SERVICE MANUAL
Level 1&2

NOKIA 6110 Navigator

RM-122

Transceiver characteristics:

Band:

EGSM: Quad-band 850/900/1800/1900MHz

WCDMA: 2100MHz

Display:

LCD: 5.588cm QVGA (2.2") (240x320 pixel); 16M colors

Camera:

Camera: 2.0 Megapixel SMIA95, 4x digital zoom

CIF Camera:

Operating System:

Series 60 3rd Edition

Connections:

Wireless: Bluetooth, GPS

Connector: Mini USB Connector; AV Connector

Memory:

MicroSD™ (max 4GB)

Transceiver with BP-5M Li-Ion battery pack

Talk time	Standby	Note
up to 3.5h	up to 11days	Depends on network parameters

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1. CHANGE HISTORY

Status	Version No.	Date	Comments
Draft	0.1	13.Mrz.2007	Initial draft
Approved	1.0	26.Apr.2007	Approval
Approved	2.0	02.May.2007	Disassy/Assy text modification page 28; pic. 21
Approved	3.0	08.May.2007	Disassy/Assy text modification page 12; pic.1 & page 13 pic. 8
Approved	4.0	25.July.2007	Exploded view & Spare Parts overview updated (I0205 corrected)

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 endeavor 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:

CMO Operation & Logistics
Training and Vendor Development
Multimedia Creation & Support
mailto:Service.Manual@nokia.com

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

2. COPYRIGHT

3. WARNINGS AND CAUTIONS

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 THE IMMUNITY OF VEHICLE ELECTRONIC SYSTEMS TO RF ENERGY.
2. 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.

4. ESD PROTECTION

Nokia requires that service points have sufficient ESD protection (against static electricity) when servicing the phone.
Any product of which the covers are removed must be handled with ESD protection. The SIM card can be replaced without ESD protection if the product is otherwise ready for use.
To replace the covers ESD protection must be applied.
All electronic parts of the product are susceptible to ESD. Resistors, too, can be damaged by static electricity discharge.
All ESD sensitive parts must be packed in metallized protective bags during shipping and handling outside any ESD Protected Area (EPA).
Every repair action involving opening the product or handling the product components must be done under ESD protection.
ESD protected spare part packages MUST NOT be opened/closed out of an ESD Protected Area.
For more information and local requirements about ESD protection and ESD Protected Area, contact your local Nokia After Market Services representative.

5. CARE AND MAINTENANCE

This product is of superior design and craftsmanship and should be treated with care. The suggestions below will help you to fulfil any warranty obligations and to enjoy this product for many years.
• Keep the phone and all its parts and accessories out of the reach of small children.
• Keep the phone dry. Precipitation, humidity and all types of liquids or moisture can contain minerals that will corrode electronic circuits.
• Do not use or store the phone in dusty, dirty areas. Its moving parts can be damaged.
• Do not store the phone in hot areas. High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics.
• Do not store the phone in cold areas. When it warms up (to its normal temperature), moisture can form inside, which may damage electronic circuit boards.
• Do not drop, knock or shake the phone. Rough handling can break internal circuit boards.
• Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the phone.
• Do not paint the phone. Paint can clog the moving parts and prevent proper operation.
• Use only the supplied or an approved replacement antenna. Unauthorised antennas, modifications or attachments could damage the phone and may violate regulations governing radio devices.
All of the above suggestions apply equally to the product, battery, charger or any accessory.

6. BATTERY INFORMATION

Note: A new battery's full performance is achieved only after two or three complete charge and discharge cycles! The battery can be charged and discharged hundreds of times but it will eventually wear out. When the operating time (talk-time and standby time) is noticeably shorter than normal, it is time to buy a new battery. Use only batteries approved by the phone manufacturer and recharge the battery only with the chargers approved by the manufacturer.
Unplug the charger when not in use. Do not leave the battery connected to a charger for longer than a week, since overcharging may shorten its lifetime.
If left unused a fully charged battery will discharge itself over time Temperature extremes can affect the ability of your battery to charge.
For good operation times with Ni-Cd/NiMh batteries, discharge the battery from time to time by leaving the product switched on until it turns itself off (or by using the battery discharge facility of any approved accessory available for the product).
Do not attempt to discharge the battery by any other means Use the battery only for its intended purpose. Never use any charger or battery which is damaged.
Do not short-circuit the battery. Accidental short-circuiting can occur when a metallic object (coin, clip or pen) causes direct connection of the + and - terminals of the battery (metal strips on the battery) for example when you carry a spare battery in your pocket or purse. Short-circuiting the terminals may damage the battery or the connecting object.
Leaving the battery in hot or cold places, such as in a closed car in summer or winter conditions, will reduce the capacity and lifetime of the battery. Always try to keep the battery between 15°C and 25°C (59°F and 77°F). A phone with a hot or cold battery may temporarily not work, even when the battery is fully charged. Batteries' performance is particularly limited in temperatures well below freezing.
Do not dispose batteries in a fire! Dispose of batteries according to local regulations (e.g. recycling). Do not dispose as household waste.

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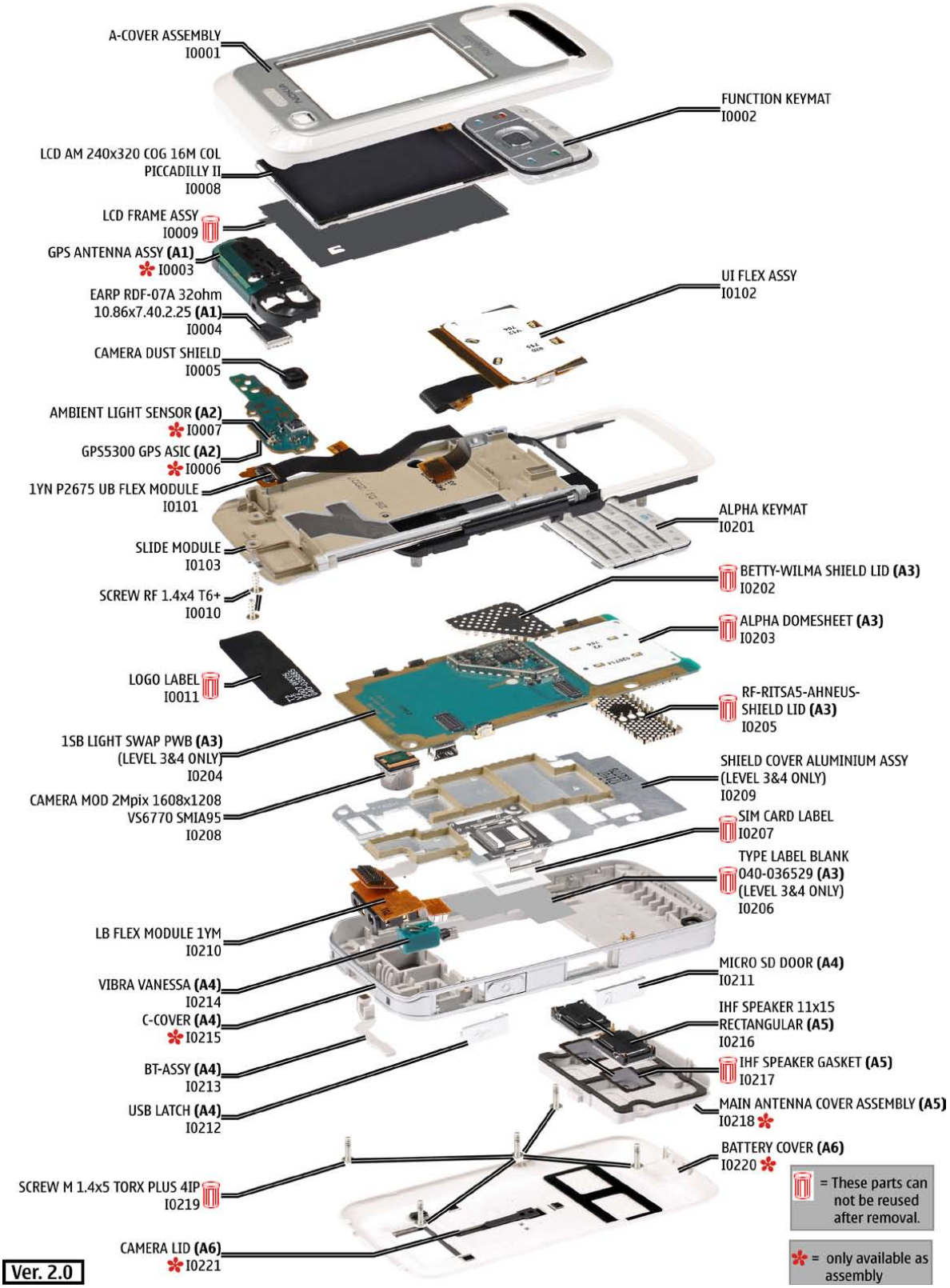
7. EXPLODED VIEW

See corresponding ITEM/CIRCUIT REF in the Spare Parts Service Bulletins on NOL.

6110 NAVIGATOR RM-122 EXPLODED VIEW



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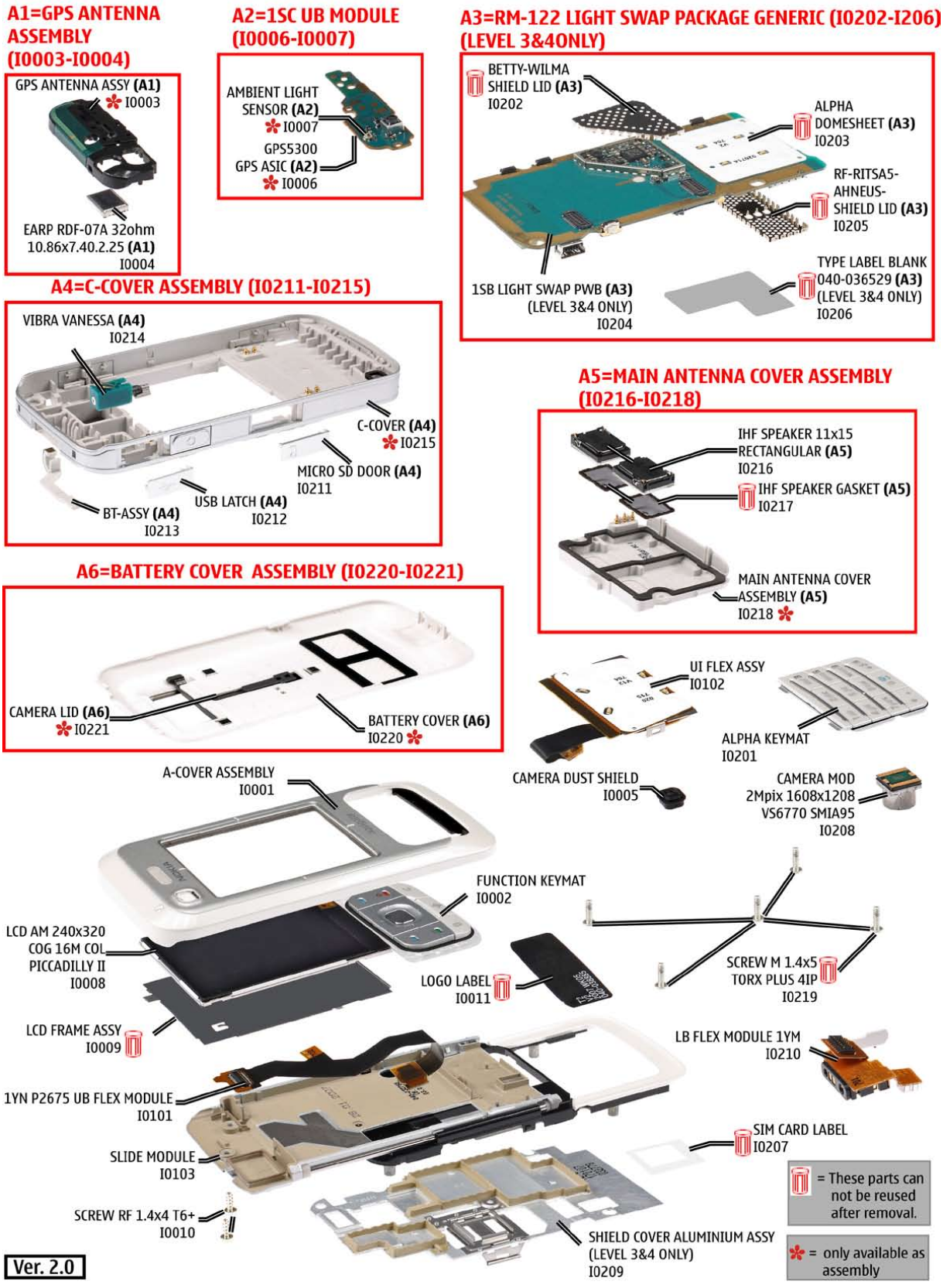
8. SPARE PARTS OVERVIEW

6110 NAVIGATOR RM-122 SPARE PARTS OVERVIEW



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9. GENERAL RECYCLING RECOMMENDATION

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CMO Operations & Logistics
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Multimedia Creation & Support

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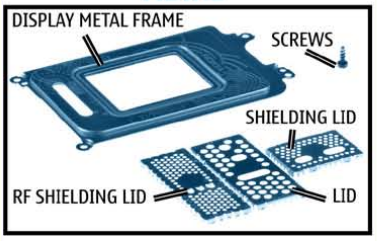
13.11.2006
MGR

General Recycling recommendation

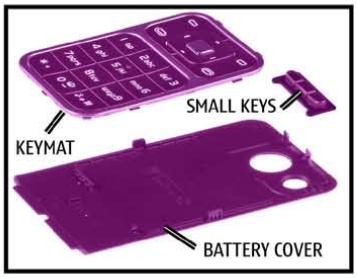
100% - only one Material
(Example components)

Mixed components
(Example components)

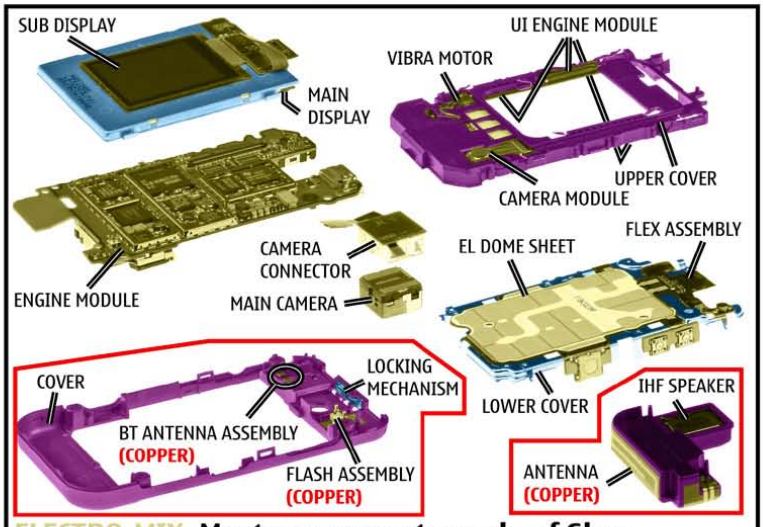
METAL



PLASTIC

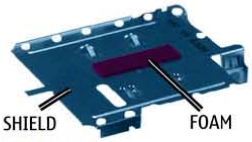


ELECTRO-MIX



ELECTRO-MIX: Most components made of Glass, Ceramics, Glassfiberreinforced epoxy.
ALL fractions containing any copper should be send to ELECTRO-MIX!!!

