Service Manual
for Smartphone - Tanager

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HTC Corp.
Engineering Mobility

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TITLE: Service Manual for TANAGER

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1.1	Feb. 26, 2003	Add safety notice	GSD Technical Support	Henry Lai		
1.2	Apr. 16, 2003	Modified Diagnostic test and Spare part list	GSD Technical Support	James Kao		
1.3	Apr. 22, 2003	Delete Appendix	GSD Technical Support	James Kao		

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1.Introduction

This manual provides the technical information to support the service activities of the TANAGER.

This document contains highly confidential information, so any or all of this document should not be revealed to any third party.

2.Product Specifications

Function	Specification
Platform	● Phone Centric base product (Smart Phone) ● Windows CE with Stinger OS
Outside Dimensions	● 120.4 (L) x 50.1 (W) x 23.5 (T) mm
Weight	● 130g with battery; 92g without battery
CPU	● PERSEUS 1 (120 MHZ)
Memory	● SDRAM：16MB ● Flash ROM：32MB
GSM Function	● Tri-band 900/1800/1900 ● Support GPRS, Class C ● Multi-slot class 8 (4R1T) ● Internal antenna with tri-band support.
Display	● 2.2 inch, 176x220 dots resolution ● 64K colors TFT Transflective LCD ● Dot Pitch：66um x 198 um ● White LED back Light
Keyboard/Button	● Two Phone Button (Send & End) ● One Navigation Button (5 way) including Action Key ● One Dialing Keypad (12 buttons) ● Two Stinger Soft Key Button ● Two Stinger Buttons Home and Back ● One Recording Button ● One Volume Up/Down button (side button) ● One Power Button (On the Top) ● Hands free mode Support

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Interface	● 3.3 V SIM Card. ● One Cradle Connector (Audio line in/Out for both phone and Media Player, Serial, Slave USB, DC IN) ● One Infrared IrDA SIR. ● One SD Memory Extension Slot
Docking Cradle	● Table sitting Cradle ● 22-Pin connector connected with Main Unit ● Serial or USB cable between Cradle and PC. ● One DC Jack

Notification	● One Bi-color LED (Green and Red) and Lens for GSM standby, GSM Network status, Event notification, and Power Charging status. ● Vibration for notification and Incoming call. ● Notification by LED, Sound, Message, Vibration Motor.
Audio	● Built-In Microphone, and 3-in-1 Speaker (Receiver, Loudspeaker and buzzer) ● Loudspeaker for hands-free supported ● One Earphone/Microphone Jack with stereo sound, 2.5 Ø diameter, Support PTT (Push to Talk) function or headset. ● Full Duplex with software AGC supported. ● 16 bits with 8KHZ, 11KHZ, 22KHZ, 44KHZ sample rate ● MP3 Stereo ● Automatically answer supported, for Car kit and Headset. ● Ring sound for both speaker and headset during auto answer mode ● Recording function in a voice call
Power	● Talk：3 hours ● Operation Time in GPRS mode：1.5 hours. ● Standby：90 hours ● Battery Recharge Time must not exceed 4 hours. ● Standard Battery： - Rechargeable battery, Li-Ion 1000maH - A removable battery with hard-packed. ● AC Adapter: - AC input rating：100 ~ 240 VAC, 50/60 HZ, 0.2A Max. - DC Output rating：5VDC,1 A.
Accessories	● Serial Combo Cable — Serial + DC Jack ● USB Combo cable — USB + DC Jack ● Headset (Stereo earphones with mono microphone) ● Docking Cradle ● Pouch ● AC Adapter (5W)
Regulatory	● GSM type approval (GCF/FTA) ● R&TTE: EMC/EMI, RF, Safety. ● PTCRB and FCC for US ● WinCE logo (NSTL)

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Application (In addition to Stinger's APs)	● Intel IPSM ● MMS client ● T9 text entry ● SIM manager ● Action engine (backup and update)

3. Servicing Tools

This chapter provides information for the servicing tools for TANAGER.

List of Servicing Tools

No.	Item	Use	Remark
1	Disassembly tools	Plastic stick for dismantle the unit Cleaning wipers Screw driver Protective Film Tweezers Air Gun	
2	Diagnostic Test Program	Test Program for Functional Test	
3	USB/Serial Cradle or Cable	For Synchronization Test For RS232 test	
4	SD Memory Card	For SD card test	
5	Earphone Headset	For Hand free / Recording test	
6	Special Made Plastic Stick	Disassembling use	
7	AC Adapter	Power supply to TANAGER	
8	Label Printer	For changing regulation label when housing was changed.	
9	Regulation Label	Replace to new Label when housing or M/B was changed.	

