Level 1 and 2 Service Manual

6809505A62-O

MOTOROLA

# MOTORIZR™ Z3

# Digital Wireless Telephone


GSM 850/900/1800/1900 MHz, EDGE, GPRS

Mobile Devices Business,
Sawgrass International Concourse
789 International Parkway
Room S2C
Sunrise, FL 33325-6220

# Contents

# Introduction

Motorola® Inc. maintains a worldwide organization that is dedicated to provide responsive, full-service customer support. Motorola products are serviced by an international network of company-operated product-care centers as well as authorized independent service firms.

Available on a contract basis, Motorola Inc. offers comprehensive maintenance and installation programs that allow customers to meet requirements for reliable, continuous communications.

To learn more about the wide range of Motorola service programs, contact your local Motorola products representative or the nearest Customer Service Manager.

## Product Identification

Motorola products are identified by the model number on a label usually located under the battery. Use the entire model number when inquiring about the product. Numbers are also assigned to chassis and kits. Use these numbers when requesting information or ordering replacement parts.

## Product Names

Product names are listed on the front cover. Product names are subject to change without notice. Some product names, as well as some frequency bands, are available only in certain markets.

## Product Changes

When electrical, mechanical or production changes are incorporated into Motorola products, a revision letter is assigned to the chassis or kit affected, for example; -A, -B, or -C, and so on.

The chassis or kit number, complete with revision number, is imprinted during production. The revision letter is an integral part of the chassis or kit number and is also listed on schematic diagrams and printed-circuit board layouts.

## Regulatory Agency Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device may not cause any harmful interference
- This device must accept interference received, including interference that may cause undesired operation

This class B device also complies with all requirements of the Canadian Interference-Causing Equipment Regulations (ICES-003).

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## Computer Program Copyrights



## About This Service Manual

Use of this manual assures proper installation, operation, and maintenance of Motorola products and equipment. It contains all service information required for the equipment described and is current as of the printing date. Refer questions about this manual to the nearest Customer Service Manager.

### Audience

This manual aids service personnel in testing and repairing Z3 telephones. Service personnel should be familiar with electronic assembly, testing, and troubleshooting methods, and with the operation and use of associated test equipment.

### Scope

This manual provides basic information relating to Z3 telephones, and also provides procedures and processes for repairing the phones at Level 1 and 2 service centers including:

- Unit swap out
- Repairing of mechanical faults
- Basic modular troubleshooting
- Testing and verification of unit functionality
- Initiate warranty claims and send faulty modules to Level 3 or 4 repair centers

### Conventions

The following special characters and typefaces, are used in this manual to emphasize certain types of information.

*Note: Emphasizes additional information pertinent to the subject matter.*

*Caution: Emphasizes information about actions which may result in equipment damage.*

*Warning: Emphasizes information about actions which may result in personal injury.*

Information from a screen is shown in text as similar as possible to what displays on the screen. For example, MESSAGE.

## Warranty Service Policy

The product is sold with the standard 12-month warranty terms and conditions. Accidental damage, misuse, and extended warranties offered by retailers are not supported under warranty. Non-warranty repairs are available at agreed fixed repair prices.

### Out-of-Box Failure Policy

The standard out-of-box failure criteria applies. Return customer units that fail very early on after the date of sale to Manufacturing for root cause analysis, to guard against epidemic criteria. Manufacturing to bear the costs of early life failure.

### Product Support

Customer's original units will be repaired but not refurbished as standard. Appointed Motorola Service Hubs will perform warranty and non-warranty field service for level 2 (assemblies) and level 3 (limited PCB component). Motorola High Tech Centers will perform level-4 (full component) repairs.

### Customer Support

Customer support is available through dedicated Call Centers and in-country help desks. Product Service training is available through the local Motorola Support Center.

## Parts Replacement

When ordering replacement parts or equipment, include the Motorola part number and description used in the service manual.

When the Motorola part number of a component is not known, use the product model number or other related major assembly along with a description of the related major assembly and of the component in question.

In the U.S.A., to contact Motorola, Inc. on your TTY, call: 800-793-7834.

## Replacement Parts Service Division (RPSD)

Order replacement parts, test equipment, and manuals from RPSD.

