Service Manual
AF51
Level 1-3

Release	Date	Department	Notes to change
R 1.0	29.12.2005	BenQ Mobile S CC CES	New document

Table of Content

1 Key Feature

Battery	Li-Ion 620 mAh
Stand – by Time	Up to 220 hrs (standard battery)
Talk Time	Up to 300 min (standard battery)
SIM Functionality / Security Controls	SIM lock Secure transactions Digital signatures Digital Rights Management: OMA standard
Data Services	SMS, SMS MT, SMS MO MMS rel. 4 GPRS class 8 WAP 1.2.1, WAP 2.0 content provisioning Java MIDP 1.0, CDLC 1.0 WML/XHTML dual stack
System Standards	Tri-band: 900/1800/1900 MHz (for EMEA, APAC and LAM) EGSM (GSM phase 2/phase 2+)
Antenna	Integrated
Length	79 mm
Width	41 mm
Weight	80g
Display	Main-Display: CSTN, 130 x 130 pixels, 65,536 colors Sub-display: CSTN, 96 x 64 pixels, 65,536 colors
Features	4-way navigation key and two soft keys Two color displays: 65,536 color internal glass display, 65,536 color external display SMS to group, predefined text blocks MMS supporting text, still images, voice and animations 32-chord polyphonic ring tones, MIDI, SP MIDI, WAV Speed dialing keys Programmable soft keys Incite Service Light Indication LED Calendar including day, week, and month PC-Synchronization with Mobile Phone Manager Personal information manager GPRS modem assistant J2ME (Java) based games and applications Handsfree talking Silent alert (Vibra) Games, Speaker-dependent voice dialing File manager: Flash File System and Explorer Calculator, Currency converter Birthday reminder Start-up assistant for clock set Car Kit Portable as accessory

2   AF51 Interface to Accessories

Nano I/O connector is for G85 generation. The compatible interface is suitable to use the travel charger.
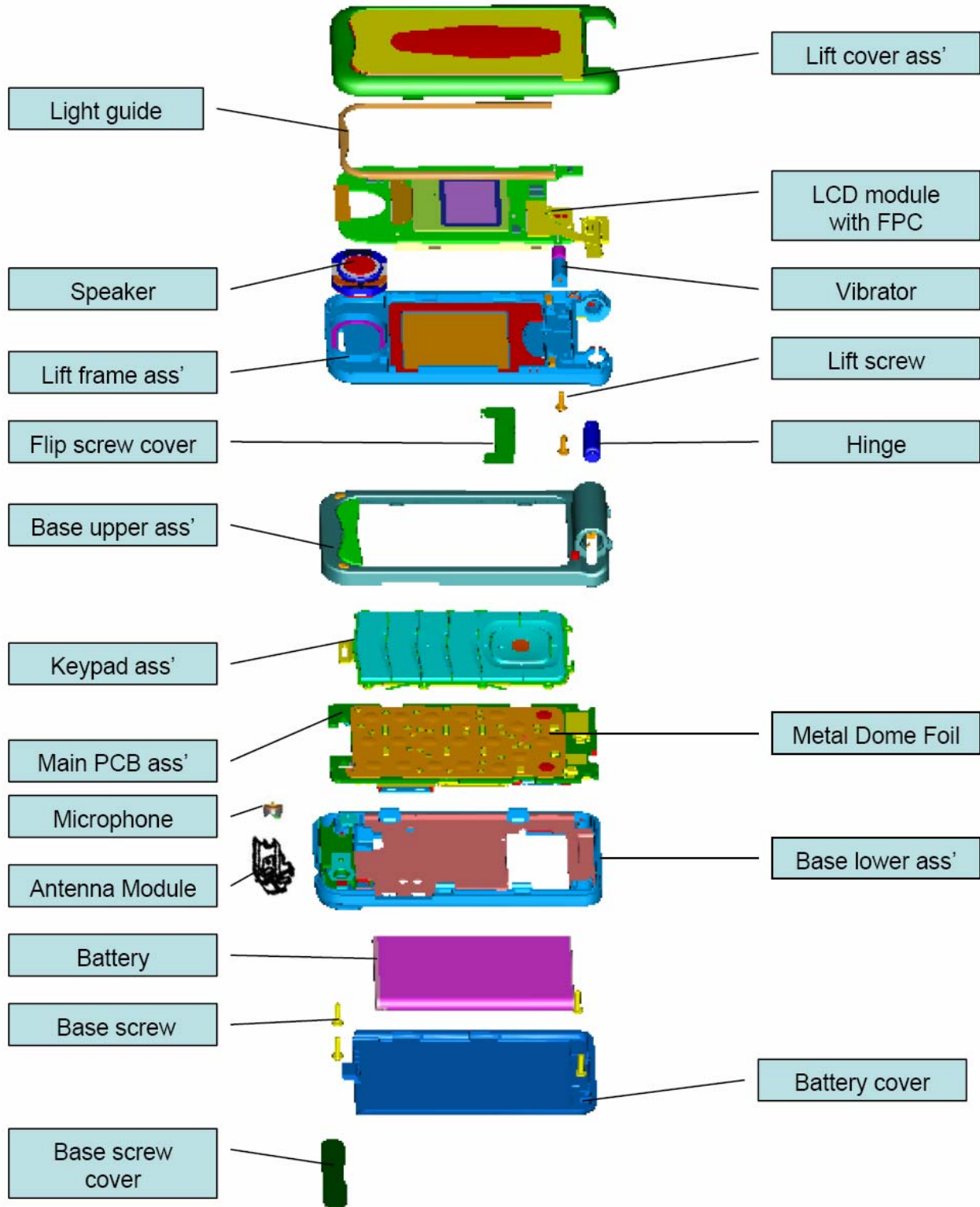
3   Unit Description of AF51

Demonstrate modern styling with the timelessly elegant "pocket size" clamshell design with integrated antenna and a valuable look.

The highly scratch-resistant internal glass display surface preserves the visibility of the colors displayed and ensures a long-lasting, enjoyable user experience.

Ergonomic keypad and two color displays for convenient, easy handling. The integrated organizer supports the simplification of daily life. The Incite Service Light Indication LED informs the user at a glance about missed calls and incoming SMS, etc., under any light conditions.

4 Exploded View of AF51

Light guide	Lift cover ass'
Speaker	LCD module with FPC
Lift frame ass'	Vibrator
Flip screw cover	Lift screw
Base upper ass'	Hinge
Keypad ass'	
Main PCB ass'	Metal Dome Foil
Microphone	
Antenna Module	Base lower ass'
Battery	
Base screw	Battery cover
Base screw cover	

5   Disassembly of AF51

All repairs as well as disassembling and assembling have to be carried out in an ESD protected environment and with ESD protected equipment/tools. For all activities the international ESD regulations have to be considered.

For more details please check information in c – market

https://market.benqmobile.com/SO/welcome.lookup.asp

There you can find the document "ESD Guideline".

Step 1	
	Remove Battery Cover and Battery.

Step 2	Remove Screw cover with the alternative opening tool
Step 3	Remove screws with the Torque – Screwdriver T5+
Step 4	Remove rear cover with the Alternative Opening Tool carefully.

Step 5	
Step 6	
	Remove PCB cover plate by using the alternative opening tool.
Step 7	
	Remove antenna by using the alternative opening tool.

Step 8	
	Remove microphone by using tweezers carefully.
Step 9	
	Disconnect the Flex Cable from PCB by using Tweezers.
Step 10	
	Assemble PCB by using the tweezers carefully.
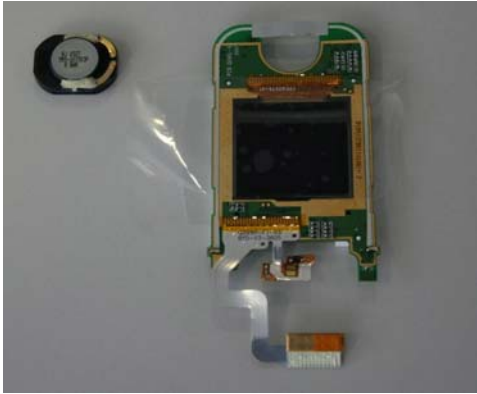
Step 11	
Step 12	Remove Keypad by using Tweezers.

Step 13	Remove screw cover by using the alternative opening tool carefully.
Step 14	Remove screws with the Torque – Screwdriver T5+
Step 15	Remove Front Cover with the Alternative Opening Tool.

Step 16	
Step 17	
	To avoid scratches it is mandatory to place a protection foil onto the Display!!!
Step 18	
	Remove Display spacer.

Step 19	
	Remove Vibramotor by using tweezers.
Step 20	
	Remove Vibra contact Flex foil by using tweezers carefully
Step 21	
	Remove PCB by using the alternative opening tool. Separate Earphone from front cover carefully.