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4. Assembling and Disassembling

4.1 Disassembling

Tools needed for Assembling and Disassembling the Smart Phone

1. Lens Cleaning Tissue.
2. Philip Screw Driver #0.
3. Special Made Plastic Stick.
4. Tweezers.

Disassembly process

First, Remove the battery from Phone unit
Just push the lock located at the bottom part at the Rear Side.

Warning: To reduce risk of fire or burns, do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water. Replace only with specified batteries. Recycle or dispose of used batteries properly.

Li-ion

Disassembly rear case

From Unit Left side (SD / MMC card slot), use plastic stick tool to release the hooks. Insert and gently twist into the gap at the between front and rear case with the FLAT side of the tool.

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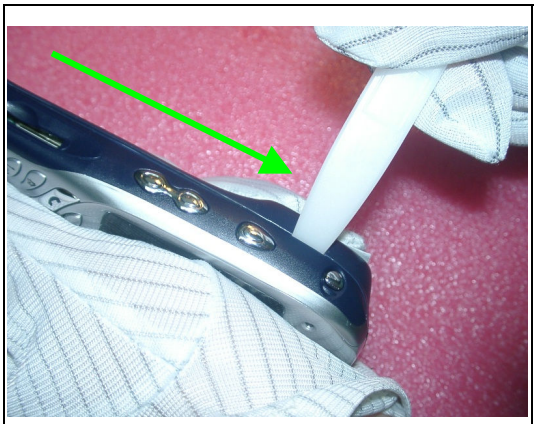
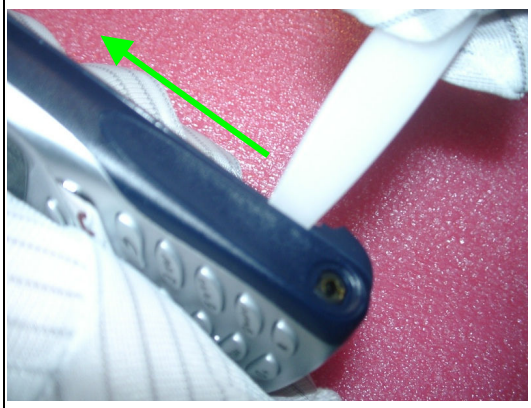
	Once the first hook has been released, slide the Plastic Tool along the gap of the unit to unlock the rest of the hooks.
	Then, for the other side of the unit, also start it at the point near the audio jack.
	Continue sliding the plastic tools along the unit's Up side and stop before the Infrared port.

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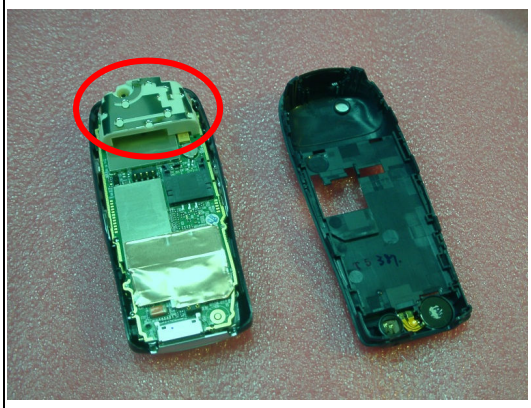
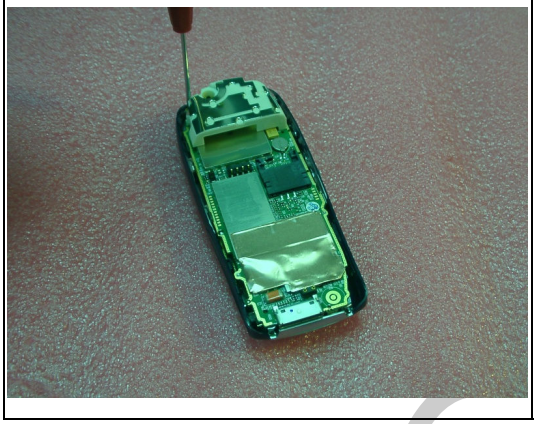
	After ALL the hooks around the perimeter of the unit, separate the Rear Housing of the unit as shown in the picture.
	Bezel with Mainboard parts, rear housing. **NOTICE:** Please Do not touch the antenna parts. **Rear Housing P/N : 74H00166-00**
	Remove one screw located at the top left side of unit as shown on figure. **Screw P/N : 72H00160-00**