METAL - MIX



METAL-MIX: Most components made of Metal

BATTERY

BATTERY: Chemicals, Plastic and Ceramics

PLASTIC-MIX

PLASTIC-MIX: Most components made of Plastic

Some of these options can be utilized directly and some need pretreatment as for instance dismantling, grinding, milling, etc.
For sorting the waste into fractions for recycling, your recycler will offer you more specific information, but a GENERAL RULE is:
Elecronic Equipment: There are recyclers that can process this "multimaterial" for high recycling yields.
Metals: Fractions containing metals must always be collected and sent for (metal) material recycling.
Plastics: Pure plastics fractions (i.e. covers) can be sent for (plastics) materials recycling.
Mixed Plastic/Metals: A metal fraction contaminated with plastics does not represent a problem for metal recycling/recovery whereas recycling/recovery of plastics is generally sensitive for contamination by other materials.

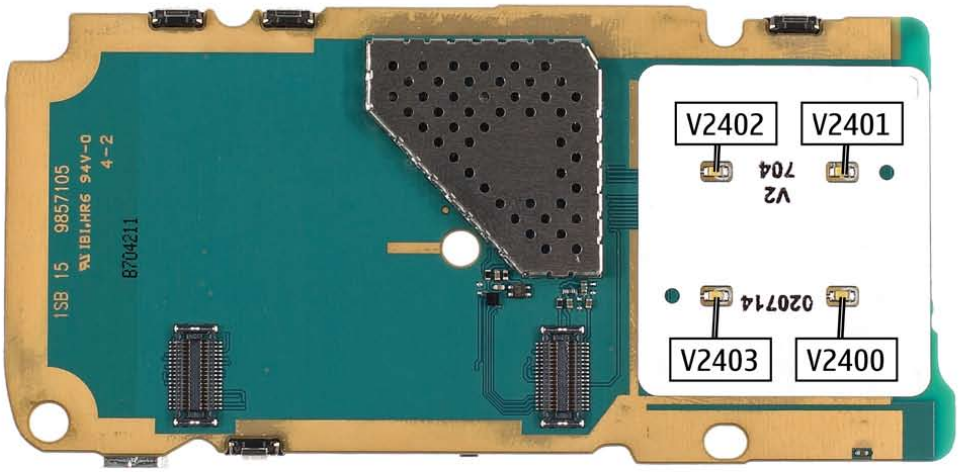
ELECTRO METAL PLASTIC BATTERY

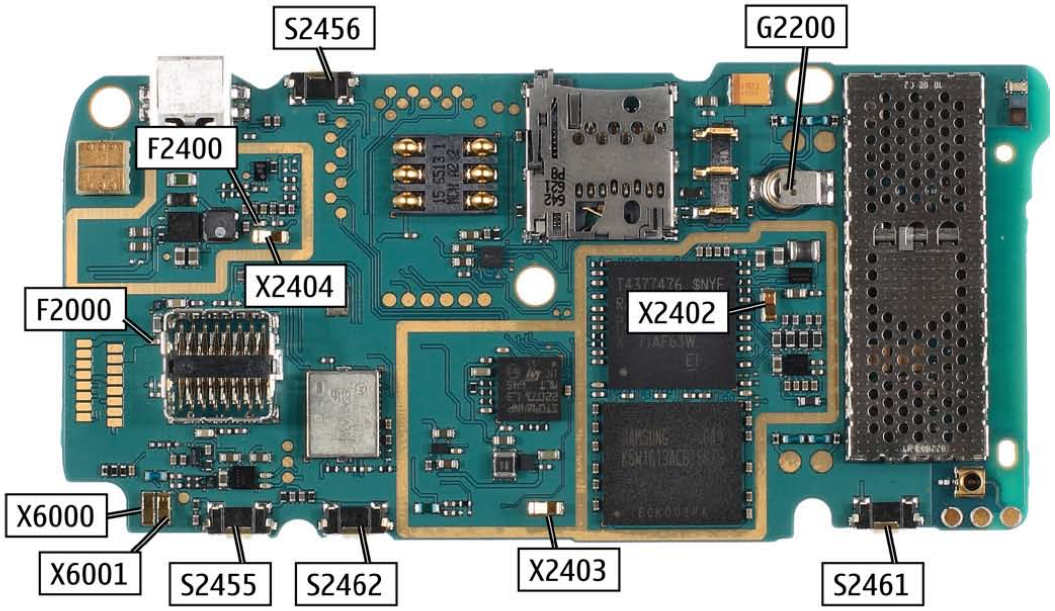
Ver. 3.0

10. LEVEL 2 SOLDER COMPONENTS

6110 Navigator RM-122 Level 2 solder components

Solder components only for LEVEL 2





Ver. 1.0

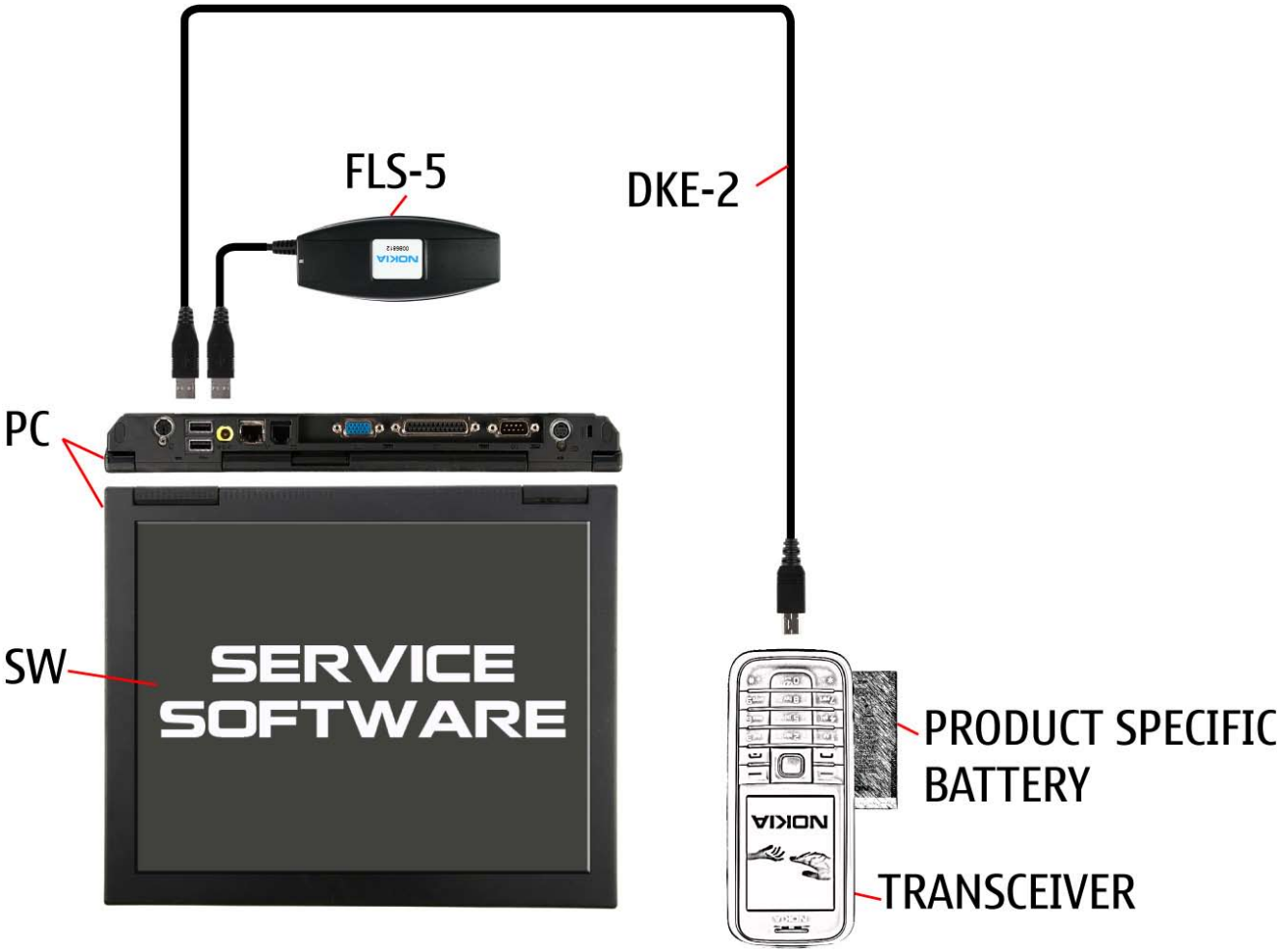
11. SERVICE DEVICES

		
FLS-5 incl. ACF-8, Driver and User Guide Dongle and flash device incorporated into one package, developed specifically for POS use.	**ACF-8** Universal Power Supply is used to power FLS-4S.	**Travel Charger AC-4** Small and lightweight charger for fast charging of your phone battery.
		
DKE-2 Service Cable to connect the PC with the mini USB connector.	**SS-45** Camera removal tool. One side is for disassembly, the other side for assembly.	**RJ-102** Soldering Jig
		
Internal Battery BP-5M Inserted under the back cover, this Li-Ion battery provides power in a lightweight package.	**Lead-free Solder Wire** Mandatory for lead-free products (Level 2 only).	**0772040** **NMP Standard Toolkit (V2)** For more informations refer to the Service Bulletin (SB-011) on NOKIA Online. Supplier or manufacturer contacts for tool re-order can be found in "**Recommended service equipment**" document on NOKIA Online.

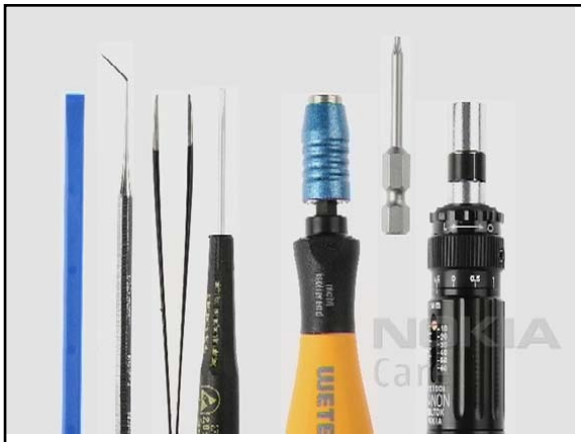
12. SW-UPDATE

Flash Concept – (Point of Sales)

To use FLS-5 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.



13. UPPER BLOCK DISASSEMBLY



1. Needed tools: The SS-93, the dental pick, metal tweezers, a flat bladed screwdriver, a bit holder with a torx size 6 bit and a torque driver.

2. Check that no battery is still inserted.

3. Open the assembly in order to reach the LOGO LABEL.

4. Use the dental pick to release the label at the position shown.

5. Do not use it again.

6. Gently lift up, remove and discard the LOGO LABEL.

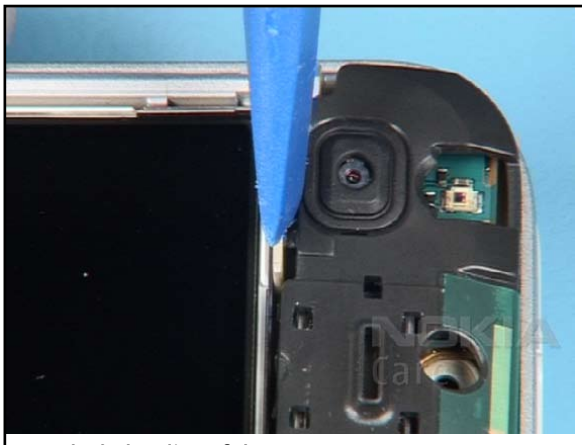
7. Remove the adhesive residues before reassembly.

8. Unscrew both screws. It is not necessary to remove the 2nd screw if only A-COVER or FUNCTIONAL KEYMAT needs to be replaced.

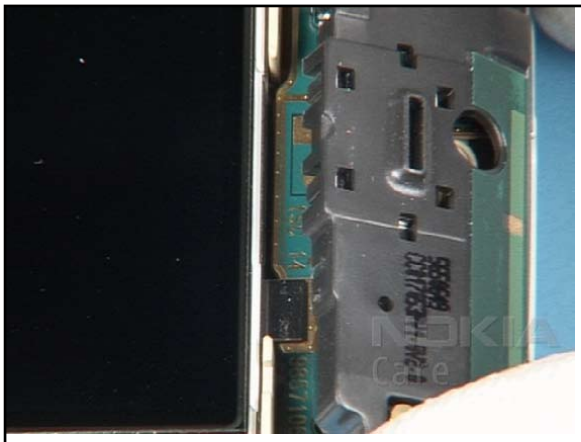
9. Open the clips of the A-COVER.

10. Shift it to bottom side direction and lift it up.

11. The FUNCTION KEYMAT can be removed easily.



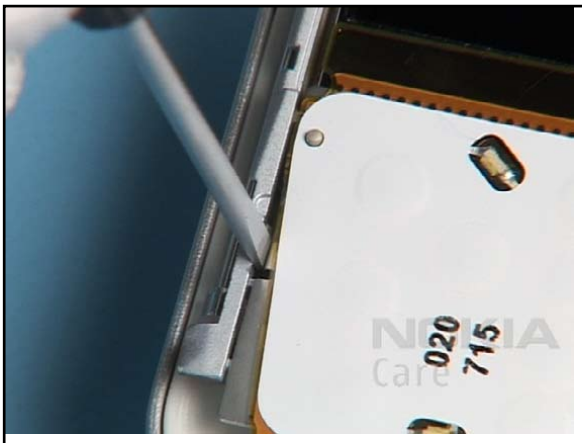
12. Unlock the clips of the GPS ANTENNA ASSEMBLY.



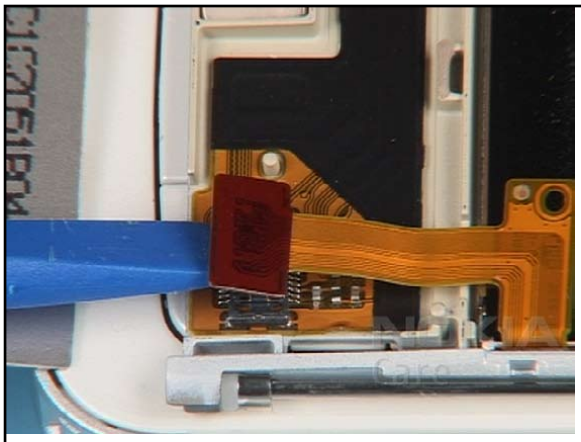
13. It can be removed now.

14. The EARPIECE is not glued in and can be replaced easily.

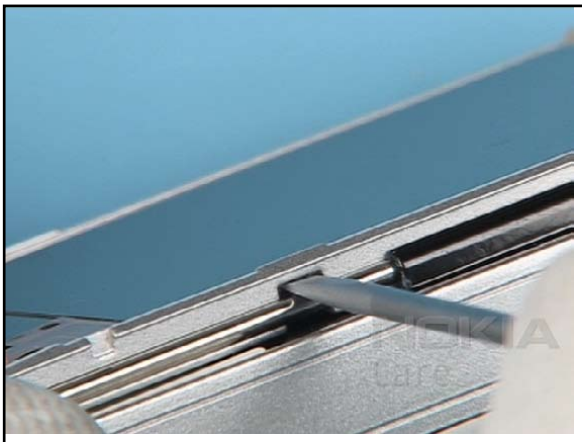
15. Open the metal latches of the SHIELD...



