

SERVICE MANUAL

Level 1&2

NOKIA
E60

RM-49



Transceiver characteristics:

Dual Mode:

- GSM: Tri band phone for GSM 900/1800/1900MHz
- WCDMA: 2100MHz

Display: Active matrix color display with 16 Million colors,
resolution 352 x 416 pixel

Bluetooth

Vibra Alert

CARD TYPE: MMC

Connector: Pop-Port™ connector

Transceiver with BL-5c 970mAh Li-Ion battery pack

Standby time (estimated)	Up to
GSM	6.4 - 8.3 days
WCDMA	6.3 - 8.4 days
GSM/WCDMA and WLAN	4.5 - 5.4 days*
Talk time (estimated)	Up to
GSM	3.2 - 6.4 days
WCDMA	2.2 - 3.4 days
VoIP	3.8 - 6 days*

*In GSM/WCDMA network; WLAN network supporting 11-54 Mbx; 1-10 users Operation times may vary depending on radio access technology, network and usage.

Environmental characteristics:

- Lead-free soldered

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CHANGE HISTORY

Status	Version No.	Date	Comments
Draft	0.1	25.11.2005	Initial draft
Approved	1.0	28.03.2006	Approval
Approved	2.0	29.03.2006	POS Flash Concept and Service Tools chapter updated

1. INTRODUCTION

The purpose of this document is to help NOKIA service levels 1 and 2 workshop technicians to carry out service to NOKIA products. This Service Manual is to be used only by authorized NOKIA service suppliers, and the content of it is confidential. Please note that NOKIA provides also other guidance documents (e.g. Service Bulletins) for service suppliers, follow these regularly and comply with the given instructions.

While every endeavour has been made to ensure the accuracy of this document, some errors may exist. If you find any errors or if you have further suggestions, please notify NOKIA using the address below:

<mailto:cc-ts-rc.documentation@nokia.com>

Please keep in mind also that this documentation is continuously being updated and modified, so watch always out for the newest version.

Warnings and Cautions

Please refer to the phone's user guide for instructions relating to operation, care and maintenance including important safety information. Note also the following:

Warnings:

1. CARE MUST BE TAKEN ON INSTALLATION IN VEHICLES FITTED WITH ELECTRONIC ENGINE MANAGEMENT SYSTEMS AND ANTI-SKID BRAKING SYSTEMS. UNDER CERTAIN FAULT CONDITIONS, EMITTED RF ENERGY CAN AFFECT THEIR OPERATION. IF NECESSARY, CONSULT THE VEHICLE DEALER/MANUFACTURER TO DETERMINE
2. THE IMMUNITY OF VEHICLE ELECTRONIC SYSTEMS TO RF ENERGY. THE HANDPORTABLE TELEPHONE MUST NOT BE OPERATED IN AREAS LIKELY TO CONTAIN POTENTIALLY EXPLOSIVE ATMOSPHERES EG PETROL STATIONS (SERVICE STATIONS), BLASTING AREAS ETC.
3. OPERATION OF ANY RADIO TRANSMITTING EQUIPMENT, INCLUDING CELLULAR TELEPHONES, MAY INTERFERE WITH THE FUNCTIONALITY OF INADEQUATELY PROTECTED MEDICAL DEVICES. CONSULT A PHYSICIAN OR THE MANUFACTURER OF THE MEDICAL DEVICE IF YOU HAVE ANY QUESTIONS. OTHER ELECTRONIC EQUIPMENT MAY ALSO BE SUBJECT TO INTERFERENCE.

Cautions:

1. Servicing and alignment must be undertaken by qualified personnel only.
2. Ensure all work is carried out at an anti-static workstation and that an anti-static wrist strap is worn.
3. Use only approved components as specified in the parts list.
4. Ensure all components, modules screws and insulators are correctly re-fitted after servicing and alignment.
5. Ensure all cables and wires are repositioned correctly.



Electrostatic discharge can easily damage the sensitive components of electronic products. Therefore every Service Supplier has to take care of all precautions, which are mentioned in the service level related "Service Partner Requirements", available on NOKIA Online. Also see ESD Protection Requirements in this Service Manual.

2. GENERAL REPAIR INFORMATION

In this section the technician will get some general hints how to carry out repairs:

- To familiarize oneself with NOKIA product read the tutorials or user guide on www.nokia.com -->Support--> Phones, by selecting the Phone Model.
 - Before starting the repair you must take care of ESD precautions like being in your ESD Protected Area and connecting your wristband.
 - Use gloves to avoid corrosion and fingerprints.
 - Protect windows and displays with a film to avoid dust and scratches.
 - When cleaning the LCD Module any lint-free cloth can be used (e.g. Micro-Fibre cloth).
 - When cleaning the pads you have to use a soft cloth/ESD brush and Isopropanol. It is not allowed to use a glass fiber pencil because it scratches the surface and will lead later on to corrosion.
 - Mechanical parts (except shielding lids and bent parts), which didn't repair the failure, can be reused, if they are not soldered.
 - When removing the shielding lids make sure to replace them with new ones, otherwise the high-frequency leakage can have an influence on the device.
 - Always use original NOKIA spare parts.
 - Check the soldering joints of the parts, which are concerned regarding the indicated error (e.g. soldered connectors or switches) and resolder them if necessary (Level 2 only).
 - Remove redundant soldering flux after repair.
 - Meet the torque requirements when assembling the unit (see also the document "torques for transceiver assembly" on NOKIA Partner Web Site/NOKIA Online).
 - Always use your own equipment for testing where you are sure that it works. E.g. if the customer complains about charger function, please test the phone with your own charger to be sure if phone or charger causes the malfunction.
 - A SIM card is needed for all GoNoGo tests.
 - When doing the fault log entries, always note the Item code, which caused the malfunction. Also, fill in the appropriate part code from the assembly, if needed.
 - Please be aware that some malfunctions could be software related and solved by an update.
-
- There are several documents available on NOL, which have to be followed:
 - First, take care for the latest content pages of Service Bulletins, which are always available for each folder on NOKIA Online. This is also important to recognize, if existing documents have become invalid.
 - The service level indicator at the bottom of each document tells the appropriate destination.

Downloads > Support Library >

1. Instructions
2. General Service Bulletins
3. Product related documents
4. Spare Part Service Bulletins
5. Service Tools Service Bulletins
6. Common Software Service Bulletins
etc,...

Use General SB-217 as a reference or overview.

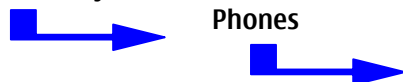
Please also check NOKIA Online (NOL) for latest news and files on a regular basis.

3. PATHFINDER FOR WORKSHOP STAFF

In addition to the information in this Service Manual, there are several instructions and information, which have to be followed. Main documentation database is [NOKIA Online](#) with the purpose of serving different multimedia content, like video clips or interactive tutorials.

It is mandatory to watch for newest technical and organizational information on a daily basis to be updated as required (see "Latest files in Support Library"). Every new information has to be processed and implemented as soon as possible. When logged into NOL you can also find needed information in different folder like:

Support Library



Service Manuals
Service Bulletins
Software
Repair Information

Level 1&2 e-learning (former NOKIA CarePoint) on NOKIA Online

Former NOKIA CarePoint content, such as	<ul style="list-style-type: none"> • Online Troubleshooting • Product information • Videos – Disassembly/Assembly 	can be found on NOKIA Online
<p>NOKIA Online</p> <p>↓</p> <p>Care Services</p> <p>↓</p> <p>Training</p> <p>↓</p> <p>Phone Models</p>		

Level 1&2 e-learning courses offer a quick overview of the NOKIA phone and support for how to repair and use the phone:

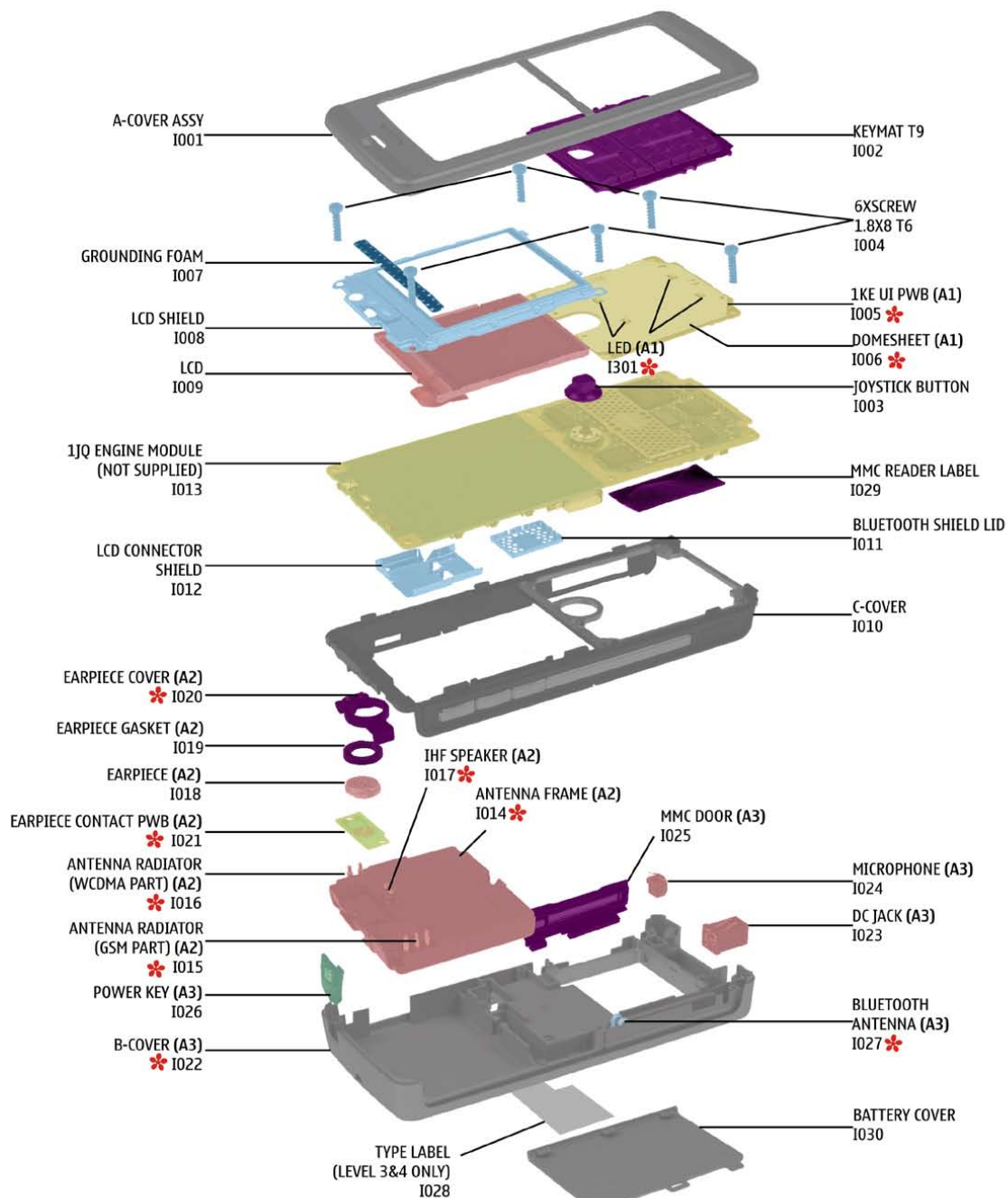
Overview & Guides Basic information about the phone, features and technologies	Disassembly & Assembly Instructions how to disassemble and assemble the phone	Troubleshooting Step-by-step instructions on how to locate and repair the most common problems with the phone
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To reduce the server traffic it is recommended to download newest version of huge files like videos, Phoenix packages or Service Manuals only once and distribute it internally for further use.

4. EXPLODED VIEW AND COMPONENT DISPOSAL

Recommendation for the ecologically friendly disposal of components. Colorized components show the different categories. See corresponding ITEM/CIRCUIT REF in the Spare Parts Service Bulletins on NOL.

E60 RM-49 Exploded view



A1= UI PWB ASSY
A2= ANTENNA MODULE ASSY
A3= B-COVER ASSY

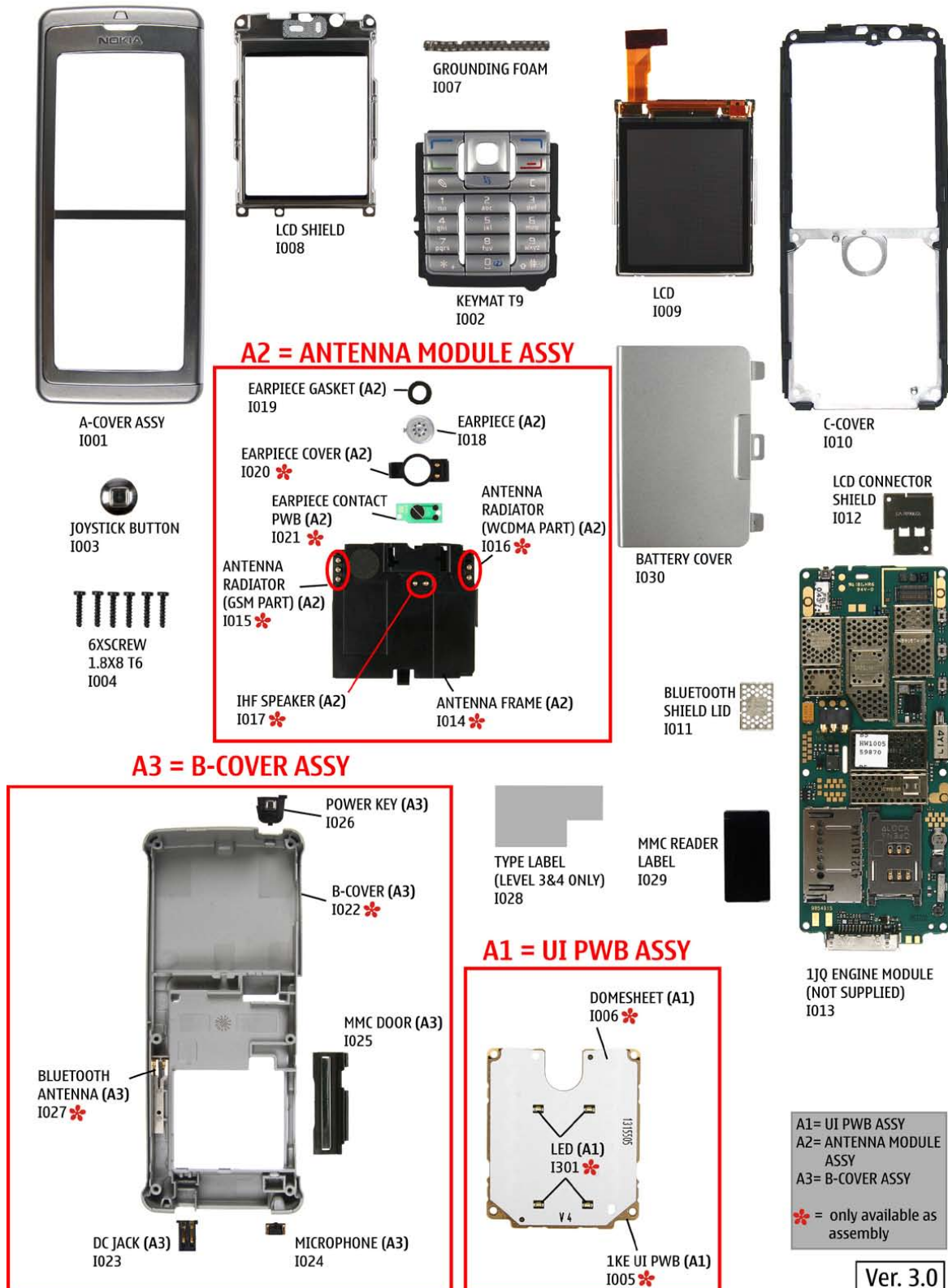
* = only available as assembly

Ver. 3.0

ELECTRO SILICON METAL PLASTIC PWB COVER

5. SPARE PARTS OVERVIEW

E60 RM-49 Spare Parts overview




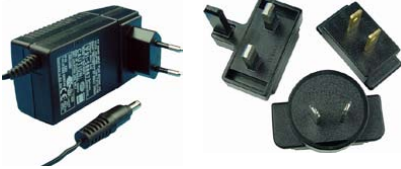





6. SPARE PARTS LIST


Please exchange this page (placeholder) with latest corresponding Service Bulletins (spare parts, SWAP units and service tools) from NOL!