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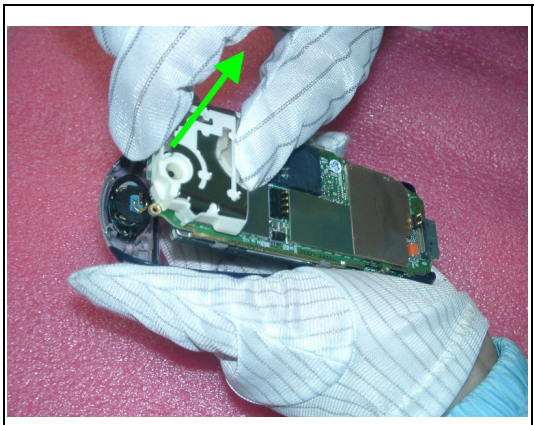
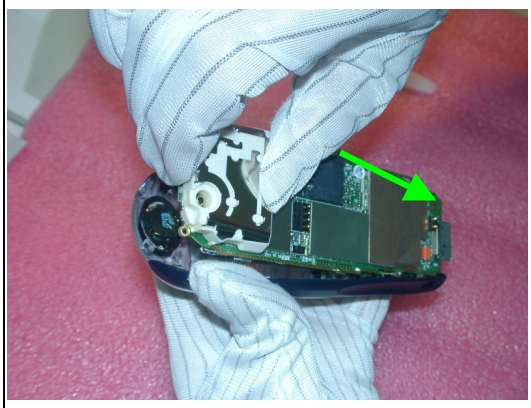
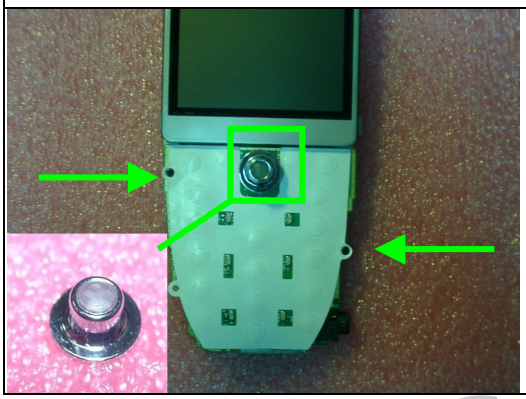
	**Release the MB from Bezel** To Remove the LCD-MB assembly, hold the two edges of antenna part, pulling upward the Mainboard from unit's bezel about 45 ˚angle. **Notes :** 1. Do not touch the antenna part directly with your finger. 2. Use Glove to prevent fingerprint left on LCM.
	Then pulling leftward the Mainboard to separate the Mainboard with the Bezel. **Notes :** Please protect the LCM and Win-Panel by using protective film immediately.
	**To Remove the Switchboard from MB** Unfasten two Screws that fix the switchboard to Main board. Then pull the switchboard upward, by disconnecting it from the connector. **Screw P/N : 72H00134-00** **Joystick P/N : 71H00475-00**

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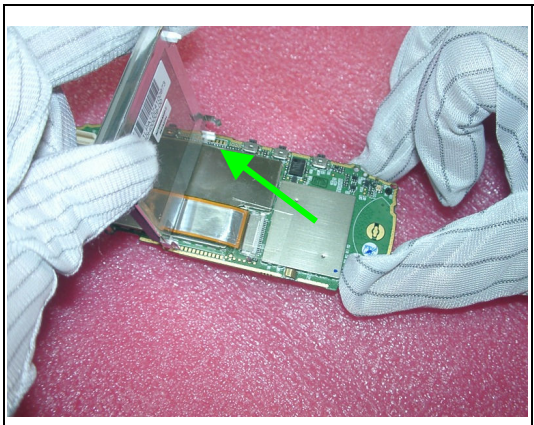
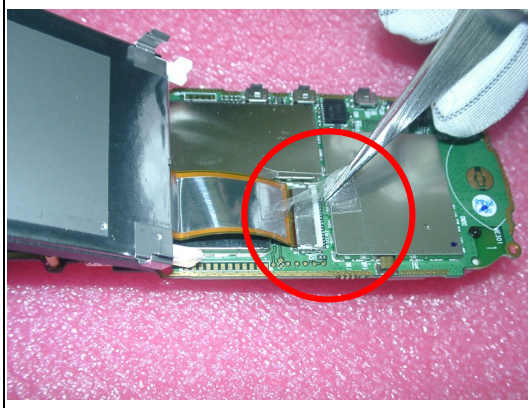
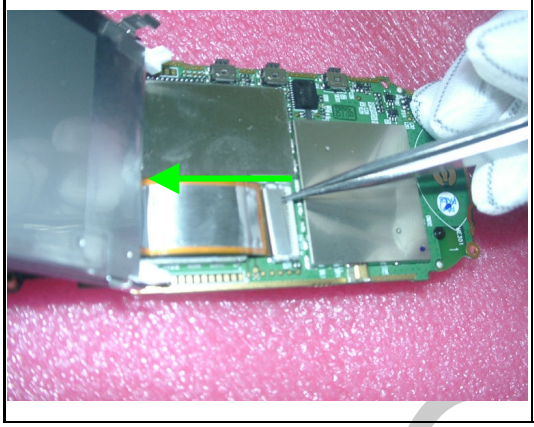
	**To Remove the LCD from MB** Hold the LCD and carefully pull upward, to disconnect the LCD from its guide pins and LCD gasket.
	**To disconnect the LCD from its connector** Remove the plastic tape stuck on the FPC and Connector.
	**To Disconnect the FPC** Use Tweezers to push the first side of the connector cover backward.