16. ...on both sides.



17. Lever up the flex connector of the display.



18. Unlock the clip of the display through the recess.

19. Now the display can be lifted up.

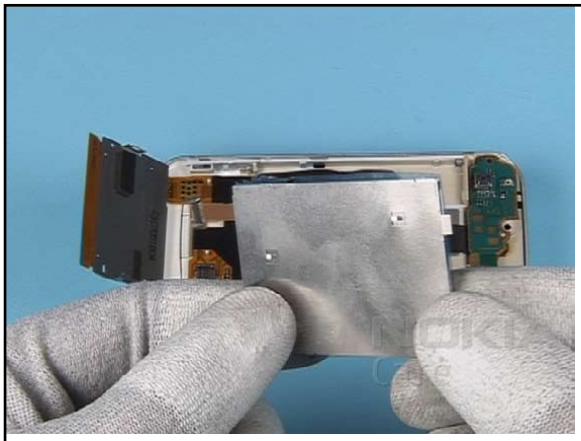
20. The glued in UI FLEX can be removed. Note: For disconnecting the flex connectors the lower block must be disassembled first. The adhesive was assembled for production issues and must not be replaced.

21. The disassembly procedure is now completed.

14. UPPER BLOCK ASSEMBLY

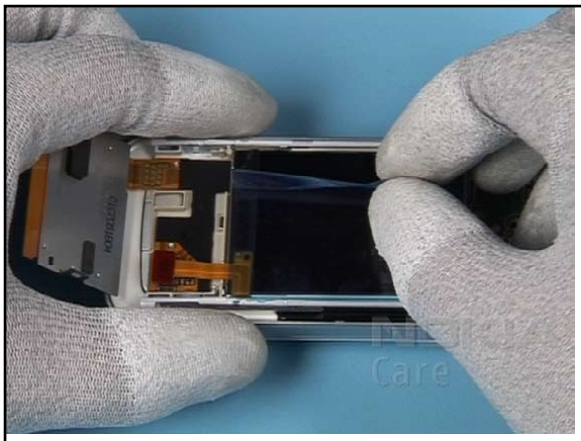
1. Assembly.

2. Mind the correct positioning when replacing the UI FLEX foils.

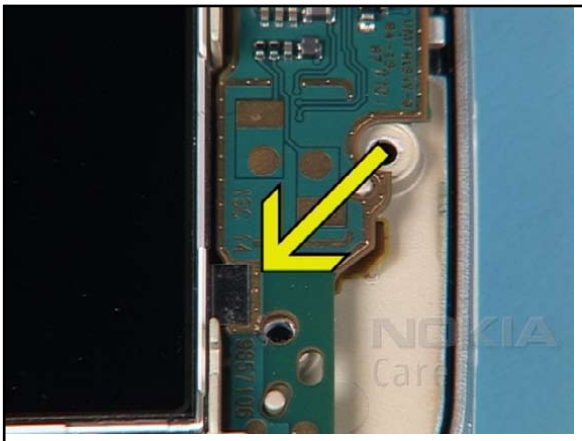


3. When replacing the LCD FRAME ASSEMBLY, mind the correct positioning of the LCD FRAME.

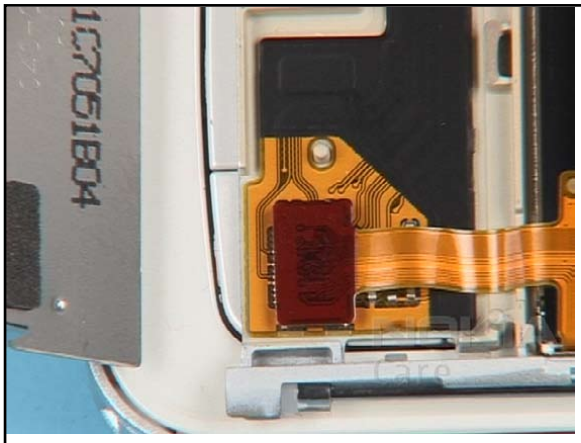
4. Position the LCD into its compartment.



5. Peel off the protective film.

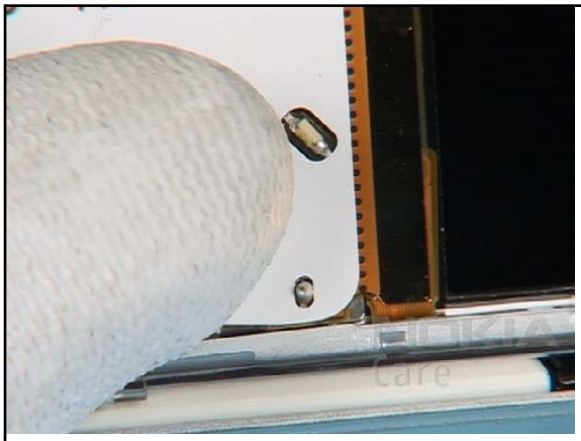


6. Mind the correct positioning of the grounding pad.

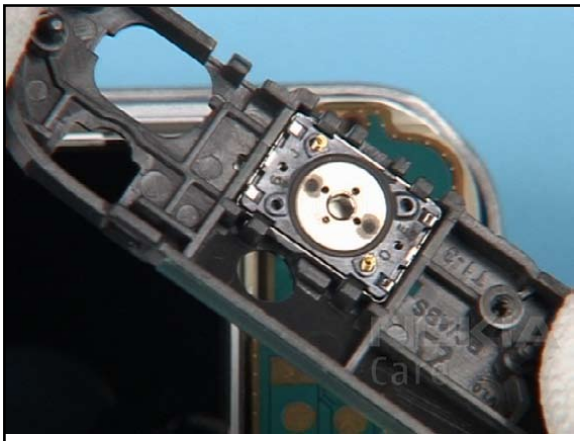


7. Close the flex connector.

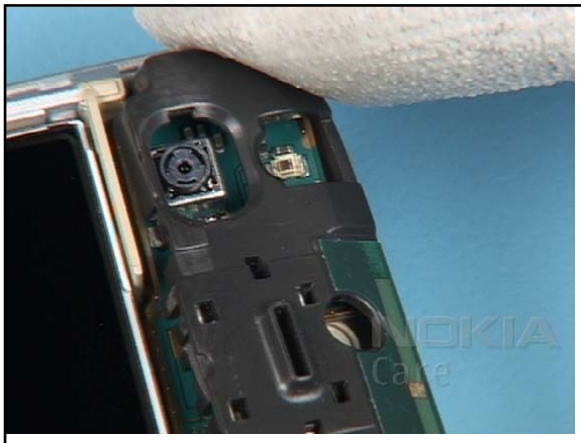
8. Flip over the SHIELD LID.



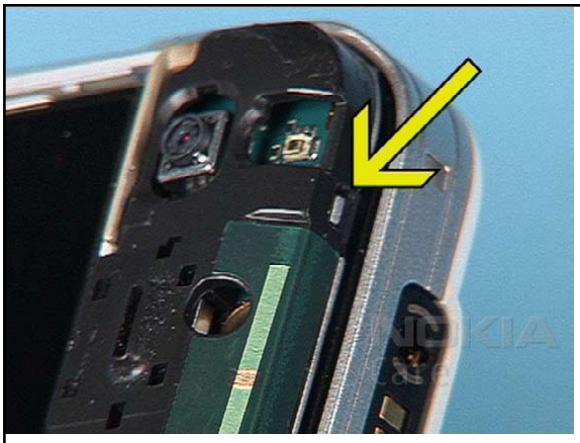
9. Click the snaps into their places. Note the correct positioning of the alignment tabs.



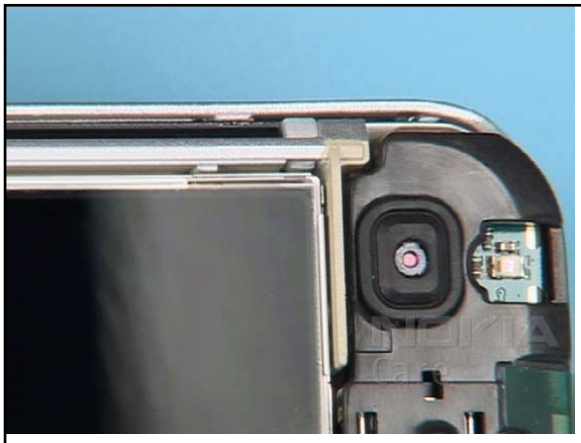
10. Fit the EARPIECE into the GPS ANTENNA ASSEMBLY.



11. Place the GPS ANTENNA ASSEMBLY, click the snaps into their places.



12. Check that this snap clicked into its place correctly.



13. Do not forget placing the CAMERA DUST SHIELD.

14. Insert the FUNCTION KEYMAT.

15. Insert the assembly into the A-COVER, beginning from the bottom.

16. Click all snaps into their places.

17. Insert the screws.

18. Set the correct torque.

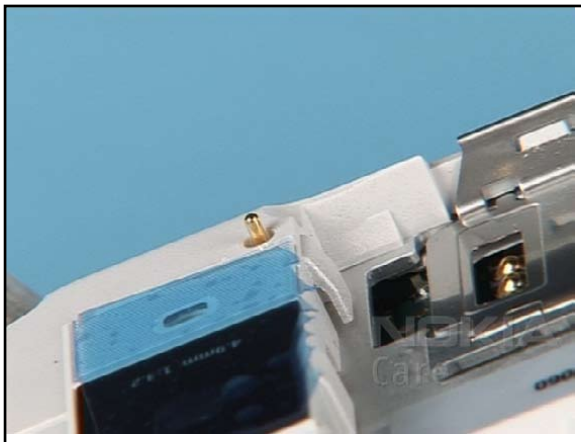
19. Tighten both screws with the correct torque.

20. Place a new LOGO LABEL. Align it correctly and smooth it down evenly.

15. LOWER BLOCK DISASSEMBLY

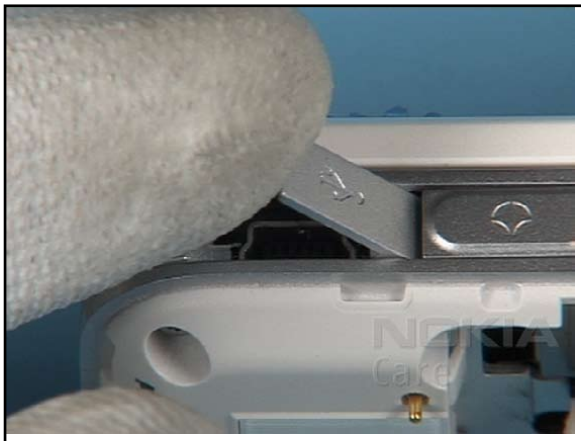
1. Needed tools: The SS-93, metal tweezers, the SS-45 camera removal tool, a bit holder with a Torx Plus size 4 bit and a torque driver.

2. Start your repair with opening the BATTERY COVER. Ensure that no battery is still inserted.

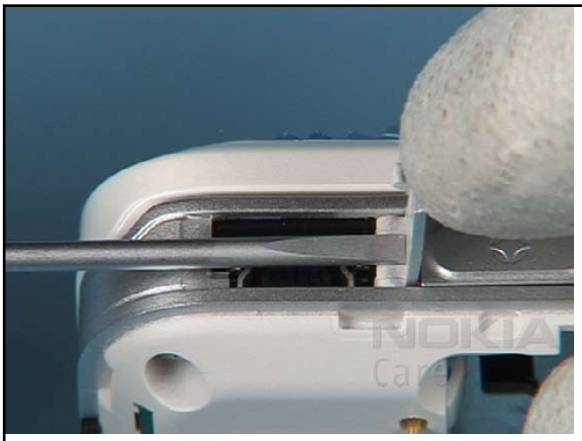


3. Note not to damage this pin while proceed.

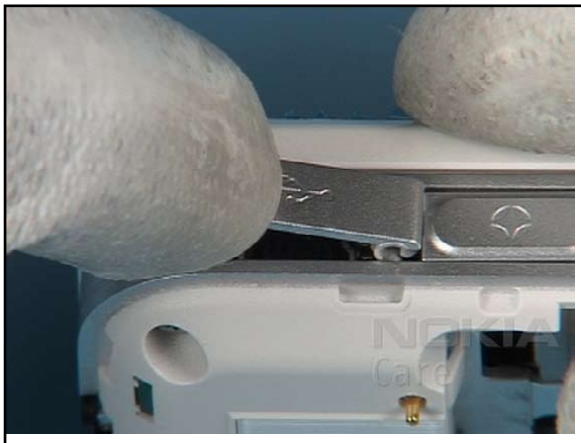
4. This ALPHA KEYMAT can be exchanged without removing any screws. Gently lever out and remove it.



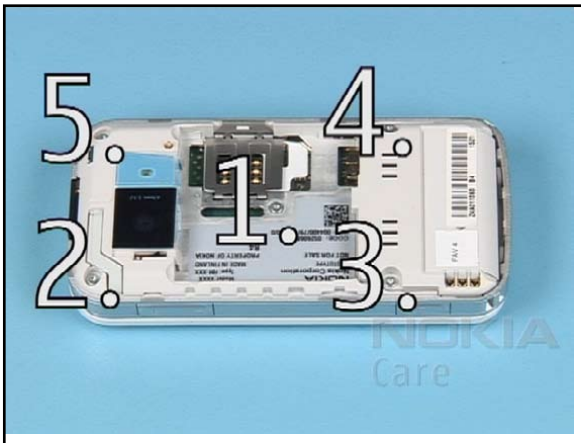
5. It is possible to remove the USB LID and the MICRO SD DOOR without removing the cover. Open the lid first.



6. Place the flat bladed screwdriver close to the hinge clips.



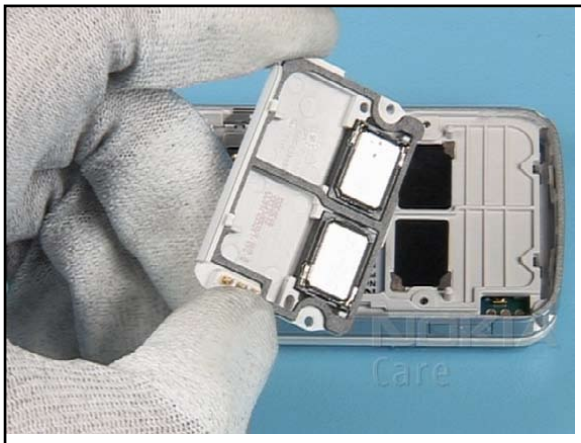
7. Now close the lid carefully and lever it up.



8. Release the 5 screws in the order shown. In case of trouble shooting at the MAIN ANTENNA ASSY ,only the screw 3 and 4 must be removed.

9. Due to the fact that these screws are using locking compound, they must always be replaced after unscrewing.

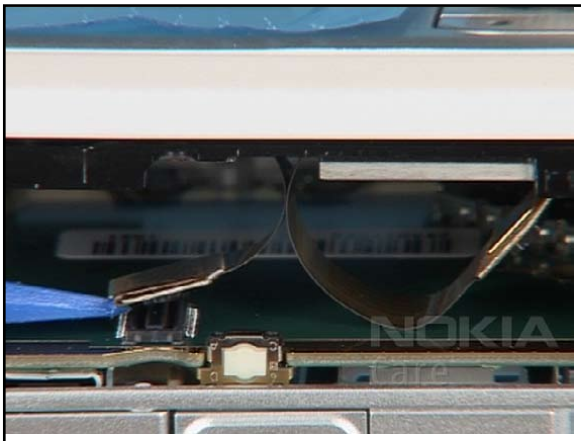
10. Lift up the MAIN ANTENNA COVER ASSEMBLY.



