

Test Instructions

- mechanical -



ST27i, ST27a

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make.believe

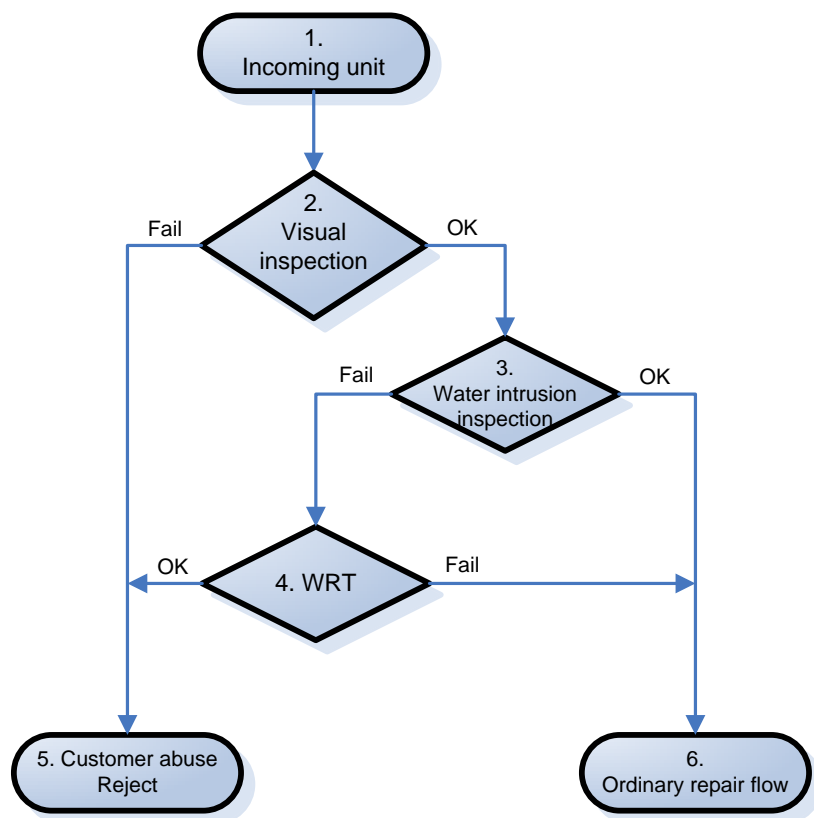
Test Instructions (mech)

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

1 Pre-Test Preparations

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



This process flow is a complement to the process flow in the *1220-1333 Generic Repair Manual*.

1. Unpack and handle the unit according to your local instruction and check of warranty.
2. Try to determine whether the unit has been exposed to abuse by doing a close general visual inspection, according to chapter 4 *1220-1333 Generic Repair Manual*.
3. General condition inspection of the sealings at the Audio Jack Cap, Micro SD Cover, SIM Drawer and Micro USB Cap. Check the Liquid Indicator. This check up will give you an indication whether the unit has been in contact with liquid.
4. Perform a Water Resistance Test to verify if the unit is water resistance or not.
5. The unit must be rejected if the visual inspection or the Water Resistance Test shows any kind of abuse of the unit.
6. Otherwise shall the unit be handled in the ordinary repair flow.

Pre-Test Preparations

1.2 Hardware

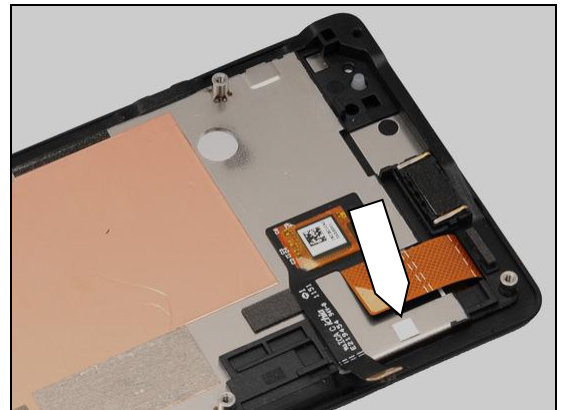
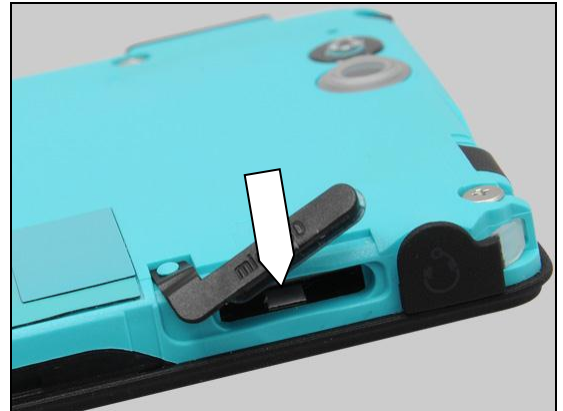
1.2.1 Water indicator inspection

Before starting any tests, make a general inspection of the unit. If the Liquid Indicator has been affected or the unit indicates any kind of water damaged, perform the WRT test to confirm if the unit still is water resistance, see chapter 1.1

The indicators are located as shown in these pictures after the Battery Cover Assy removed and the Micro SD Cover is opened.

If Liquid Indicator are affected (red color) **and** the WRT test proves that the unit is water resistance then handle the phone according to your local directives.

If the Liquid Indicator isn't affected or the WRT test prove that the unit **isn't** water resistance, proceed to the 'Pre-Test Preparation' below.



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

- Start up the phone
 - Note: Make sure the phone is in call setup.
- Press the following keypad combination: *##7378423#*##*
- Select 'Service info'
- Select 'Software info'
- Check the software file revisions and, 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!

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://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

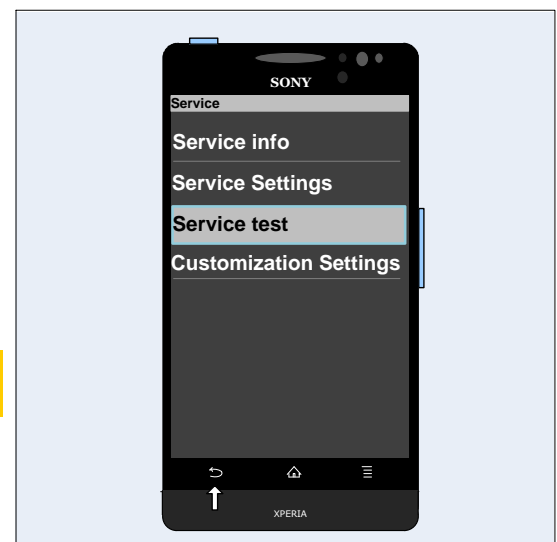
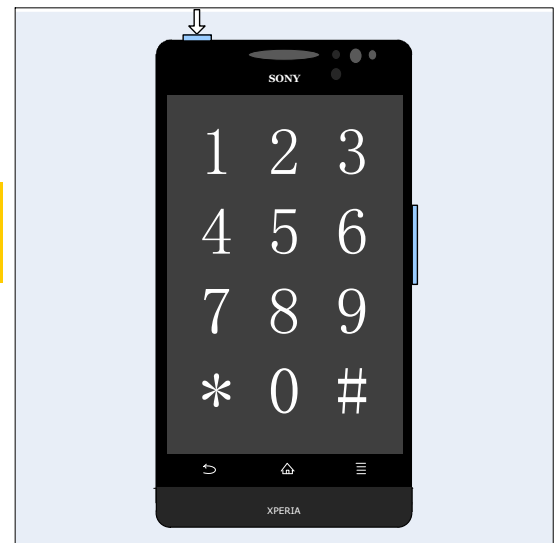
Note: Make sure the phone is in call setup when pressing these touching keypads to get into the Service menu!