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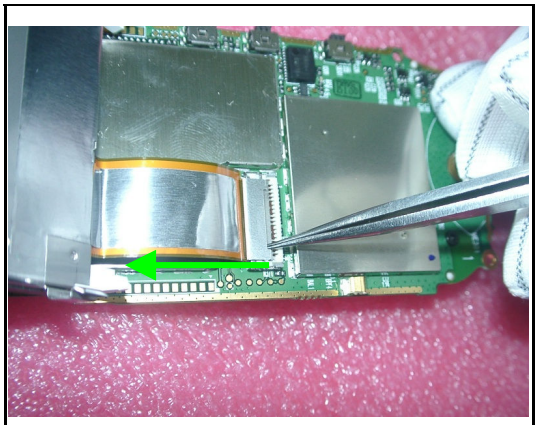
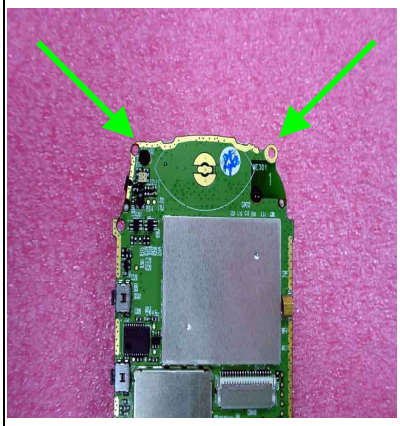
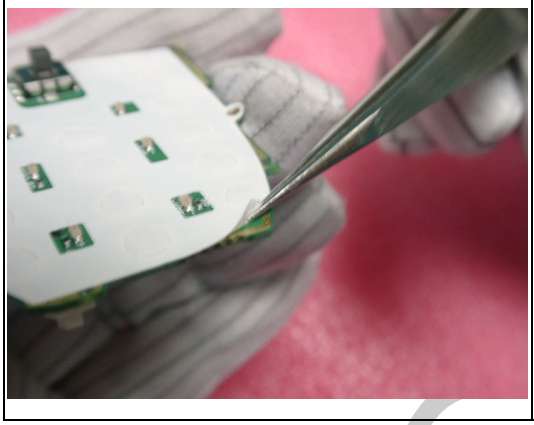
	Apply the same method to its second side. **LCD P/N：60H00009-00**
	**To Remove the Antenna from MB** Unfasten two screws that fix the Antenna to MB. **Screw P/N：72H00160-00** **Antenna P/N：36H00046-00**
	**Metal Dome Replacement** In case of need to replace the Metal dome, slightly remove the metal dome from Switchboard. Sticking new metal dome on switchboard by adjusting three guide holes on switchboard, and keep the surface flat. **Metal Dome P/N：72H00263-00**

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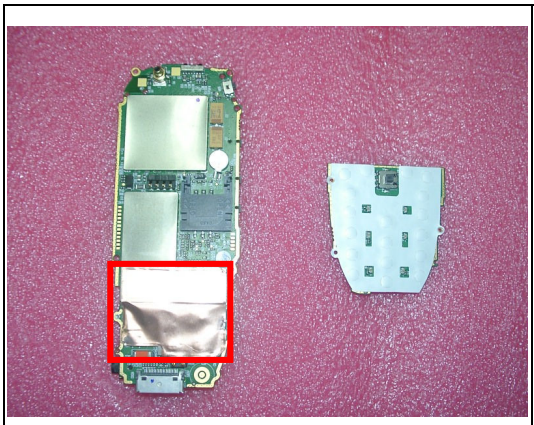
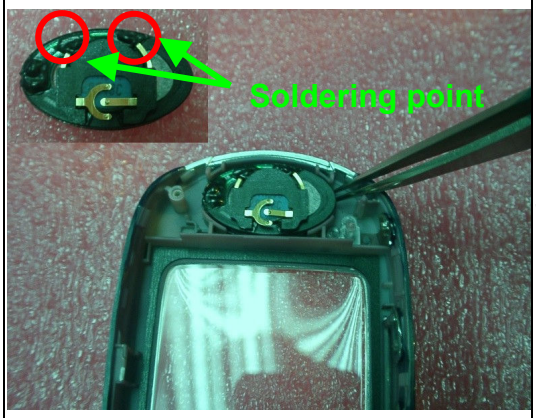
	**To replace Copper Paper** If the copper paper broken, not flat or without stickiness, it must be replaced. It may affect the product sensitivity. If M/B changed, it must be replace new one also. The **used** copper paper can not be used again. **Copper Paper P/N：72H00264-00**
	**To Remove the Speaker from Bezel** Use Tweezers to disconnect the Speaker from bezel (there is double side tape stick the speaker to bezel) **Speaker P/N：36H00093-00** **Important notice:** In case of speaker replacement, the soldering part of speaker should be at **UPPER side**.
	To Remove Key Pad As shown on picture, use your both hand thumb and forefinger to push it (Talk and End keys) inward (there is double side tape on it.) **Keypad P/N：71H00476-00**

