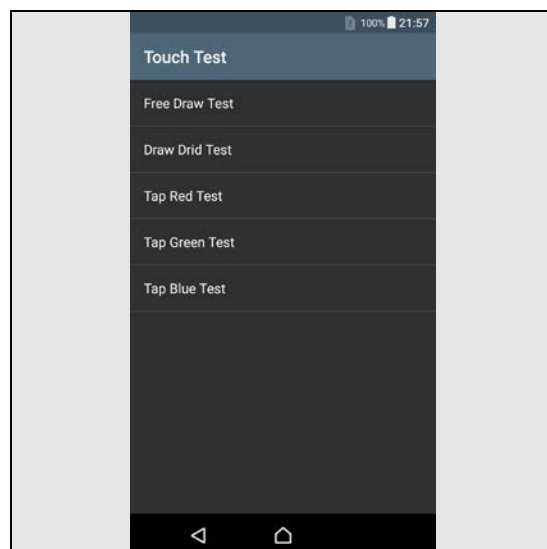
To return to the Service Test Menu, wait for 8 seconds.

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.
- **Power key:** the screen will enter sleep mode, press the Power key one more time to wake up.
- **Volume up key:** notification on screen.
- **Volume down key:** notification on screen.
- **Auto Focus key (short press) / Camera key (long press):** notification on screen.



2.2.1 Touch Screen

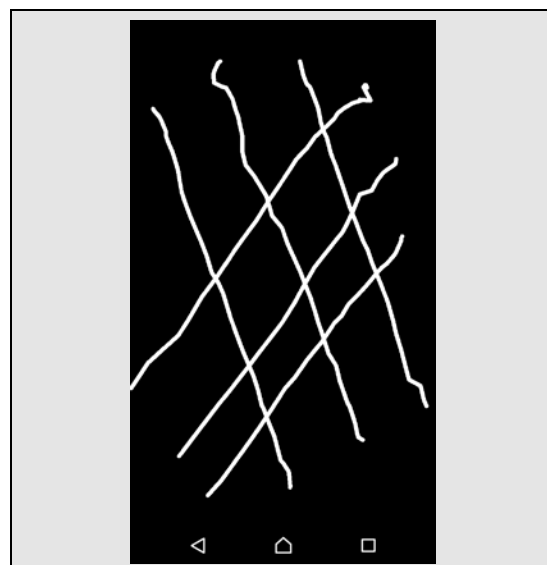


Free Drawing Test

Move four fingers at the same time across the touch screen, four lines will be drawn as it touches.

Check all area of the touch screen as indicated.

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



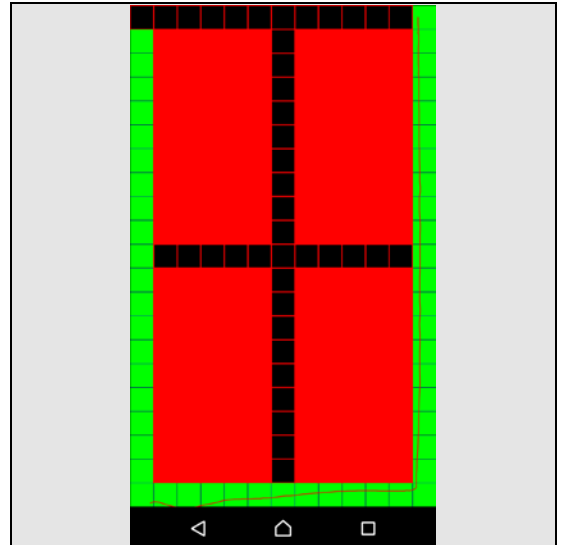
Tests: Service Tests

Draw grid test

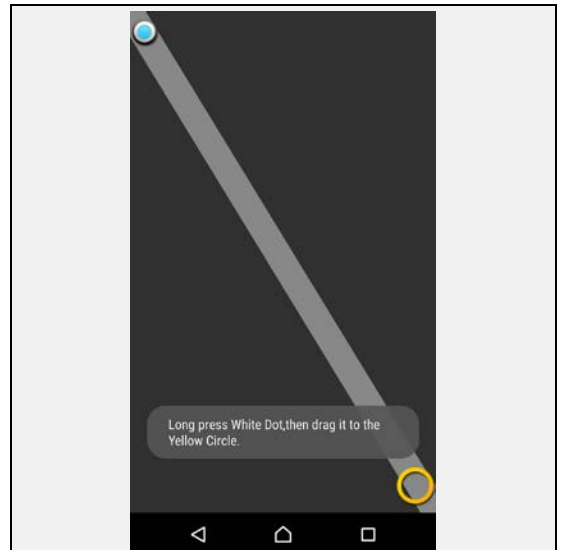
Move a finger across the boxes and they should switch colour.

Check all boxes as indicated, if you can't fill a box yellow it indicate a problem with the lines in TP sensor.

Swipe from bottom of screen to get the Press the Back key to return to the Service Test Menu.

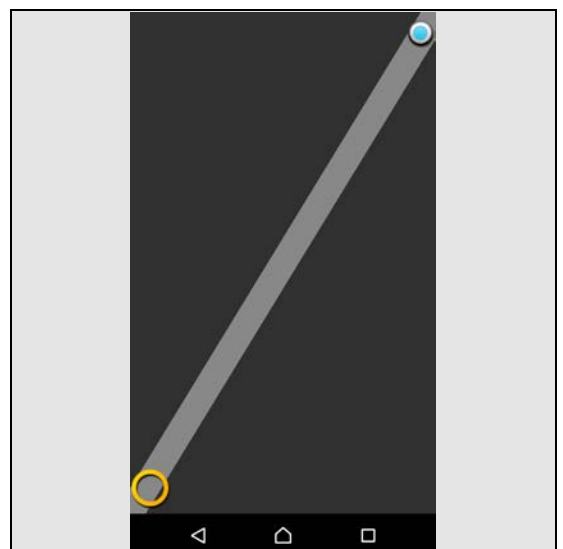


Long press White Dot and drag the Dot to the yellow circle on the lower right corner along the gray channel to accomplish the test and enter into the next step.



Do the same for the opposite side.

It will automatically go back to the Touch Test Menu after finishing the test.



Tests: Service Tests

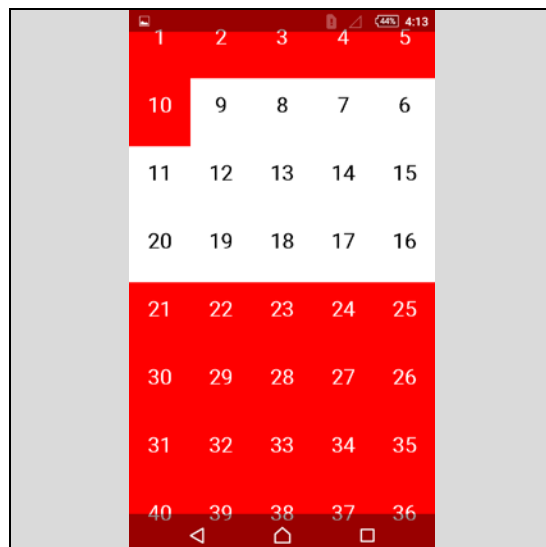
Click Tap test Red to start:

The screen is divided into forty modules marked with numbers.

Touch each module with finger, the module will turn from white to red. Touch again, color turns back to white.

Test all the forty modules.

Drag the bottom of screen to exit the full screen mode and show the key bar; press Back Key to return to the “Touch Test” Menu.