Start up the phone and enter the service menus:

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

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

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



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

Tests

2.2 Service Tests

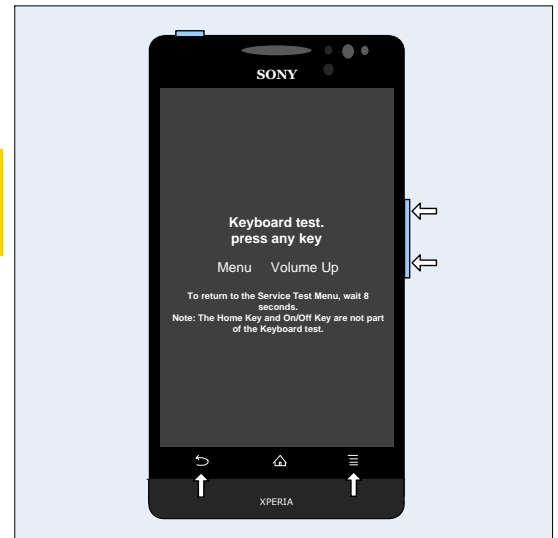
2.2.1 Keyboard & Switch

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

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

Press all keys on the phone:

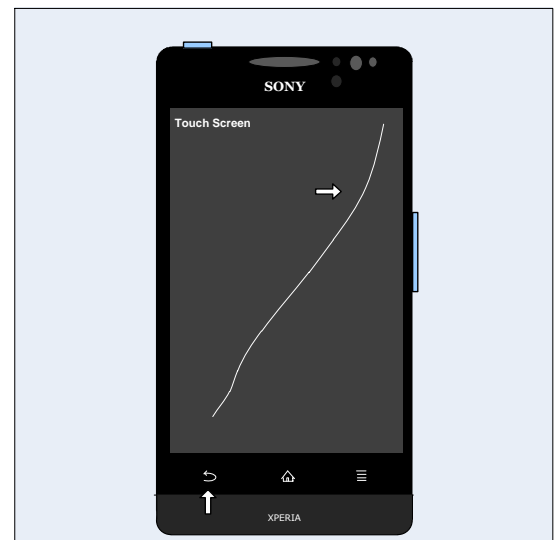
- Back key
- Menu key
- Volume up key
- Volume down key



2.2.2 Touch Screen

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

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



2.2.3 Display

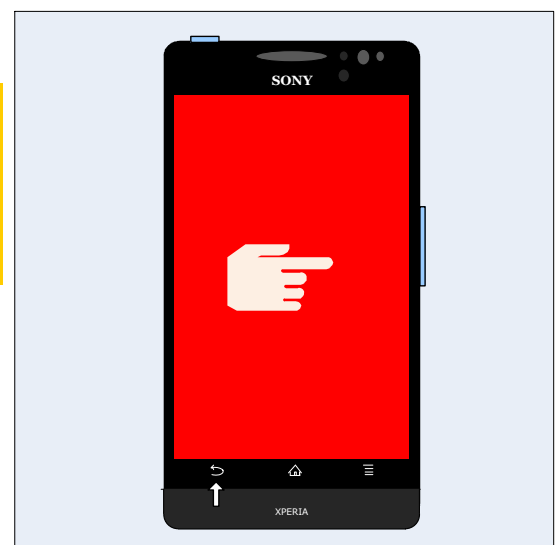
Minor variations in the display's brightness and color may occur between phones.

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

Two defective pixels are considered to be acceptable.

Touch the display using a finger. With every touch, the display will show six test patterns of White, black, red, green, blue and rainbow colors on the full screen. Make sure that there are no missing segments and that the colors and contrast are OK.

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



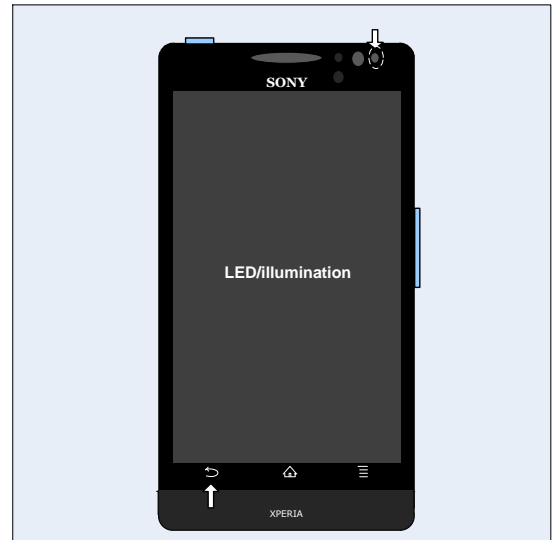
Tests: Service Tests

2.2.4 LED/Illumination

Check that the:

- Display Backlight illumination goes from low to high strength back to low again.
- Notification LED on the top right corner changes, showing four colors in the following sequence: red, green, blue, and off.
- The underlines backlight illumination of menu, home and back keys goes from low to high strength back to low again.

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



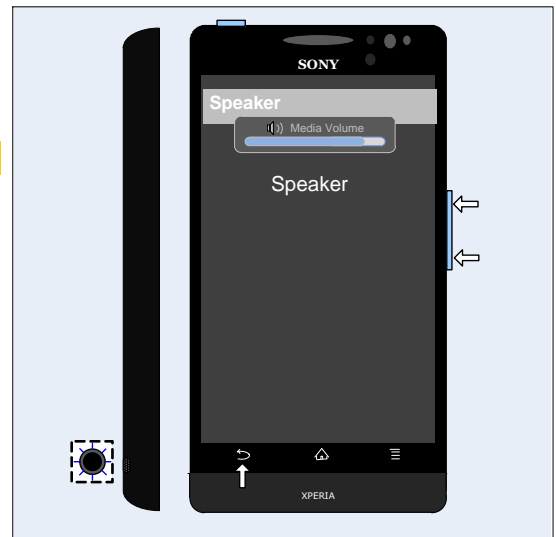
2.2.5 Speaker

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

Make sure that the sound from the speaker port on the middle top back side of the phone is emitted loud and clear and that the test includes maximum volume.

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

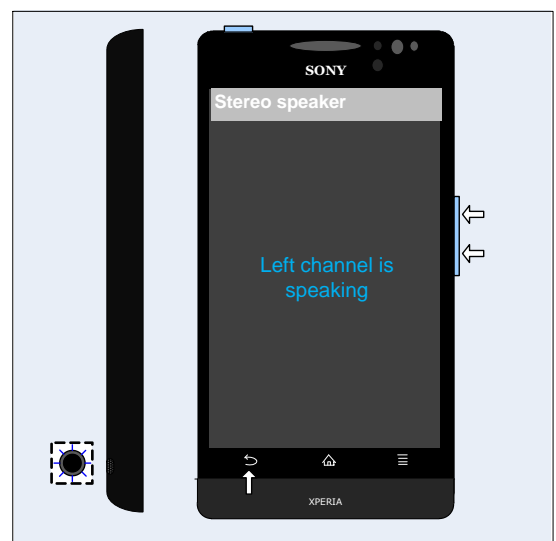
Press the Back key to return to the Service Test Menu.



2.2.6 Stereo speaker

Not applicable, do not use.