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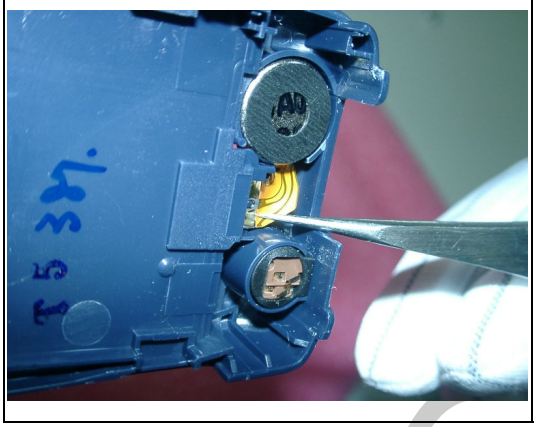
	To Remove the Win-Panel Slightly push the Win-panel outward starting from its center.
	Win Panel P/N：74H00168-00
	**To Remove or Replace the Vibrator** Use the tweezers to remove the vibrator's FPC slightly then use plastic stick to remove the Vibrator. Be careful to handle its FPC cable which is fragile **Vibrator P/N：36H00092-00**

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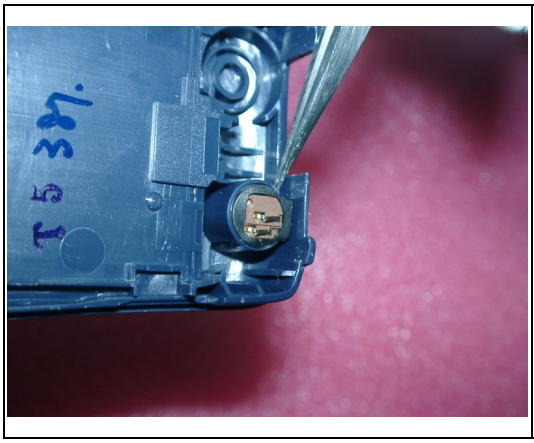	**To Remove or Replace the Microphone** Use tweezers to remove the MIC. **Notice：** Any bent, deform of pin will cause the MIC malfunction. **Microphone P/N：36H00065-00**

The disassembly procedure is finished.

4.2 Assembling

	Win-Panel to Bezel Assembly 1, Strongly request to wear glove. 2, Remove the sticker of Win-Panel (for new part) 3, Put the Win-Panel to the bezel
	Keypad Assembly During Assembling the Keypad, please make sure the upper rubber is fixed properly into its place.

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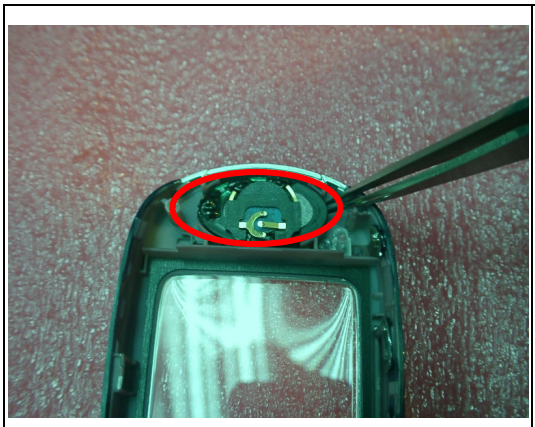
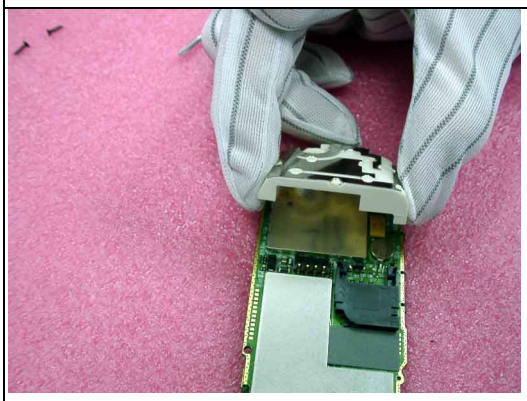


Speaker Assembly

Use tweezers to put the Speaker into bezel.