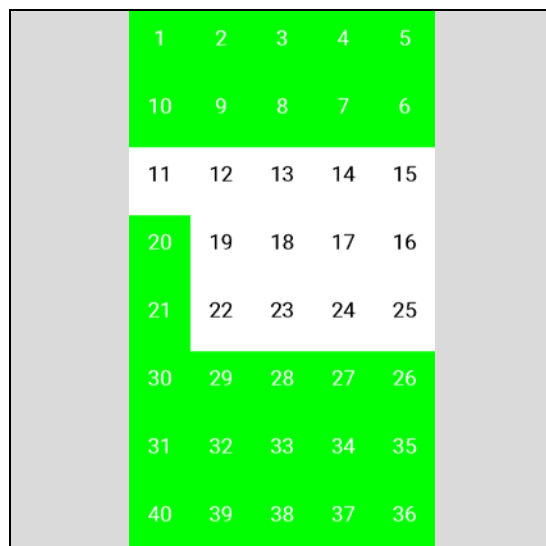
Click Tap test Green to start:

The screen is divided into forty modules marked with numbers.

Touch each module with finger, the module will turn from white to green. Touch again, color turn back to white.

Test all the forty modules.

Drag the bottom of screen to exit the full screen mode and show the key bar; press Back Key to return to the “Touch Test” Menu.



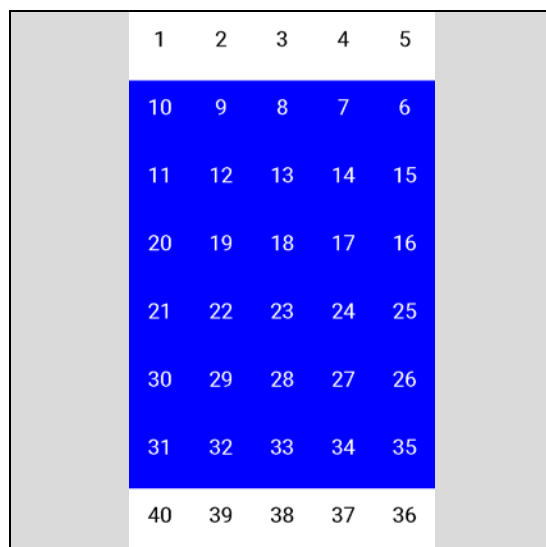
Click Tap test Blue to start:

The screen is divided into forty modules.

Touch each module with finger, the module will turn from white to blue. Touch again, color turn back to white.

Test all forty modules.

Drag the bottom of screen to exit the full screen mode and show the key bar; press Back Key to return to the “Touch Test” Menu and press Back Key again to return to the Service test Menu.



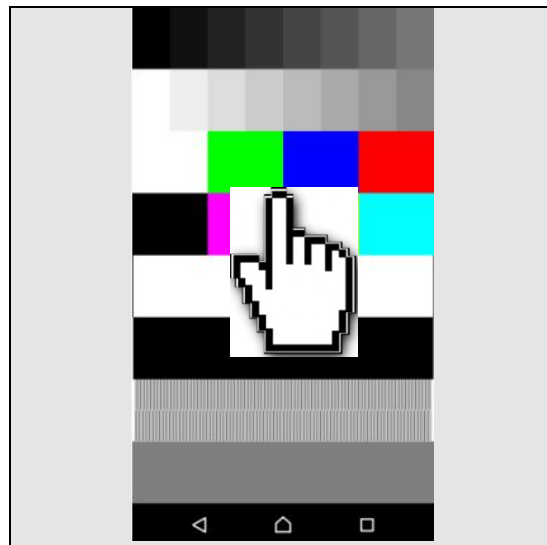
Tests

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, Four boxes Pattern, and TV Pattern on the full screen. Make sure that there are no missing segments; the colors and contrast are OK.

Press Back Key to return to the Service Test Menu.

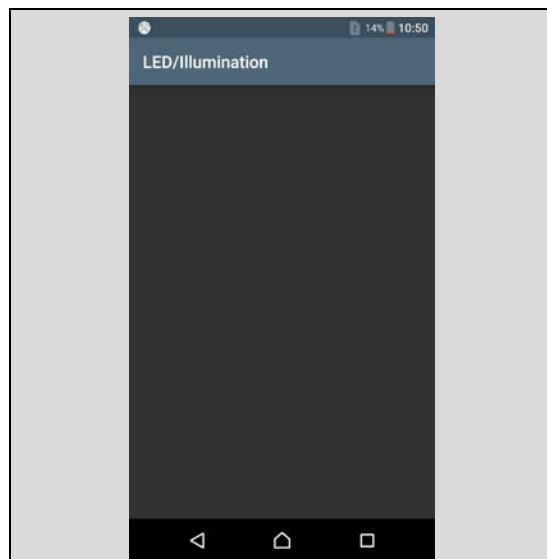


2.2.3 LED/Illumination

Check that the:

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

Press Back Key to return to the Service Test Menu.



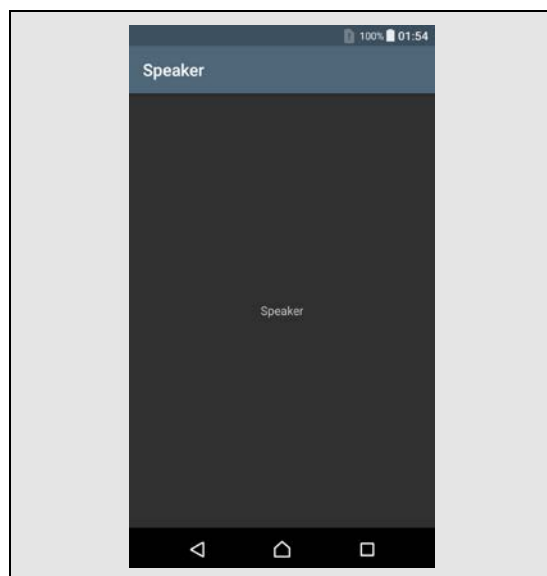
2.2.4 Speaker

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

Make sure that the music sound from the speaker port at the lower right side is 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.



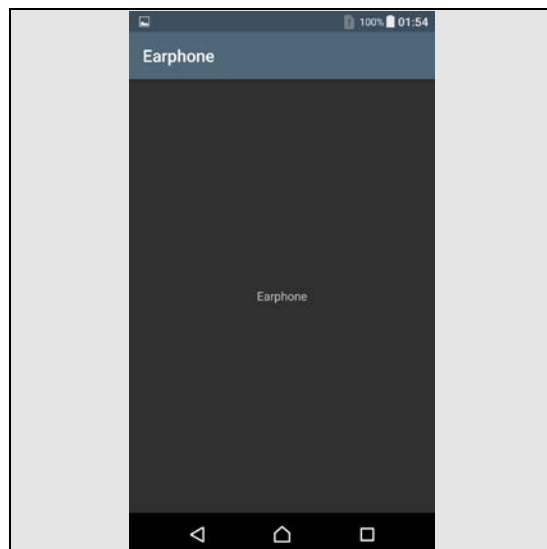
Tests: Service Tests

2.2.5 Earphone

Make sure that the music 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 Back Key to return to the Service Test Menu.