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



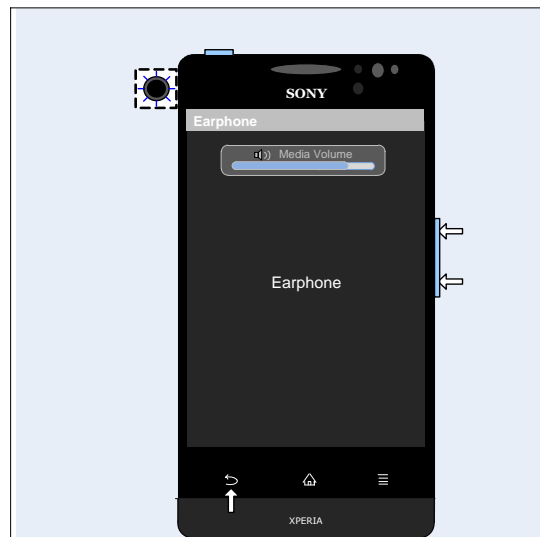
Tests: Service Tests

2.2.7 Earphone

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

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

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



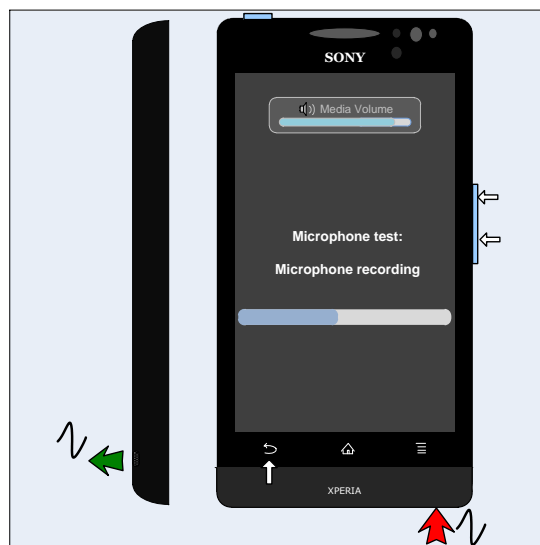
2.2.8 Microphone

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

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

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

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



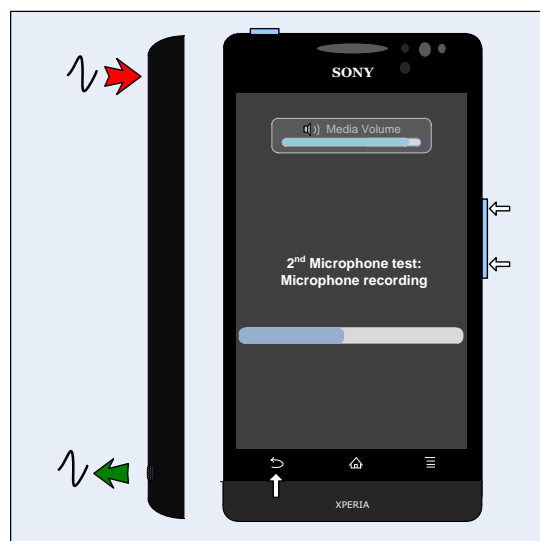
2.2.9 Secondary Microphone

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

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

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

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



Tests: Service Tests

2.2.10 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.



2.2.11 Camera

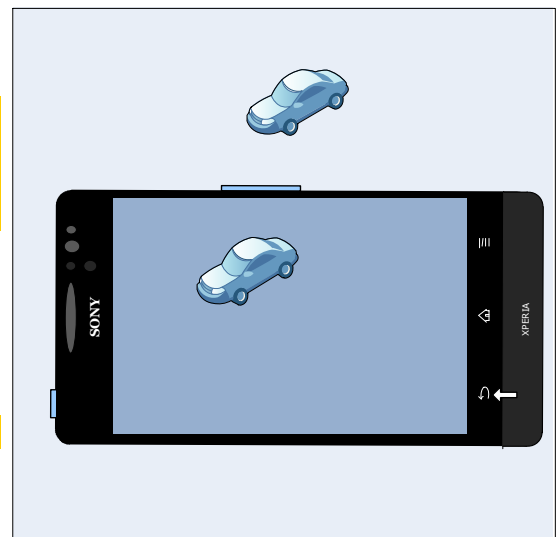
Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

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

Press screen to preview the photo's auto focus quality.

Photos are taken but not saved during this test!

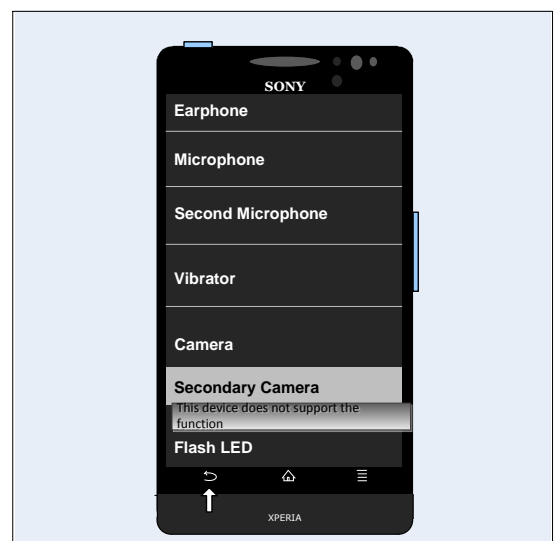
Press the Back key to return to the Service Test Menu.



2.2.12 Secondary Camera

Not applicable, do not use.

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



Tests: Service Tests

2.2.13 Flash LED

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

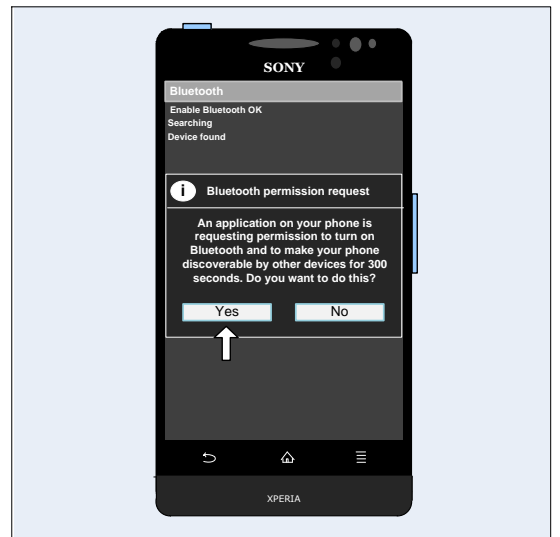
Press the Back key to return to the Service Test Menu.



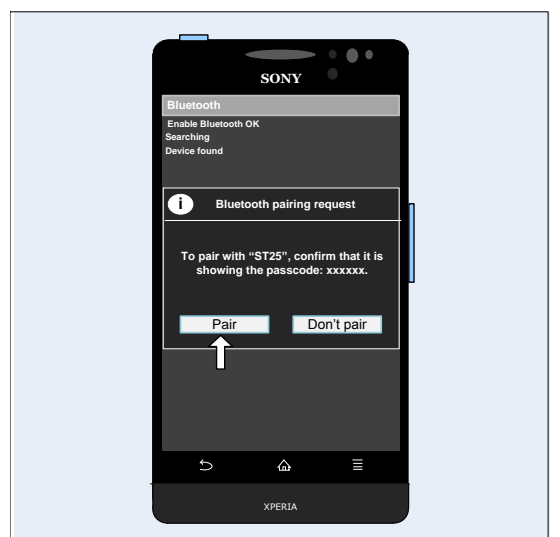
2.2.14 Bluetooth

***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;
 Step 2: Searching;
 Step 3: Press "Yes" to setup its visibility to target;



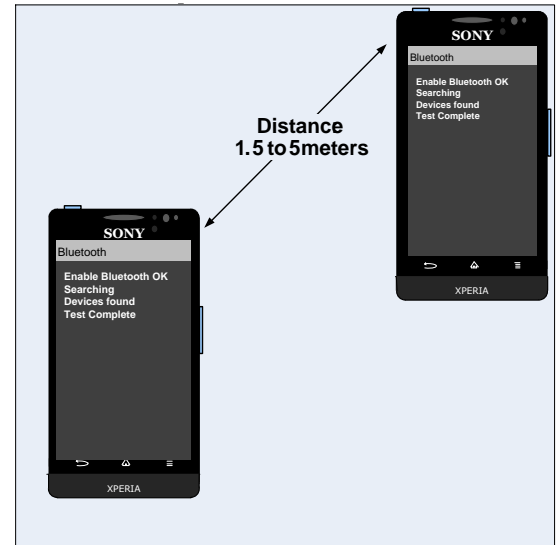
Step 4: Select the Target Bluetooth Device;
 Step 5: Bluetooth pairing request shows, verify the passcode and select "Pair" to confirm it;



Tests: Service Tests

Step 6: On Target Bluetooth Device, verify the passcode and select "Pair" to confirm it also, when succeeded, it shows "Test Complete".