Important notice：

In case of speaker replacement, the soldering part of speaker should be at **UPPER** side.



Antenna Assembly

1, Put the antenna into its position by holding its two sides.

2, Make sure two guide pins connected properly.

3, Fasten two screws located on the reverse side.

Screw P/N：72H00160-00

Screw Torque：1.5 +0 / -0.1 kgf-cm

LCD assembly

1, Please be noted there are two sponges stick on both side (right and left).

2, Sponge must be added in if LCD replacement occurs during repair process.

LCD Sponge P/N: 76H00236-00

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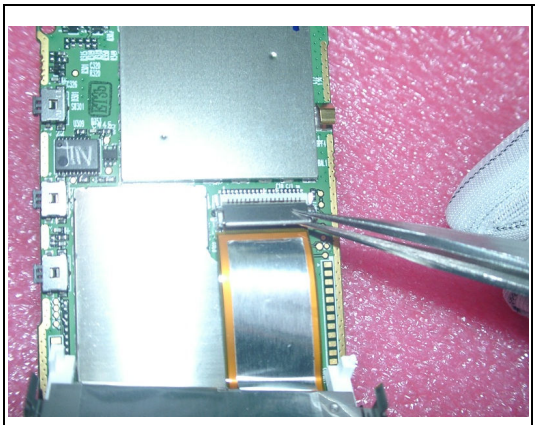
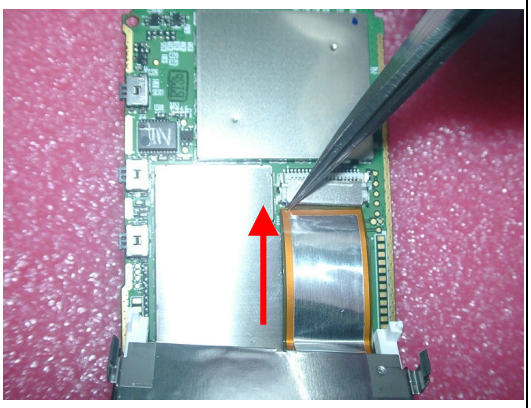
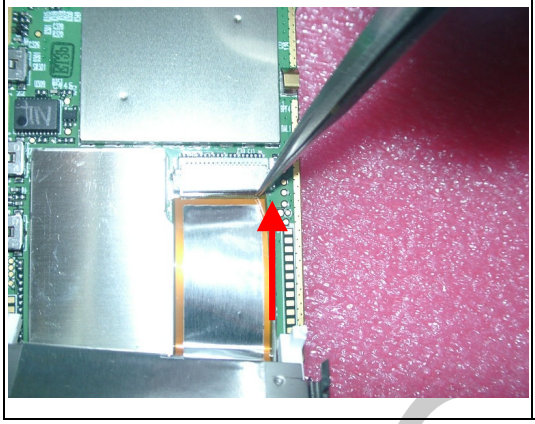
	**Connect the LCD FPC cable into its connector** 1, Unlock the connector cover by putting it upside direction. 2, Insert the FPC cable in place, and make sure it must be aligned with the connector. 3, To press down the cover.
	Use Tweezers to push the first side of the connector cover frontward.
	1, Push the second side of the connector cover frontward. 2, Stick tape on the connector.

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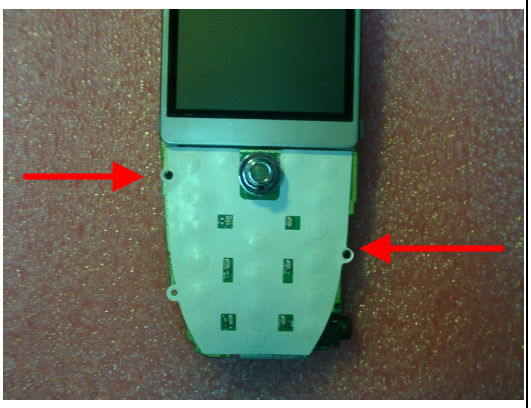
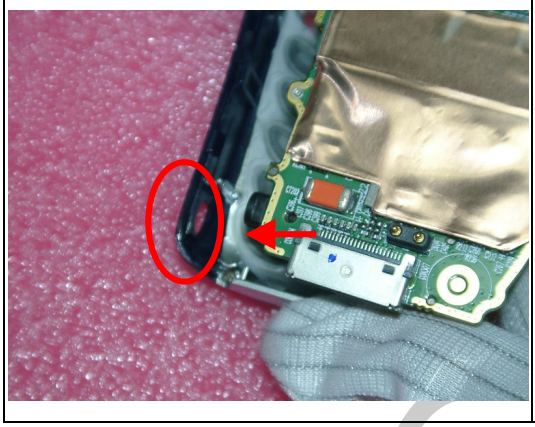
	LCD Assembly 1, Turn over the LCD and assembly it into main board. 2, Please avoid bending on LCD FPC. 3, Make sure the LCD's guide pins, and gasket is adjusted properly.
	**Switch board Assembly** Connect the switchboard to main board. Fix two screws on it. **Screw P/N：72H00134-00** Screw Torque：0.5 +0 / -0.1 kgf-cm
	**IMPORTANT NOTICE** Before assembling the MB-LCD module on bezel, it should **CLEAN the Win-Panel and LCD surface at Clean-bench to prevent dust or particle.** After clear the LCD and Win-Panel, put the Audio Jack into the hole on the Bezel.