Step 22	
	Remove Upper Case from Lower Case by pushing the Hinge-spring, now you can separate the Upper Base Frame from the Lift Frame. **Take care of the Flex Cable!!!**
Step 23	
	Remove PCB from Lower base frame. **Take care of the Flex Cable!!!**
Step 24	

Step 25	To avoid scratches it is mandatory to place a protection foil onto the Display!!!
Step 26	Disconnect the loudspeaker from PCB with Tweezers.
Step 27	

Step 28 	Remove Hinge - Spring by pushing it through the Hinge.
Step 29 	

Overview Upper Parts	Overview Lower Parts
Display Module, Main PCB, Front Cover, Upper Base Frame, Screw Cover, Screw Cover, loudspeaker, Screws, Spacer Display, Vibramotor	Battery Cover, Keypad, Rear Cover, Microphone, Antenna, Hinge, Battery, PCB cover plate, Lower Base Frame
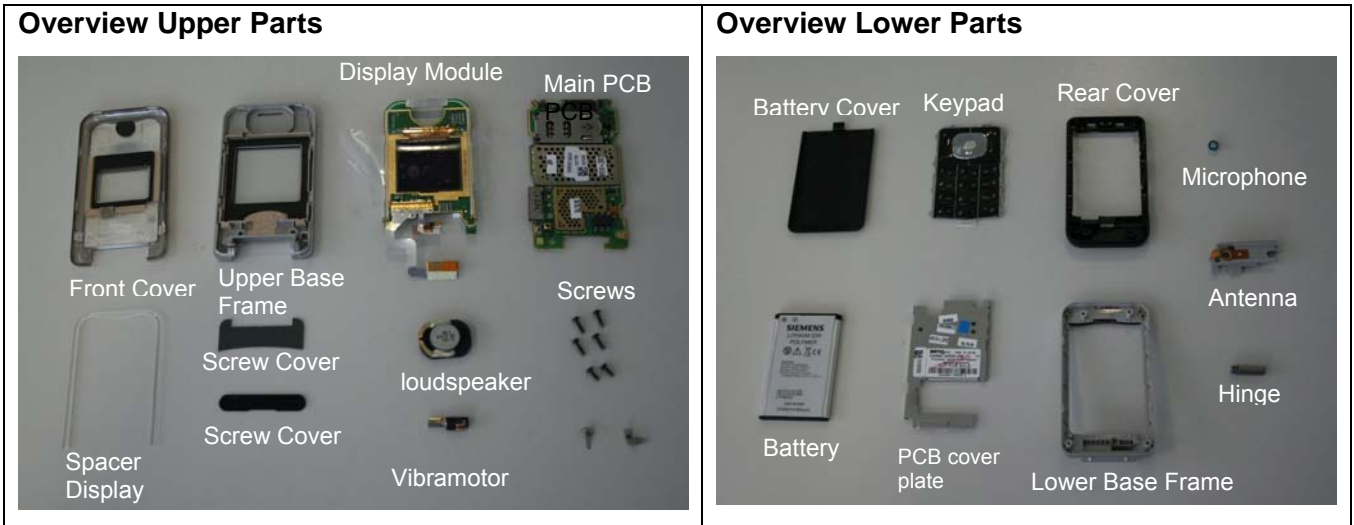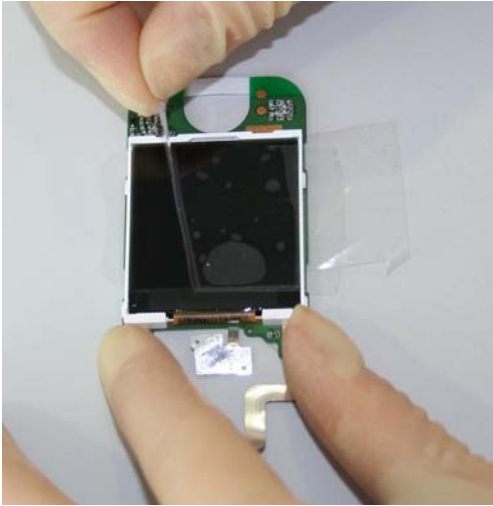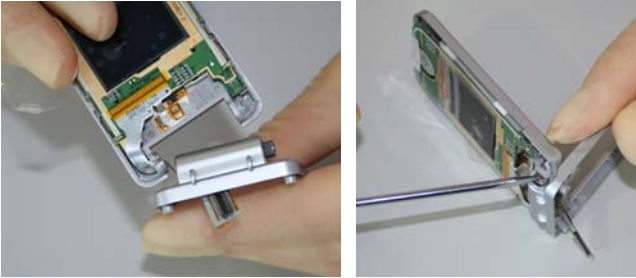
6   Assembly of AF51

Step 1	
	Push the Hinge inside the Frame.

Step 2	
	Assemble mircrophone by using tweezers.

Step 3	
	Attention! Before assembling the Display Module it is mandatory to remove the Display Foil!

Step 4	
	Assemble Display Spacer.

Step 5	
	Fix the assembled Display Module into the Lift Cover.

Step 6 	???
Step 7 	
Step 8 	

Step 9	
	To assemble the Display, you have to push the Flex Cable through the slot of the Lift Cover.

Step 10	
	Use the Hinge – Tool to push the Hinge spring inside to assemble the Upper Case with Upper Base Case.

Step 11	

Step 12	
	Assemble Vibramotor by using tweezers.
Step 13	
	Attention! Before assembling the Display Module it is mandatory to remove the Display Foil!
Step 14	
	Assemble front cover.

Step 15	
	Fix screws with the Torque – Screwdriver T5+
Step 16	
	Assemble screw cover.

Step 17	
	Assemble the Keypad by using Tweezers.
Step 18	
	Assemble PCB.
Step 19	
	Connect the Flex Cable with the assembled PCB.

Step 20	
	Assemble microphone by using tweezers.
Step 21	
	Assemble antenna module by using tweezers.
Step 22	
	Assemble PCB cover plate.

Step 23	
	Assemble rear cover.
Step 24	
	Place screws with the Torque – Screwdriver.
Step 25	
	Assemble Screw cover.

Step 26	
	Assemble Battery.

Step 27	
	Assemble Battery Cover.

Step 28	

7   BenQ Service Equipment User Manual

Introduction

Every LSO repairing BenQ handset must ensure that the quality standards are observed. BenQ has developed an automatic testing system that will perform all necessary measurements. This testing system is known as:

BenQ Mobile Service Equipment

- **For disassembling / assembling**

	Torque – Screwdriver **Part Number: F 30032 – P 228 – A1**
	Opening tool **(Case opening without destroying)** **Part Number: F 30032 – P 38 – A1**
	Alternative Opening tool **Part Number: F30032 – P583 – A1**
	Tweezers

- **For testing**

All mobile phones have to be tested with the GRT – Software. The service partner is responsible to ensure that all required hardware is available.

For additional Software and Hardware options as well as the supported GRT equipment, please check the GRT User manual.

8 GRT Software: Functionality Configuration

Sep 1: Select „Settings >> SWUP / JPICS"
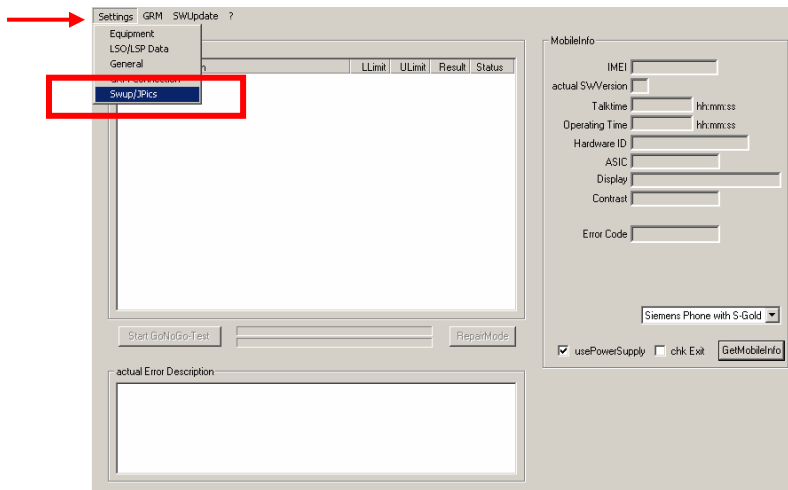
Step 2: Proceed as follows:

➢ Select all required Variants you need to repair (click onto the "+" in front of the product name.
➢ Check Com-Port setting. If necessary change it
➢ Check speed setting. Select always the lowest speed if your PC does not have a fast serial card
➢ Enter the value for "JPICS Server Timeout". Be careful, this value defines how long GRT tries to reach the server until you get an error message. Do not select a very long time
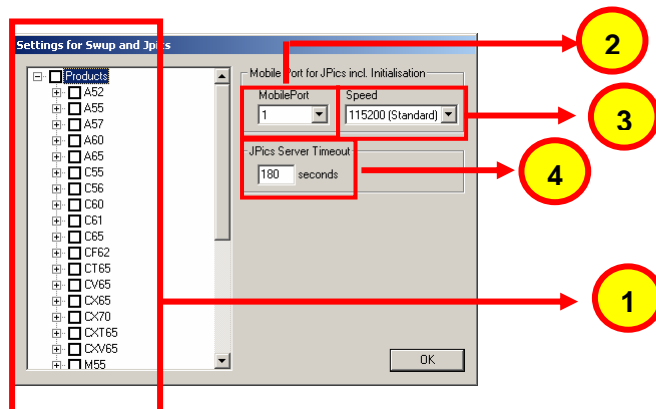
Step 3: Connect to GRM Server