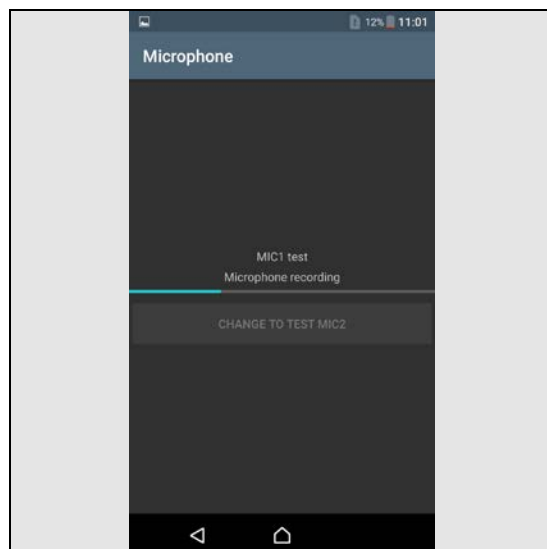


2.2.6 Microphone

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

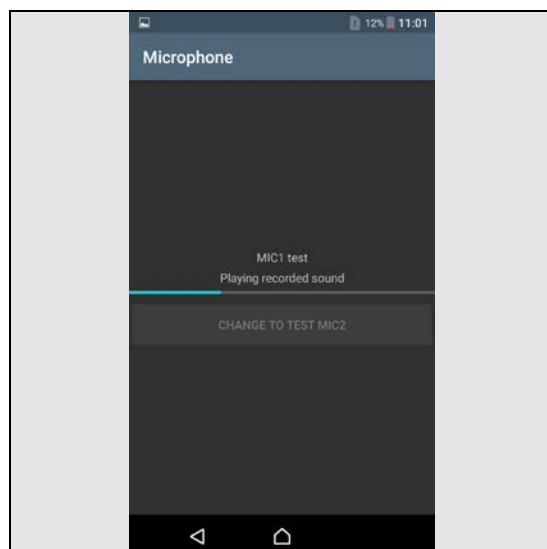
The phone will start to record and after approximately ten seconds the sound is played back through the speaker.

Step 1: Speak into the microphone during the 'MIC 1 test 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 Back Key to return to the Service Test Menu.



Tests: Service Tests

2.2.7 Secondary Microphone

The previous “Speaker” and Main Microphone test must have been successfully carried out before doing this test!

Click Change to TEST MIC2 to enter into the test:

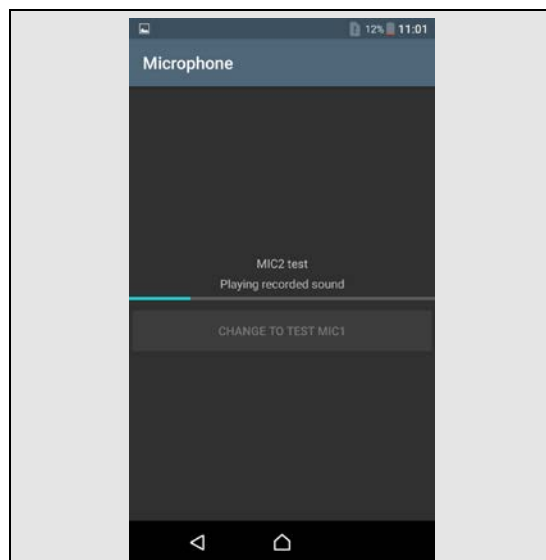
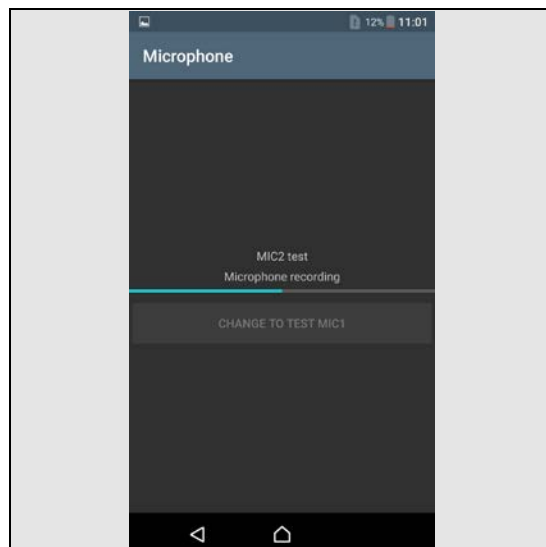
The phone will start to record and after approximately ten seconds the sound is played back through the speaker.

Step 1: Speak into the secondary microphone during the ‘MIC 2 test 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 Back Key to return to the Service Test Menu.

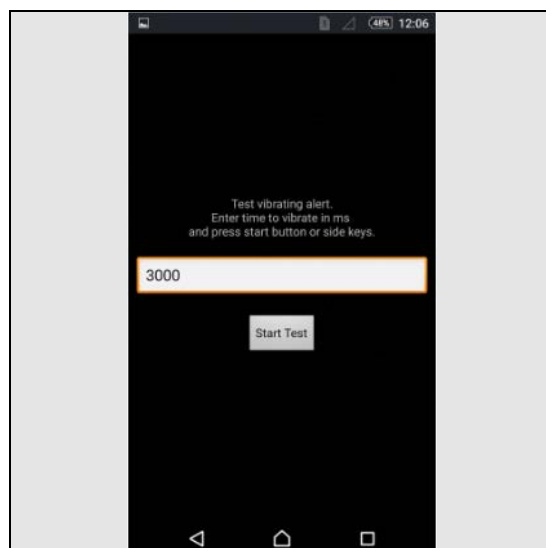
Note! Covering the secondary microphone hole accidentally will greatly affect voice quality when making a call by using the hands free function mode. Refer to Test Enablers for the secondary microphone location.



2.2.8 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

2.2.9 Camera

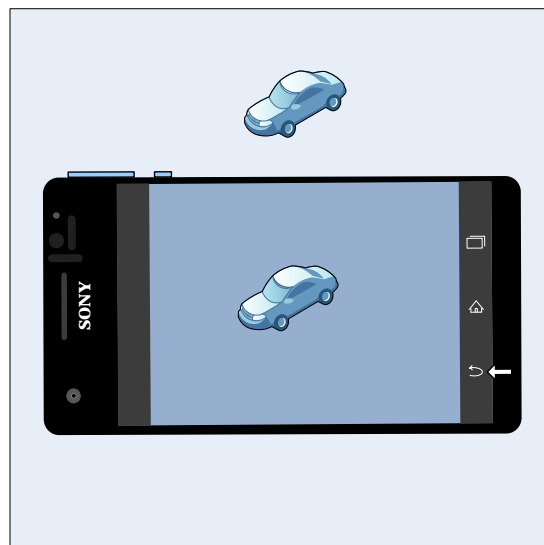
Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

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.



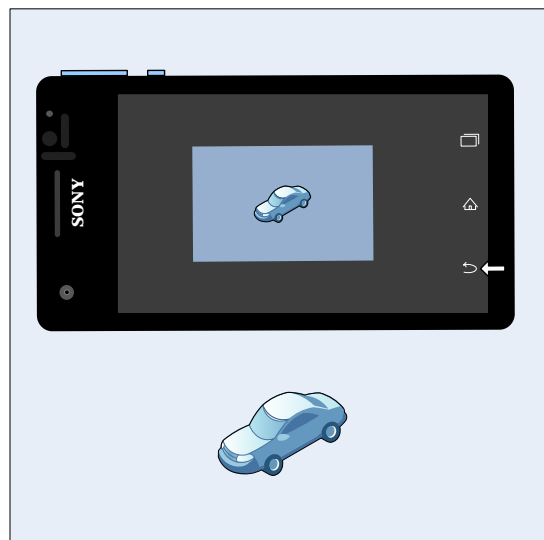
Only symbolic view

2.2.10 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.