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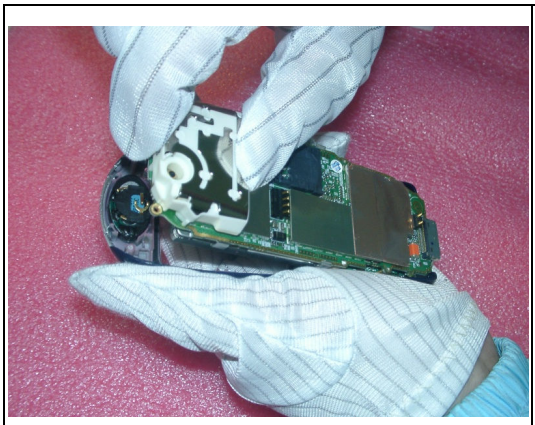
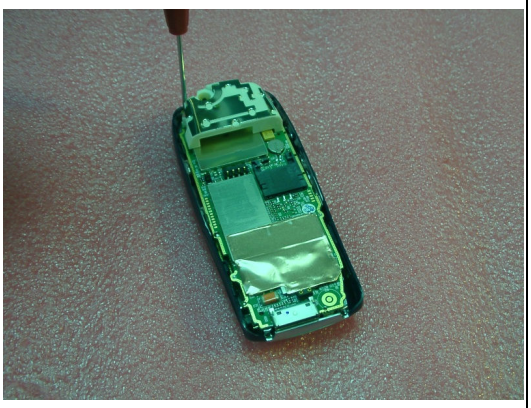
	Adjust the LCM-MB about 45 °angle to put it on the bezel.
	Fasten the screw on the top left side to fix the MB and bezel. **Screw P/N：72H00160-00** Screw Torque: 1.0 +0 / -0.1 kgf-cm
	Rear Housing Assembly Adjust and assemble the rear housing in direction as shown on picture.

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	Push the rear housing and gently close it into bezel, the same method apply along the unit.
	Then assemble the battery into unit. Remember to put the SD dummy filler into phone unit. By pushing the cover to its place located at the left side of phone.
	Warning: To reduce risk of fire or burns, do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water. Replace only with specified batteries. Recycle or dispose of used batteries properly. Li-ion

The Unit Assembly is done ready for further tests.

5. Diagnostics Program

1, List of Test Item

- You will see HTC Copy right on the first page of Diagnostic program.
- Totally there are 28 items content of Diagnostic test.

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No.	Item	Description	Remark
1	RUN-IN Test	Run in function Test, run continuously	Will halt on failed item. HTC doesn't recommend test this item.
2	GET Info	Read IMEI and S/N information	
3	MEM Test	SDRAM size, Read/Write and compare test	
4	KEY Test	Key Press Test	
5	LED Test	LED ON/OFF TEST	
6	Timer Test	RTC Count Test	
7	Vib Test	Vibrator ON/OFF Test	
8	Disp. Test	LCD Pattern display	
9	Wave Play	Audio Play Test	
10	Audio REC	Audio record and play back Test	
11	Gas Gauge	Read Battery information	
12	Checksum	Calculate Checksum of Flash Rom	
13	SD Test	SD read/Write Test	
14	Proc Wave	Make a simulate wave in memory. To see the result, turn to next page.	Record (EAR/CAR/INT) PLAY (EAR/CAR/INT)
15	3-Ring	To test Earphone detection	
16	REC Ear	Test Record by Earphone	
17	REC Car	Test Record By Car adapter	
18	REC Int	Test Recording by Internal Speaker	
19	Play Ear	Play record result by Earphone	
20	Play Car	Play record result by Car Adapter	
21	Play Int	Play record result by Internal Speaker	
Some Items Need To Be Tested Under OS - Smartphone Mode			
1	RS232 TEST	Link with PC/Notebook to check Link function	
2	SIR	Test IR by link with PC or other mobile device	

2, Test procedure

(a) Turn off the unit power

(b) Insert Diagnostic SD card to Smartphone (provide by HTC)

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(c) Set the Unit into Bootloader Mode (While Press & Hold Record button, then press Power button). Wait for “HTC logo” appears on screen, press Action key to into Diagnostic test.