- Choose in the section „GRM" the „Connect to GRM Database" functionality
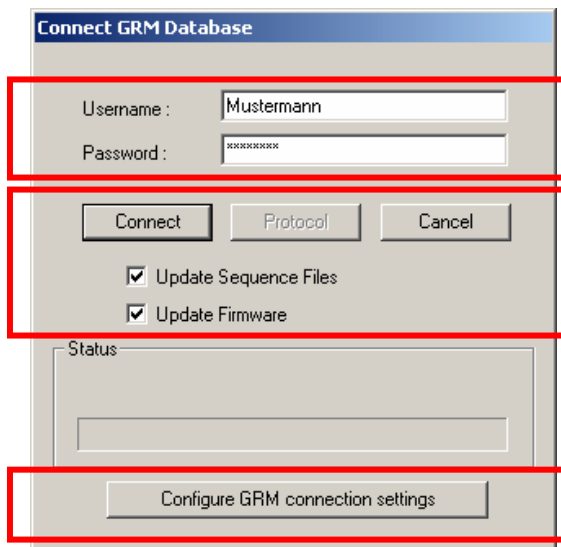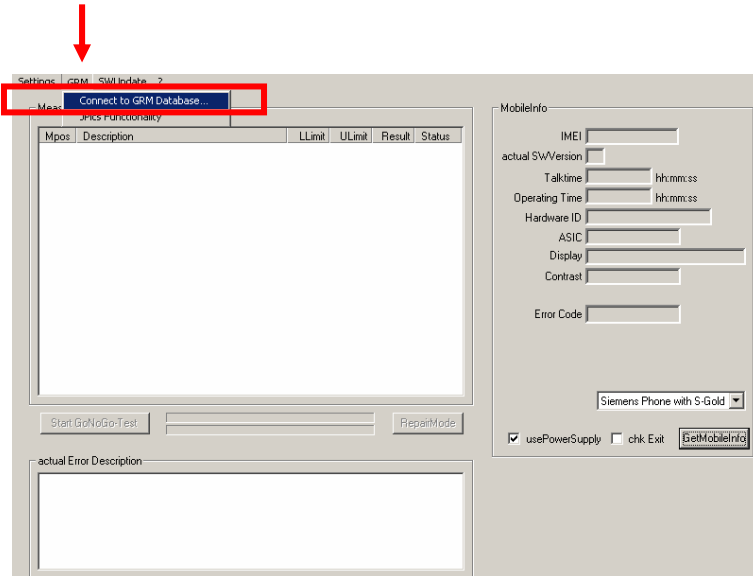
1	Enter your GRT-Username and Password into this fields
2	Activate always both boxes if you connect to the database. Start with "Connect"
3	It you IT infrastructure parameter have changed, use this button to move to the configuration mask

- End the connection with a click onto the „Exit button"
  (appearing after successful data exchange)

GRT Software has now finished all required settings and configuration tasks. All files have been down- and uploaded.
In dependency of the selected number of mobile phones and variants the volume

9 GRT Software: Regular Usage

Step 1: Select the section SWUpdate
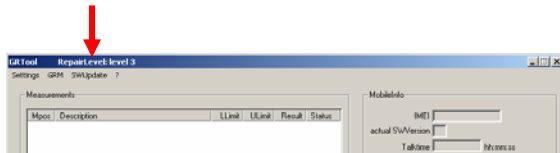
Step 2: Choose the area you want to work with
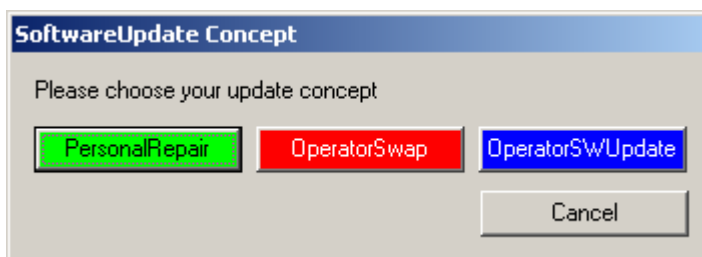
- **Personal Repair**
  Personal Repair is always accessible. Basis for the decision if a SW-Update is authorised by Siemens is the so called Service Release-Table .

  Example: Mobile Phone has already SW50. Service -Release-Table shows SW50

  In this case SW-Update is not necessary and therefore not authorised

  In any case customer data can be erased on request. (xfs and mapping have to be activated) Of course **JPICS** hardware and authorisation have to be available.

- **Operator SWAP**
  This area is only accessible if you are released by the service management to perform SW-Updates for Net-Operators. Basis for the decision if a SW-Update is authorised by Siemens is the so called Master-Table .

  Customer data will be erased without any exception and any chance to influence by the user. **JPICS** hardware and authorisation have to be available.

- **Operator SWUpdate**
  This area is only accessible if you are released by the service management to perform SW-Updates for Net-Operators. Basis for the decision if a SW-Update is authorised by Siemens is the so called Master-Table .

  Like in "Personal Repair" customer data can be erased on request. (xfs and mapping have to be activated) Of course **JPICS** hardware and authorisation have to be available.

9.1 Window explanation

This general explanation is valid for all SW-Update channels
(**Personal Repair**, **Operator SWAP**, **Operator SWUpdate**)

After using „Check Variant" Phone IMEI-
Number will be shown here

Window to select the mobile
phone CPU

Shows the different SW –Versions
a) SW inside the mobile phone
b) Version of Service Release Table
SW
c) Version of Master Table SW

Start button for SW-
Update

Stop / leave SW-Update

1.1.1.1.1.1.4   **Automatic read
out function of phone
type/Variant. Appearing in the
window above.**

Select boxes for:
Content = xfs
Settings = mapping
Attention:
Activation of the boxes
will cause erase of
customer date while SW-
Update

Remarks:

In case of malfunction please check

- o Is the correct phone type selected
- o Is the correct COM-Port selected
- o If a variant is missing, move back to Settings select the missing variant and
  conncet the GRM Server. Then continue with SW-Update.

Case 1: Personal Repair (green)

Step 1: Carry out step 1 – 4 to start SW-Update.

Remarks:

- The decision about a Siemens authorised SW-Update depends only on the Service Release-Table .
- The SW which is booted by GRT can be below the SW mentioned in the Service Release Table, if this SW is not released for the Net-Operator
- If **xfs** and **mapping** are activated, GRT will erase in any case the customer data even if the action is cancelled.
- If the user wants to download an other variant then the automatically identified one, he has simply to select an other variant from the list. Afterwards he has to start the SW-Update

BenQ *mobile*

9.3 Case 2: Operator SWAP (red)

Step 1: Carry out step 1 – 4 to start SW-Update.

Remarks:

- The decision about a Siemens authorised SW-Update depends only on the Master-Table .
- The user has no chance to influence the decision
- **Xfs** and **mapping** are always activated there is no chance to deactivate them. GRT will erase in any case the customer data even if the action is cancelled.
- If the user wants to download an other variant then the automatically identified one, he has simply to select an other variant from the list. Afterwards he has to start the SW-Update

9.4   Case 3 Operator SWUPdate (blue)

Step 1: Carry out step 1 – 4 to start SW-Update.

Remarks:

- The decision about a Siemens authorised SW-Update depends only on the Master-Table .
- The user has no chance to influence the decision
- **Xfs** and **mapping** can be activated on demand. GRT will erase in any case the customer data even if the action is cancelled.
- If the user wants to download an other variant then the automatically identified one, he has simply to select an other variant from the list. Afterwards he has to start the SW-Update