**U.S.A.**

Phone: 800-422-4210

FAX: 800-622-6210

**Outside U.S.A.**

Phone: 847-538-8023

FAX: 847-576-3023

Website: http://businessonline.motorola.com

**EMEA**

Phone: +49 461 803 1404

Website: http://emeaonline.motorola.com

**Asia**

Phone: +65 648 62995

Website: http://asiaonline.motorola.com

# Specifications

| General Function | Specification |
|---|---|
| Frequency Range GSM 850 | 824-848 MHz Tx<br>869-893 MHz Rx |
| Frequency Range GSM 900 | 880-915 MHz Tx (with EGSM)<br>925-960 MHZ Rx |
| Frequency Range DCS 1800 | 1710-1785 MHz Tx<br>1805-1880 MHz Rx |
| Frequency Range PCS 1900 | 1850-1910 MHz Tx<br>1930-1990 MHz Rx |
| Channel Spacing | 200 kHz |
| Channels | 174 EGSM, 374 DCS, 374 PCS, 124 GSM 850 carriers with 8 channels per carrier |
| Modulation | GMSK at BT = 0.3 |
| Transmitter Phase Accuracy | 5 Degrees RMS, 20 Degrees peak |
| Duplex Spacing | 45 MHz |
| Frequency Stability | ± 0.10 ppm of the downlink frequency (Rx) |
| Operating Voltage | +3.2V dc to +5.5V dc (battery)<br>+4.8V dc to +6.5V dc (external connector) |
| Transmit Current Drain | 101-260 mA average talk current drain |
| Stand-by Current drain | 5 mA (DRX2), 2 mA (DXR9) typical |
| Temperature Range | -10° C to +55° C (+15° F to +130° F) |
| Dimensions, with 780 mAh Li Ion battery | 45.5 mm x 105.4 mm x 15.99 mm<br>(1.79 inches x 4.15 inches x 0.63 inches) |
| Size (Volume) | 69 cc (4.21 $in^3$), with battery |
| Weight | 115.0 grams (4.05 oz), with battery |
| Battery Life, with standard 780 mAh Li-Ion Battery | Talk Time 200 to 400 minutes<br>Standby time 200 to 350 hours<br>All talk and standby times are approximate and depend on network configuration, signal strength, and features selected.<br>Standby times are quoted as a range from DRX=2 to DRX=9.<br>Talk times are quoted as a range from DTX off to DTX on. |
| Battery Charge Time | 4 hours to 90% of 780 mAh capacity |
| Alert volume | Max 95 dB @5cm, 0.5 Watts input |

| Transmitter Function | Specification |
|---|---|
| RF Power Output | 32 dBm nominal GSM 850/900,<br>29 dBm nominal GSM 1800/1900 |
| Output Impedance | 50 ohms nominal |
| Spurious Emissions | -36 dBm from 0.1 to 1 GHz, -30 dBm from 1 to 4 GHz |

| Receiver Function | Specification |
|---|---|
| Receive Sensitivity | Better than -103 dBm |
| RX Bit Error Rate (100k bits) Type II | < 2% |

| Speech Coding Function | Specification |
|---|---|
| Speech Coding Type | Regular pulse excitation/linear predictive coding with long term prediction (RPE LPC with LTP) |
| Bit Rate | 13.0 kbps |
| Frame Duration | 20 ms |

| Speech Coding Function | Specification |
|---|---|
| Block Length | 260 bits |
| Classes | Class 1 bits = 182 bits; Class 2 bits = 78 bits |
| Bit Rate with FEC Encoding | 22.8 kbps |

# Product Overview

Motorola's Z3 GSM wireless telephone incorporates a graphics based user interface (UI) for easy operation, allows multimedia message service (MMS) messaging, and includes personal information manager (PIM) functionality.

The Z3 is a quad-band phone that allows roaming within the GSM 850/900/1800/1900 MHz bands.

Z3 telephones support GPRS and SMS in addition to traditional circuit switched transport technologies.

Z3 telephones feature the new slider form factor. They feature a 176 x 220 1.9" 262K color TFT display. The bottom part of the phone contains the keypad, transceiver printed circuit board (PCB), microphone, flex connection, external accessory connector, smart button, volume buttons, and voice button. The standard 780 mAh Lithium Ion (Li Ion) battery fits behind a removable back cover.

The phone accepts both 3V and 1.8V mini subscriber identity module (SIM) cards which fit into the SIM holder underneath the battery. The Z3 phones use two antenna styles. One style is a fixed stub type antenna. The other antenna style is an internally mounted antenna.