11. Both IHF SPEAKER can be removed, but fit them with new gaskets before reassemble.

12. Shift open again the assembly, gently pry open the hidden clips of the C-COVER.

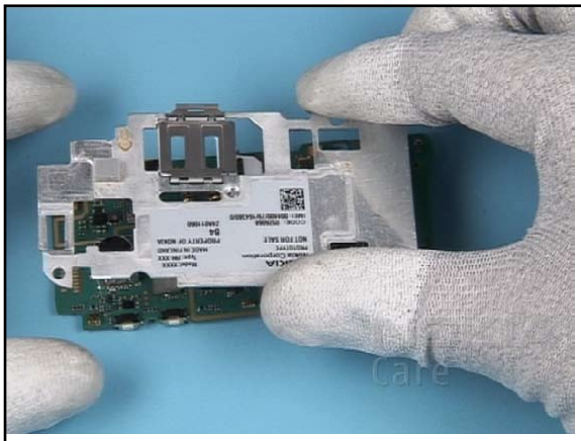
13. Note that both parts are still connected with the flex foils.



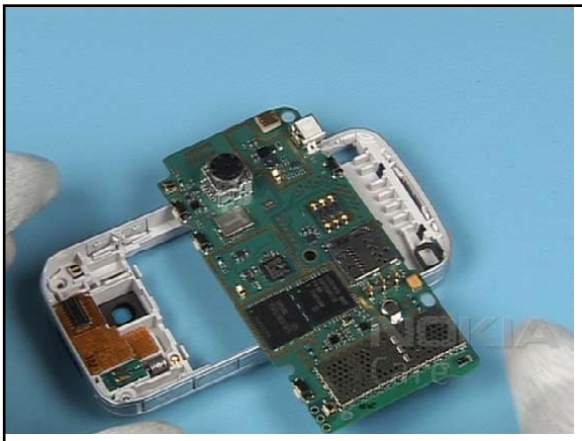
14. Disconnect both flex connectors. For complete removal of these flex foils the upper block must be disassembled, too.

15. Now the parts can be separated.

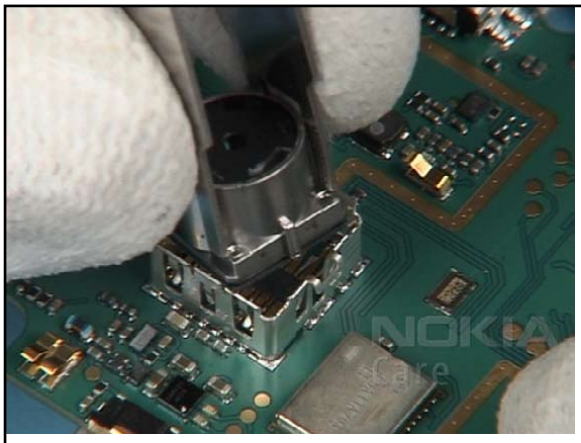
16. Lift up the B-COVER now.



17. The SHIELD LID can be lifted up easily.



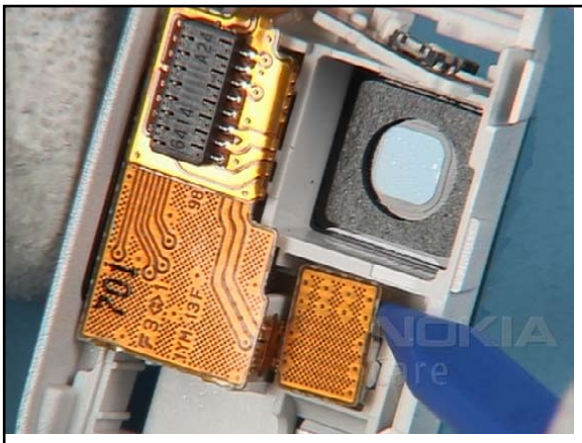
18. Use appropriate soldering jig or at least the B-COVER as support when replacing the CAMERA MODULE.



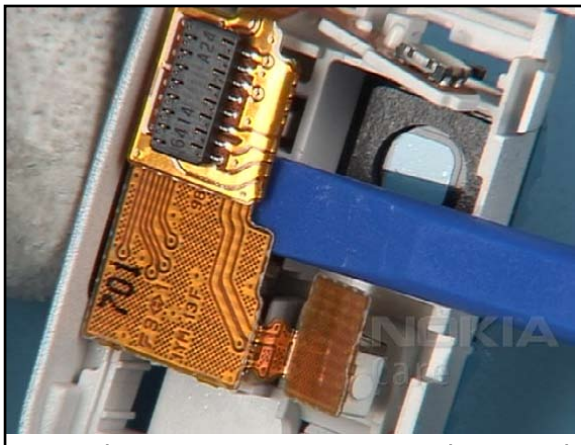
19. Unlock and remove the CAMERA MODULE with the SS-45.

20. The removal of the VIBRA is easy.

21. Detach the snap of the LB FLEX MODULE.

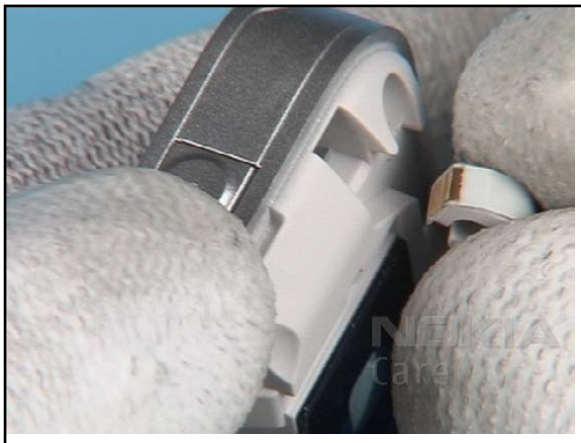


22. Pry out the FLASH LIGHT.



23. Now the LB FLEX MODULE ASSEMBLY can be removed.

24. Release the clip of the BT ASSEMBLY.

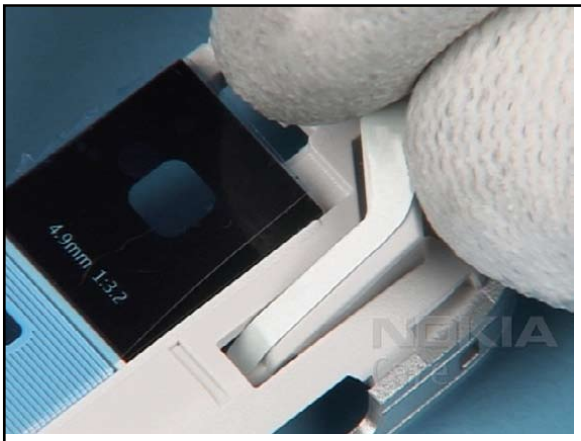


25. Push out and remove it.

26. The disassembly procedure is now complete.

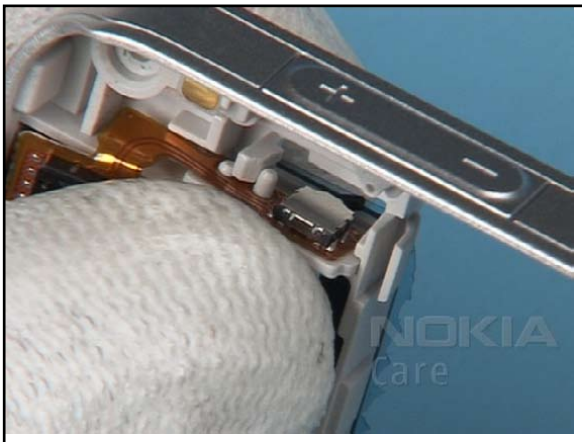
16. LOWER BLOCK ASSEMBLY

1. Assembly.



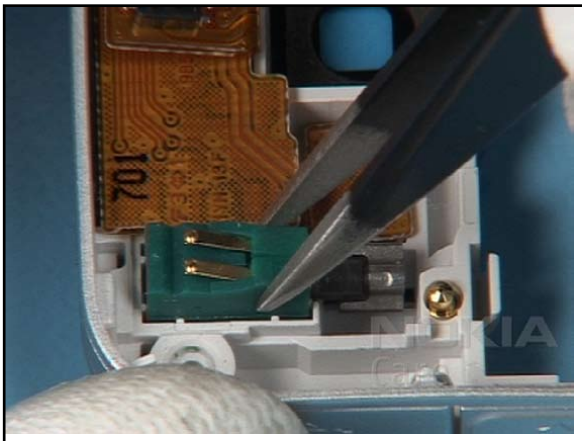
2. Insert the BT ASSEMBLY.

3. Fit the connector with LB FLEX MODULE into the B-COVER.



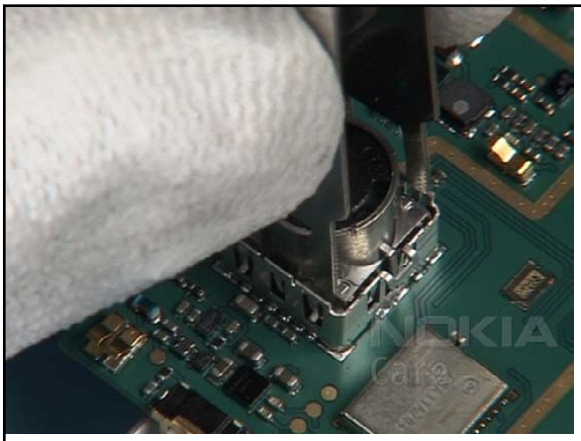
4. Position the switch as shown.

5. Position the FLASH LIGHT.

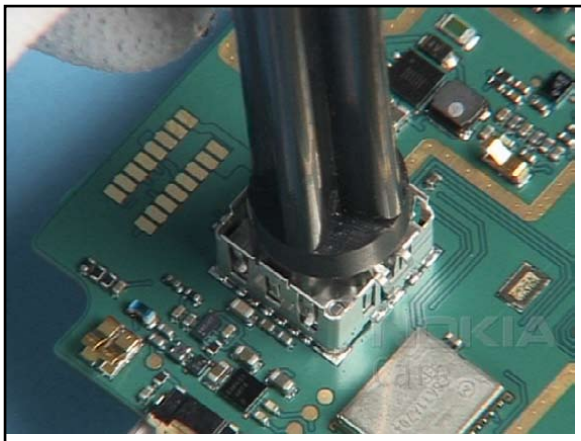


6. Insert the VIBRA. Push it into its correct position.

7. Insert the CAMERA MODULE.

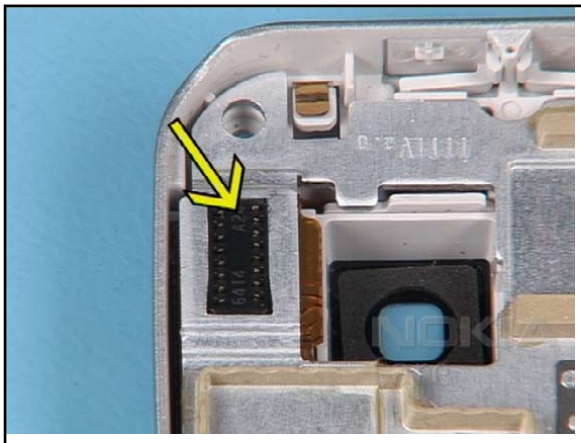


8. Note the correct positioning of the alignment tab.



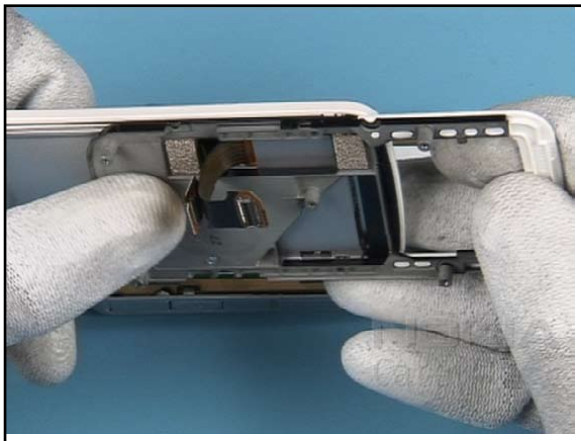
9. Slightly push it into its place.

10. Insert the SHIELD LID into the B-COVER.

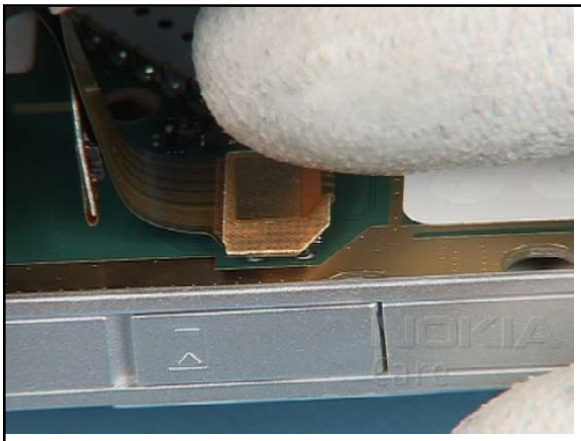


11. Note the correct positioning of the spring contacts as shown before continue.

12. Place the ENGINE MODULE.

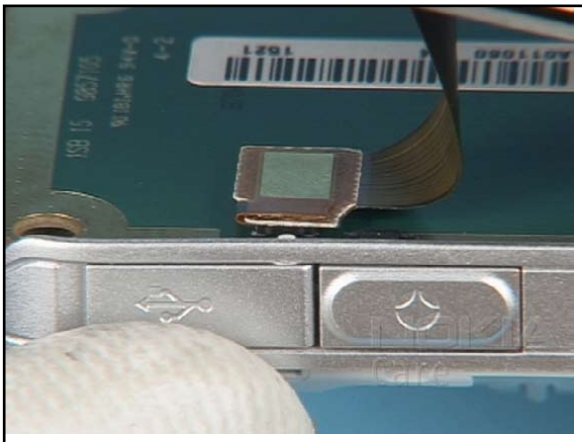


13. Slide the assembly into the open - position to gain the maximum flex foil lengths.



14. Now close the flex connector.

15. Carefully close the assembly and hold it into the middle position to gain the maximum flex foil lengths of the second connector.