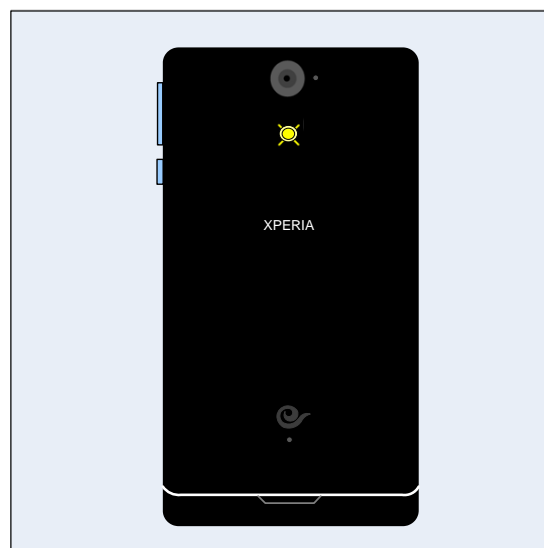


Only symbolic view

2.2.11 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

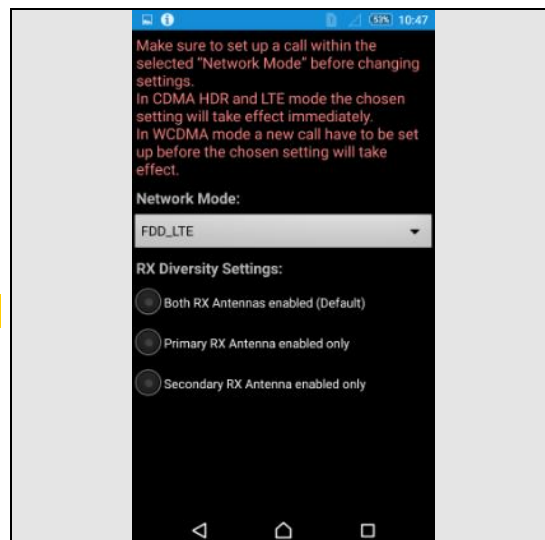
Tests: Service Tests

2.2.12 Antenna RX Diversity

N/A.

Do not use this test!

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



2.2.13 Bluetooth

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

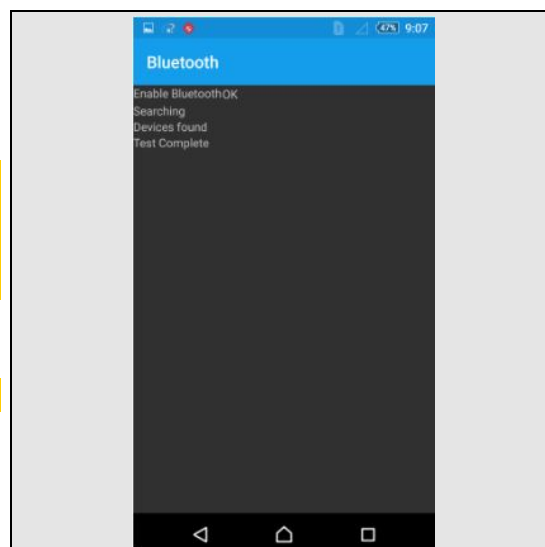
The Bluetooth test will be done in following sequences:

Step 1: Enable Bluetooth; wait 4-5 seconds, shows OK;

There is a permission request, select 'Yes'.

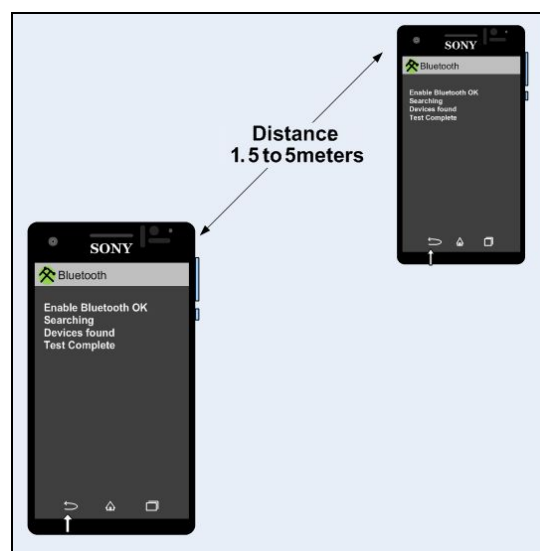
Step 2: Searching;

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.



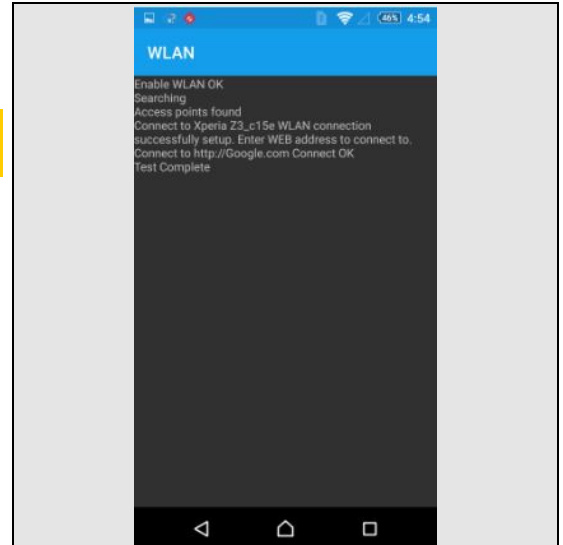
Only symbolic view

Tests: Service Tests

2.2.14 WLAN

Make sure there's a WLAN network before performing this test.

The WLAN test will be done in following sequences:
 Step 1: Enable WLAN; wait 4-5 seconds, shows OK;
 Step 2: Searching;
 Step 3: Access points found list;
 Step 4: Select the Target WLAN network, and type the password to get connected;
 Step 5: Enter a web address (e.g. Google.com);
 Step 6: When connection succeed, it shows 'Test Complete'.
 Press the Back key to return to the Service Test Menu.

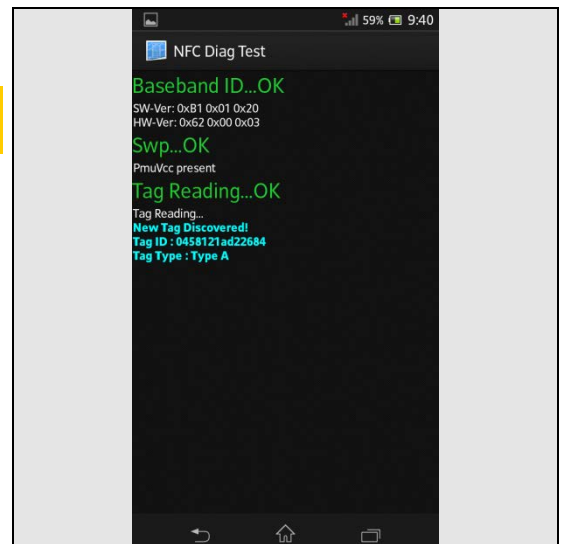


2.2.15 NFC

A NFC SIM card 4FF 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 Panel Rear.
 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.

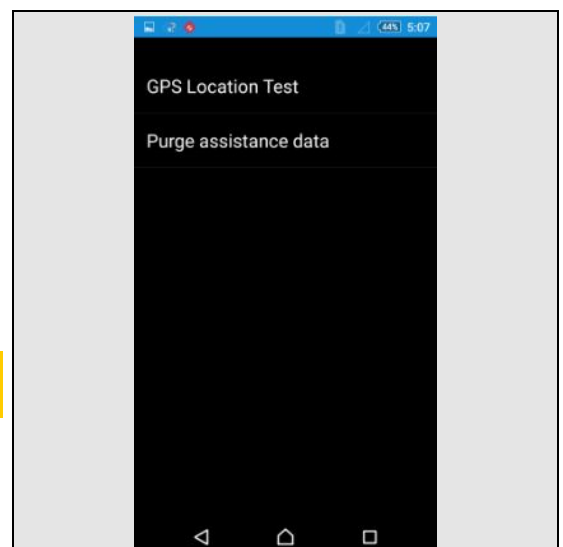


2.2.16 GPS

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



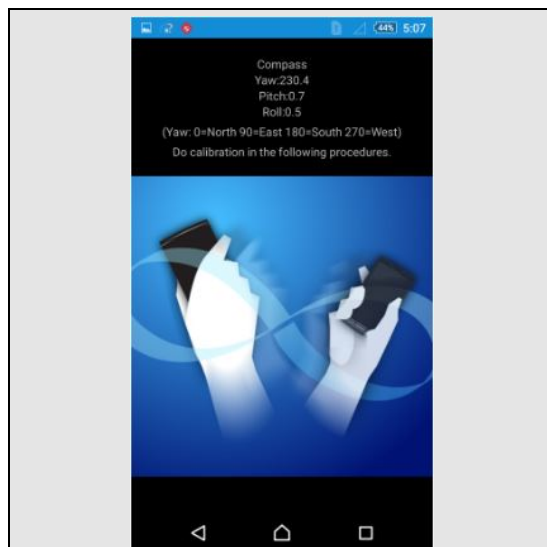
Tests: Service Tests

2.2.17 Compass

Do the test with hand movements as shown in the phone, and then check the actual direction with measured Yaw value.