With the optional mobile Phone Tools software™, inexpensive, direct connection to a computer or handheld device is available through the phone's USB port and optional data cable accessory. This connection provides the ability for data and fax calls, and synchronizing phonebook entries.

## Features

Z3 telephones use advanced, self-contained, sealed, custom integrated circuits to perform the complex functions required for GSM GPRS communication. Aside from the space and weight advantage, microcircuits enhance basic reliability, simplify maintenance, and provide a wide variety of operational functions.

Features available in this family of telephones include:

- 2MP camera with 8x zoom and LED flash
- Video capture/playback/streaming w/progressive download
- Large Keys, Dedicated Portal Key
- MMS, WV, EMS, SMS, Wireless Village Instant Messaging
- microSD™ slot for upgradeable memory
- Integrated MP3 player
- Video playback (MPEG4/H.263)
- Push To Talk Over Cellular [PoC]
- World-class talk and standby times
- Loud, clear audio
- Large, color display (176 x 220 pixels, 262K TFT)
- High quality finish
- Bluetooth™ (class 2 w/A2DP support)
- Bluetooth stereo headset compatible
- MP3 ring tones
- Java
- Games (embedded & downloadable)
- PC synchronization via mini USB
- Acoustic reliability with separate speakers for alert and earpiece

- GPRS Class 10

## Speaker Dependent Voice Activation and Voice Note Recording

Voice tags can be used for voice dialing up to 20 phone numbers in the phone book and for creating up to 5 voice shortcuts for menu items. The phone must be "trained" by the voice tag being read into the phone's memory twice before it is recognized.

You can add voice tags to the phone's memory using the usual name addition methods (i.e., via the phone book menu structure or with the shortcut editor).

*You cannot place or receive calls while adding voice tags to the phone's memory.*

*Because the GSM standard does not provide the option to store voice tags onto the SIM card, voice tags are added to the phone's memory.*

Z3 telephones also include a voice recorder that allows up to 2 minutes of personal messages to be recorded. This feature has a complete set of record, playback, and management tools that make it easy to store and maintain a list of personal memos.

## SIM Application Toolkit™ - Class 2

SIM Application Toolkit is a value-added service delivery mechanism that allows GSM operators to customize the services they offer their customers, from the occasional user who requests sports news and traffic alerts, to a high call time business user who receives stock alerts and checks flight times. Operators can now create their own value-added services menu quickly and easily in the phone. The customized menu will appear as the first menu and may be updated over-the-air with new services when customers request them.

## Simplified Text Entry

There are three different ways to enter text using the phone keypad:

- iTAP™ predictive text entry. Press a key to generate a character and a dynamic dictionary uses this to build and display a set of word or name options. The iTAP™ feature may not be available on the phone in all languages.
- Tap. Press a key to generate a character.
- Numeric. The keypad produces numeric characters only. For some text areas this is the only method available; for example, phone numbers.

# General Operation

## Controls, Indicators, and Input / Output (I/O) Connections

The Z3 telephone's controls are located on the sides of the device and on the keypad. Indicators, in the form of icons, are displayed on the LCD (see Figure 3). Z3 phones have an audible alert transducer on the top and I/O connectors, consisting of a headset jack and an accessory port, located on the top and bottom of the phone. See Figure 1.


**Figure 1. Controls, indicators, and I/O**

"Soft keys" refer to non-labeled keys that correspond to text options displayed on the screen. The left and right soft keys perform the function shown in the corners of the display. The right key will usually select an option whereas the left key will usually exit a function or return to a previous screen.

The center key opens the initial menu structure, or allows access to a submenu.

The Volume Keys, Smart key, Voice command key, and Camera key controls are located on the sides of the Z3 (see Figure 2).