10   JPICS (Java based Product Information Controlling System)
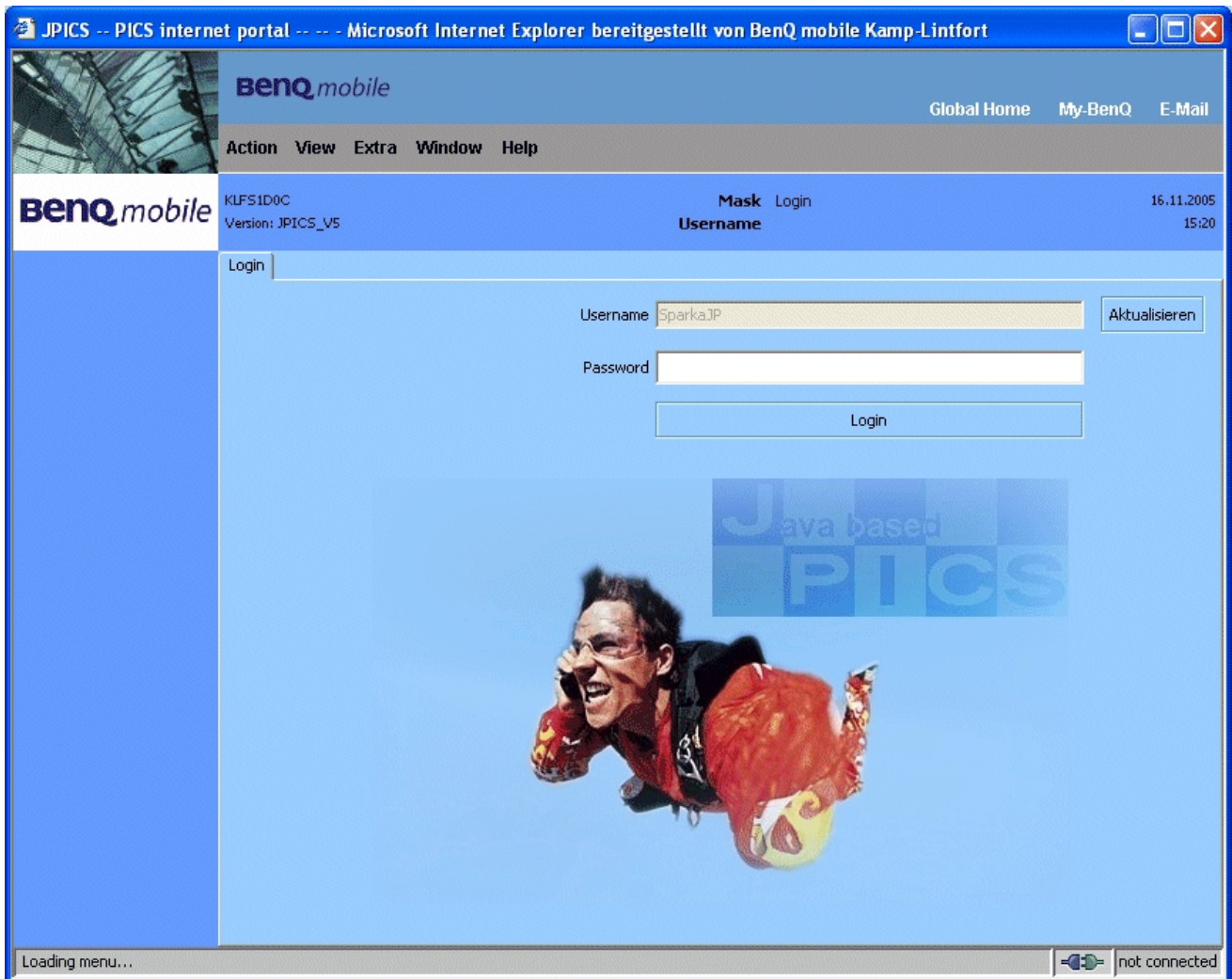
Overview

The following functions are available for the LSO:

- General mobile information

- Generate PINCODE

- Generate SIMLOCK – UNLOCK – Code

- Print IMEI labels

- Lock, Unlock and Test the BF - Bus
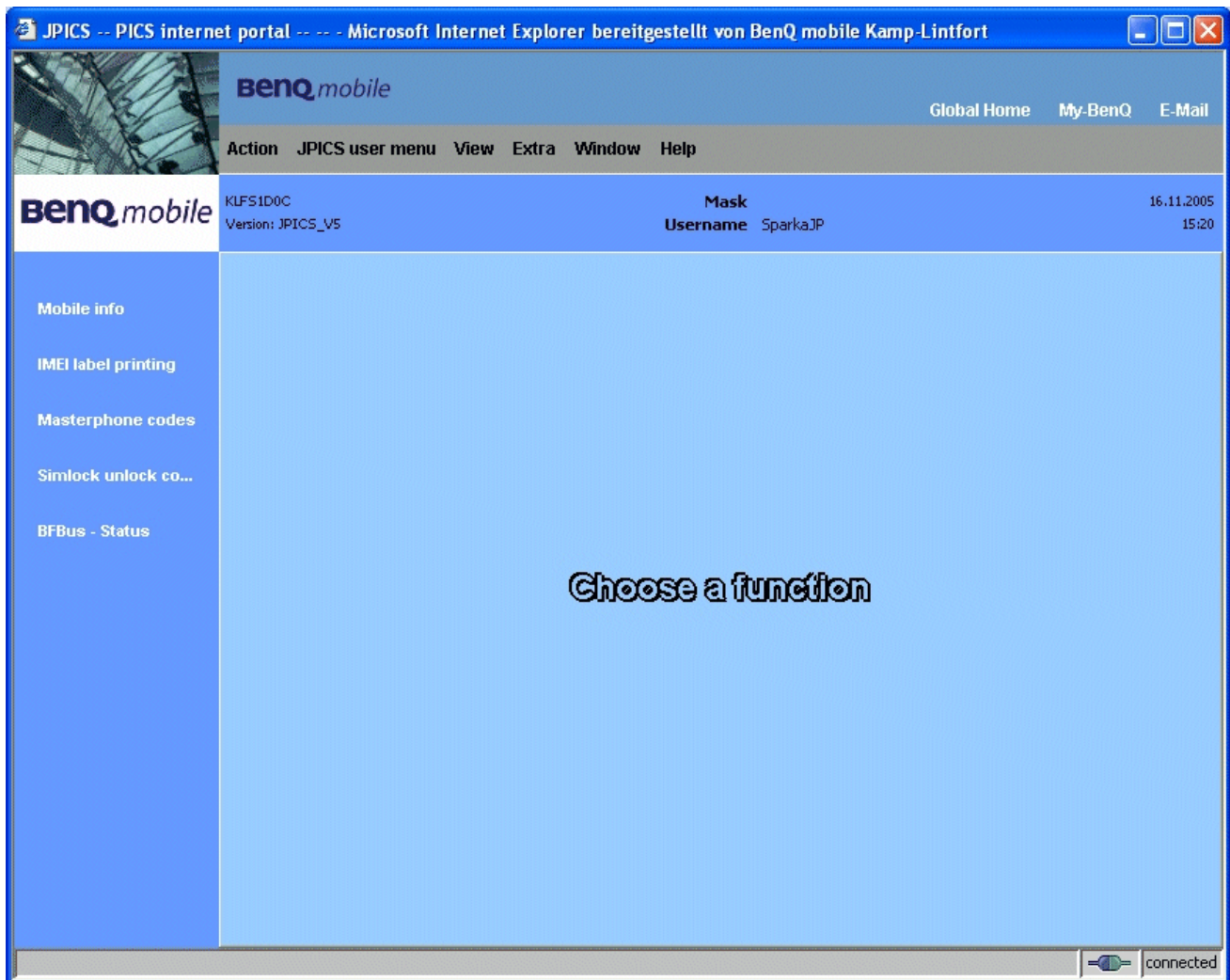
The access to the JPICS server which is located in Kamp – Lintfort is protected by chip card and in addition using secure socket layer (SSL) connection.

The JPICS server is only available for authorized users with a specially coded smart card. These smart cards and the administration of the JPICS web server and the PICS database – server can only be provided by the JPICS – TRUST – Center of the responsible department in Kamp – Lintfort.

In case of any questions or requests concerning smart cards or administration of the databases please ask your responsible BenQ Customer Care Manager.

Installation overview

The following installation description assumes that a web browser is already installed.
JPICS is tested with the following browsers:

1. Internet Explorer Version 5.5 and higher
2. Netscape Version 6 and higher

For further information regarding supported browsers, browser version and supported operating systems, see the Sun FAQ's.

Here is a step by step instruction to install all the required components:

It is necessary to follow this order!

1. Smart Card Reader (Omnikey: Cardman 2020 USB or Cardman 3121 USB)
2. CardOS interface (Siemens Version 3.0 B)
3. Java Runtime Environment (Sun)
4. Java additional components

Every user is responsible for a proper installation matching the license agreements.

For installation and further access you need the following:

1. The JPICS Installation – CD
2. The Smart Card JPICS. These cards can be ordered via your responsible Customer Care Manager within Siemens or on http://jpics.siemens.com/jpics/admin/request-new_jpics.jsp
3. A supported Smart Card Reader (Omnikey Cardman) in order to access your Smart Card.

Remark: We recommend using Cardman 2020 USB or Cardman 3121 USB. Serial card readers are not supported!!!

Generate Codes

In the JPICS application you can choose to generate:

- **Masterphone codes**
- **Simlock – Unlock – Codes**

Masterphone codes

The **Masterphone code** is used to unlock blocked mobiles.

Masterphone codes can only be supplied for mobiles which have been delivered in a regular manner.

Simlock – Unlock – Code

The **Simlock – Unlock – Codes** can only be generated if the following conditions are given:

- Mobile must have an active **Simlock** inside.
- The user must be given the authorization to obtain **Simlock – Unlock – Codes** for the variant of the operator to which the mobile was delivered last time.