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



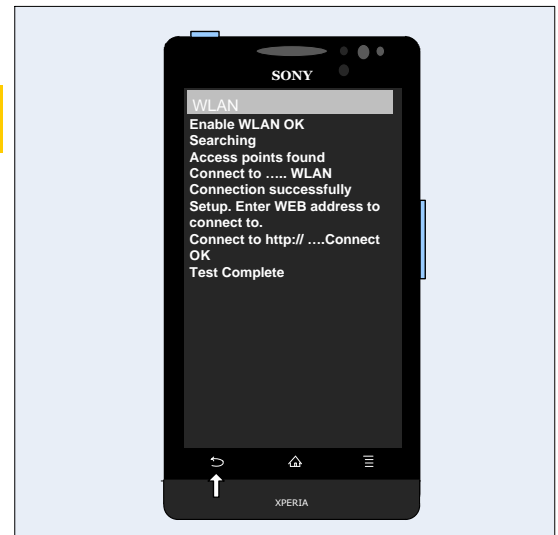
2.2.15 WLAN

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

The WLAN test will be done in following sequences:

- Step 1: Enable WLAN; wait 4-5 seconds, shows OK;
- Step 2: Searching;
- Step 3: Access points found list;
- Step 4: Select the Target WLAN network, and type the password to get connected;
- Step 5: Enter a web address (e.g. Google.com)
- Step 6: When connection succeeded, it shows "Test Complete".

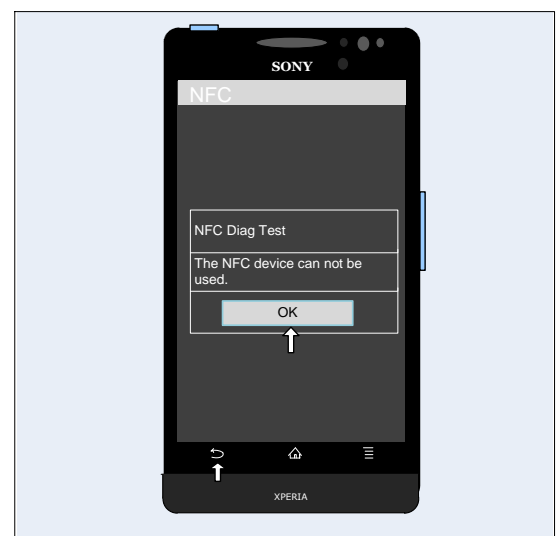
Press the Back key to return to the Service Test Menu.



2.2.16 NFC

Not applicable, do not use.

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



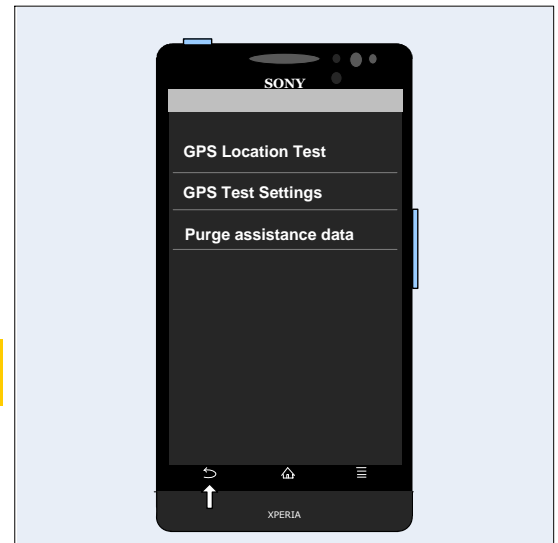
Tests: Service Tests

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.

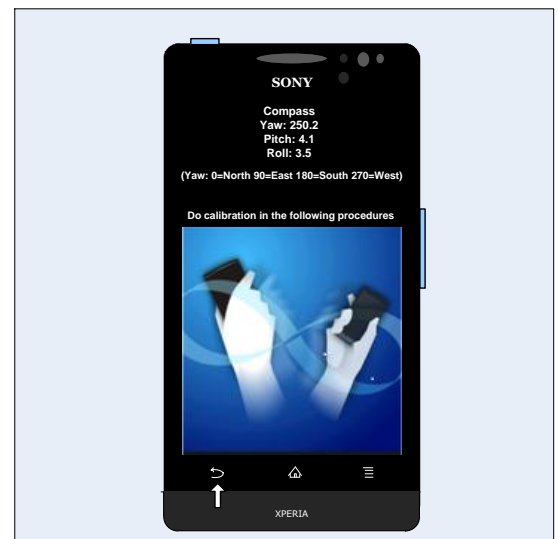
**For GPS testing, refer to
1220-1333: Generic Repair Manual – mechanical**



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)

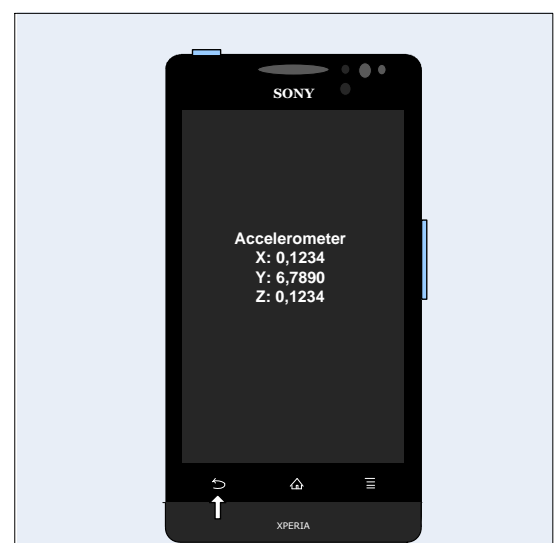
Press the Back key to return to the Service Test Menu.



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.

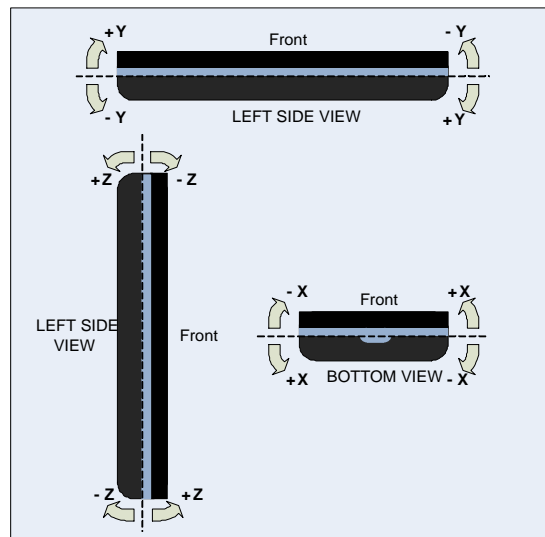


Tests: Service Tests

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

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

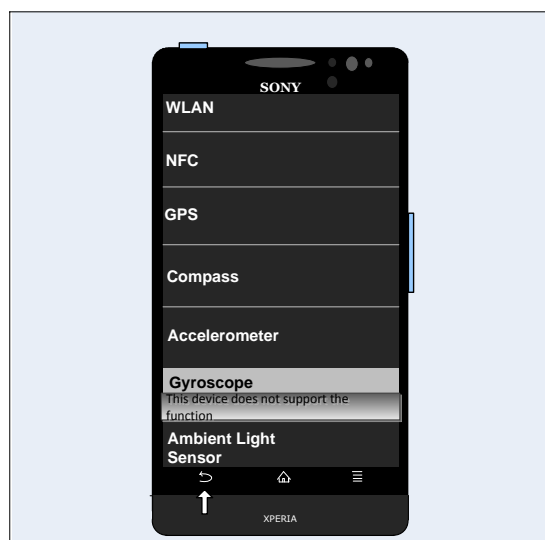
Press the Back key to return to the Service Test Menu.



2.2.20 Gyroscope

Not applicable, do not use.