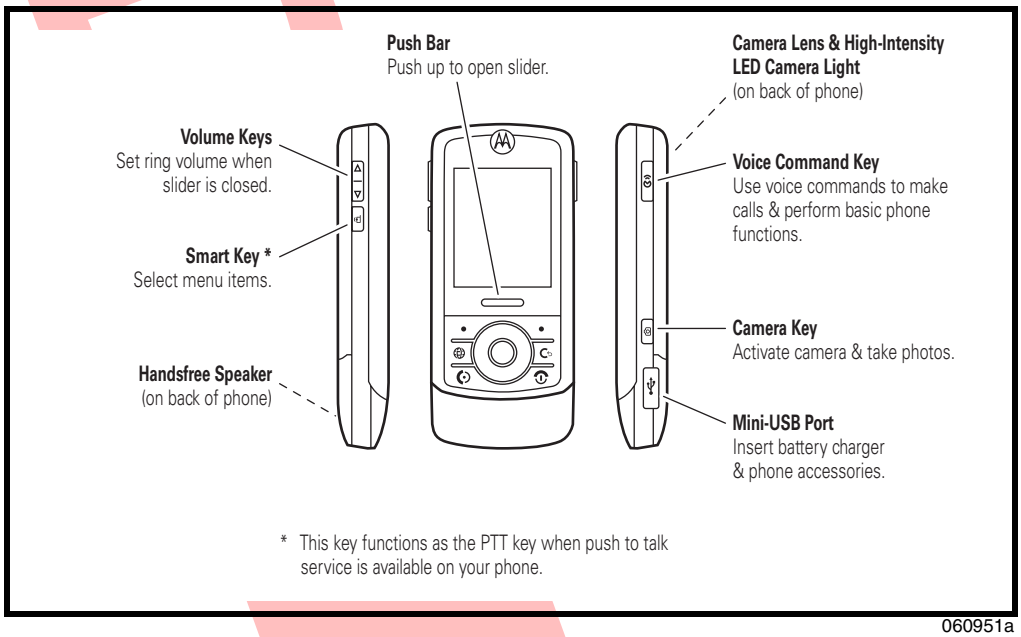


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**Figure 2. Controls, indicators, and I/O (Side Views)**

## Color Display

The Z3 wireless phone features a 262K color Thin Film Transistor (TFT) 176 x 220 pixel display.

Display animation makes the phone's menus move smoothly as the user scrolls up and down. Turn animation off to conserve the battery.

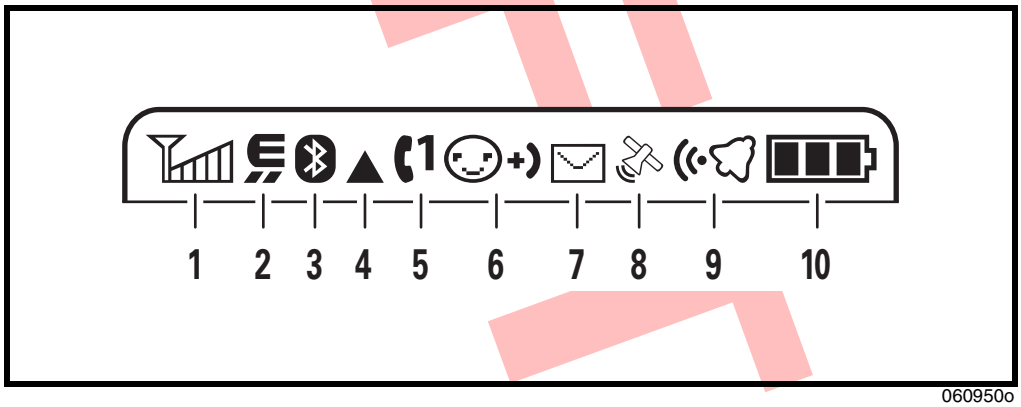


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**Figure 3. Icon Indicators**

*Whether a phone displays all indicators depends on the programming and services to which the user subscribes.*

Figure 3 shows some common icons displayed on the LCD.

1. **Signal Strength Indicator —** Vertical bars show the strength of the network connection. You cannot make or receive calls when ▼ or ▼⊘ displays.
2. **GPRS Indicator —** Shows that your phone is using a high-speed Enhanced Data for GSM Evolution (EDGE) or General Packet Radio Service (GPRS) network connection. Indicators can include:
   - = EDGE connection
   - = GPRS connection
3. **Data Indicator —** Shows connection and data transmission status. The Bluetooth™ wireless connection indicator shows when a Bluetooth connection is active. Other indicators can include:
   - = secure packet data transfer
   - = unsecure packet data transfer
   - = secure application connection
   - = unsecure application connection
   - = secure Circuit Switch Data (CSD) call
   - = unsecure CSD call
4. **Roam Indicator —** The roam indicator ▲ shows when your phone is seeking or using another network outside your home network.
5. **Active Line Indicator —** Shows to indicate an active call, or to indicate that call forwarding is on. Indicators for dual-line-enabled SIM cards can include:
   - = GPRS PDP context active
   - = GPRS packet data available
   - = line 1 active = line 2 active
   - = line 1 active, call forward on
   - = line 2 active, call forward on

   a. When push to talk (PTT) service is available on your phone, indicators show when you can make and receive PTT calls () or both PTT calls and Instant Messages ().
6. **Messaging Presence Indicator —** Shows when instant messaging is active. Indicators can include:
   - = IM active = available for IM
   - = busy = invisible to IM
   - = available for phone calls
   - = offline

When a Java™ application is active, the Java midlet indicator displays in this location.