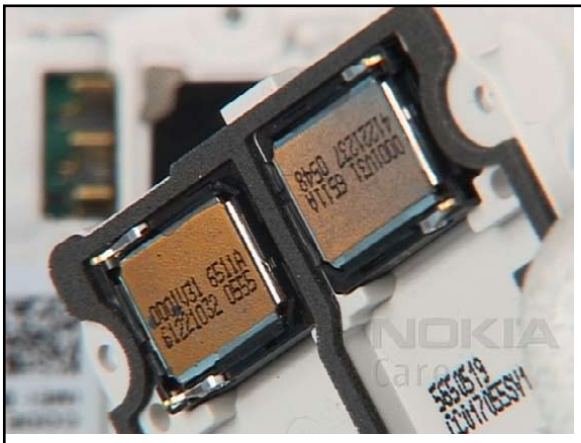


16. Close this connector, too.

17. Open the slider. Position the upper part over the lower part.

18. Mind this guides.

19. Check the correct position of the parts before continuing.

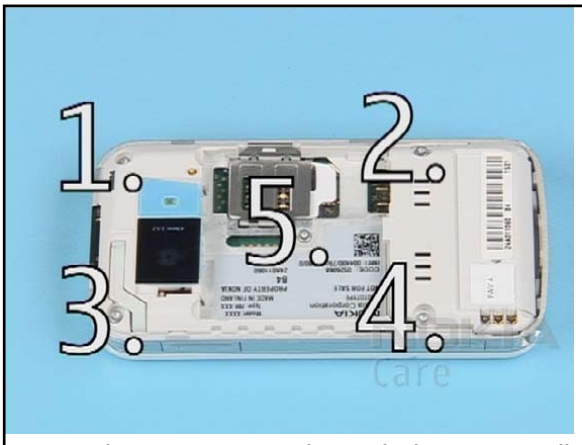


20. When replacing the IHF Speaker - always fit new gaskets and mind the correct positioning of the speakers.

21. Click the snaps of the MAIN ANTENNA COVER ASSEMBLY into their place. Check the correct position before going on.

22. Insert the screws.

23. Set the correct torque.



24. Note the correct screw order. Apply the torque to all screws.

25. Click the USB LID and MICRO SD DOOR into their places.

26. Place the BATTERY COVER.

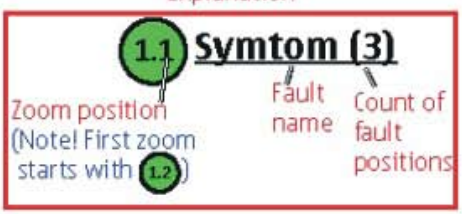
27. While inserting the KEYMAT - use the SS-93 only. Mind the components underneath.

17. LEGEND FOR QUICK TROUBLE SHOOTER

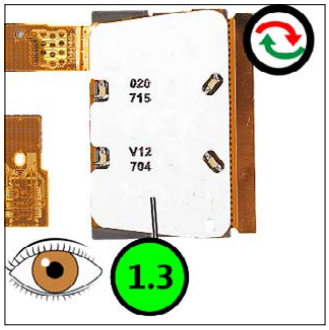
Legend for Quick Trouble Shooter

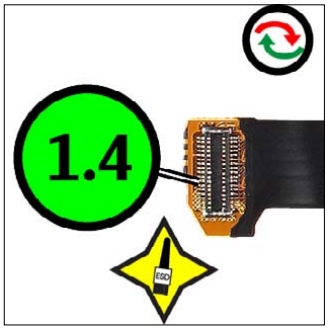
This legend is valid for all parts of the Quick Trouble Shooter

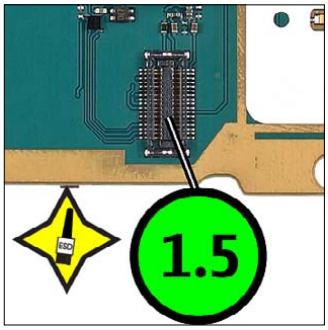
Follow the steps until the problem is solved. If this doesn´t help, you are not authorized to go forward.

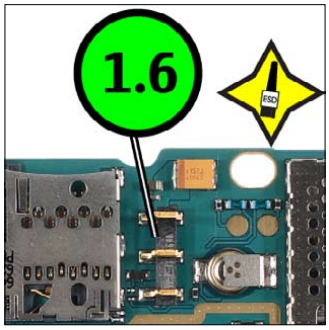
	Check the mechanical condition of the component (bent, broken or missing).
	Only marked components can be replaced. If additionally "**=CHANGE ASSY**" appears, then change the whole assembly (e.g. A4=D-COVER ASSEMBLY).
	**Cloth usage:** Check pads or contacts for optical and mechanical condition particularly regarding to corrosion. Clean it if necessary. 
	Measure component for electrical functionality and change, if needed. (Level 2 only) 
	**ESD Brush usage:** Check contacts for optical and mechanical condition particularly regarding to corrosion. Clean it if necessary. 
	Explanation 