This will ensure, that you are using up-to-date order codes only.

Therefore Service Bulletins have to be checked from NOL on daily basis.

7. SERVICE TOOLS

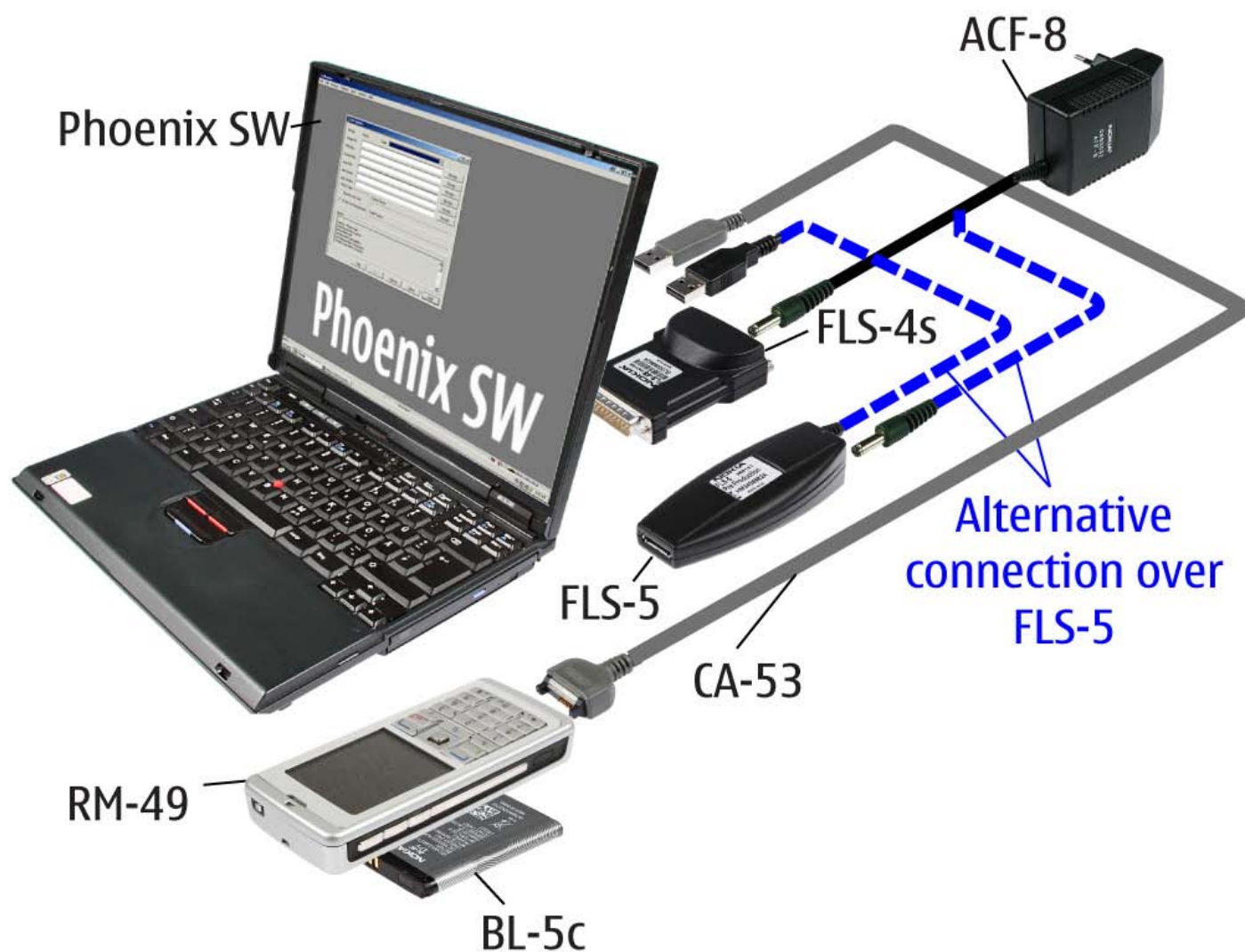
	<p>FLS-4s incl. ACF-8, Driver and User Guide Dongle and flash device incorporated into one package, developed specifically for POS use.</p> <p>Alternative</p> <p>FLS-5</p>
	<p>ACF-8 Universal Power Supply is used to power FLS-4s and FLS-5 .</p>
	<p>Travel Charger AC-4 Small and lightweight charger for fast charging of your phone battery.</p>
	<p>Internal Battery BL-5c Inserted under the back cover, this Li-Ion 970 mAh battery provides power in a lightweight package.</p>
	<p>Headset HS-23 Small and lightweight stereo headset with handsfree call handling, volume control, push to talk support, and comfortable earpieces for listening to the FM radio or music player.</p>
	<p>RJ-70 Soldering Jig</p>
	<p>Lead-free Solder Wire Mandatory for lead-free products (Level 2 only).</p>

	<p>CA-53 Service Cable to connect the PC with the Pop-Port™ Connector.</p>
	<p>0772040 NMP Standard Toolkit</p> <ul style="list-style-type: none"> • NOKIA opening tool SRT-6 NOKIA No. 0770431 • Tonichi torque driver NOKIA No. 6901525 • Hoya micro Fibre cloth MX304 • Dastex gloves S, M, XL • Artlux goggles AH166 • Wera bit T5 867/4TX 5x50 • Wera 867/4 6IP; 50mm (Torx 6 PLUS®) • Wera bit T6 867/4TX 6x50 • Wera 867/1 5IP; 25mm (Torx 5 PLUS®) • Wera bit T6 PLUS® 867/4TX 6IP • Facom side cutter 416E • Facom T5 driver SP.14032 • Facom T6 driver SP.14033 • Facom slot screwdriver AEF. 2x35.E • Wetec tweezers 7abb SA-ESD • Wetec tweezers 22 SA-ESD • Wetec tweezers 13 SA-SMD ESD • Wetec tweezers PSF SA-ESD • Wetec ESD brush E1211 • Kaiser Fototechnik airbrush 6315 • Wetec dental tool DEM83266/0 • RS Components Scissors 323-5732

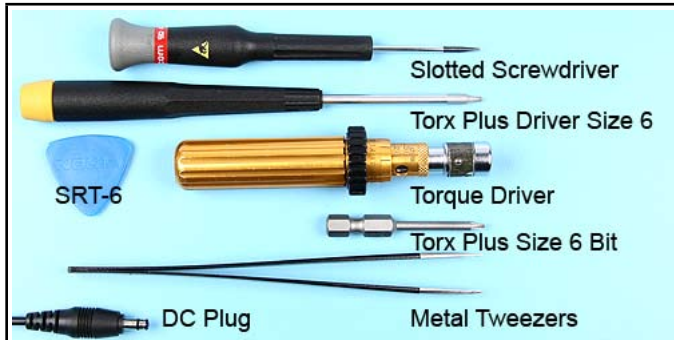
8. SW-UPDATE

Flash Concept – (Point of Sales)

To use FLS-5S Flash Dongle you have to follow the user guide inside the sales package. Please check always for the latest version of flash software, which is available on [NOKIA Online](#).



9. DISASSEMBLY INSTRUCTION



1.) You need the following tools.



2.) Remove the Battery Cover.



3.) Carefully open the A-Cover Assy with the SRT-6.