7. **Message Indicator —** Displays when you receive a new message. Indicators can include:
   - = text message
   - = voicemail message
   - = voicemail and text message
   - = IM message
   - = active chat session
8. **Battery Level Indicator —** Vertical bars show the battery charge level. Recharge the battery when Low Battery displays and the battery alert sounds.

9. **9. Ring Style Indicator —** Shows the ring style setting.
   = loud ring = soft ring
   = vibrate = vibrate then ring
   = vibrate & ring = silent

## Alert Settings

Z3 telephones include up to 32 preset alert tones and vibrations that can be applied to all alert events at the same time.

*Pressing either volume key will mute the alert.*

## Battery Function

### Battery Gauge

The telephone displays a battery level indicator icon in the idle screen to indicate the battery charge level. The gauge shows four levels: 100%, 66%, 33%, and Low Battery.

### Battery Removal

Removing the battery causes the device to immediately shut down and any pending work (for example, partially entered phone book entries or outgoing messages) is lost.

*To ensure proper memory retention, turn OFF the phone before removing the battery. Immediately replace the old battery with a fresh battery.*

*If the battery is removed while receiving a message, the message will be lost.*

# Tools and Test Equipment

The following table lists tools and test equipment recommended for disassembly and reassembly of Z3 telephones. Use either the listed items or equivalents.

**Table 1. General Test Equipment and Tools**

| Part Number[1] | Description | Application |
|---|---|---|
| RSX4043-A | Torque Driver | Used to remove and replace screws |
| — | Torque Driver Bit T-5, Apex 440-6I Torx or equivalent | Used with torque driver |
| See Table 7 | Rapid Charger | Used to charge battery and to power device |
| 0180386A82 | Antistatic Mat Kit (includes 66-80387A95 antistatic mat, 66-80334B36 ground cord, and 42-80385A59 wrist band) | Provides protection from damage to device caused by electrostatic discharge (ESD) |
| 6680388B67 | Disassembly tool, plastic with flat and pointed ends (manual opening tool) | Used during assembly/disassembly of device |
| 6680388B01 | Tweezers, plastic | Used during assembly/disassembly |
| | Tweezers, metal | Used during assembly/disassembly |
| 0-00-00-40841[2] | Flex connector removal tool | Used for Flip and Vibrator Flex removal |

1. To order in North America, contact Motorola Aftermarket and Accessories Division (AAD) at (800) 422-4210 or FAX (800) 622-6210; Internationally, AAD can be reached by calling (847) 538-8023 or faxing (847) 576-3023.
2. Available from AMS Software & Elektronik GmbH, c/o Holger Grube, Lise-Meitner-Straße 9 D-24941, Flensburg Tel.: +49-461-90398-0 Fax: +49-461-90398-50
3. Not available from Motorola. To order, contact Hewlett Packard at (800) 452-4844.

# Disassembly

The procedures in this section provide instructions for the disassembly of Z3 telephones. Tools and equipment used for the phone are listed in Table 1, preceding.

*Many of the integrated devices used in this equipment are vulnerable to damage from electrostatic discharge (ESD). Ensure adequate static protection is in place when handling, shipping, and servicing the internal components of this equipment.*

*Avoid stressing the plastic in any way to avoid damage to either the plastic or internal components.*

## Removing and Replacing the Battery Cover and Battery

*All batteries can cause property damage and/or bodily injury, such as burns if a conductive material, such as jewelry, keys, or beaded chains touch exposed terminals. The conductive material may complete an electrical circuit (short circuit) and become quite hot. Exercise care in handling any charged battery, particularly when placing it inside a pocket, purse, or other container with metal objects.*