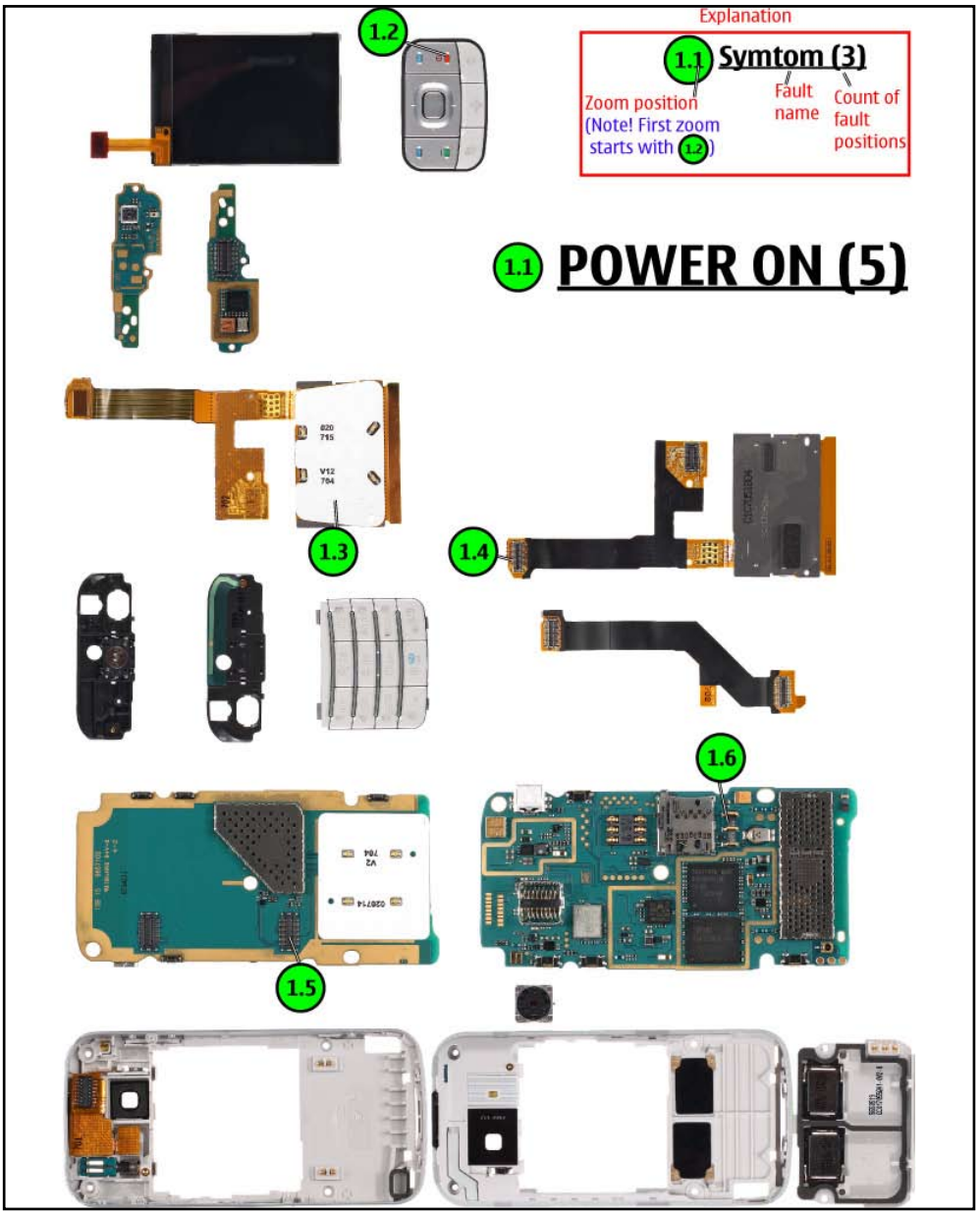
18. QUICK TROUBLE SHOOTER - POWER ON



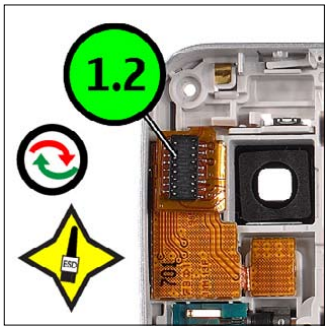


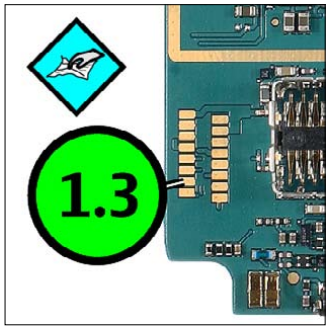


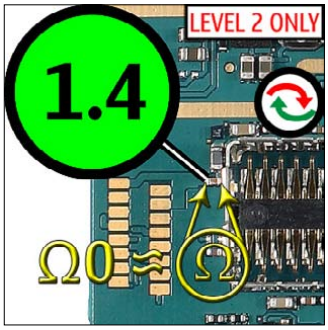


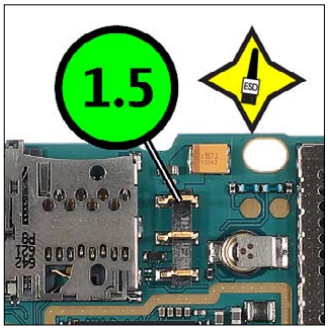


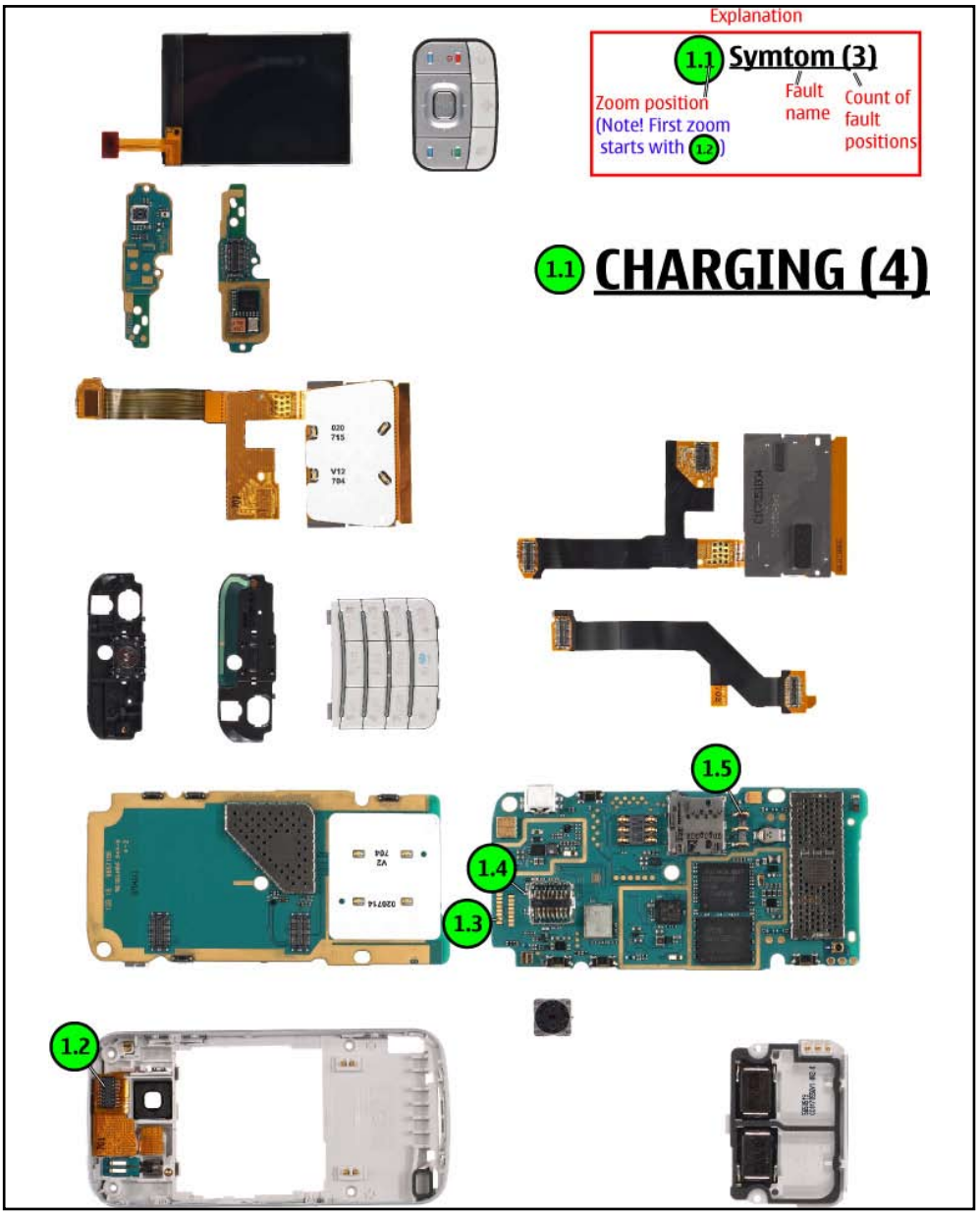
19. QUICK TROUBLE SHOOTER - CHARGING



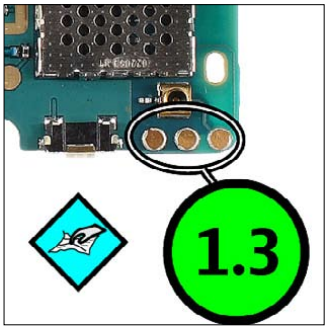


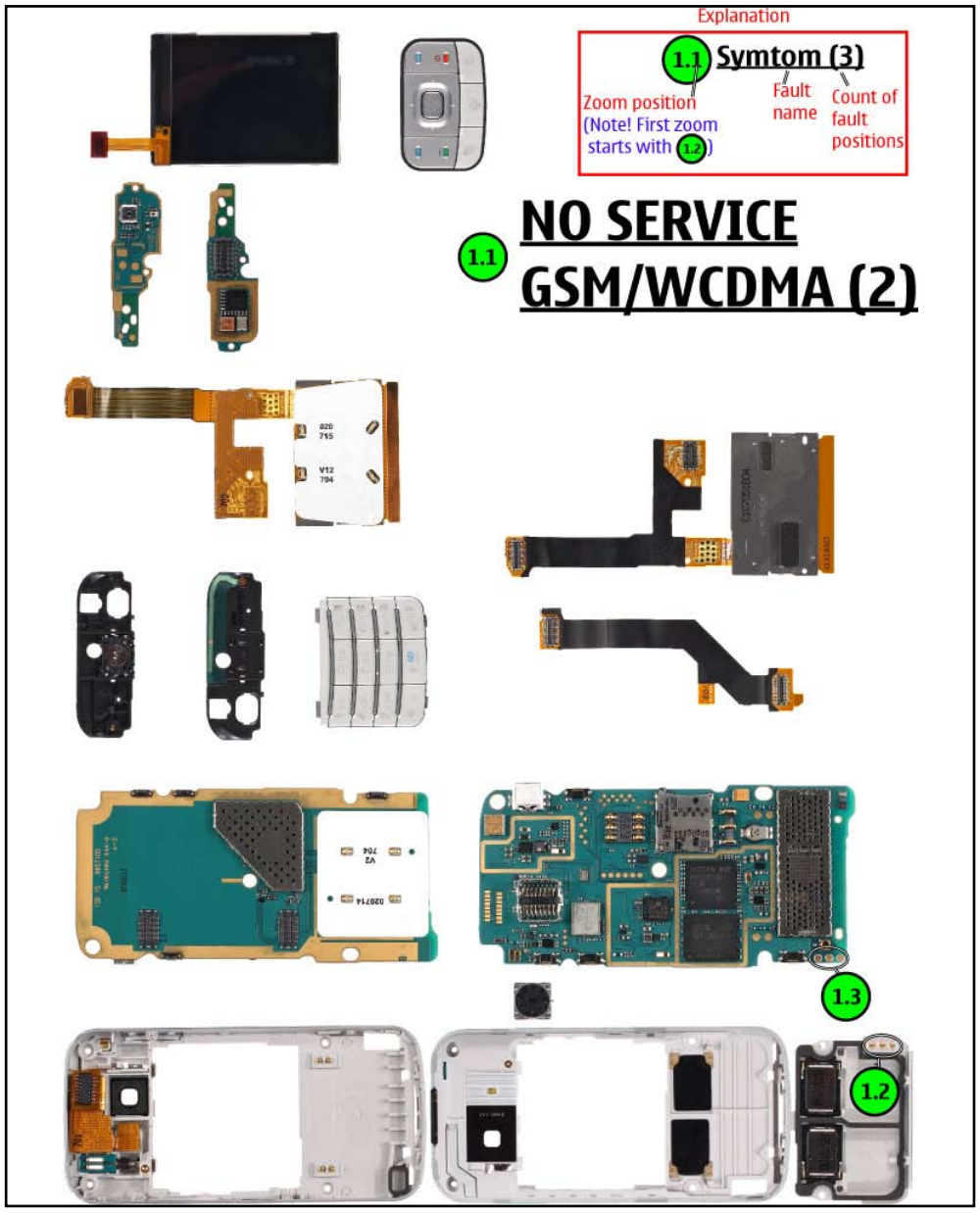




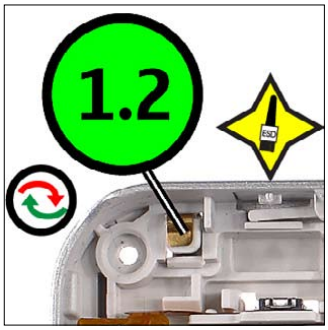


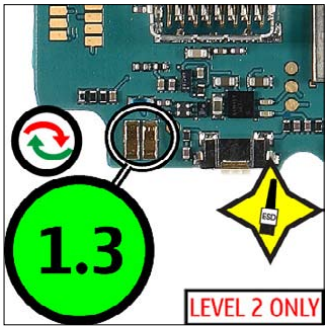
20. QUICK TROUBLE SHOOTER - NO SERVICE

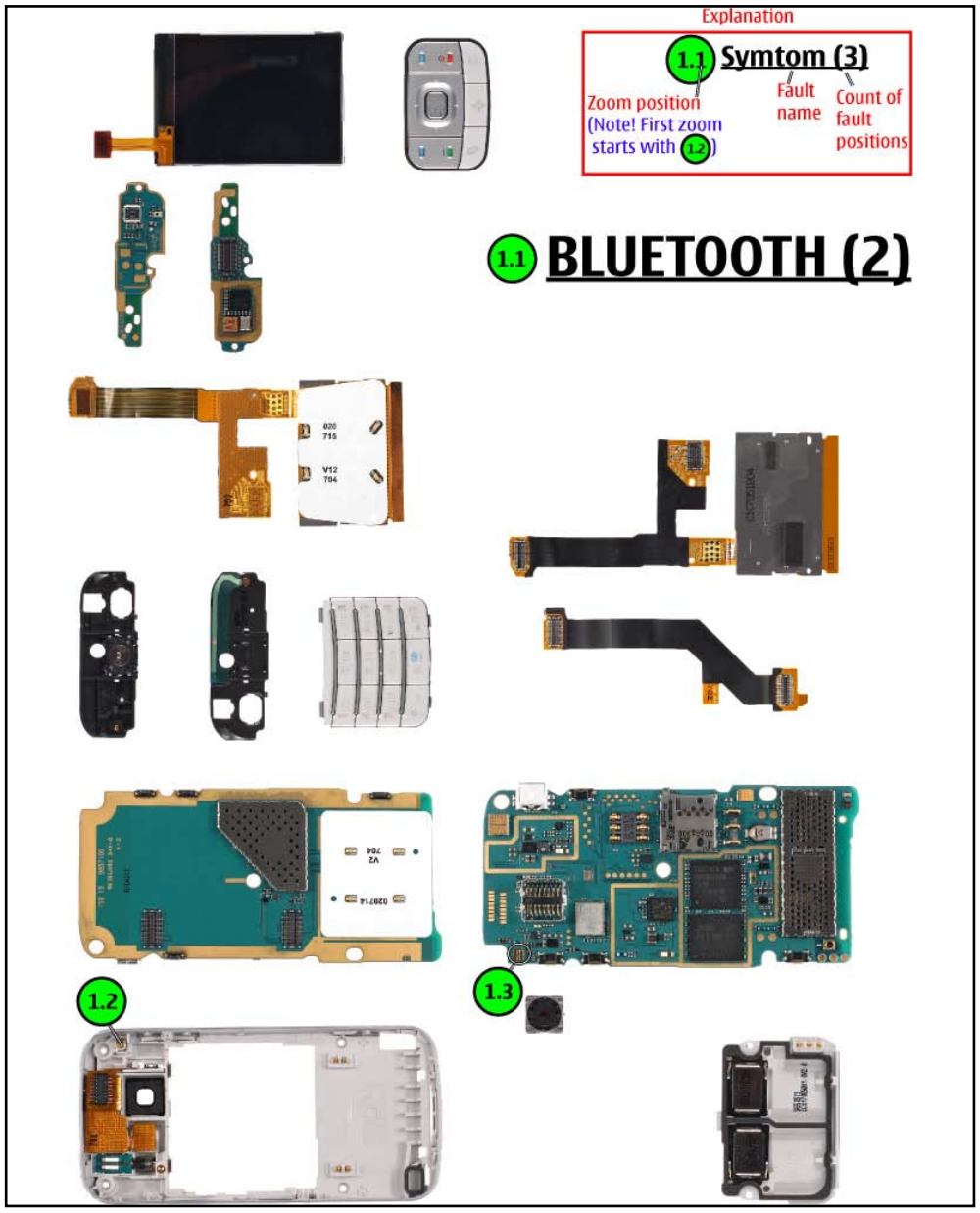




21. QUICK TROUBLE SHOOTER - BLUETOOTH







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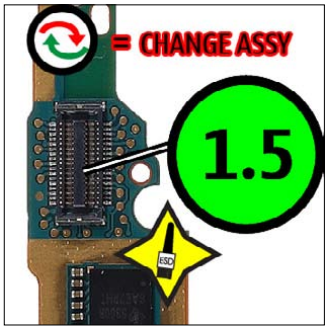
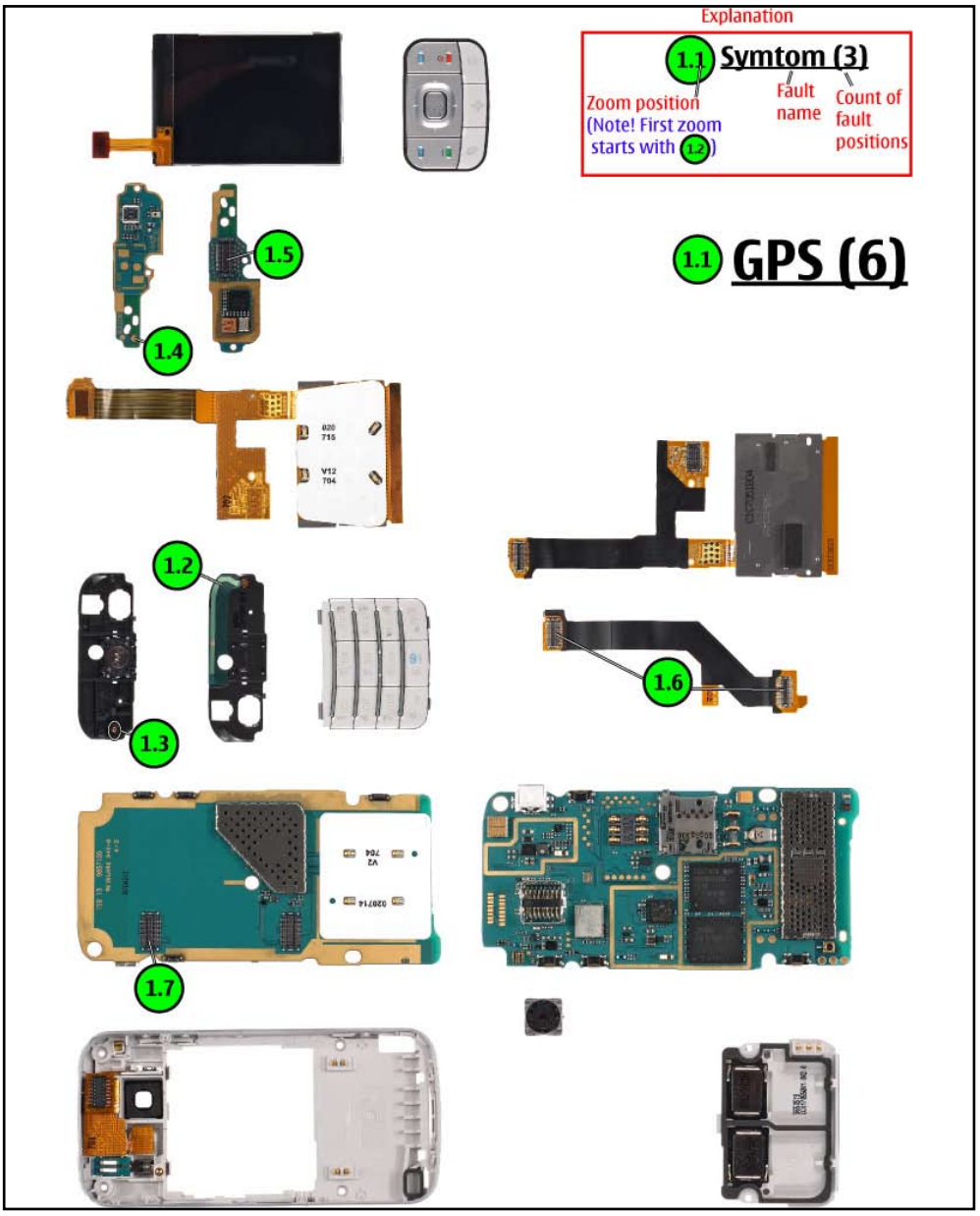
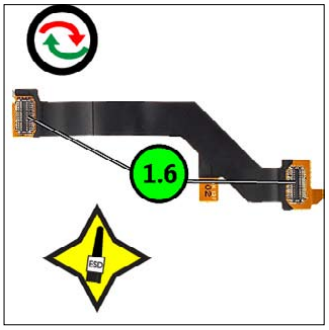
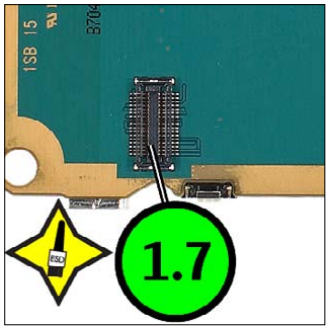
22. QUICK TROUBLE SHOOTER - GPS