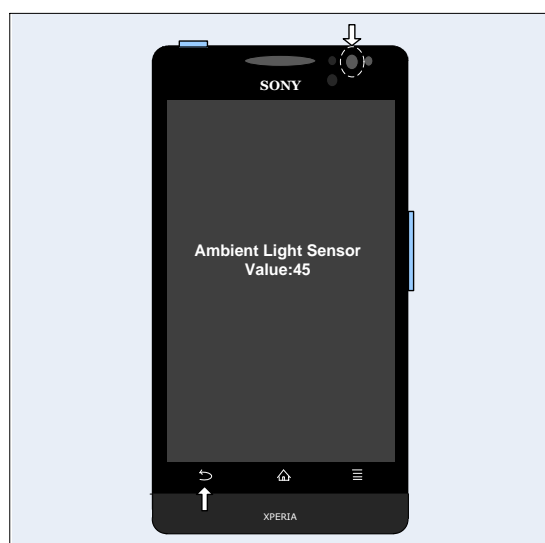
Press the Back key to return to the Service Test Menu.



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.



Tests: Service Tests

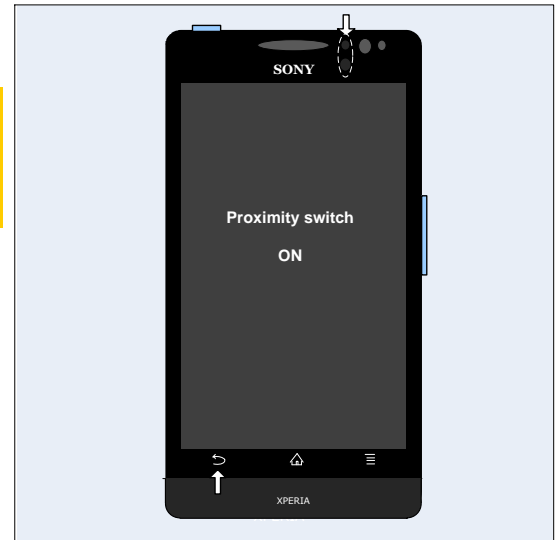
2.2.22 Proximity switch

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

When entering into the test, the screen shows 'Proximity switch OFF' and a tone is emitted.

When covering the proximity switch area (on the right side of the Ear Speaker), 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 0.2Millibars.

If the value shouldn't be static.

Press Back key to return to Service Test Menu.

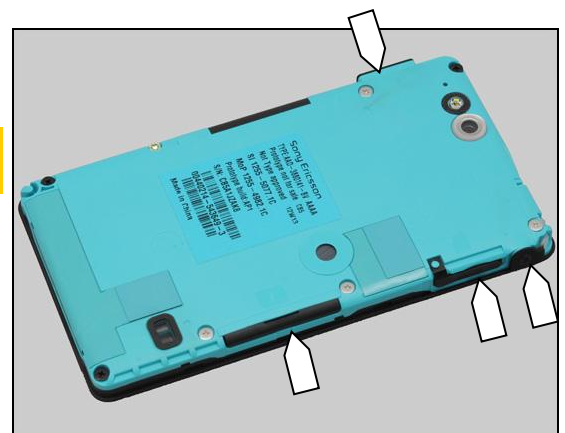


2.2.24 Water Resistance

The previous test 'Pressure Sensor' should have been successfully carried out before doing this test.

It is mandatory to verify that the unit is water resistance if you disassemble the unit or suspect abuse, (i.e. not for No Trouble found or Software problems).

This test is done with air, therefore you have to seal the two microphones, and make sure that Audio Jack Cap, Micro SD Cover, SIM Drawer and Micro USB Cap are assembled well.



Tests: Service Tests

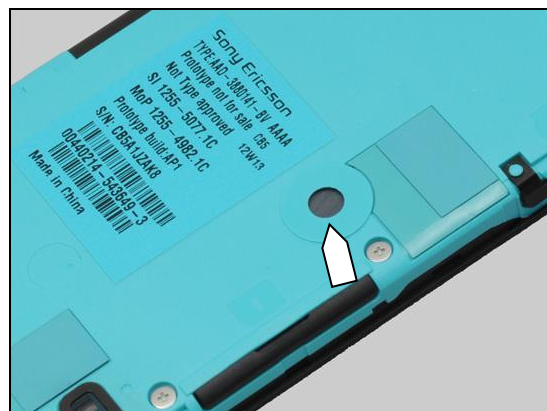
Seal the primary microphone hole with tape.



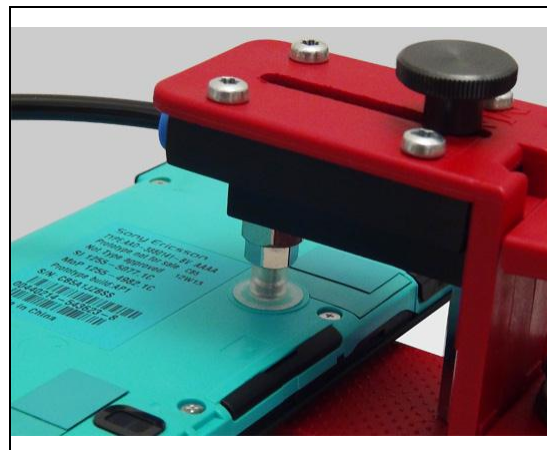
Seal the secondary microphone hole with tape.



ST27 Ventilation hole position as shown in photo.



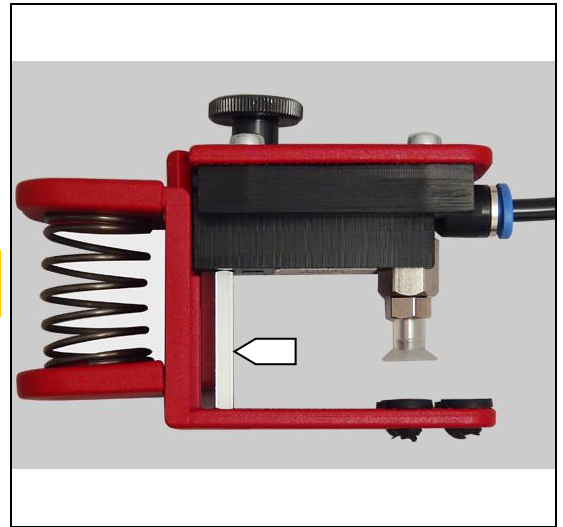
ST27 phone under Water Resistance Test.



Tests: Service Tests

Pillar for WRT 23mm, part number is 1264-8565.

Note: Use the 23mm Pillar(1264-8565: Pillar for WRT 23mm) for ST27 instead of the original 25mm pillar.



How to assemble the Water Resistance Test equipment?

Note: Use the 23mm Pillar (1264-8565: Pillar for WRT 23mm) for ST27 instead of the original 25mm pillar.



How to run the Water Resistance Test - WRT

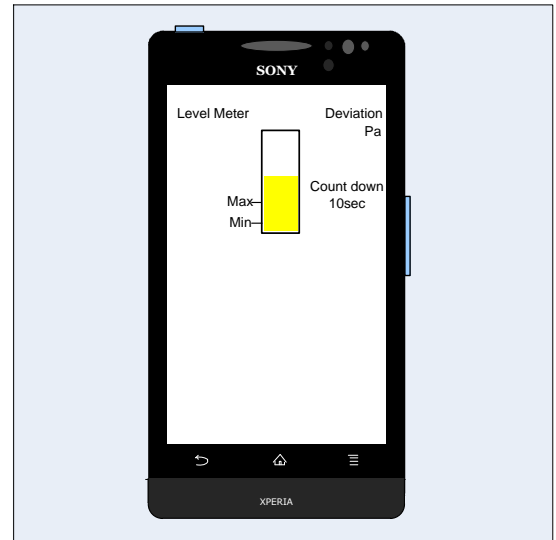
Note: Sample phone are used in Movie, WRT method are the same.