(d) Into test menu, use joystick to select the item then press Action key for testing. It also can use joystick to change another page of menu.

(e) Remove the battery directly to exit the Diagnostic program when finish the testing.

(f) If the system fails while testing, please also remove the battery directly to turn off power.

3, Test Result

No.	Item	Test result	Remark
1	GET Info	Check S/N and IEMI numbers match with product label	Press recording button to exit
2	MEM Test	Check the test result Pass or Fail	
3	KEY Test	Check each key is working	
4	LED Test	Check Power LED and LCD front-light	Use joystick for testing
5	Timer Test	Check the test result Pass or Fail	
6	Vib Test	Check vibrator is working	Use joystick for testing
7	Disp. Test	Check the LCD if it has line or dot	Press “Talk” -> “End” -> “Home” -> “Return”
8	Wave Play	Check the speaker is working without noise/weak sound	
9	Audio REC	Check microphone is working	Press Volume “up” & “down” keys
10	Gas Gauge	Check battery status (pass or fail)	Press any key return to menu
11	Checksum	Check ROM code checksum	Press “Power” button to exit
12	SD Test	Check SD card read / write function (pass or fail)	
13	Proc Wave	This function will create wave in memory. Then run below items –18, 19 & 20 to check audio functions	To verify this function, it must change third page – Play Ear/Car/Int
14	3-Ring	Check the phone can detect the earphone	Insert earphone to audio jack, then press “push” button on earphone
15	REC Ear	Check earphone / microphone function, then select item 18-Play ear to verify.	After voice recording, select “Play Ear” to verify result
16	REC Car	Check Car kit / microphone function, then select item 18-Play ear to verify.	After voice recording, select “Play Car” to verify result
17	REC Int	Check internal microphone function, then select item 18-Play ear to verify.	After voice recording, select “Play Int” to verify result
18	Play Ear	Check sounds when record from earphone	
19	Play Car	Check sounds when record from Car kit	
20	Play Int	Check sounds when record from internal microphone	

6. Spare parts list

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Item	Description	P/N	Using Q'ty
1	Internal antenna, TANAGER	36H00046-00	1
2	Microphone, TANAGER	36H00065-00	1
3	Vibrator, TANAGER	36H00066-00	1
4	Speaker, 0.2W, 8 Ohm, TANAGER	36H00117-00	1
5	Switch board, TANAGER	51H00173-00	1
6	2.2" TFT color LCD, TANAGER	60H00009-00	1
7	Joystick, TANAGER	71H00475-00	1
8	Key pad, TANAGER	71H00476-00	1
9	Screw, PH/S, M1.0*L3.0	72H00134-00	2
10	Screw, PH, PT1.4*5.5, black	72H00160-00	3
11	Metal dome, TANAGER	72H00263-00	1
12	Copper paper	72H00264-00	1
13	Absober, 22*17mm	72H00268-00	1
14	Bezel, Pre-assy, TANAGER	74H00165-00	1
15	Housing, Pre-assy, TANAGER	74H00166-00	1
16	Sponge, LCD, TANAGER	76H00236-00	2
17	Rubber, Antenna, Housing, TANAGER	76H00259-00	1
18	Sponge Mylar, Switch, 40*3.5*0.7	76H00374-00	1
19	Stopper A, Switch, 7.2*7.2*1.5	76H00375-00	1
20	Stopper B, Switch, 1.5*0.8*1.5	76H00376-00	1
21	Fragile Label	77H00066-01	1
22	Regulation Lable, Main unit, TANAGER	By region	1
23	Window panel, TANAGER	By region	1
24	Filler SD card, TANAGER	By region	1

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Accessories for Tanager			
Item	**Description**	**P/N**	**Using Q'ty**
25	Headset, TANAGER	36H00081-00	1
26	USB Cable, TANAGER	73H00066-00	1
27	Serial Cable, TANAGER	73H00067-10	1
28	DC converter	75H00207-00	1
29	AC Adapter, TANAGER	79H00016-10	1
30	Plug For AC adapter, US	79H00019-00	1
31	Plug For AC adapter, UK	79H00019-10	1
32	Plug For AC adapter, EU	79H00019-20	1
33	Plug For AC adapter, AU	79H00019-30	1
34	Rechargeable battery, 1000mAH, TANAGER	By region	1
35	Digital Camera module, TANAGER	By region	1

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