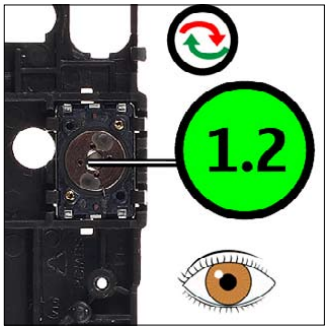


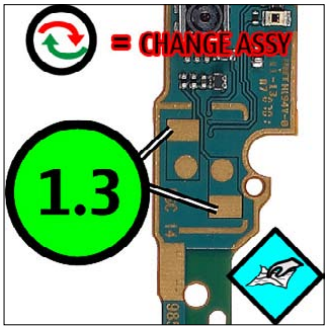


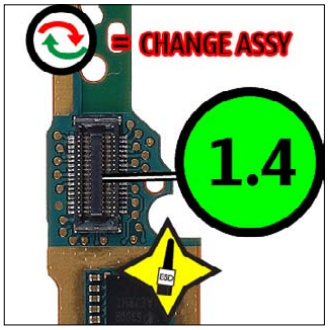


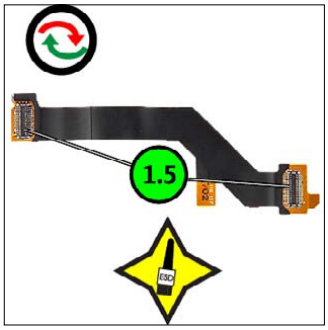


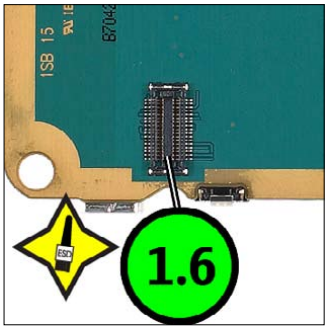
23. QUICK TROUBLE SHOOTER - EARPIECE

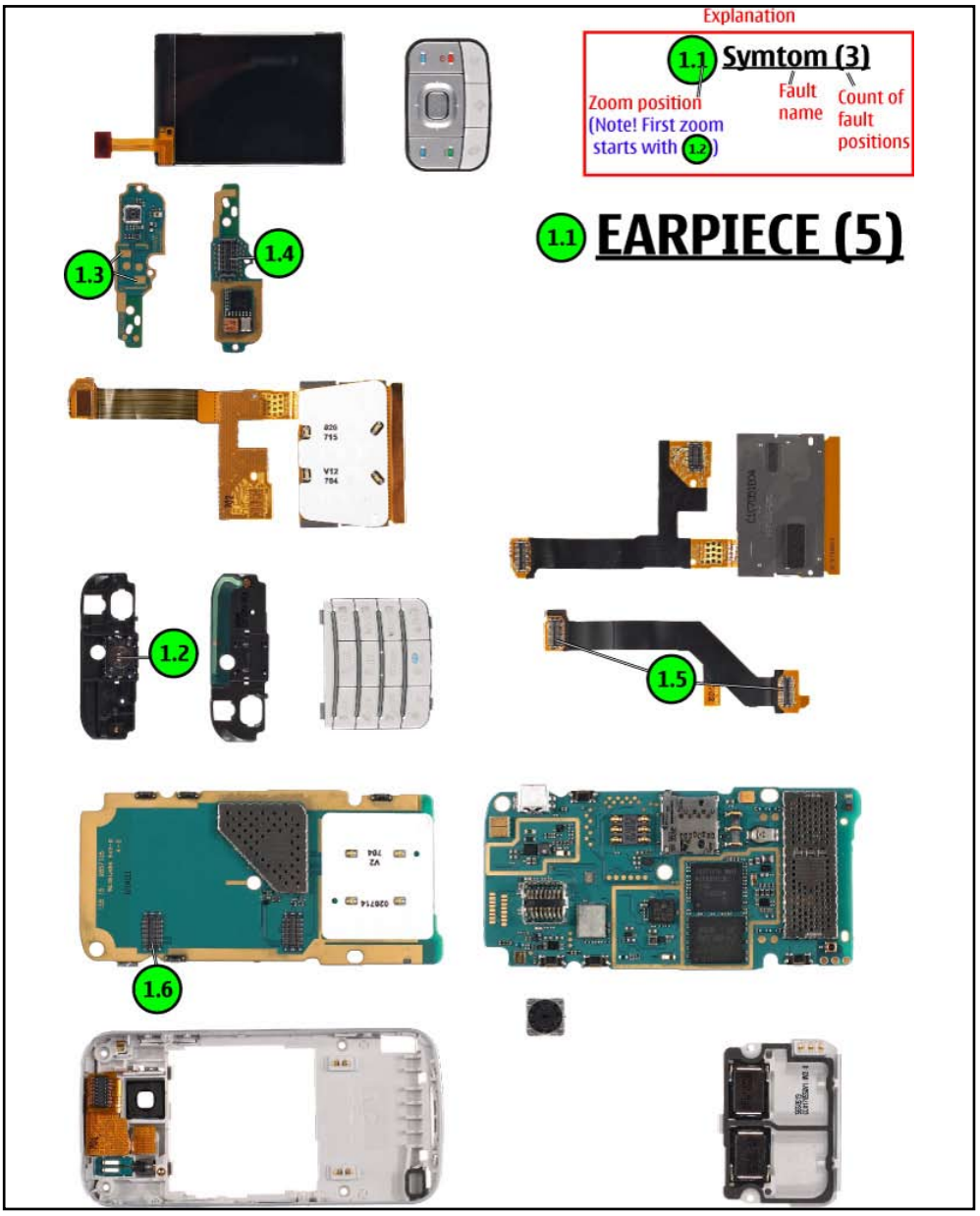




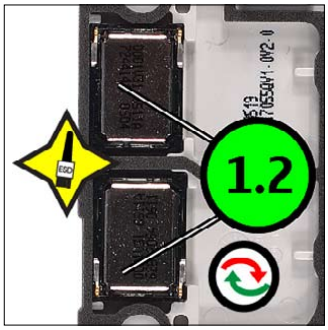


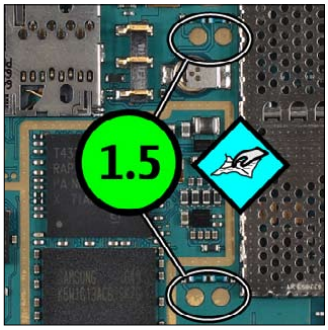


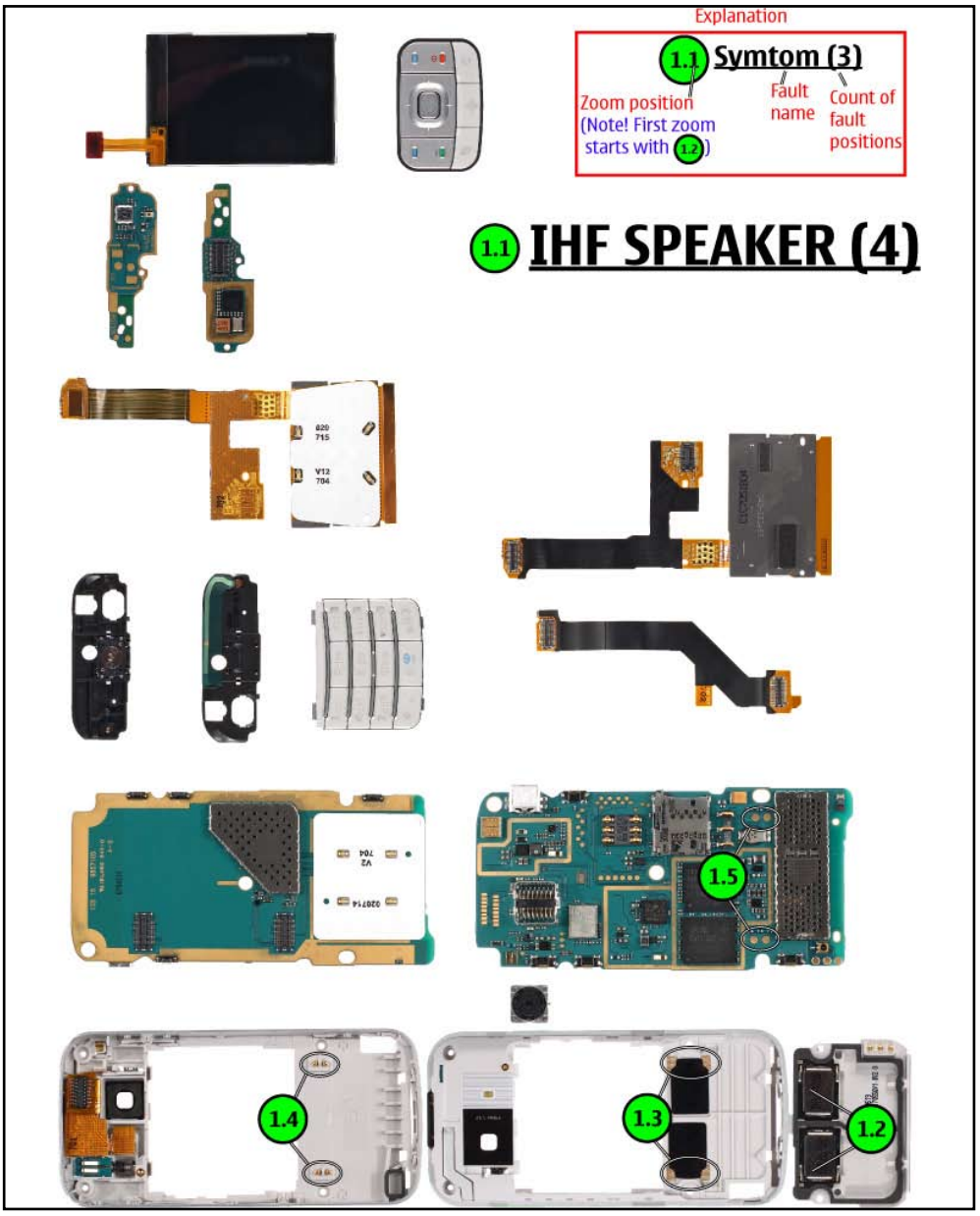




24. QUICK TROUBLE SHOOTER - IHF SPEAKER







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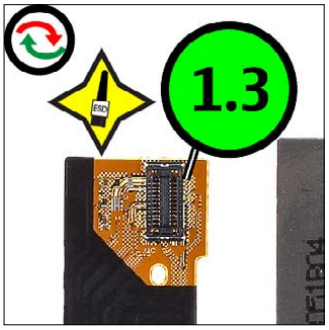
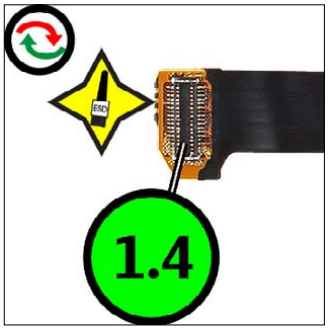
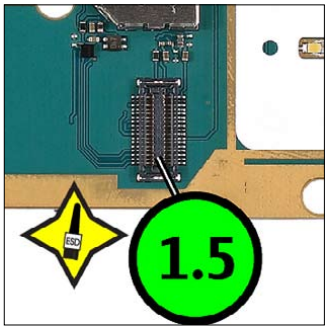
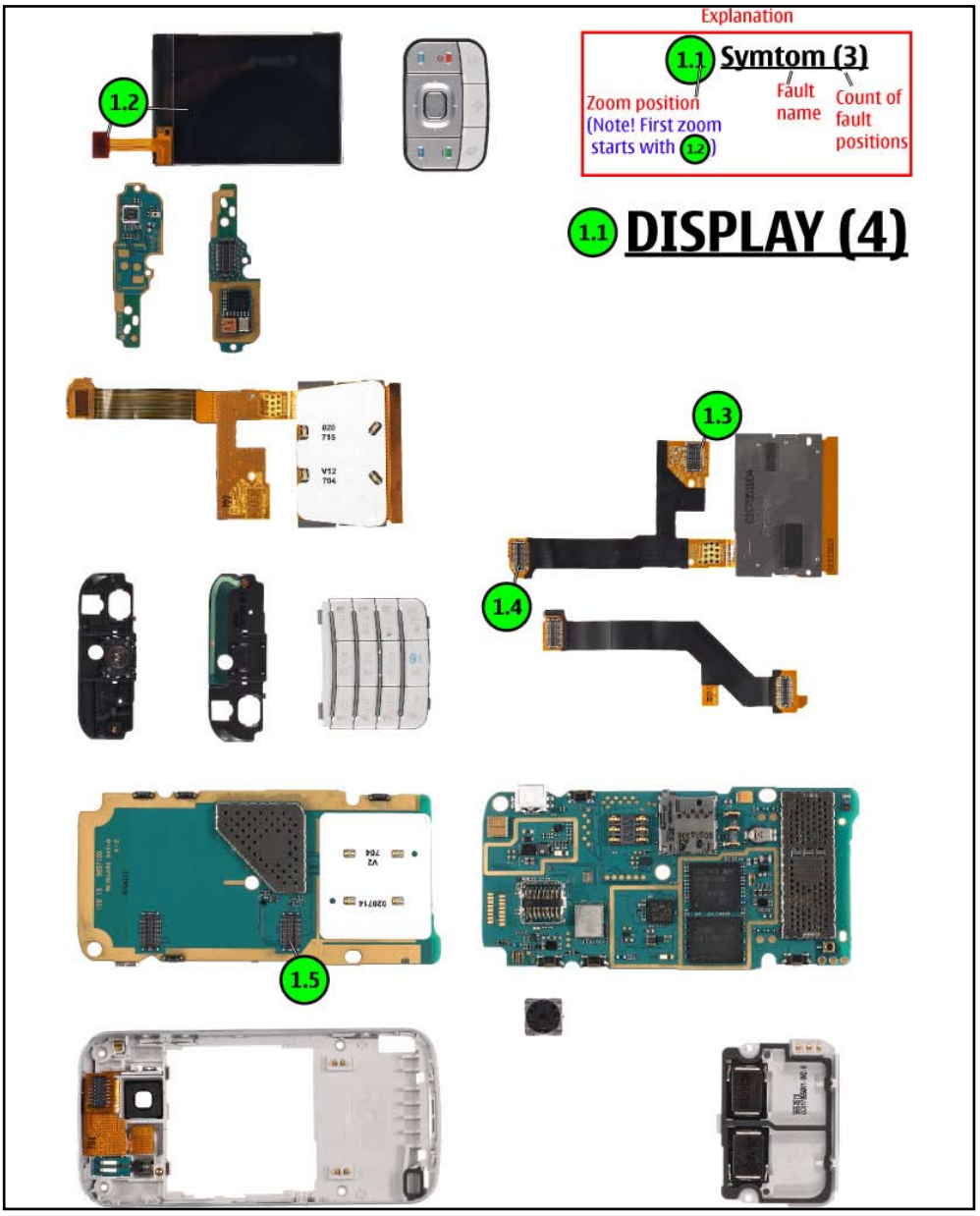
25. QUICK TROUBLE SHOOTER - DISPLAY