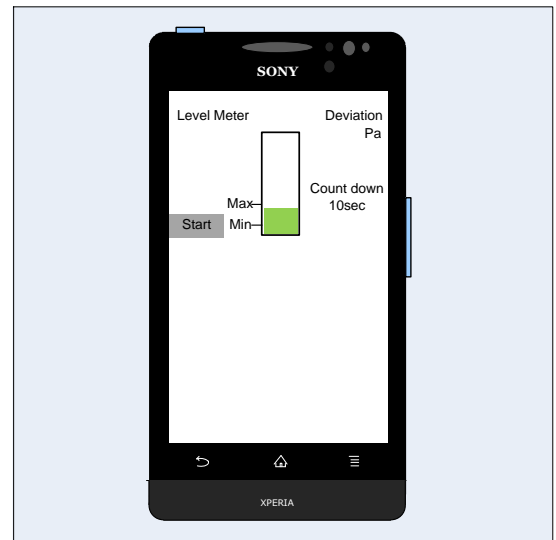
Tests: Service Tests

Enter the Water Resistance test after sealing openings of the primary microphone and the secondary microphone. The Water Resistance test initial status is a yellow bar graph with a 10 seconds countdown.

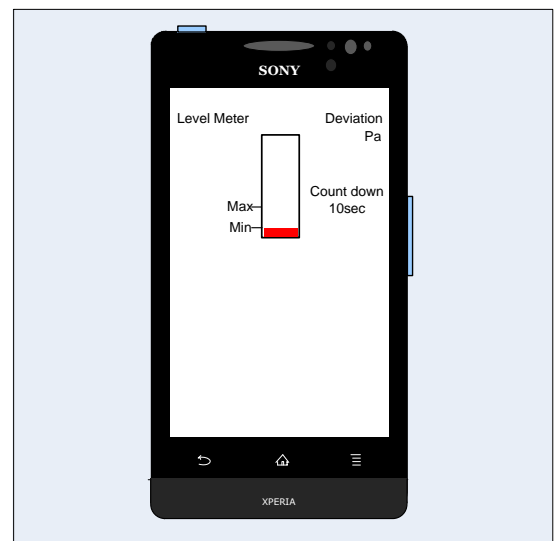
Assembly the Generic Clamp over the ventilation hole as shown in the instruction movie *How to run the Water Resistance Test – WRT*.



It should take minimum 10 seconds to generate the under pressure with the syringe. When you hit the area between *Max* & *Min* value, the bar graph will turn to green and the *Start* button will appear on the left hand side.



If you produce too much under pressure, the bar graph turns to red and is below the *Min* level.

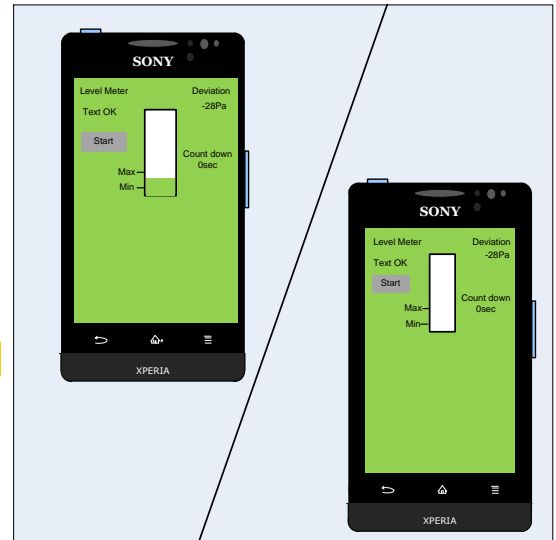


Tests: Service Tests

After a 10 second count down the test result is shown on phone screen.

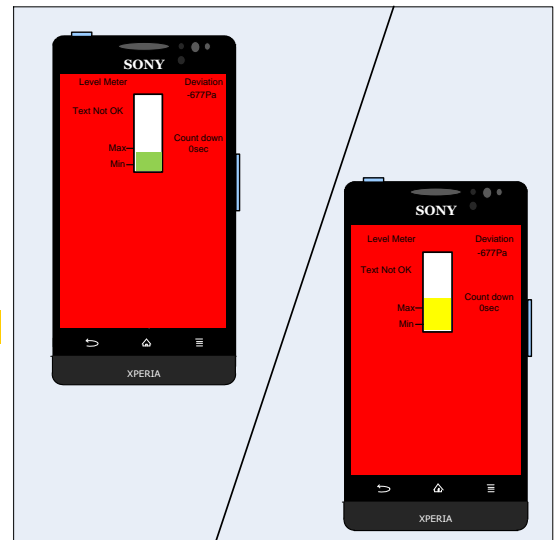
If the phone passed the *Water Resistance Test*, the display will show a yellow or green bar graph. The background turns to green and shows **Test OK** on the left top of the display.

A green background indicates that the test has passed.

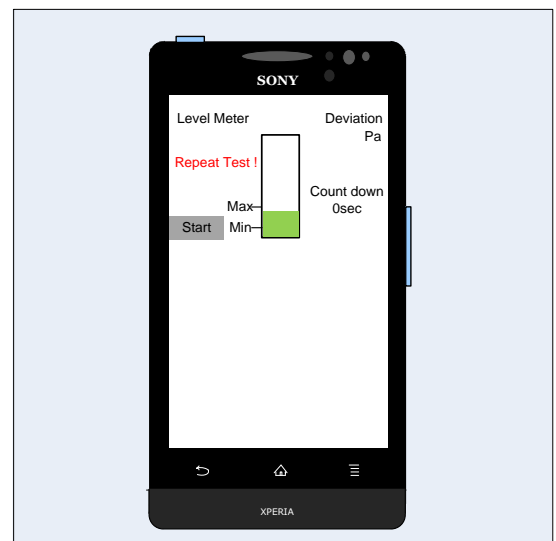


If the phone failed the *Water Resistance Test*, the display will show a yellow or green bar graph. The background turns to red and shows **Test Not OK** on the left top of the display.

A red background indicates that the test has failed.



If the pressure isn't stable enough during the test, the display will show a red text **Repeat Test!** on the top left of the bar graph.

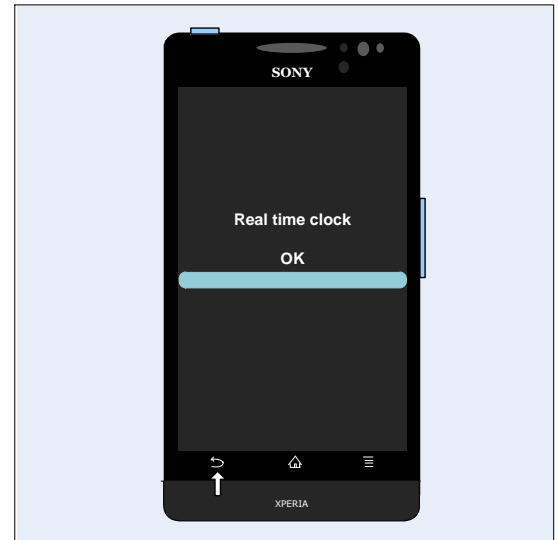


Tests: Service Tests

2.2.25 Real time clock

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

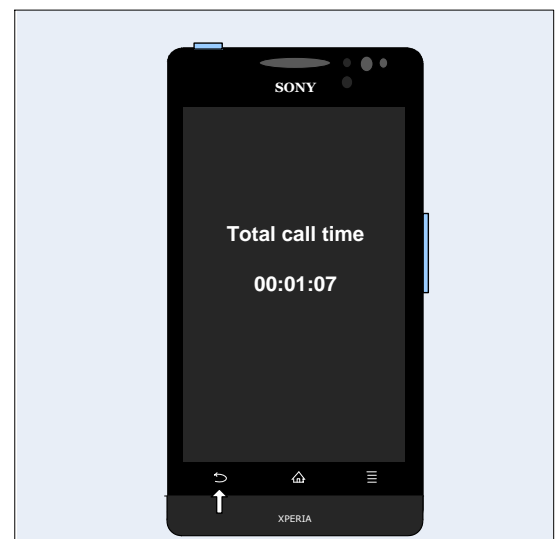
Press the Back key to return to the Service Test Menu.



2.2.26 Total call time

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

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



2.2.27 Storage

A memory card should be inserted before start this test.