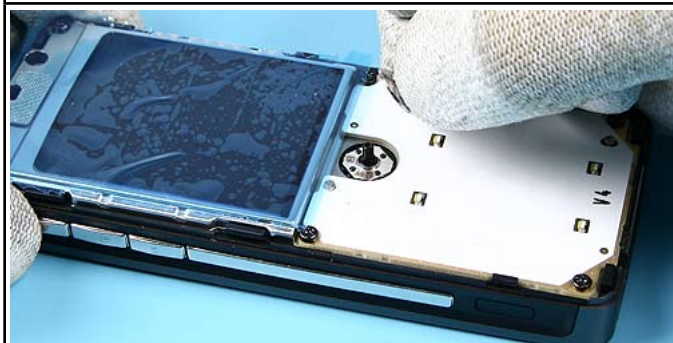
4.) Slide along both sides beginning from the bottom.



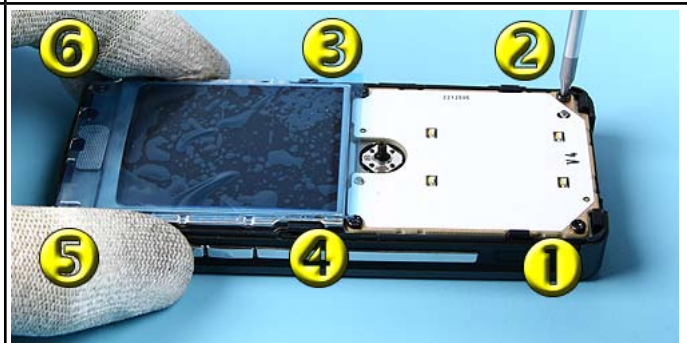
5.) Protect the LCD Shield with a plastic film.



6.) Remove the Keymat T9.



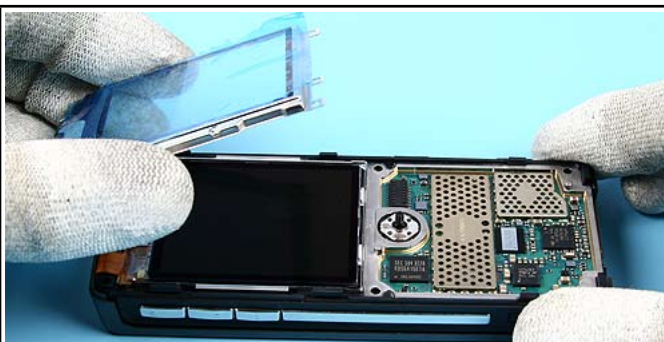
7.) Remove the Joystick Button.



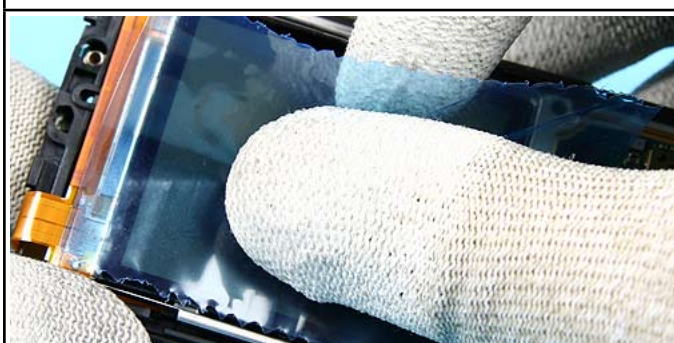
8.) Unscrew the 6 Torx Plus size 6 screws in the shown order.



9.) Remove the 1KE UI PWB.



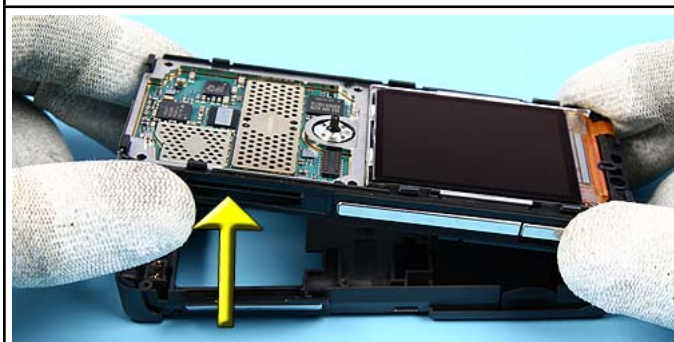
10.) Remove the LCD Shield.



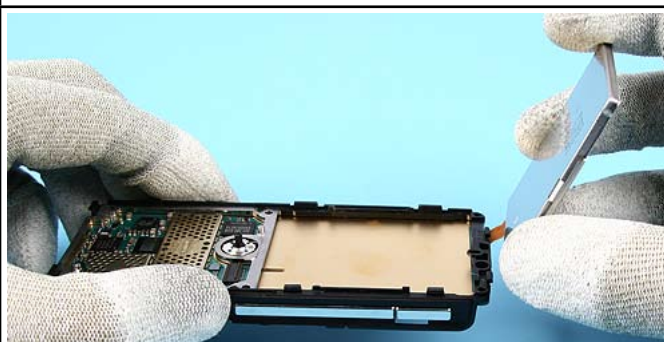
11.) Protect the LCD with a plastic film.



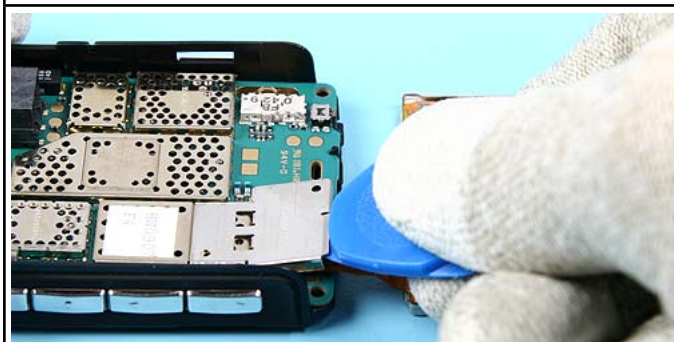
12.) Open the MMC Door before continuing.



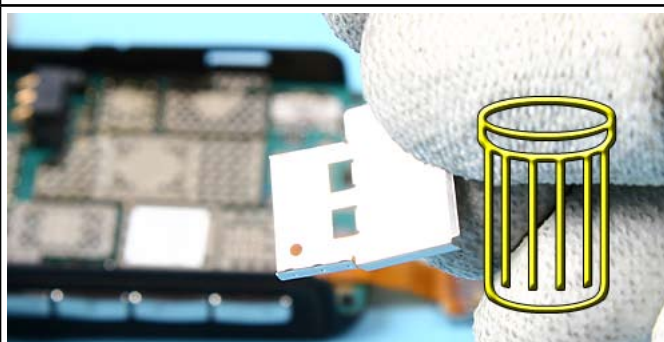
13.) Separate the parts.



14.) Flip the LCD as shown.



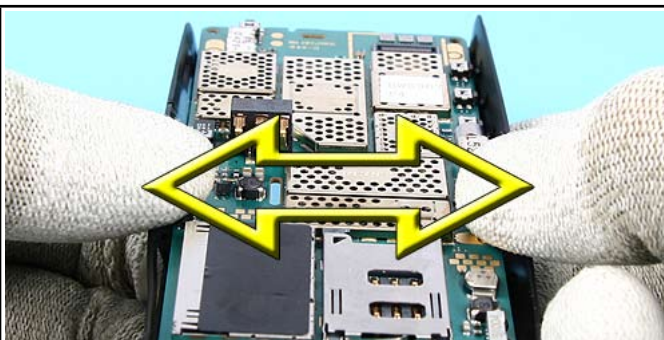
15.) Gently remove the LCD Connector Shield with the SRT-6.



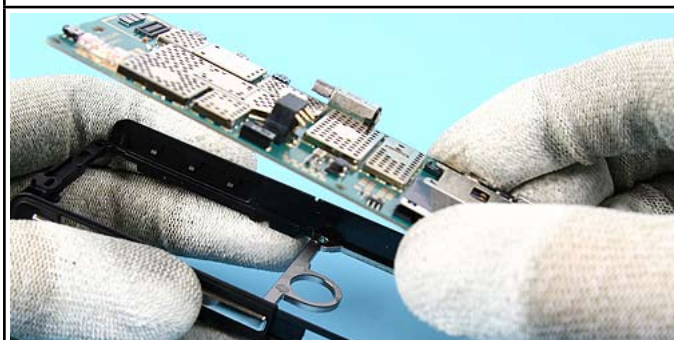
16.) Always use a new shield when reassembling.