1. Ensure the phone is turned off.
2. Press in and hold the battery door latch, as shown in Figure 4.


**Figure 4. Removing the Battery Door**

3. Lift the battery cover up and over the battery, and lift it off the phone.

4. Lift up the side edge of the battery first, then lift it completely out of the battery compartment. See Figure 5.

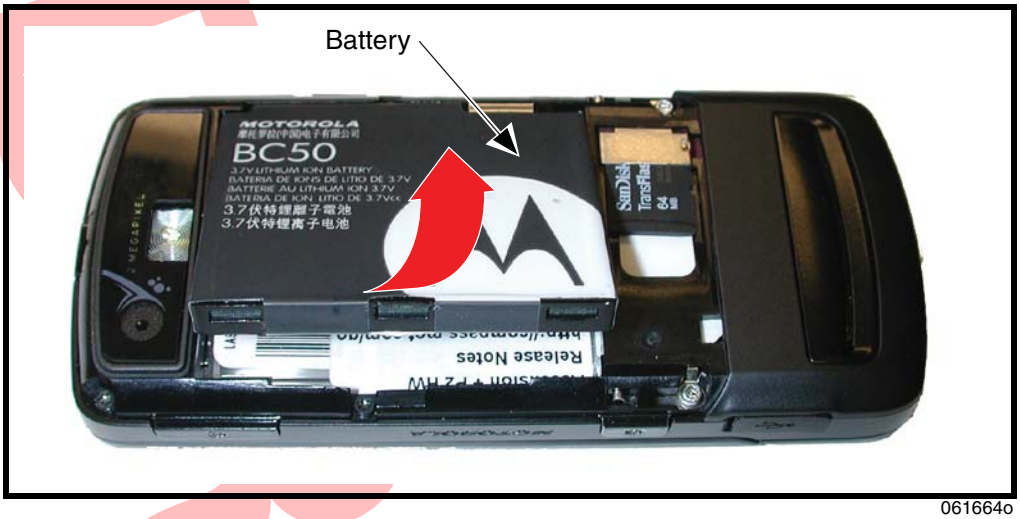


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**Figure 5. Removing the battery**

*There is a danger of explosion if the Lithium Ion battery is replaced incorrectly. Replace only with the same type of battery or equivalent as recommended by the battery manufacturer. Dispose of used batteries according to the manufacturer's instructions.*

5. To replace, align the battery with the battery compartment so the contacts on the battery match the battery contacts in the phone.
6. Insert the side edge of the battery into the battery compartment, with the contacts facing downward.
7. Insert the opposite edge of the battery into the battery compartment.
8. Lower the battery cover onto the phone, and press down slightly on the cover to engage the battery latch.

*Do not use the extended battery cover when using a standard battery. The battery could separate from the contacts in the battery compartment resulting in a loss of power.*

## Removing and Replacing the Trans Flash Memory Module

1. Remove the battery cover as described in the procedures.
2. Slide the Trans Flash memory module out of its socket to release as shown in Figure 6.

*The battery does not need to be removed to access the memory module.*

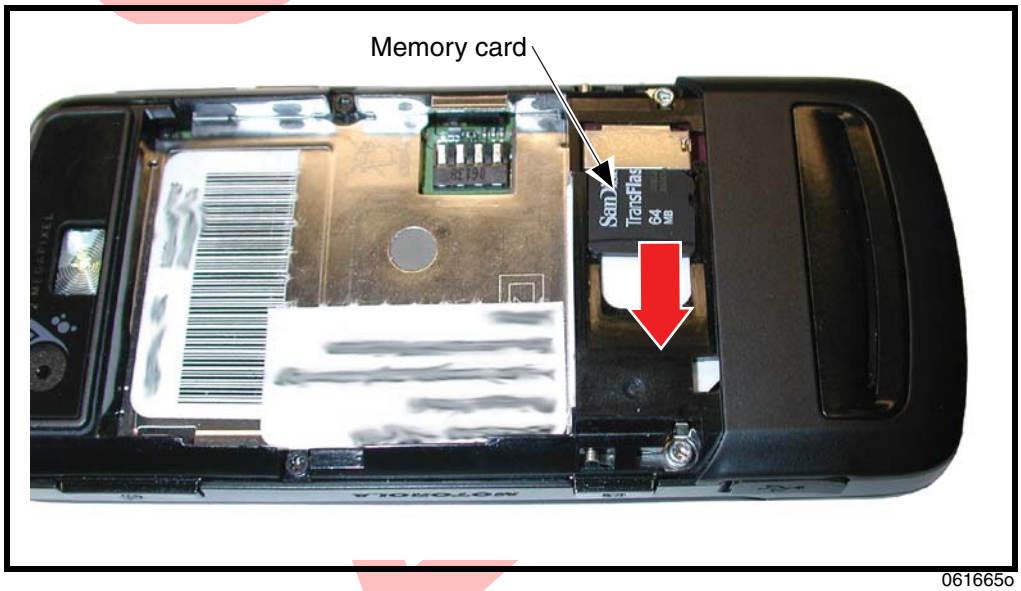


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**Figure 6. Removing the Memory Card**