(Yaw: 0=North, 90=East, 180=South, 270=West)

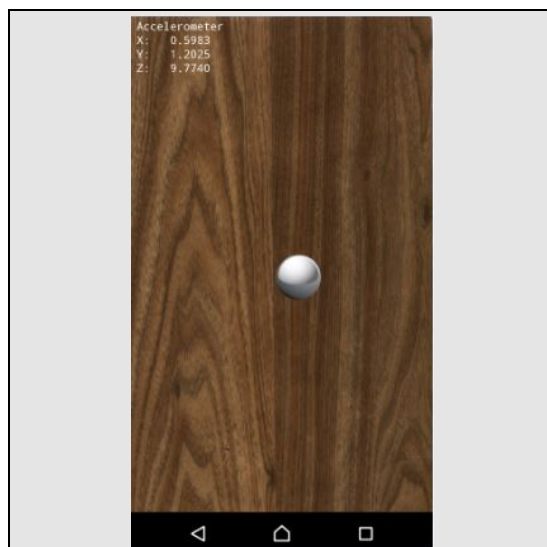
Press the Back key to return to the Service Test Menu.



2.2.18 Accelerometer

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

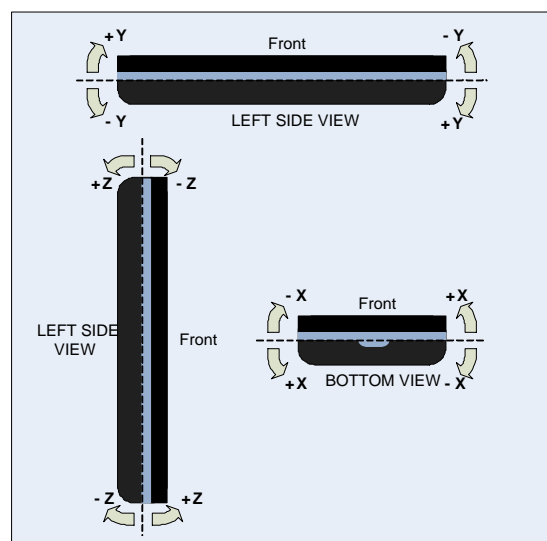
Press the Back key to return to the Service Test Menu.



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.

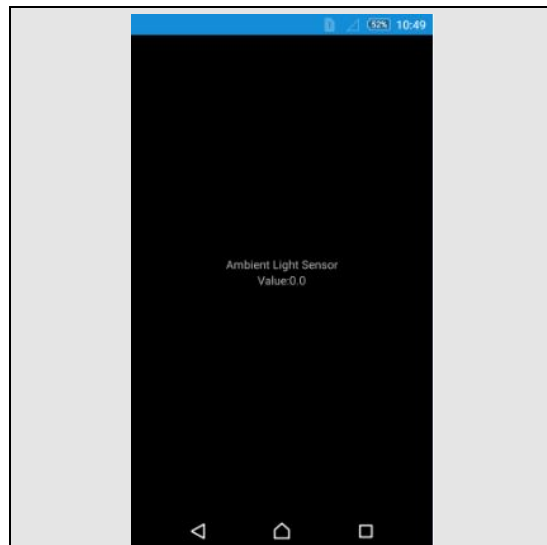


Tests: Service Tests

2.2.19 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.



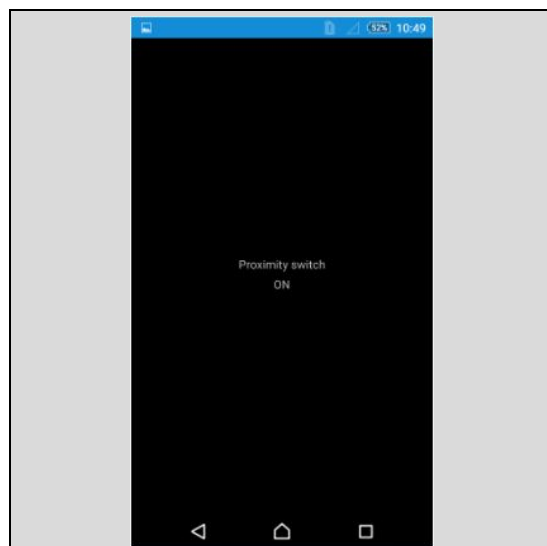
2.2.20 Proximity switch

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.

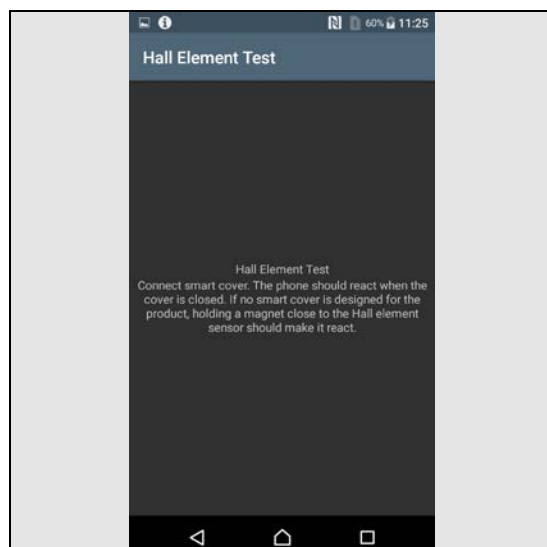


2.2.21 Hall Element Test

Enter this test and press power key to enter sleep mode! Put the magnet above the Hall sensor area and then remove the magnet, the phone will wake up.

Refer to Test Enablers for the Hall sensor area location.

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

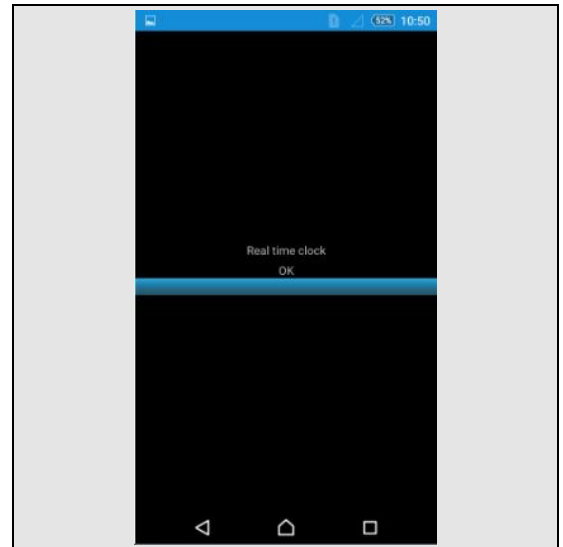


Tests: Service Tests

2.2.22 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.