The Memory Storage status are shown in the display:

1.Internal Mass Storage:

If not formatted/cleared, it will shows "Inserted/Unmounted";

If formatted/cleared , it will shows "Inserted/Mounted";

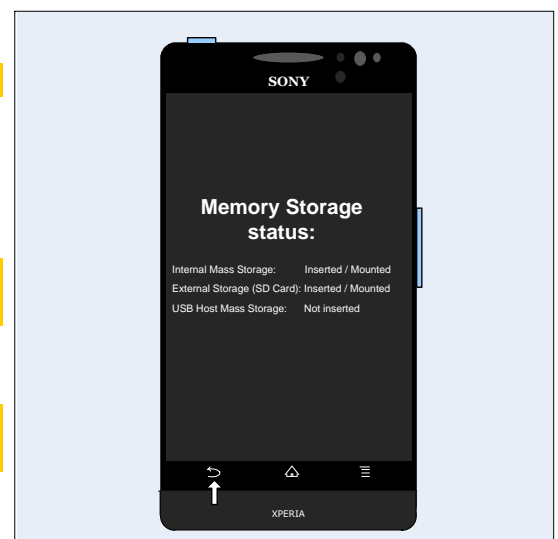
Note: Only after the internal Mass Storage is formatted/cleared, it can be used by user.

How to format/clear: Menu key-Settings-Storage-Clear internal storage.

Note: Be careful that all the user data on this storage will be erased after selecting "clear internal Storage".

2.External Storage (SD Card): Inserted / Mounted.

3.USB Host Mass Storage: Not inserted.

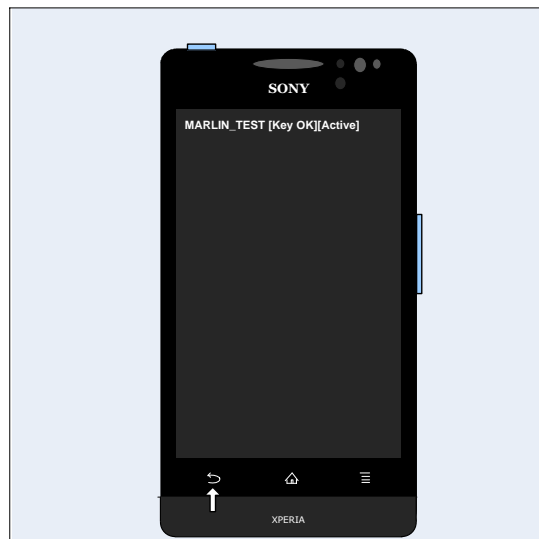


Tests: Service Tests

2.2.28 Security

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

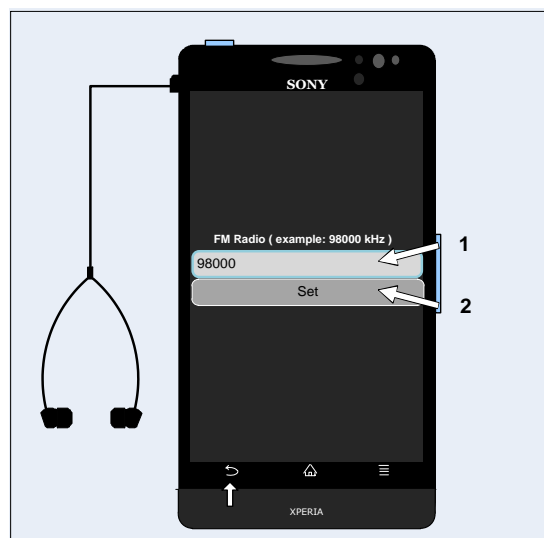
Press the Back key to return to the Service Test Menu.



2.2.29 FM radio

Verify that the phone can detect a radio station:
Connect a headset and then set your local radio station in kHz.
Verify that the reception and sound quality is normal.

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



2.2.30 Flip slider counter

Not applicable, do not use.

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

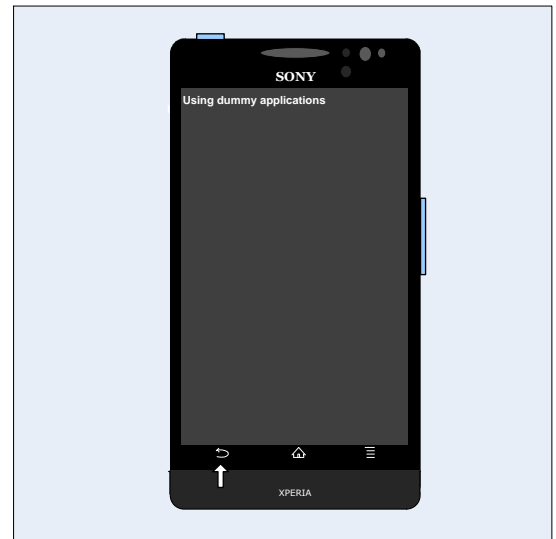


Tests: Service Tests

2.2.31 Verify certificates

Not applicable, do not use.

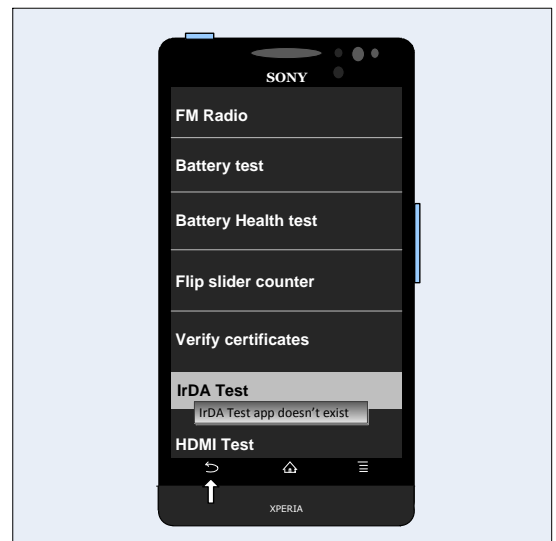
Press the Back key to return to the Service Test Menu.



2.2.32 IrDA Test

Not applicable, do not use.

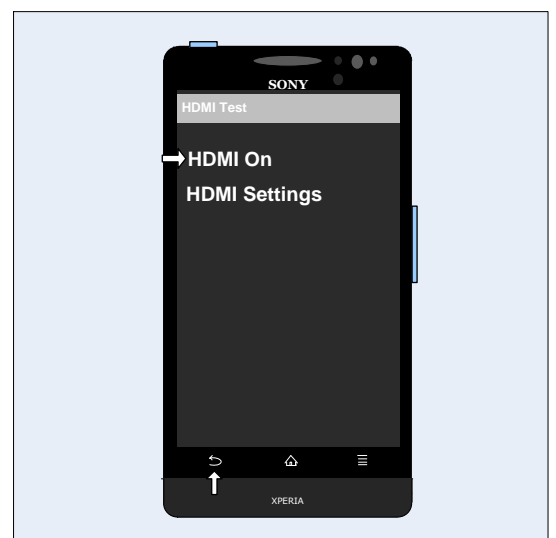
This test is not available for this product!



2.2.33 HDMI Test

Not applicable, do not use.

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



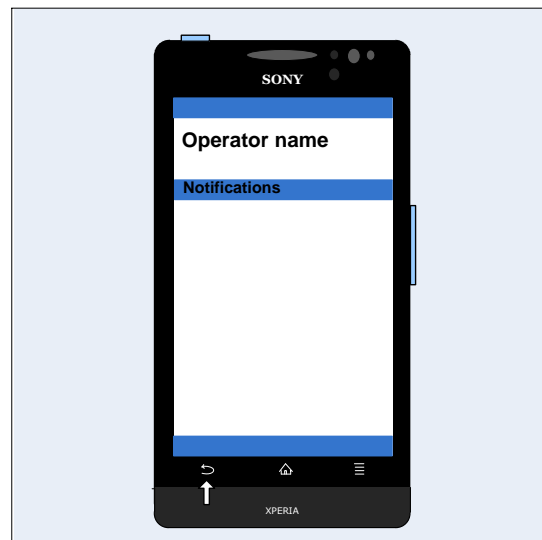
Tests

2.3 Manual Tests

2.3.1 SIM

Verify that the phone can detect a SIM card:

- Insert a SIM card, and start the phone.
- If the SIM card is detected by the phone, the start-up procedure will continue.
- Pull down the Status Bar (put finger next to the receiver and drag the menu down from the Status Bar)
- To see SIM card operator name.
- 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 On/Off key test

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

When the phone stands by, press the On/Off key for a short time to enter/exit Sleep mode.