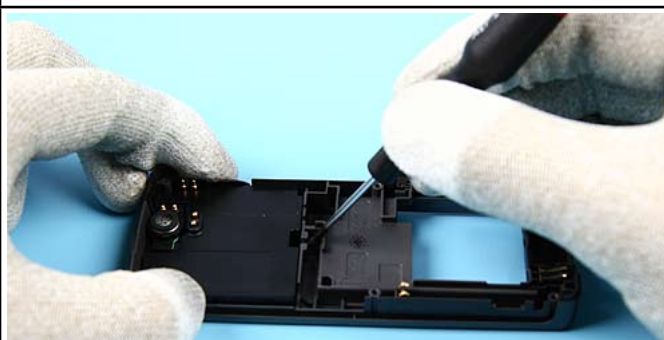
17.) Open the flex connector.



18.) First, pull the edges of the cover. Then carefully lift out the Engine Module as shown.



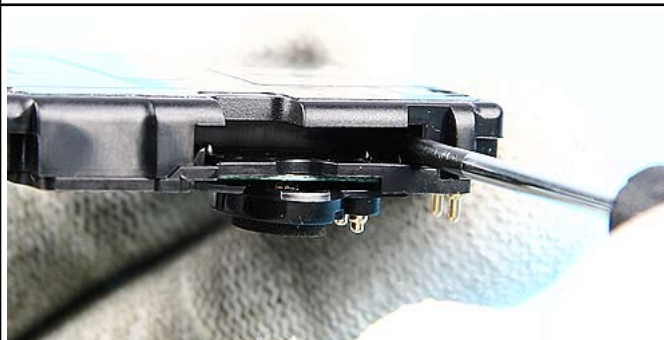
19.) Lift out the Engine Module.



20.) Use a slotted screwdriver to release the Antenna Module Assy.



21.) Unlock the clip of the Antenna Module Assy in shown direction.



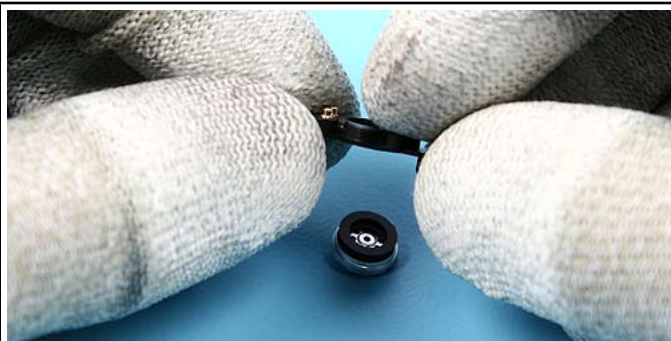
22.) Use a screwdriver to unlock the Earpiece Cover.



23.) Unlock both clips as shown to release the Earpiece Cover.



24.) Remove the Earpiece Contact PWB.



25.) Push out the Earpiece.



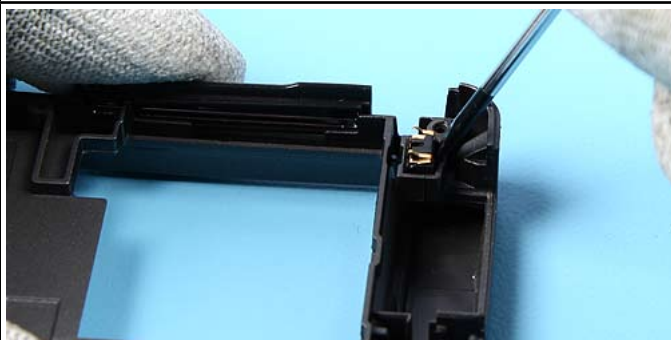
26.) Pull out the MMC Door.



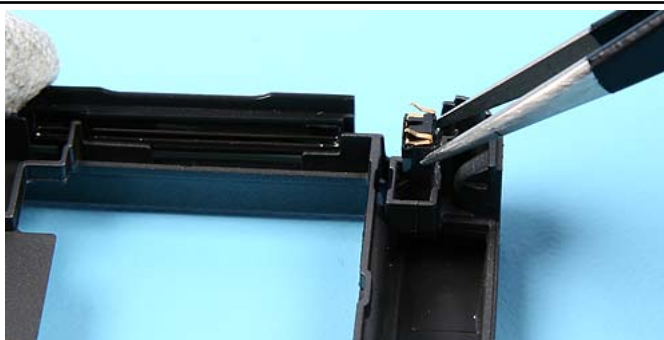
27.) Remove the Power Key.



28.) Remove the DC Jack with the DC Plug.

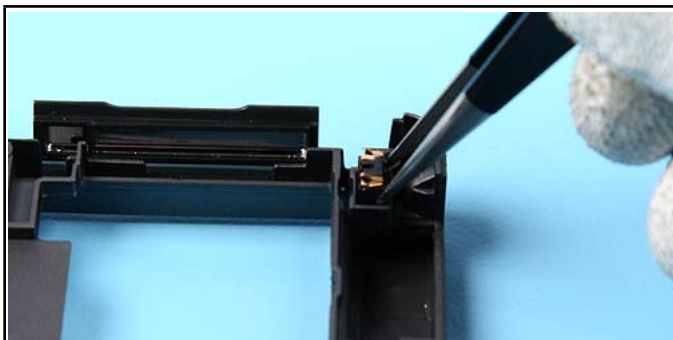


29.) Ease out the **Microphone** with a slotted screwdriver. Always use a new microphone when reassemble.



30.) Remove it with tweezers.

10.ASSEMBLY INSTRUCTION



1.) Insert the Microphone into its compartment.



2.) Insert the DC Jack.



3.) Place the Power Key.



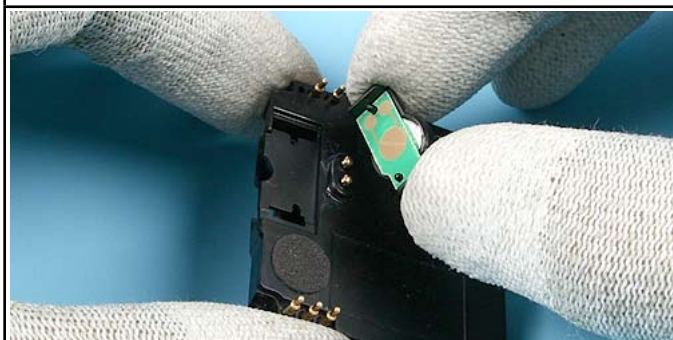
4.) Inset the MMC Door and fix it into its compartment.



5.) Place the Earpiece, mind the guiding. Always fit a new Earpiece Adhesive when replacing the Earpiece.



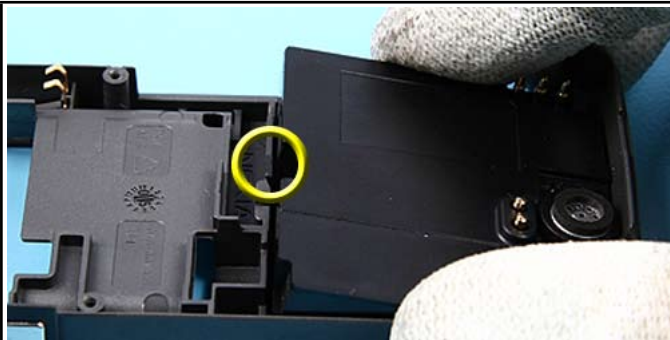
6.) Place the Earpiece Contact PWB.