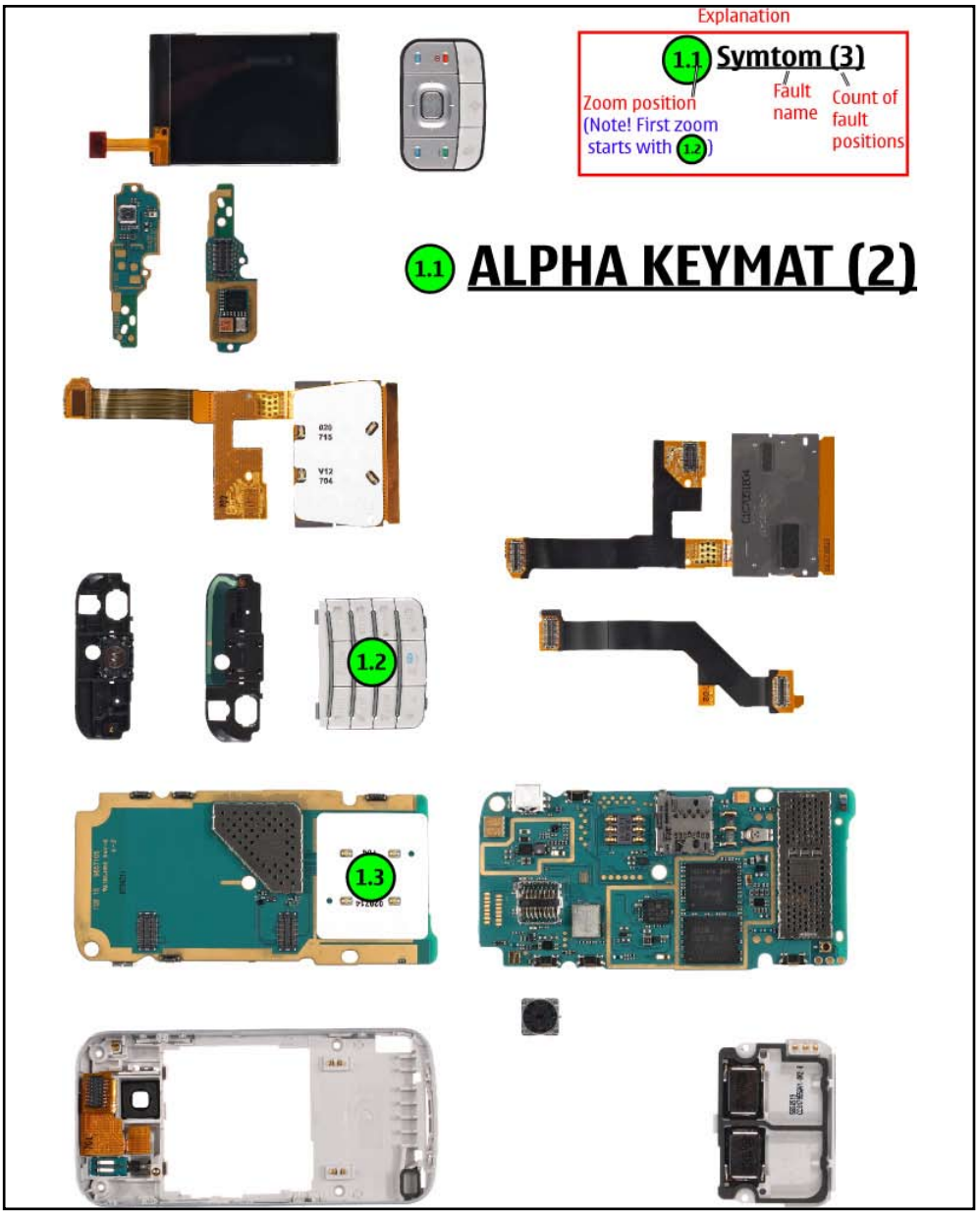




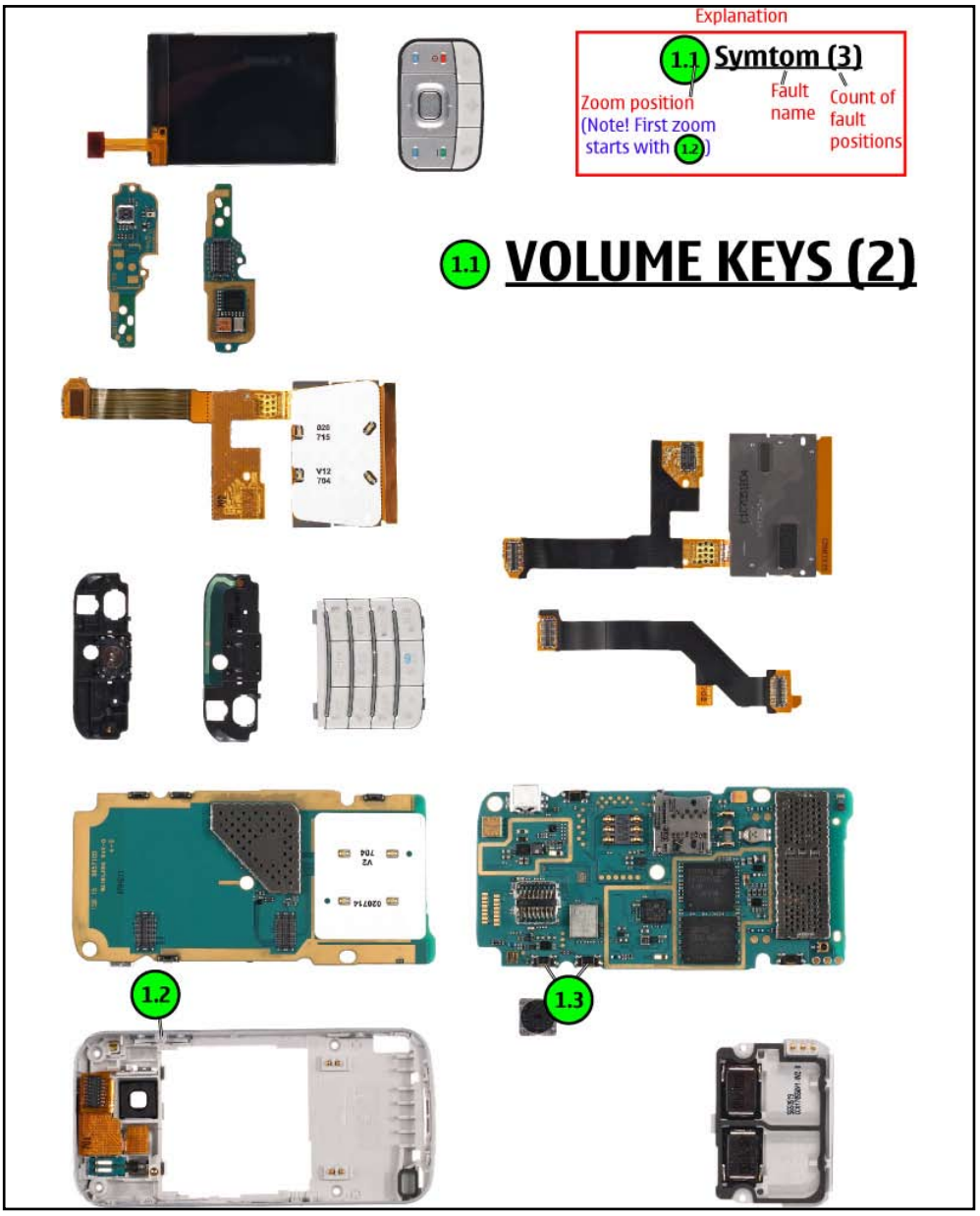




26. QUICK TROUBLE SHOOTER - ALPHA KEYMAT



27. QUICK TROUBLE SHOOTER - VOLUME KEYS



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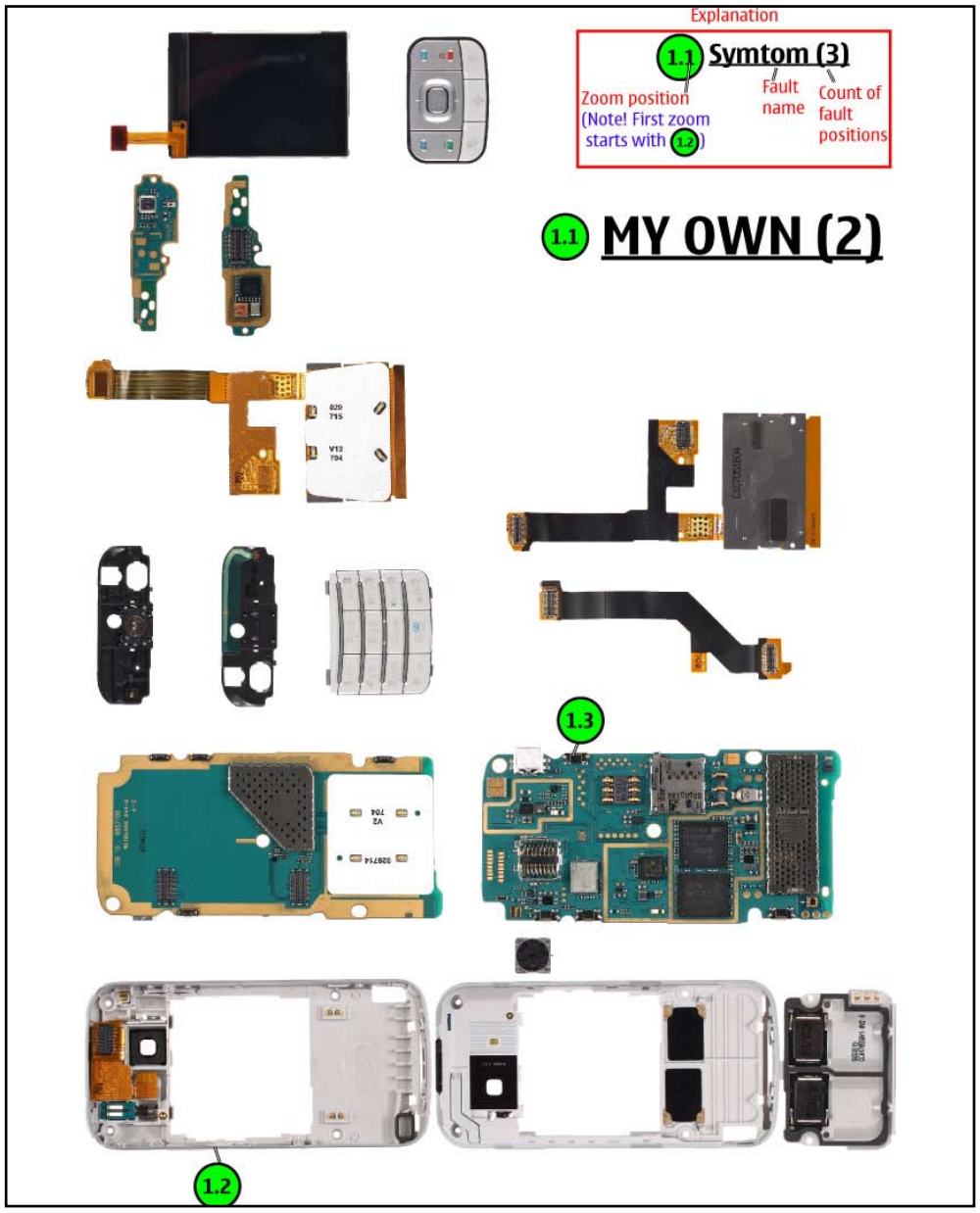
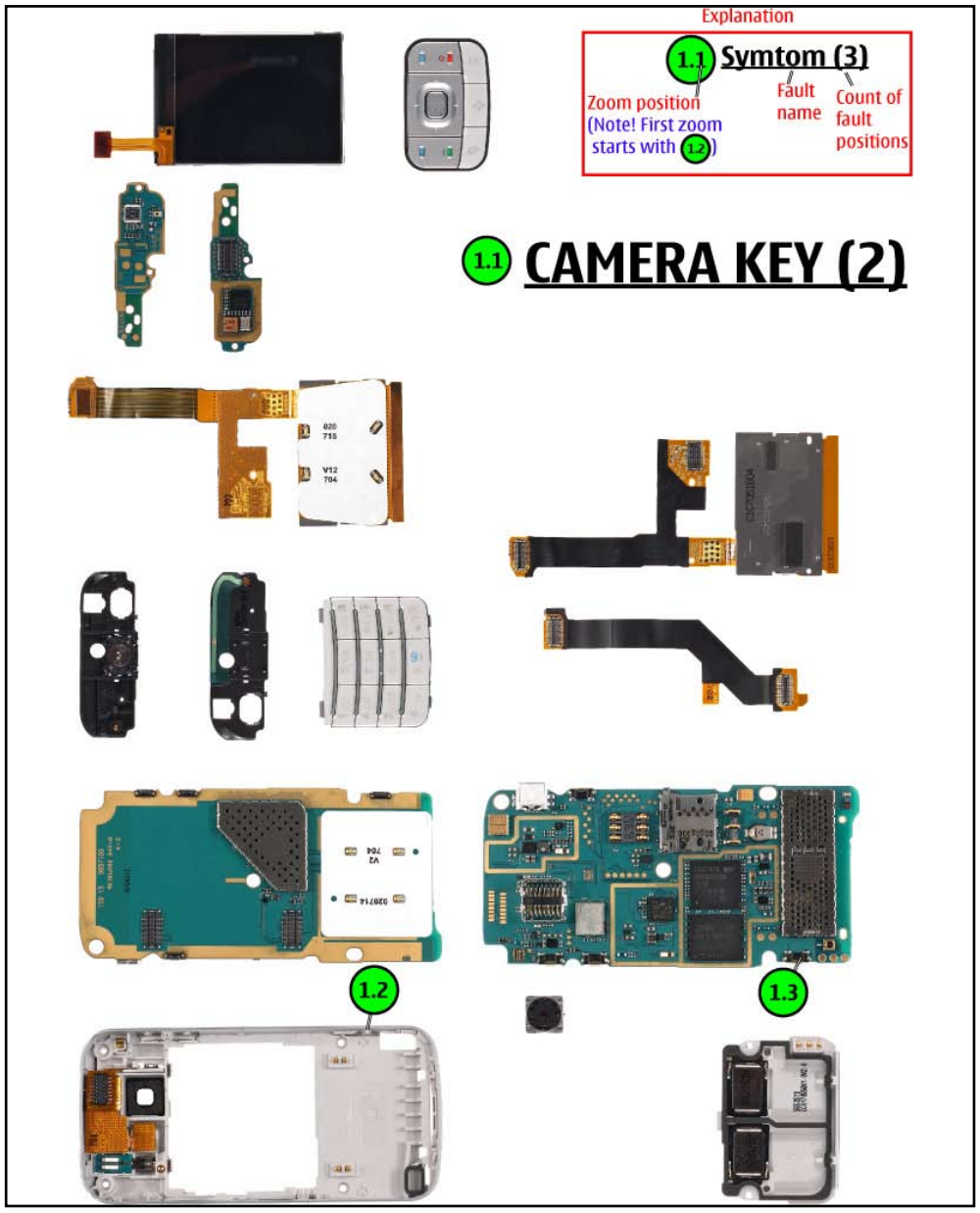
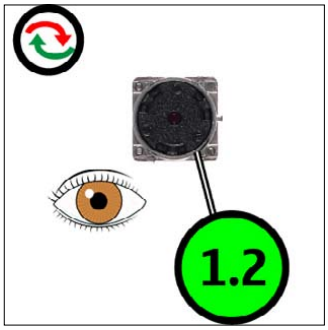
28. QUICK TROUBLE SHOOTER - MY OWN KEY

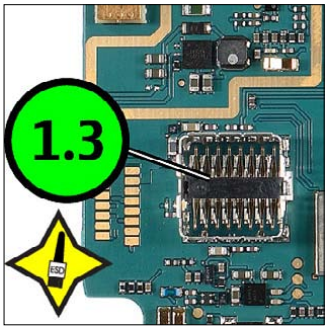


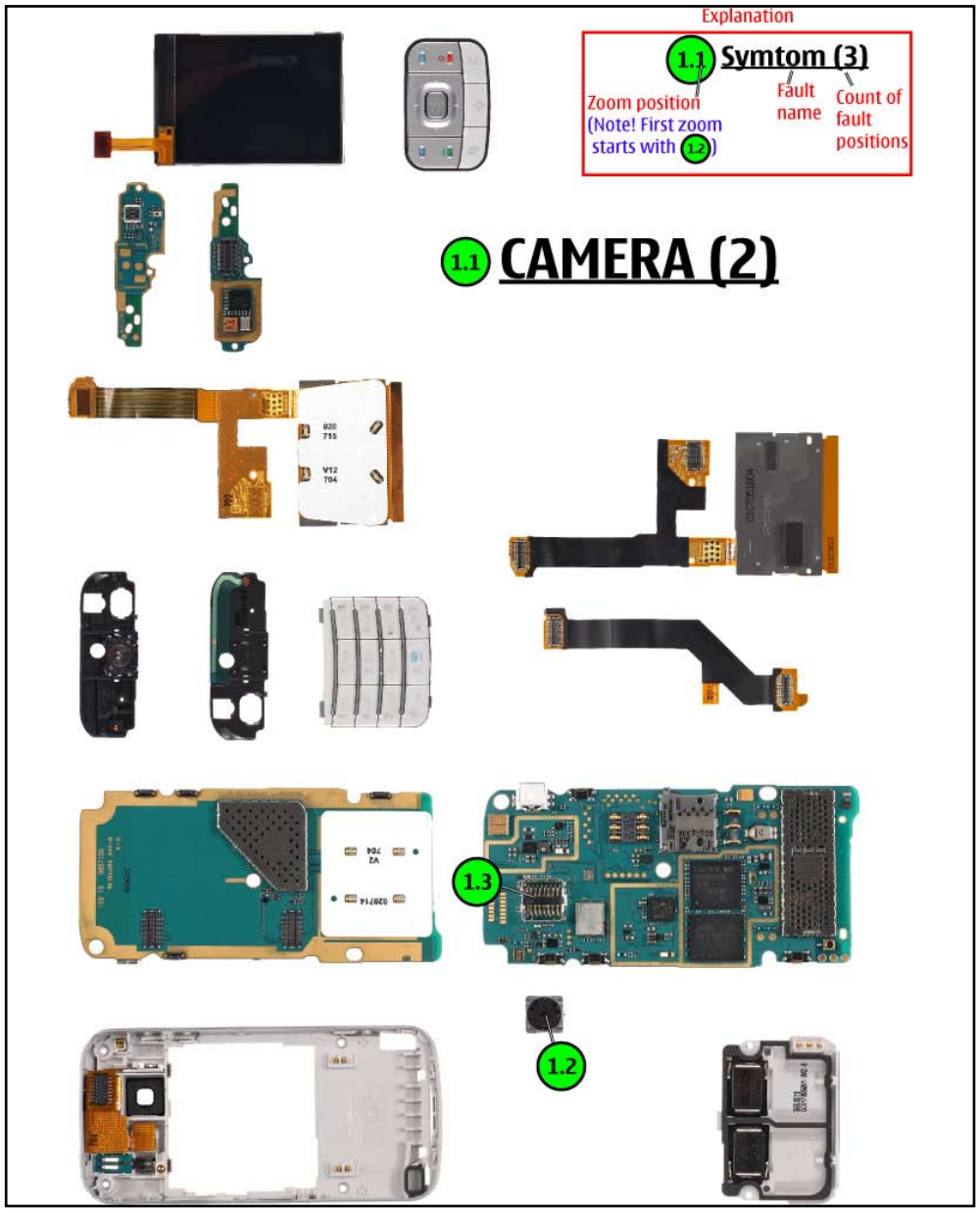
29. QUICK TROUBLE SHOOTER - CAMERA KEY



30. QUICK TROUBLE SHOOTER - CAMERA







31. QUICK TROUBLE SHOOTER - CIF CAMERA