Printing IMEI label

The module **"printing IMEI label"** offers the possibility to re-print IMEI labels for mobiles again.
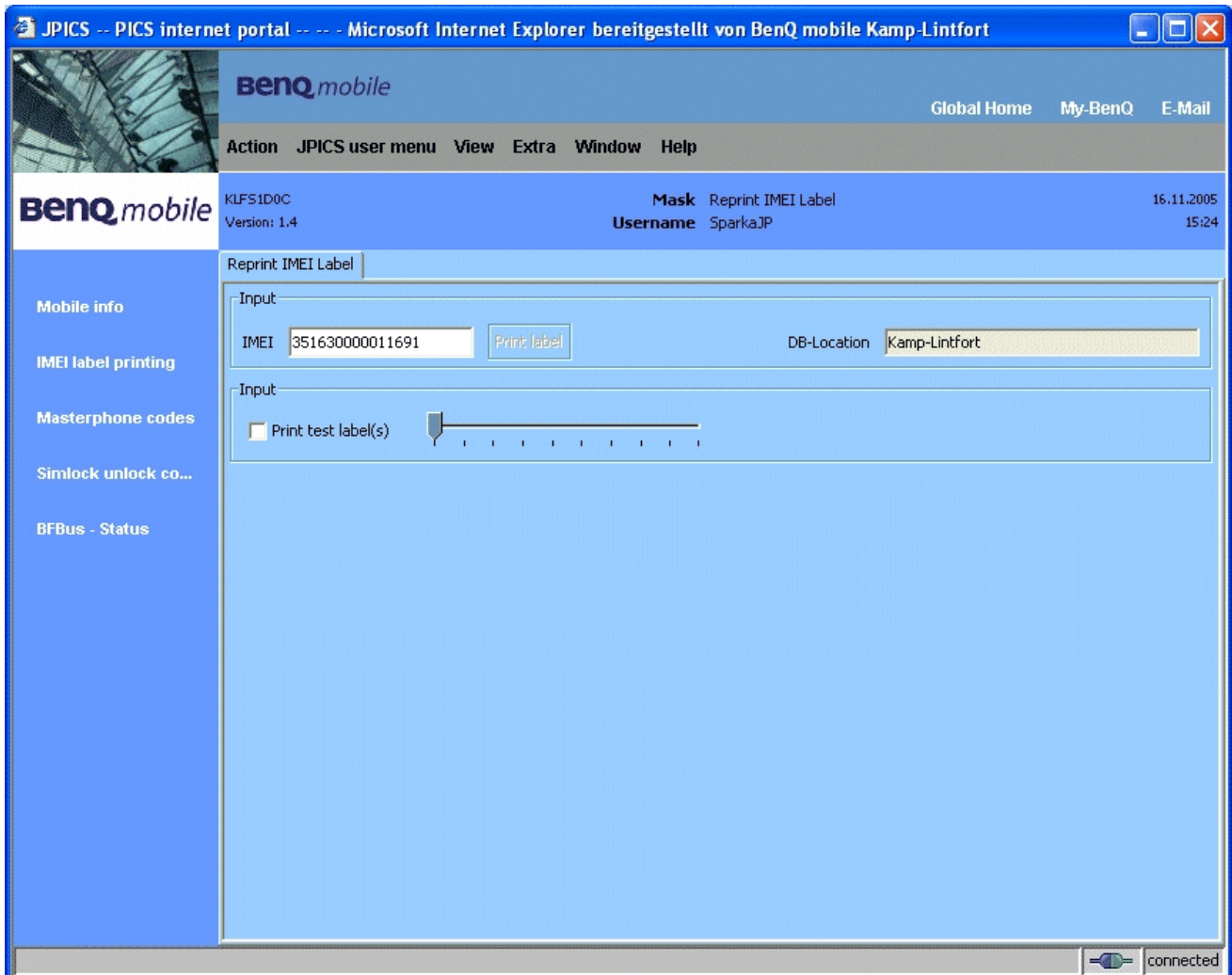
You are able to print 1 label in just one step.

To prevent that misaligned labels are being printed, the setting "Print test labels = ✓" is activated by default. After having printed a well aligned test label you can uncheck the setting and print the correct label.

Hint:

For correct printing of IMEI labels you must have a **Zebra – label printer** with special material that fits for label printing. This printer has to be connected to local LPT1 printer port (also see Installation of IMPRINT) and MUST feature a printing resolution of 300dpi.

11 International Mobile Equipment Identity, IMEI

The mobile equipment is uniquely identified by the International Mobile Equipment Identity, IMEI, which consists of 15 digits. Type approval granted to a type of mobile is allocated 6 digits. The final assembly code is used to identify the final assembly plant and is assigned with 2 digits. 6 digits have been allocated for the equipment serial number for manufacturer and the last digit is spare.

The part number for the AF51 is S30880-S2950-#xxx where the last for letters specify the housing and software variant.

AF51 series IMEI label is accessible by removing the battery.

Re – use of IMEI label is possible by using a hair – dryer to remove the IMEI label.

On this IMEI label, BenQ has also includes the data code for production or service, which conforms to the industrial standard DIN EN 60062. The data code comprises of 2 characters: first character denotes the **year** and the second character denotes the **month**.

For example: S5

CODE	Year	Month	CODE
P	2002	MARCH	3
R	2003	APRIL	4
S	2004	MAY	5
T	2005	JUNE	6
U	2006	JULY	7

To display the IMEI number, exit code and SW/HW version, key: * # 0 6 #

12 General Testing Information

General Information

The technical instruction for testing GSM mobile phones is to ensure the best repair quality.

Validity

This procedure is to apply for all from Siemens AG authorized level 2 up to 2.5e workshops.

Procedure

All following checks and measurements have to be carried out in an ESD protected environment and with ESD protected equipment/tools. For all activities the international ESD regulations have to be considered.

Get delivery:

> ➢ Ensure that every required information like fault description, customer data a.s.o. is available.

> ➢ Ensure that the packing of the defective items is according to packing requirements.

> ➢ Ensure that there is a description available, how to unpack the defective items and what to do with them.

Enter data into your database:

(Depends on your application system)

> ➢ Ensure that every data, which is required for the IRIS-Reporting is available in your database.

> ➢ Ensure that there is a description available for the employees how to enter the data.

Incoming check and check after assembling:

!! Verify the customers fault description!!

➢ After a successful verification pass the defective item to the responsible troubleshooting group.

➢ If the fault description can not be verified, perform additional tests to save time and to improve repair quality.

- Switch on the device and enter PIN code if necessary unblock phone.

- Check the <u>function</u> of all **keys** including **side keys.**

- Check the **display** for error in <u>line and row</u>, and for <u>illumination.</u>

- Check the **ringer/loudspeaker** acoustics by individual validation.

- Perform a **GSM Test** as described on page 36.

Check the storage capability:

➢ Check internal resistance and capacity of the battery.

➢ Check battery charging capability of the mobile phone.

➢ Check charging capability of the power supply.

➢ Check current consumption of the mobile phone in different mode.

Visual inspection:

➢ Check the entire board for liquid damages.

➢ Check the entire board for electrical damages.

➢ Check the housing of the mobile phone for damages.

SW update:

➢ Carry out a software update and data reset according to the master tables and operator/customer requirements.

Repairs:

The disassembling as well as the assembling of a mobile phone has to be carried out by considering the rules mentioned in the dedicated manuals. If special equipment is required the service partner has to use it and to ensure the correct function of the tools.
If components and especially soldered components have to be replaced all rules mentioned in dedicated manuals or additional information e.g. service information have to be considered

GSM Test:

With the availability of the GRT Test /Alignment software, this tool has to be used to perform the outgoing test!

>Connect the mobile/board via internal antenna (antenna coupler) and external antenna

 (Car cradle/universal antenna clip) to a GSM tester

>Use a Test SIM

For Triple Band phones use a separate test case, if the test software allows only one handover.

Skip the GSM Band test cases if not performed by the mobile phone

Example: 1. Test file   Band 1 = GSM900 / Band 2 = GSM1800
                 2. Test file   Band 1 = GSM1900

Internal Antenna			
Test case	Parameter	Measurements	Limits
1 Location Update	• GSM Band 1 • BS Power = -55 dBm • middle BCCH	• Display check	• individual check
2 Call from BS	• low TCH • highest PCL • BS Power = -75 dBm • middle BCCH	• Ringer/Loudspeaker check	• individual check
3 TX GSM Band 1	• low TCH • highest PCL • BS Power = -75 dBm • middle BCCH	• Frequency Error • Phase Error RMS • Phase Error Peak • Average Power • Power Time Template	• GSM Spec.
4 Handover to GSM Band 2 Including Handover Check			
5 TX GSM Band 2	• low TCH • highest PCL0 • BS Power = -75 dBm • middle BCCH	• Frequency Error • Phase Error RMS • Phase Error Peak • Average Power • Power Time Template	• GSM Spec.
6 Call release from BS			

External Antenna				
7	Call from MS	• GSM900 • high TCH • second highest PCL • BS Power = -75 dBm • middle BCCH	• Keyboard check	• individual check
8	TX GSM Band 1	• high TCH • second highest PCL • BS Power = -75 dBm • middle BCCH	• Frequency Error • Phase Error RMS • Phase Error Peak • Average Power • Power Time Template	• GSM Spec.
9	RX GSM Band 1	• high TCH • BS Power = -102 dBm • 50 Frames • middle BCCH	• RX Level • RX Qual • BER Class Ib • BER Class II • BER Erased Frames	• GSM Spec.
10	Handover to GSM Band 2 Including Handover Check			
11	TX GSM Band 2	• high TCH • second highest PCL • BS Power = -75 dBm • middle BCCH	• Frequency Error • Phase Error RMS • Phase Error Peak • Average Power • Power Time Template	• GSM Spec.
12	RX GSM Band2	• high TCH • BS Power = -102 dBm • 50 Frames • middle BCCH	• RX Level • RX Qual • BER Class Ib • BER Class II • BER Erased Frames	• GSM Spec.
13	Call release from MS			

Final Inspection:

The final inspection contains:

1) A 100% network test (location update, and set up call).