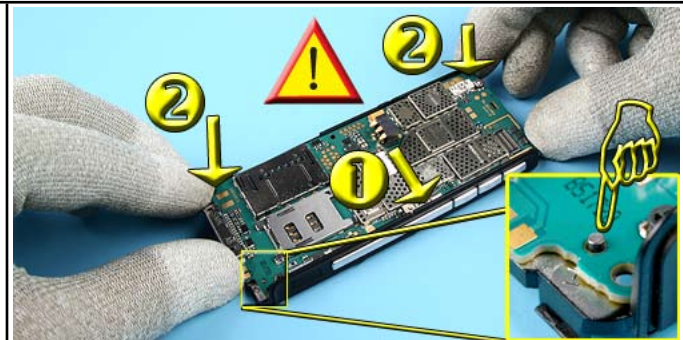
7.) Mind the correct position before placing the Earpiece Cover.



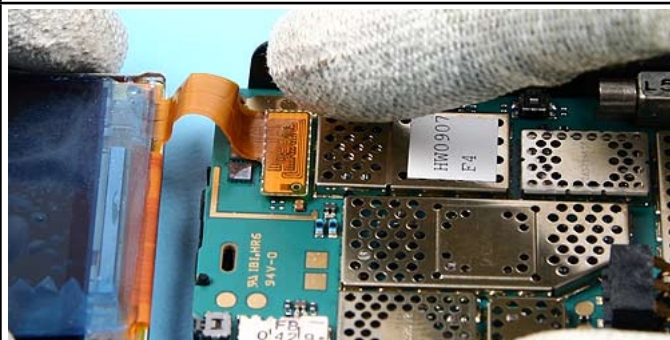
8.) Fix the Earpiece guide at the Antenna Module Assy.



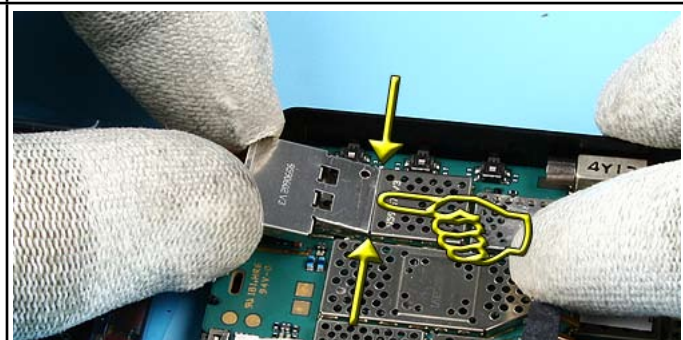
9.) Place the Antenna Module Assy into the B-Cover.



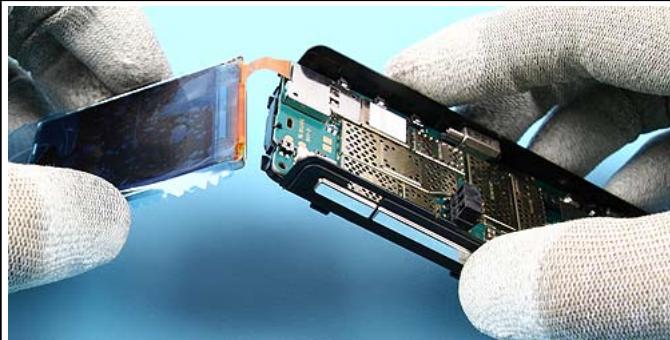
10.) Place the Engine Module into the C-Cover. Start inserting the Engine Module at position 1 (Note the guide pin) and press down at 2. **Remember the joystick on the back. Do not damage it.**



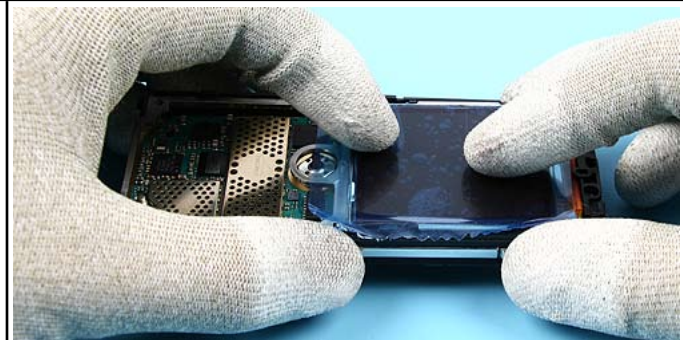
11.) Close the flex connector.



12.) Place a new LCD Connector Shield against the cans edge and press it down.



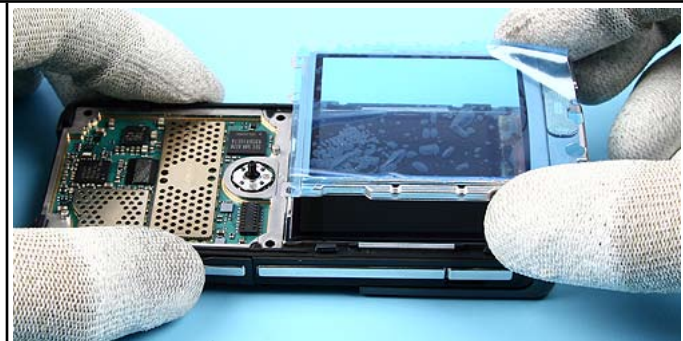
13.) Flip the LCD and place it into its housing.



14.) Note the correct position before continuing.



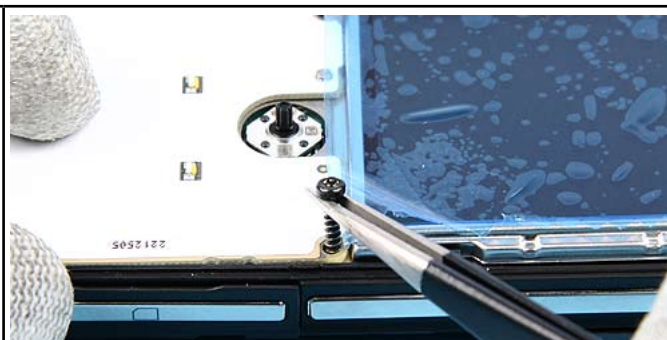
15.) Assemble the parts.



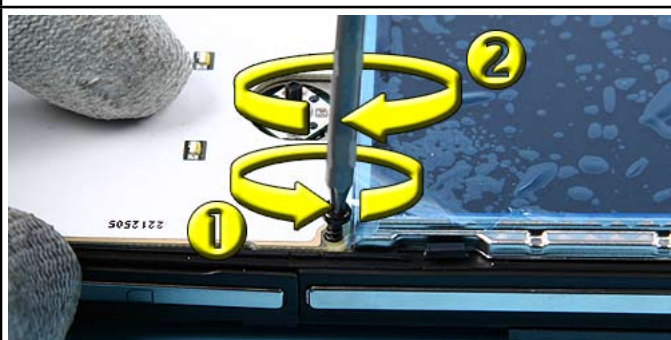
16.) Check the LCD and Display Shield before placing it to the assembly.



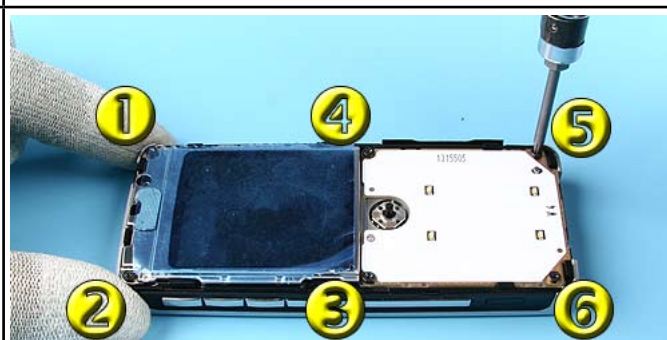
17.) Position the UI PWB Assy. Note the guiding.



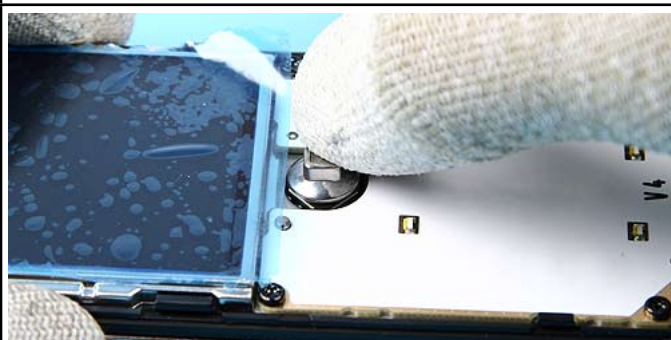
18.) Insert the six Torx Plus size 6 screws.