3. To replace, slide the memory card into its slot. The memory card can be correctly inserted only one way.
4. Replace the battery cover.

## Removing and Replacing the Subscriber Identity Module (SIM)

1. Remove the battery door and battery as described in the procedures.
2. Slide the SIM out of the slot as indicated by the arrow (see Figure 7).
3. Carefully remove the SIM from the phone.

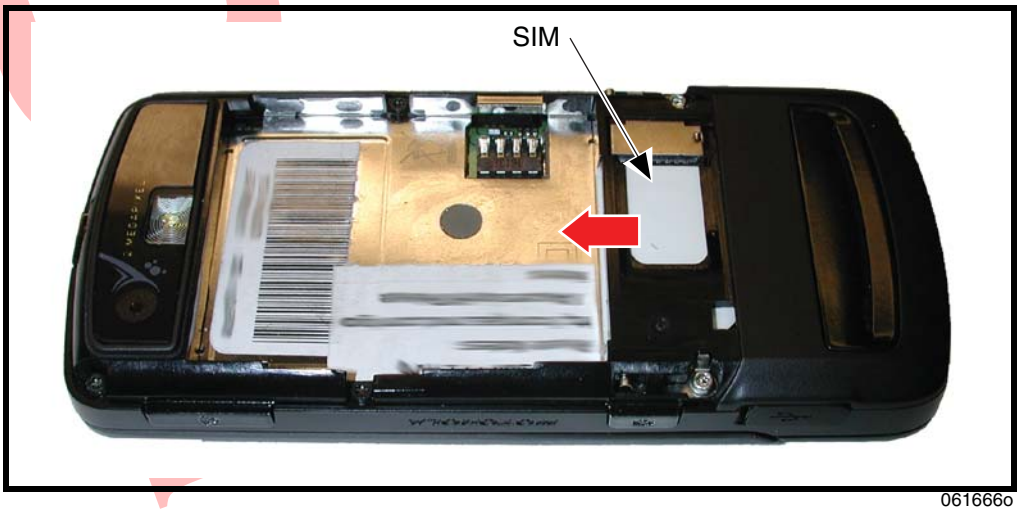


**Figure 7. Removing the SIM**

4. To replace, slide the SIM into the holder, ensuring the notched corner of the SIM aligns with the notch molded into the holder.
5. Replace the battery and battery door as described in the procedures.

## Removing and Replacing the Rear Housing

*This product contains static-sensitive devices. Use anti-static handling procedures to prevent electrostatic discharge (ESD) and component damage.*

1. Remove the battery cover, battery, and SIM as described in the procedures.

*In addition to 4 screws, the rear housing assembly is fastened with plastic latches. These are fragile and should be released with care.*

2. Using a Torx driver with a T-5 bit, remove the 6 screws along the sides of the rear housing. Retain the screws for reassembly. See Figure 8.