2.3.3 Home key test

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



Tests: : Manual Tests

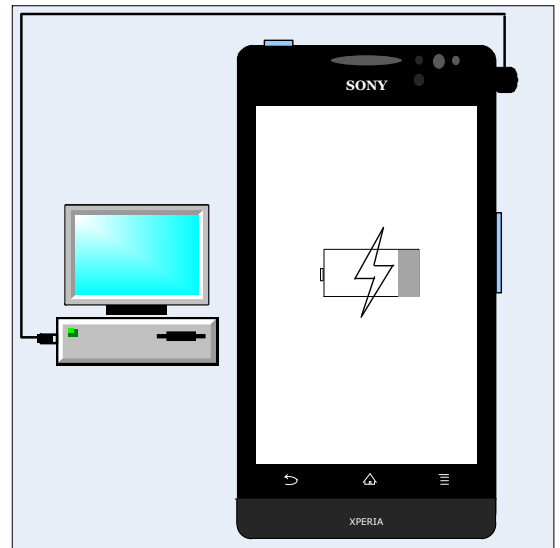
2.3.4 Charging via USB (Charger or Computer)

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!

- Do not start the phone
- Connect a USB cable from a computer (or charger) to the system connector. The phone will turn on automatically;
- Verify that the phone is being charged by green Notification LED and Battery icon;

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

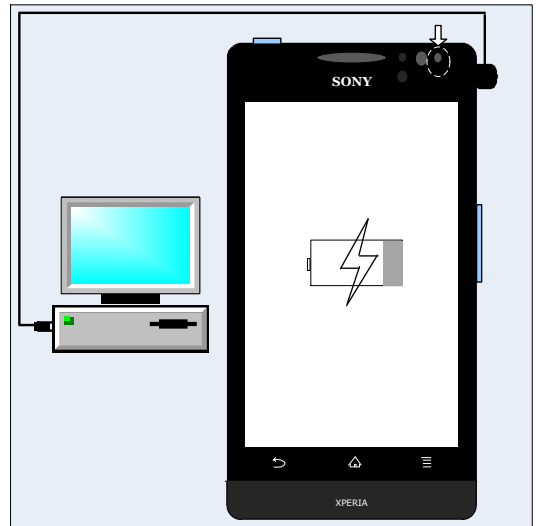


The Notification LED colour status is depended on battery remaining capacity:

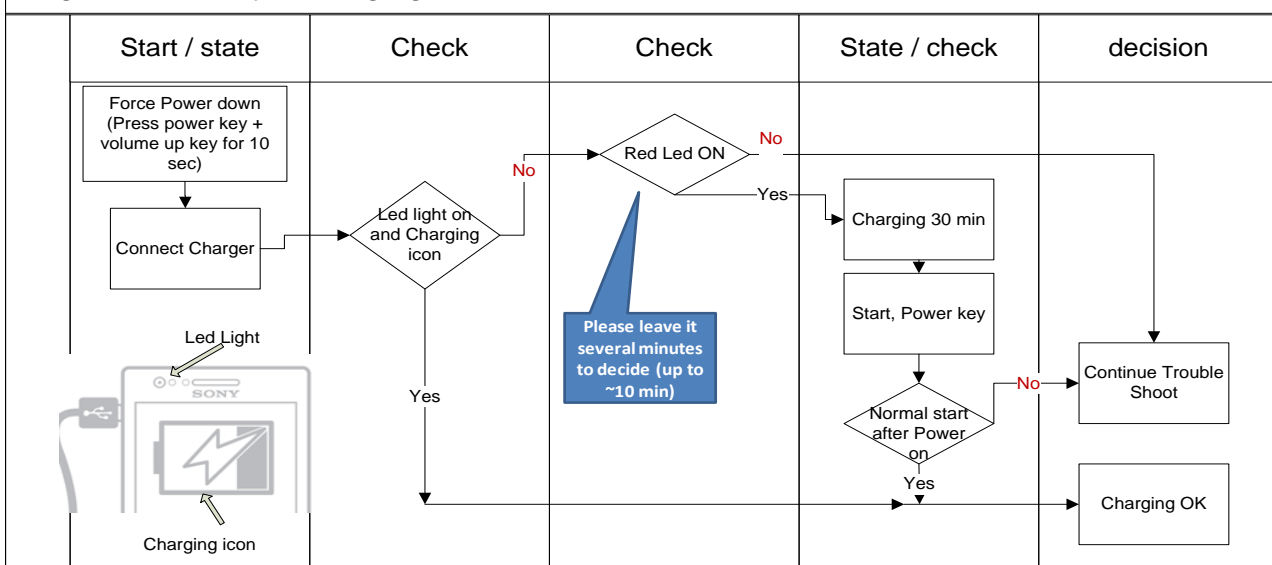
- Red: Battery level is between 1% and 10%;
- Orange: Battery level is between 11% and 89%;
- Green: Battery is between 90% and 100%;

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

Perform a force shut down (Press Power key + Volume Up for 10sec). If phones vibrate three times the shutdown is performed. If no vibration is detected, the battery might be discharged.



Diagnostic Battery / Charging Status



Tests

2.4 Network Test

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

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

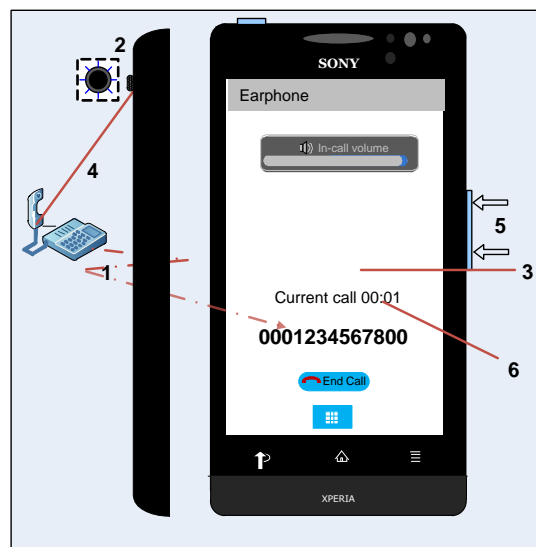
If a UMTS network is available, the network test has to be done separately for GSM and UMTS!

2.4.1 On-the-air call to mobile (no UMTS network available)

To verify the radio functions (GSM) of the phone, follow the '2.4.1.1 Procedure' below:

2.4.1.1 Procedure

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



2.4.2 On-the-air call to mobile (UMTS network available)

GSM

Go to the phone menu and set:

Press Menu key → *Settings* ⇒ *Wireless & networks* ⇒ *Mobile Networks* ⇒ *Network mode* ⇒ *GSM only*

To verify the radio functions (GSM) of the phone, follow the '2.4.1.1 Procedure' above.

UMTS

Go to the phone menu and set:

Press Menu key → *Settings* ⇒ *Wireless & networks* ⇒ *Mobile Networks* ⇒ *Network mode* ⇒ *WCDMA only*

Switch off the phone and then start it up again to enable search for an available UMTS signal.

Ensure that the UMTS/3G icon now is visible at the top of the display.

To verify the radio functions (UMTS) of the phone, follow the '2.4.1.1 Procedure' above.

3 Revision History

Rev.	Date	Changes / Comments
1	2012-Jun-25	Initial release
2	2012-Jun-29	Update picture and text in “Storage” chapter