2) Refer to point 3.3.

3) A random sample checks of:

- Data reset (if required)

- Optical appearance

- complete function

4) check if PIN-Code is activated (delete the PIN-Code if necessary).

Basis is the international standard of **DIN ISO 2859**.

Use Normal Sample Plan Level II and the Quality Border 0, 4 for LSO.

Remark: All sample checks must be documented.

Annex 1

Test SIM Card

There are two different "Test SIM Cards" in use:

    1) Test SIM Card from the company **"ORGA"**

         Pin 1 number: 0000
         PUK 1   :   12345678

         Pin 2 number: 0000
         PUK 2   :   23456789

    2) Test SIM Card from the company **"T-D1"**

         Pin 1 number: 1234
         PUK   :   76543210

         Pin 2 number: 5678
         PUK 2   :   98765432

Annex 2

Battery Date Code overview

Varta
Date code example ─────────────────► N 9 A VA

Year (N:2001, O:2002...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)

Hitachi / Maxwell
Date code example ─────────────────► N 9 A MX

Year (N:2001, O:2002...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)

Sanyo
Date code example ─────────────────► N 9 A SY

Year (N:2001, O:2002...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)

NEC
Date code example ─────────────────► N 8 A NT

Year (N:2001, O:2002...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)

Panasonic
Date code example ─────────────────► O N A PAN

Year (N:2001, O:2002...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)

Sony
Date code example ─────────────────► P N A SO

Year (O:2002, P:2003...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)

13 Introduction of Service Repair Documentation for Level 3 Basic Repairs – AF51

Purpose

This part of Service Repair Documentation is intended to carry out repairs on BenQ Mobile repair level 3basic (only for workshops without level 3 equipment (special agreement required).
The described failures shall be repaired in BenQ authorized local workshops only.

The level 3basic partners are obliged to send exchanged boards (SWAP) to the next higher Service Repair Partner.

All repairs have to be carried out in an ESD protected environment and with ESD protected equipment/tools. For all activities the international ESD regulations have to be considered.

Assembling/disassembling has to be done according to the latest AF51 Level 2 repair documentation. It has to be ensured that every repaired mobile Phone is checked according to the latest released General Test Instruction document (both documents are available in the Technical Support section of the C-market).

Check at least weekly C-market for updates and consider all AF51 related Customer Care Information

AF51   Part number on IMEI label: S30880-S2950-#xxx

Scrap Handling: All Scrap information given in this manual are related to the SCRAP-Rules and instructions.

Attention: Consider the new "LEAD-FREE" soldering rules (available in the communication market), avoid excessive heat.

Scope

This document is the reference document for all BenQ mobile authorised Service Partners which are released to repair BenQ mobile phones up to level 2.5 light.

Terms and Abbreviations

14 List of available Level 3 Basic Parts

(According to Component Matrix V1.09 - check C-market for updates)

Product	ID	Order Number	Description CM
AF51	V2801	L36840-L2082-D670	LED BLUE TOP
AF51	V2802	L36840-L2082-D670	LED BLUE TOP
AF51	V2803	L36840-L2082-D670	LED BLUE TOP
AF51	V2804	L36840-L2082-D670	LED BLUE TOP
AF51	V2805	L36840-L2082-D670	LED BLUE TOP
AF51	V2806	L36840-L2082-D670	LED BLUE TOP
AF51	V2807	L36840-L2082-D670	LED BLUE TOP
AF51	V2808	L36840-L2082-D670	LED BLUE TOP
AF51	V2809	L36840-L2082-D670	LED BLUE TOP
AF51	X1603	L50634-Z97-C407	CONNECTOR SIM CARD READER X75
AF51	X211	L50634-Z93-C364	IO-JACK NANO 12-POL
AF51	X2750	L36334-Z97-C341	CONNECTOR BOARD TO BOARD 30-POL
AF51	X320	L50634-Z97-C467	CONNECTOR BATTERY 3-POL X85
AF51	Z1601	L50620-U6029-D670	FILTER EMI (Fi-Type6) PB Free

15 Hardware Requirements

(According to L2.5L-L2.5 General soldering information V1.3 - check C-market for updates)

Jigs, Tools and working materials for all described repairs:
- hot air blower
- soldering gun
- tweezers
- flux
- solder

16   AF51 Board Layout

Upper board side

Led´s

Lower board side

Connector
SIM-Card

Connector
Battery

Connector
Board to
Board

IO Jack

EMI Filter
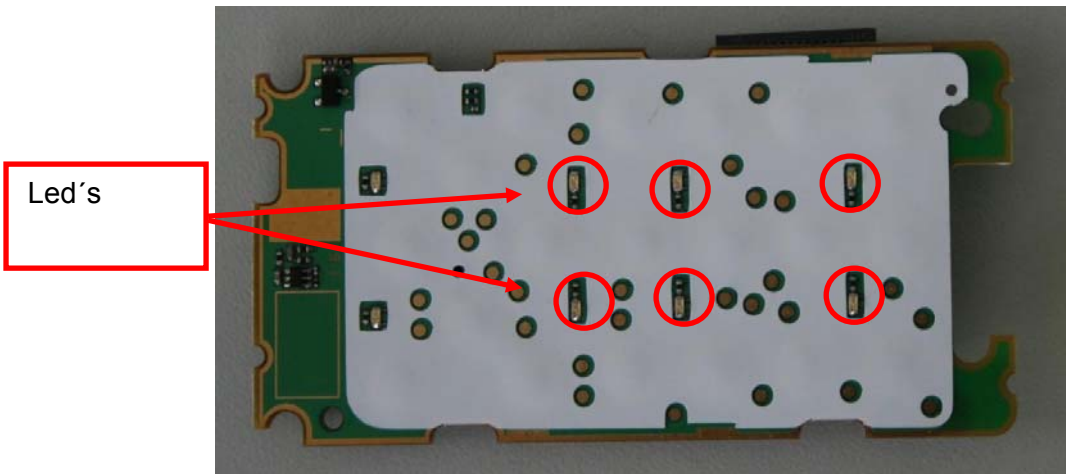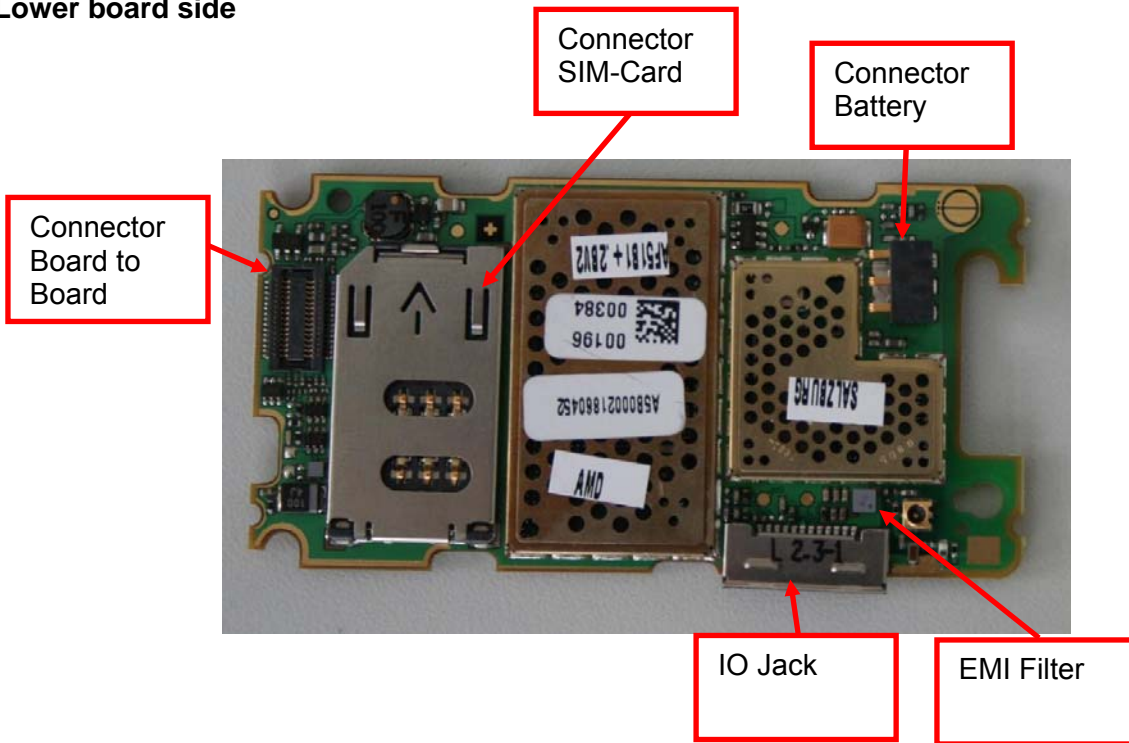
17 SIM Card Problems

Fault Symptoms	
Customer: Handset does not accept SIM card	GRT: SIM Card Problems

```
                    ┌─────────────────┐                    ┌─────────────────────┐
                    │ SIM Card Problems│                    │  Back to customer   │
                    └─────────────────┘                    │   without repair    │
                             │                             └─────────────────────┘
                             ▼                                        ▲
                    ┌─────────────────┐     Not okay      ┌─────────────────────┐
                    │ Watch for       │─────────────────▶ │  Caused by customer │
                    │ oxidation and   │                   └─────────────────────┘
                    │ damaged pads of │                              │
                    │ the SIM Card    │                              ▼
                    │ reader          │                   ┌─────────────────────┐
                    └─────────────────┘                   │ SCRAP - has to be   │
                             │ Okay                        │ send separately to  │
                             ▼                             │ WSC                 │
```