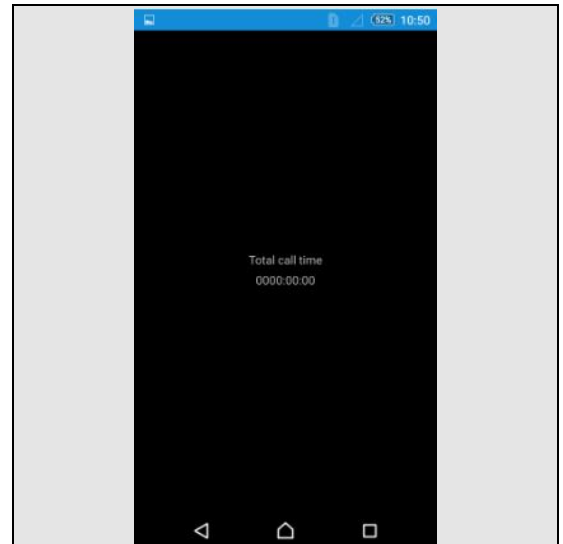
Press the Back key to return to the Service Test Menu.



2.2.23 Total call time (G3121, G3123, G3125)

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

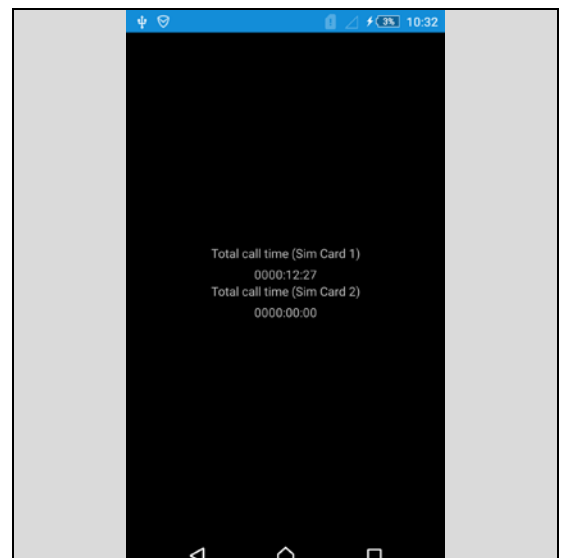
Press the Back key to return to the Service Test Menu.



2.2.24 Total call time (G3112, G3116)

The total call time of SIM Card 1 and SIM Card 2 are displayed in the format HH:MM:SS (hours: minutes: seconds).

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



Tests: Service Tests

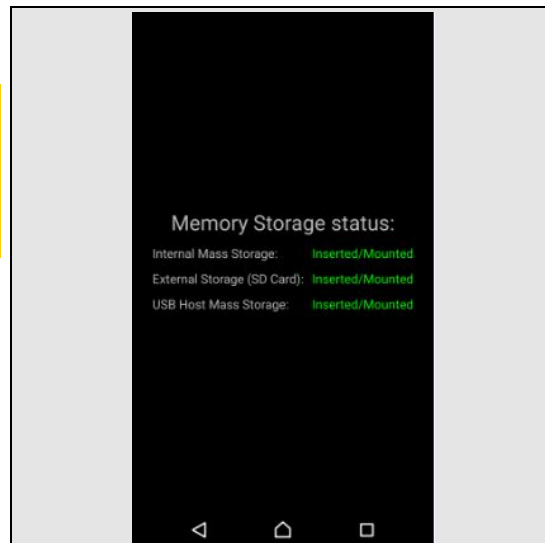
2.2.25 Storage

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

After you inserted USB disk go to Settings/Xperia Connectivity/USB Connectivity/Detect USB device/OK

- 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.

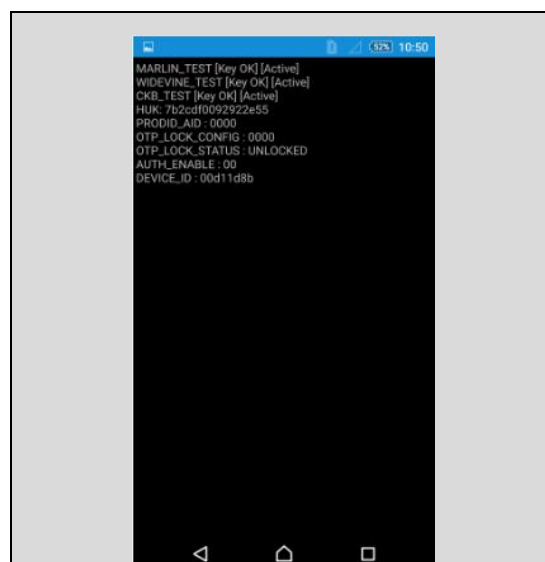


2.2.26 Security

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.



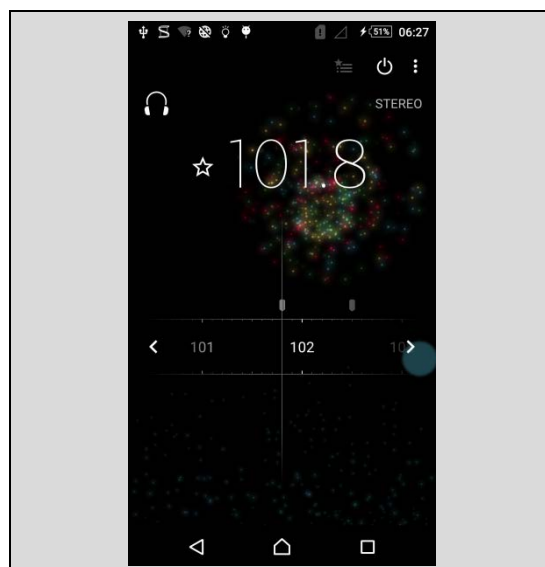
2.2.27 FM Radio

The 2.3.4 "Audio Jack Test" must have been successfully carried out before doing this test!

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 Back Key to return to the Service Test Menu.

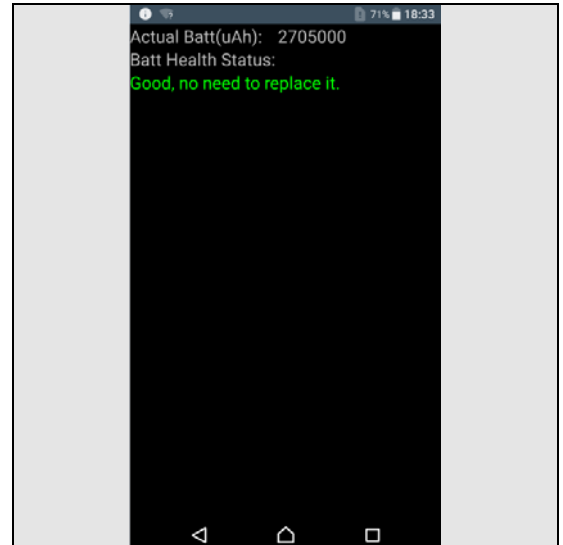


Tests: Service Tests

2.2.28 Battery Test Check

The Battery Health Status is shown in the display.

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



2.2.29 Verify certificates

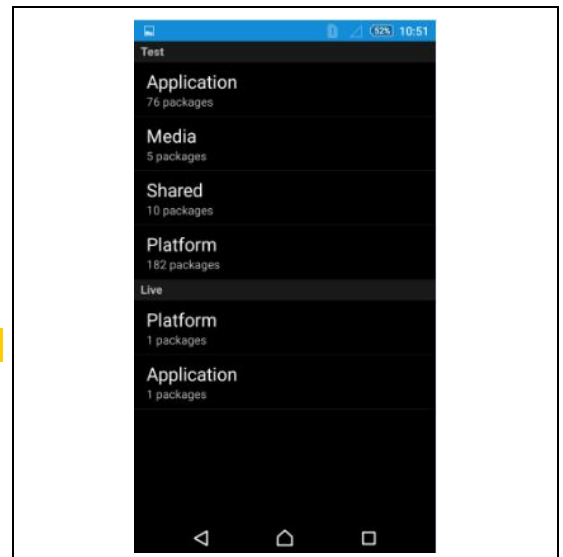
When entering the test, five information categories will be shown:

Test: Media, Application, Shared, Platform

Live: Application.