19.) To prevent damaging the plastic threads, turn the screws to the left first (1), then tighten them slightly (2).



20.) Apply the torque of 22 Ncm to the screws in the shown order.



21.) Place the Joystick Button.



22.) Place the T9 Keymat.



23.) Remove the plastic film.



24.) Glue the Grounding Foam onto the Display Shield.



25.) Place the A-COVER beginning from the top.



26.) Click all snaps into their places.



27.) Protect the window with a plastic film.



28.) Glue the MMC READER LABEL onto the MMC reader.



29.) At least place the BATTERY COVER.





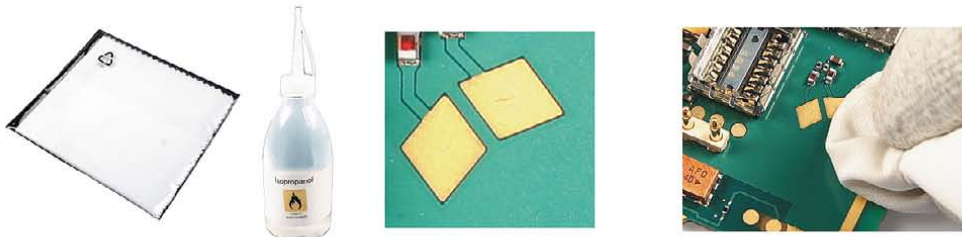







11.LEGEND FOR QUICK TROUBLE SHOOTER

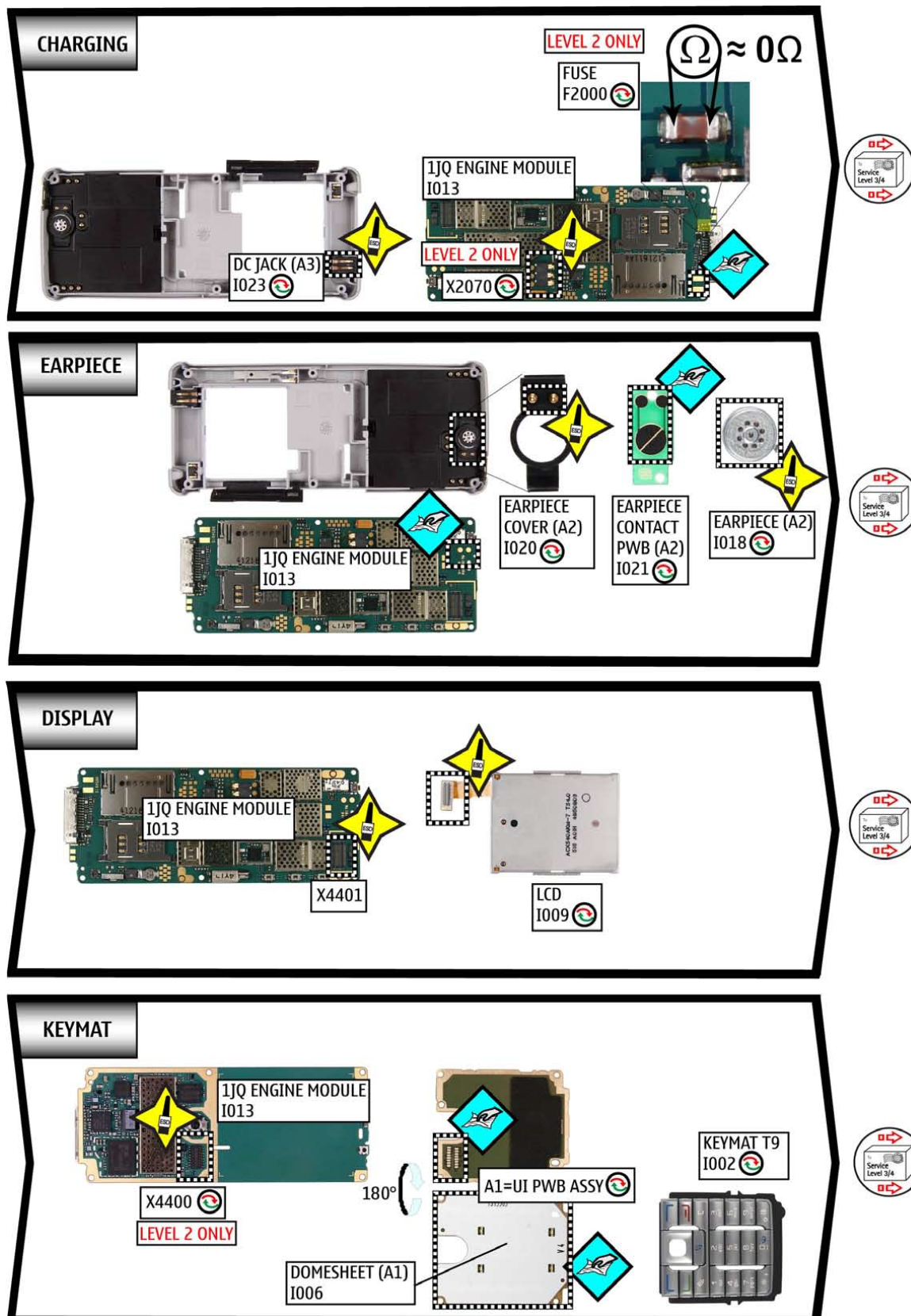
Legend for Quick Troubleshooter

This legend is valid for all parts of the Quick Troubleshooter

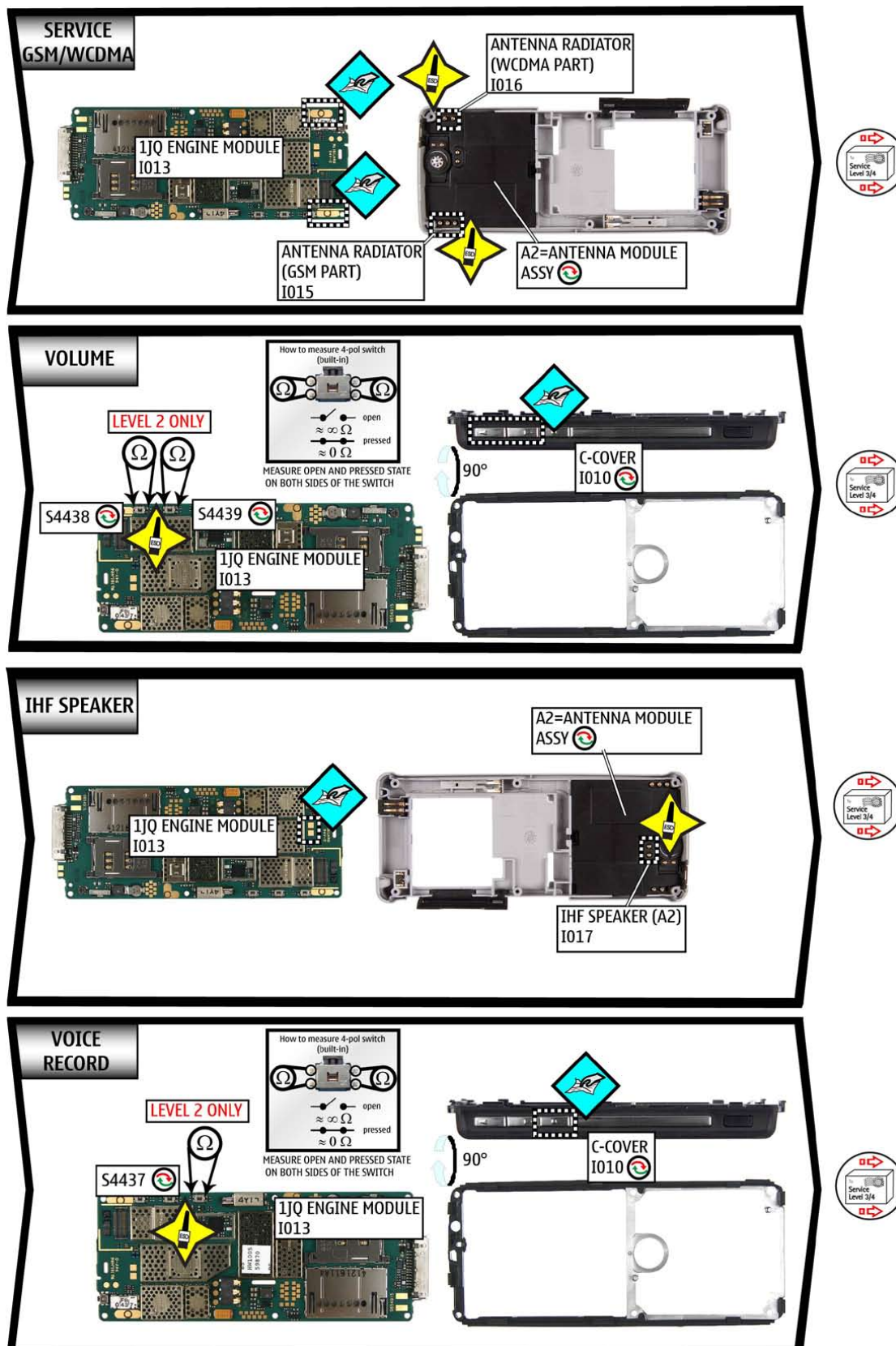
Follow the steps until the problem is solved. If this doesn't help, you are not authorized to go forward.