- Watch for oxidation and damaged pads of the SIM Card reader
  - Okay / Not okay → Caused by customer → SCRAP - has to be send separately to WSC → Back to customer without repair
- Check the status of the EMI Filter visually
  - Not okay → Exchange the damaged Filter
  - Okay ↓
- Check the status of the SIM Card reader visually
  - Okay (right) → - Check for twisted or Bent contacts / - Check for dry joints
  - Not okay → Exchange SIM Card reader
  - Okay ↓
- Use the resistor test function of a multimeter to check connection between spring contacts and soldering contacts. The value must be ~0Ω
  - not okay → Exchange SIM Card reader
  - Okay → Continue with higher repair level

Connector SIM Card Reader
Use soldering iron to remove defective component. Avoid excessive heat! Watch surrounding components! Resolder new component afterwards.
E-commerce order number: L50634-Z97-C407
E-commerce order name: CONNECTOR SIM CARD READER R65 (B)
Soldering temperature: ~ 360°C TIP Temp.

EMI Filter
Use hot air blower to remove defective component. Avoid excessive heat! Watch surrounding components! Resolder new component afterwards.
E-commerce order number: L50620-U6029-D670
E-commerce order name: FILTER EMI (Fi-Type7) PB Free
Soldering temperature: ~ 360°C TIP Temp
IRIS Diagnose Code: 43300 Interface/SIM Card reader/Mechanical Damage

18   IO Connector Problems

Fault Symptoms	
Customer: Charging Problems Problems with external loudspeaker or microphone when using a car kit Problems with accessories connected at the IO connector	GRT: No connection to GRT

```
        ┌──────────────────────┐                    ┌────────────────────────┐
        │ IO connector Problems │                    │   Back to customer     │
        └──────────────────────┘                    │   without repair       │
                    │                                └────────────────────────┘
                    ▼                                            ▲
        ┌──────────────────────┐                    ┌────────────────────────┐
        │ Watch for oxidation  │   Not okay         │  Caused by customer     │
        │ and damaged pads of  │ ─────────────────▶ │                        │
        │   the IO connector   │                    └────────────────────────┘
        └──────────────────────┘                                │
                    │ Okay                                       ▼
                    ▼                                ┌────────────────────────┐
        ┌──────────────────────┐   Not okay         │ SCRAP - has to be send  │
        │ Check the dust inside│ ─────────────────▶ │ separately to WSC       │
        │   the IO connector   │                    └────────────────────────┘
        └──────────────────────┘
                    │ Okay
                    ▼                                ┌────────────────────────┐
        ┌──────────────────────┐                    │ - Check for twisted or  │
Not okay│ Check the status of  │                    │   Bent contacts         │
 ◀──────│ the IO connector     │────────────────────│ - Check for dry joints  │
        │ visually             │                    └────────────────────────┘
        └──────────────────────┘
                    │
                    ▼
┌──────────────┐  ┌──────────────────────┐   Okay   ┌────────────────────────┐
│  Exchange    │  │ Use the resistor test│ ────────▶│  Continue with         │
│ IO connector │◀─│ function of a        │          │  higher repair level   │
└──────────────┘  │ multimeter to check  │          └────────────────────────┘
     Not okay     │ connection between   │
                  │ spring contacts and  │
                  │ soldering contacts.  │
                  │ The value must be ~0Ω│
                  └──────────────────────┘
```

Connector IO Jack
Use soldering iron to remove defective component. Avoid excessive heat! Watch surrounding components! Resolder new component afterwards.

E-commerce order number: L50634-Z93-C364
E-commerce order name: IO-JACK SLIM 12-POL
Soldering temperature: ~ 360°C TIP Temp.

IRIS Diagnose Code: 46100 Interface/Charging Connector/Mechanical Damage
                            47300 Interface/Data Interface/Mechanical Damage
                            4B100 Interface/Headset Connector/Mechanical Damage

19   B to B Connector (upper slider part) Problems

Fault Symptoms	
Customer: Upper slider keyboard malfunction Upper slider keypad illumination does not work Display problems	GRT: Keyboard malfunction Current measured failed
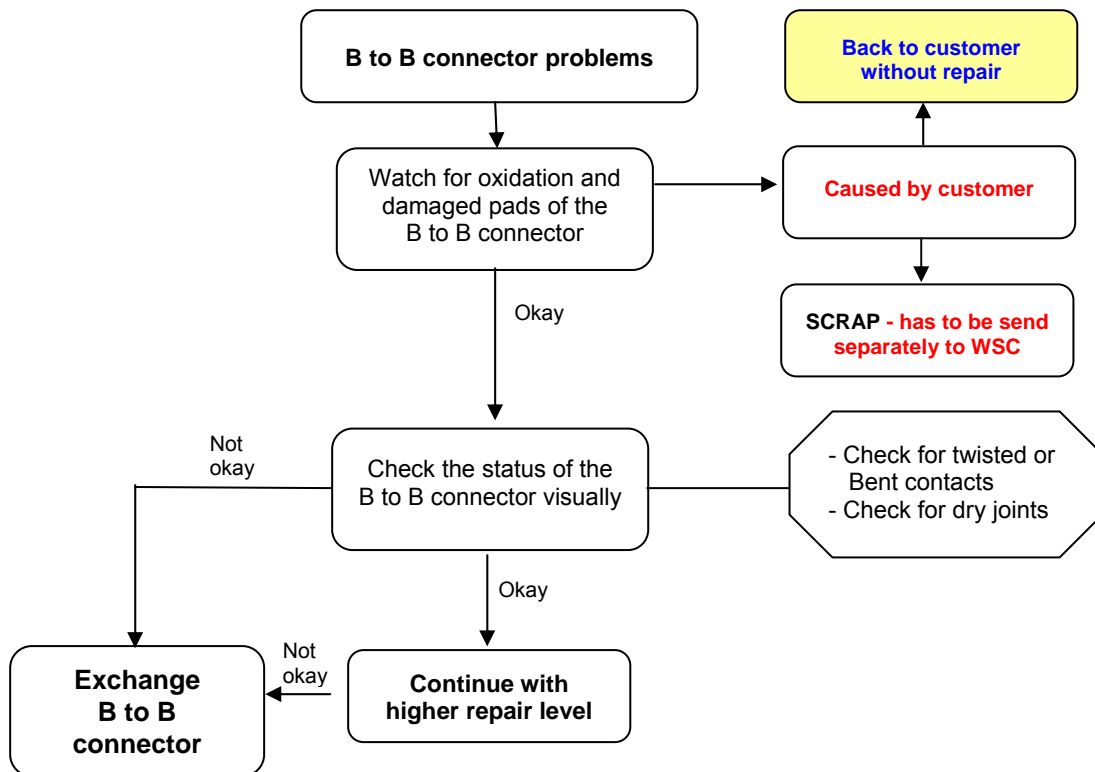
Connector Board to Board

Use hot air blower to remove defective component. Avoid excessive heat! Watch surrounding components! Resolder new component afterwards.

E-commerce order number: L36334-Z97-C341
E-commerce order name: BOARD TO BOARD 30-POL
Soldering temperature: ~ 360°C TIP Temp.

IRIS Diagnose Code: 32100 Keys / Main / No Function
                            32200 Keys / Main / Reduced Functionality
                            36000 Keys / Illumination

20 Main Keypad Illumination Problems

Fault Symptoms	
Customer: Main keypad illumination does not work	GRT: Current measured failed

```
┌─────────────────────┐          ┌─────────────────────┐
│    LED's Problems    │          │  Back to customer    │
│                      │          │    without repair    │
└─────────────────────┘          └─────────────────────┘

┌─────────────────────┐          ┌─────────────────────┐
│  Watch for oxidation │          │  Caused by customer  │
│  and damaged pads of │ ──────▶  │                      │
│     the LED's        │          └─────────────────────┘
└─────────────────────┘
         │ Okay                   ┌─────────────────────┐
         ▼                        │ SCRAP - has to be send│
                                  │  separately to WSC   │
  Not                             └─────────────────────┘
  okay    ┌─────────────────────┐
◀─────────│  Check the status of │     ┌──────────────────────┐
          │  the battery connector│ ──▶ │ - Check for twisted or│
          │      visually        │     │   Bent contacts       │
          └─────────────────────┘     │ - Check for dry joints│
                   │                   └──────────────────────┘
  Not              ▼                        Okay
  okay    ┌─────────────────────┐          ┌─────────────────────┐
┌───────┐ │  Use the diode test │ ───────▶ │   Continue with      │
│Exchange│◀│ function of a multi- │          │ higher repair level  │
│Keypad  │ │ meter to check the   │          └─────────────────────┘
│LED's   │ │ status of the diode. │
└───────┘ │ The typical voltage  │
          │ drop on the diode is │
          │ 1.7 V when testing   │
          │ the diode function   │
          │ with the multimeter. │
          └─────────────────────┘
```

LED WHITE TOP
Use soldering iron to remove defective component. Avoid excessive heat! Watch surrounding components! Resolder new component afterwards.
**Attention: Remove Metal Dome Sheet before!!!**

E-commerce order number: L36840-L2082-D670
E-commerce order name: LED WHITE TOP
Soldering temperature: ~ 360°C TIP Temp.