Do not use this test!

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



Tests: Manual Tests

2.3 Manual Tests

2.3.1 SIM test (G3121, G3123, G3125)

Verify that the phone can detect a SIM card:

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

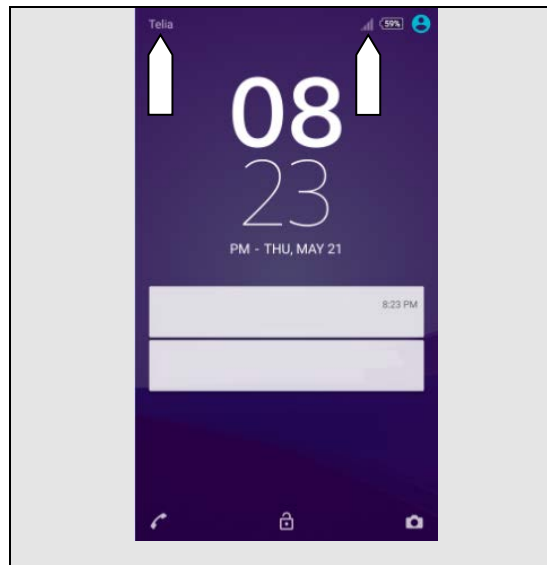
If the SIM card is detected by the phone, the start-up procedure will continue.

Step 2: The operator's name is displayed at the top left corner 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 SIM test (G3112, G3116)

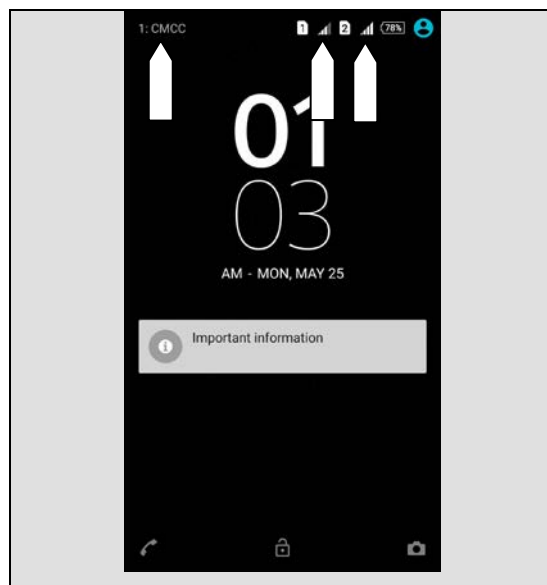
Verify the phone can detect a SIM card 1 and a SIM card 2:

Step 1: Insert a SIM card 1 and a SIM card 2, and start the phone; If the SIM card 1 and SIM card 2 is detected by the phone, the start-up procedure will continue.

Step 2: The SIM card 1 and SIM card 2 operator name will be displayed at the top left corner of the locked screen by turns.

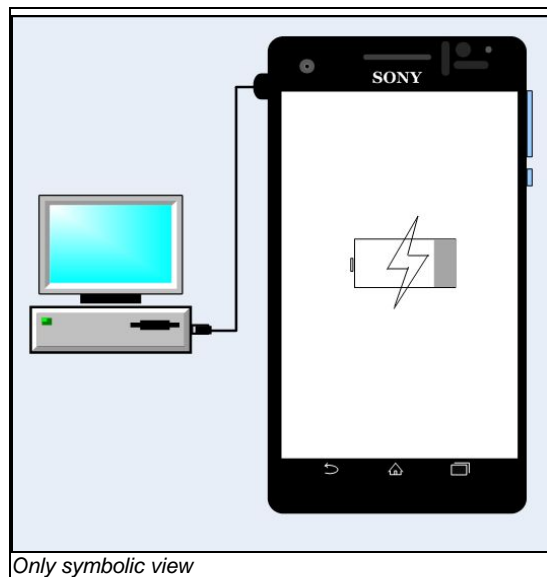
If SIM card is not detected, the message 'No SIM card-Emergency call only' will be displayed instead. If operator is not detected, the message 'No service' will be displayed instead.

Press Back key to return to Standby Menu.



2.3.3 Data Communication test

- Connect a USB cable from a computer to the started phone.
- Verify that Data Communication works by transferring a file from Computer to phone
- Erase the file



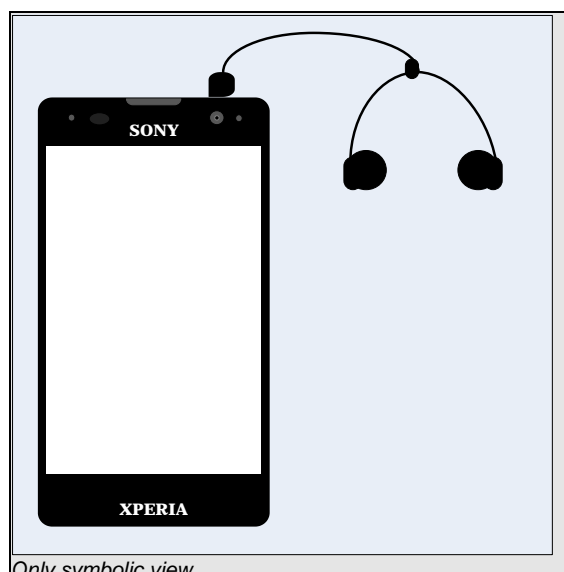
Tests: Manual Tests

2.3.4 Audio Jack test

Connect a Sony CTIA headset.

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

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



Tests: Manual Tests

2.3.5 Charging (Charger or Computer)

2.3.5.1 Charging via USB (Charger or Computer)

Verify that the phone can charge the battery by a USB port:

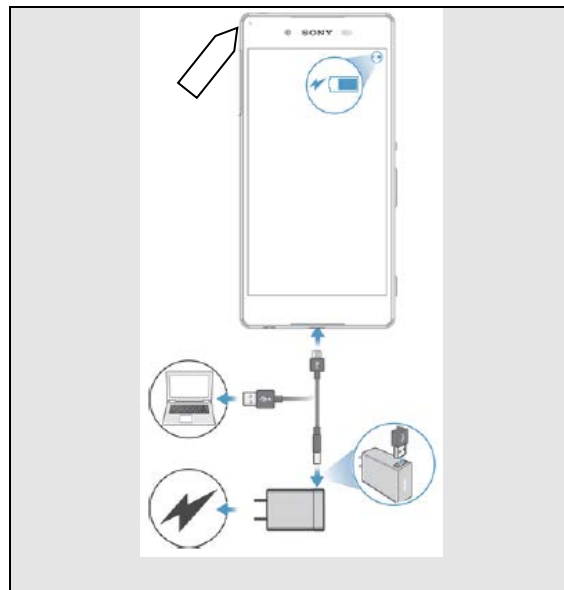
Ensure that no computer application, such as PC Suite or Emma, is active!

Do not start the phone.