	The start point of repair activities regarding the appeared fault symptoms.
	Only marked components (e.g. I002 ) can be replaced.
	Cloth usage: Check pads or contacts for optical and mechanical condition particularly regarding to corrosion. Clean it if necessary. 
	Measure component for electrical functionality and change, if needed. (Level 2 only) 
	ESD Brush usage: Check pads or contacts for optical and mechanical condition particularly regarding to corrosion. Clean it if necessary. 
	No more action possible - send product to the appropriate service supplier with higher service level.

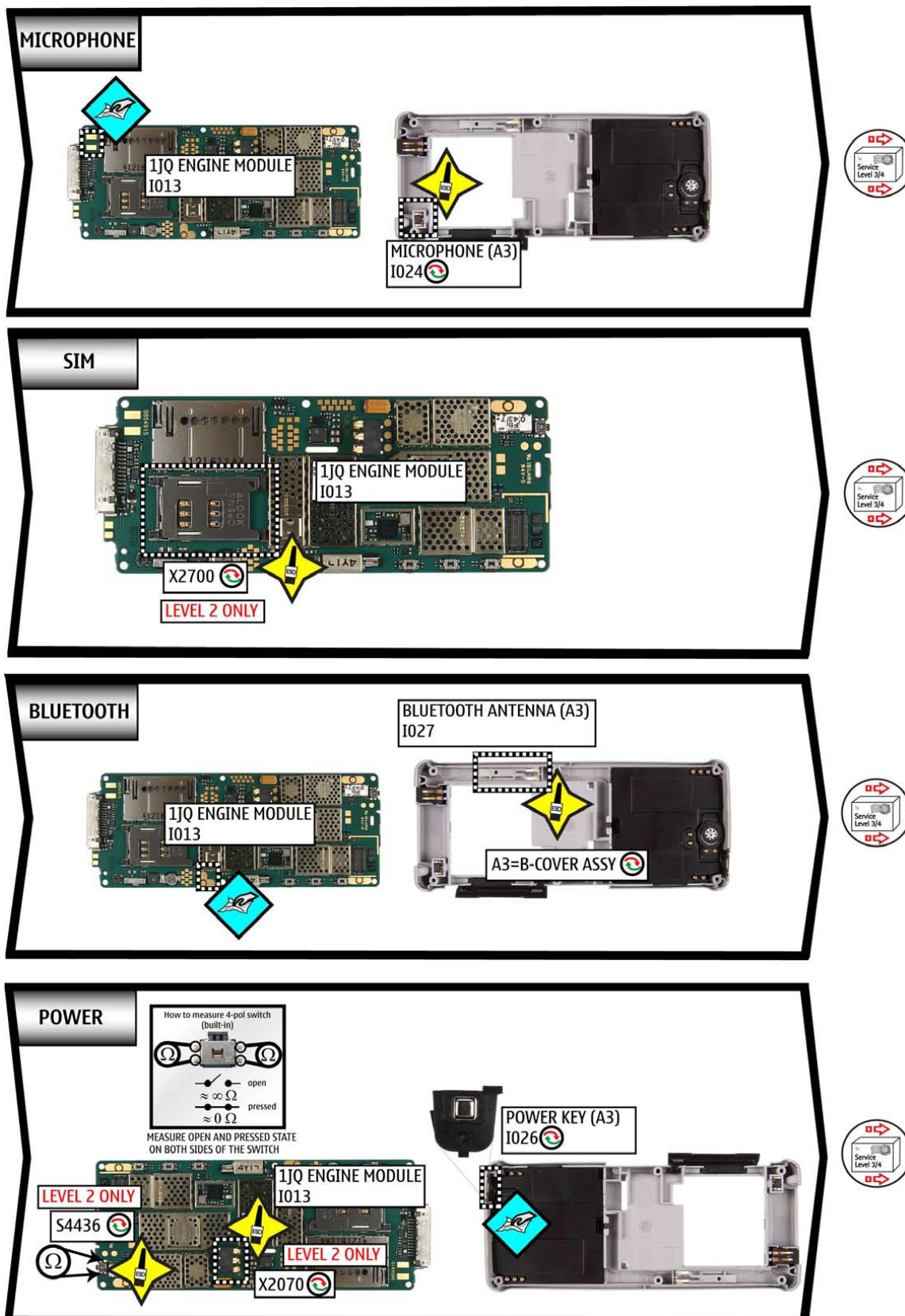
12. QUICK TROUBLE SHOOTER PART 1



13. QUICK TROUBLE SHOOTER PART 2



14. QUICK TROUBLE SHOOTER PART 3



15. BLUETOOTH & INFRARED TEST

Bluetooth test

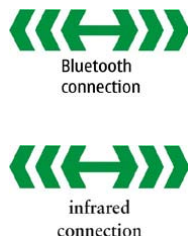
You need another Bluetooth device (e.g. 6230) to do a GoNoGo test.

Make sure that Bluetooth is activated in the reference unit. The distance of the devices should be not more than 5m from each other.

Infrared test

You need another infrared device (e.g. 6230) to do a GoNoGo test. The infrared windows of the devices must be directed to each other and should have a distance of approximate 15 cm. Make sure that infrared is activated in receiver device.

Warning: Do not point the IR (infrared) beam at anyone's eye or allow it to interfere with other IR devices. This device is a Class 1 Laser product.



Reference unit, Bluetooth /infrared activated

Test unit

Settings on the test unit:

- Press the red End key to reach the Home Menu
- Select **Contacts** and choose an entry
If phone and SIM memory is empty, create one new entry.
- Press **Options**
- Select **Send**

A) - for infrared test: Select **Via infrared**

If sending of business card fails, make sure again that infrared windows are directed to each other and infrared is activated in reference unit. Then try again sending.

Test was successful, if you get the message "**Business card received**" on the Reference unit.

You will not get a confirmation on sender device.

B) - for Bluetooth test: Select **Via Bluetooth**

Search window appears and shows all Bluetooth units in range.

Choose one unit and press **Select**

Press **Accept** on the Reference unit.

Test was successful, if you get the message "**Business card received**" on the Reference unit.

- Press red End key of the Test unit to reach the Home Menu

Note: If the Bluetooth is activated, switch it off!

16. BATTERY TEST

A battery tester lets you test the capacity of NOKIA batteries.

Please refer to the actual information on NOKIA Online.



<http://www.astratec.co.uk/>



<http://www.cadex.com/>