IRIS Diagnose Code: 36000 Keys / Illumination

21 Connector Battery

Fault Symptoms	
Customer: Mobile does not switch on	GRT: No connection to GRT

Battery connector problems

Back to customer without repair

Watch for oxidation and damaged pads of the Battery connector

Caused by customer

Okay

SCRAP - has to be send separately to WSC

Not okay

Check the status of the battery connector visually

- Check for twisted or Bent contacts
- Check for dry joints

Okay

Not okay

Exchange battery connector

Not okay

Use the resistor test function of a multimeter to check connection between spring contacts and soldering contacts. The value must be ~ 0Ω.

Okay

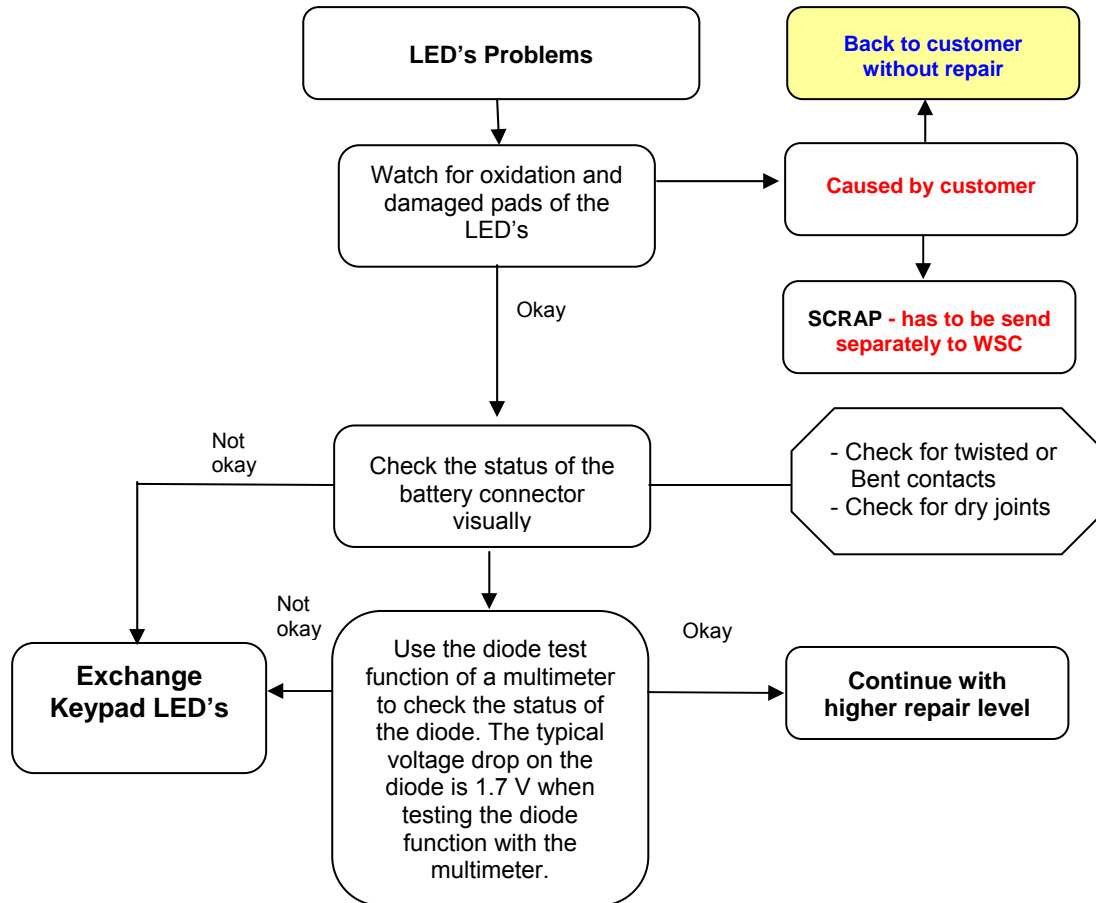**Continue with higher repair level**

Connector BATTERY
Use hot air blower to remove defective component. Avoid excessive heat! Watch surrounding components!
Resolder new component afterwards.

E-commerce order number: L50634-Z97-C467
Soldering temperature: 240 - 255°C
IRIS Diagnose Code: 13000 Battery/Mechanical Damage

22 Filter EMI Problems

Fault Symptoms	
Customer: Handset does not allow data communication via I/O connector	GRT: No service mode possible No software update possible

```
EMI Filter Problems                         Back to customer
                                            without repair
        |                                         ▲
        ▼                                         |
Watch for oxidation and  ──────────►  Caused by customer
damaged pads of the       Not okay          |
EMI Filter                                  ▼
                                     SCRAP - has to be send
        |                            separately to WSC
        | Okay
        ▼           Not okay
Check the status of the  ──────────►  Exchange the
EMI Filter visually                   damaged Filter
   |        |
Not         | Okay
okay        ▼
   |   Use the resistor test   Okay
Exchange  function of a multimeter ──►  Continue with
EMI Filter  to check connection        higher repair level
   ◄────  between spring
  not okay  contacts and soldering
            contacts.
```
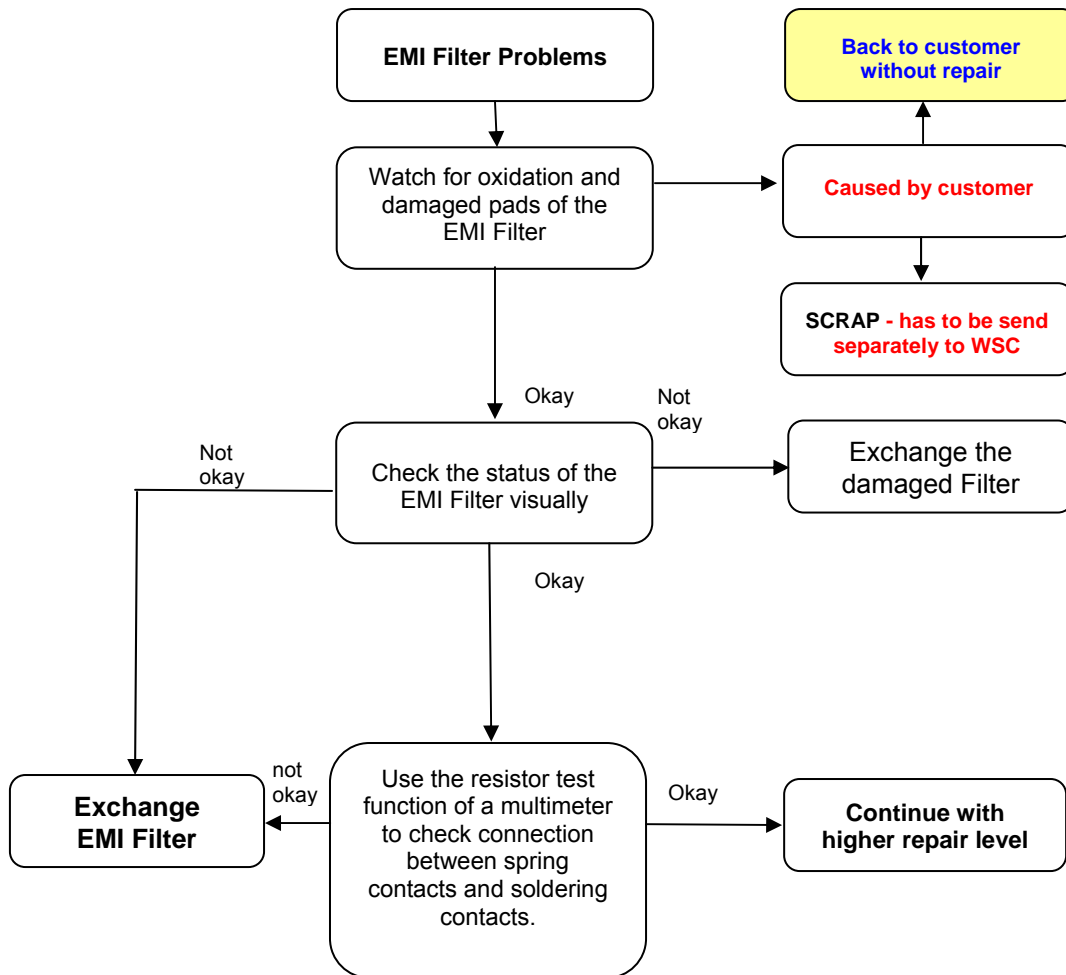
<u>EMI Filter</u>

Use hot air blower to remove defective component. Avoid excessive heat! Watch surrounding components! Resolder new component afterwards.

E-commerce order number: L50620-U6029-D670
E-commerce order name: FILTER EMI (Fi-Type7) PB Free
Soldering temperature: ~ 360°C TIP Temp
IRIS Diagnose Code: 47000 Data connectivity