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

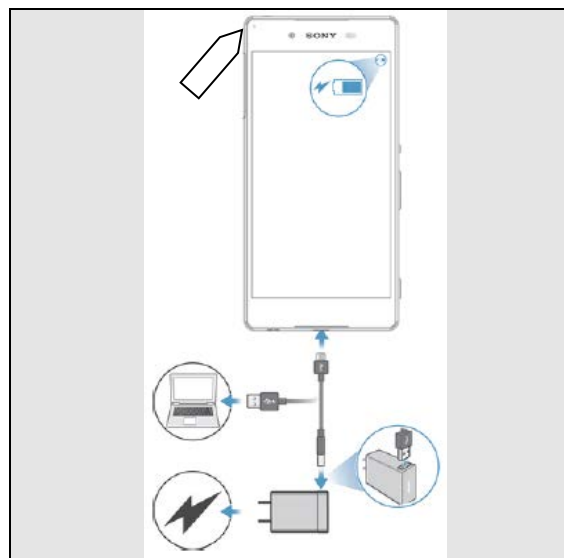
Verify that the phone is being charged by the notification LED and Battery icon in the display can take up to 10 min before LED starts.

Remove the USB cable from the connector and verify that the Notification LED (see 1.3 Test Enablers) and Battery icon no longer indicates charging.



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

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



Tests: Manual Tests

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

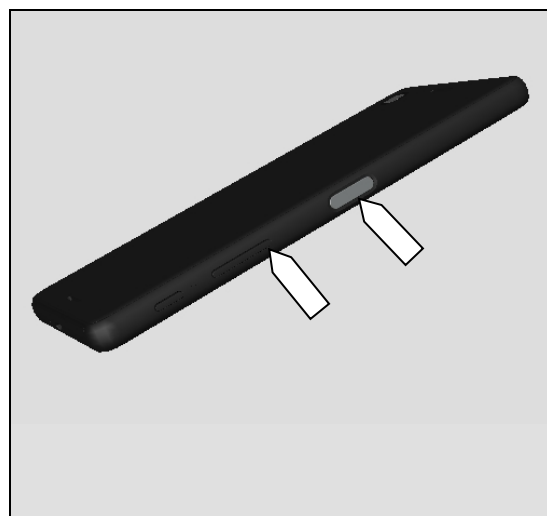
Force Power Down

Press and hold down the power key and the volume up key at the same time for 10 seconds.

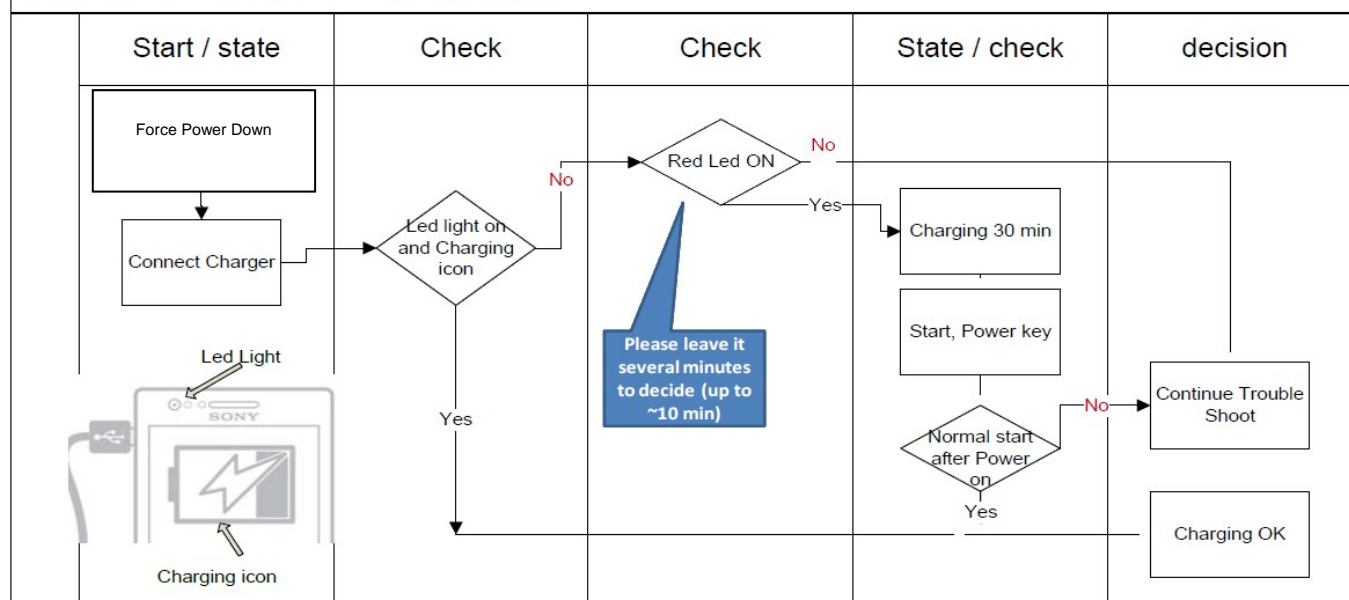
The unit vibrates once.

Continue to keep pressing the keys.

After a few more seconds, the unit vibrates three times and turns off.



Diagnostic Battery / Charging Status



The picture in above flow chart is only symbolic view.

Tests

2.3.6 Network Test

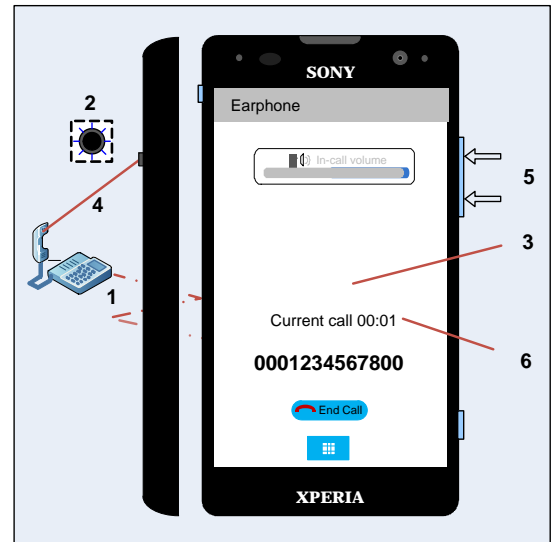
This test can only be performed if the phone has got an activated Nano SIM card (no Test Nano SIM) and an available network signal!

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

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

2.3.6.1 Procedure (GSM & UMTS)

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



Only symbolic view

Tests: Network Test

2.3.7 On-the-air call to mobile (G3121/G3123/G3125)

GSM

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Preferred network type ⇒ GSM only

Ensure that the Network Status icon show signal strength and show no symbol or E at the top of the display.

To verify the radio functions (GSM) of the phone, follow the '2.4.1 Procedure (GSM & UMTS)' above.

UMTS

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Preferred network type ⇒ WCDMA(3G) only

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

To verify the radio functions (UMTS) of the phone, follow the '2.4.1 Procedure (GSM & UMTS)' above.

LTE (if available)

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Preferred network type ⇒

LTE(4G)(preferred)/WCDMA(3G)/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 ⇒ SIM status ⇒ Mobile Network Type

Tests: Network Test

2.3.8 On-the-air call to mobile (G3112/G3116)

SIM 1 or SIM 2

GSM

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ SIM 1 or SIM 2 ⇒ Preferred network type ⇒ GSM only

Ensure that the Network Status icon show signal strength and show no symbol or E at the top of the display.

To verify the radio functions (GSM) of the phone, follow the '2.4.1 Procedure (GSM & UMTS)' above.

UMTS

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ SIM 1 or SIM 2 ⇒ Preferred network type ⇒ WCDMA(3G) only

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

To verify the radio functions (UMTS) of the phone, follow the '2.4.1 Procedure (GSM & UMTS)' above.

LTE (if available)

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ SIM 1 or SIM 2 ⇒ Preferred network type ⇒ LTE(4G) (preferred)/WCDMA(3G)/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⇒ SIM status⇒ Mobile Network Type

If one of the SIM is selected to be LTE (preferred)/WCDMA/GSM or WCDMA only, the other SIM only support GSM.

3 Revision History

Rev.	Date	Changes / Comments
1	2017-Mar-17	Initial release