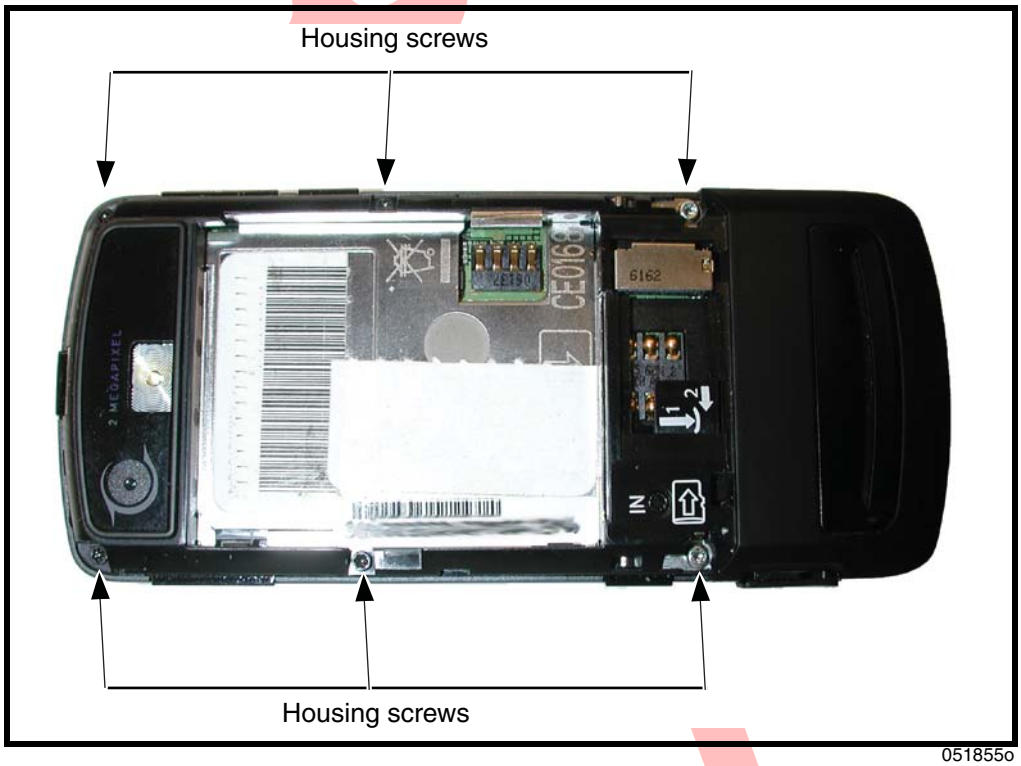


**Figure 8. Removing the Rear Housing Screws**

3. Lift up the rear housing as shown in fig 1 and insert the flat end of the disassembly tool into the opening.

4. Slide the black stick along the housing edge as shown in Fig 9 to disengage the snaps.

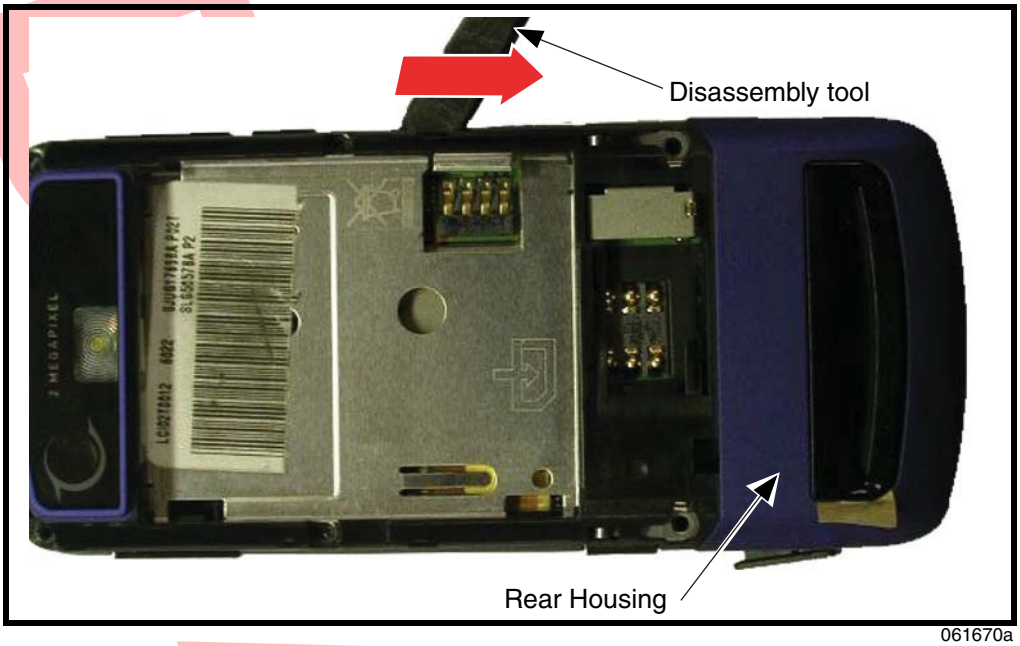


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**Figure 9. Removing the Rear Housing**

5. Pay special attention to the snaps at the bottom near the corners. Snaps must be pushed in to disengage.

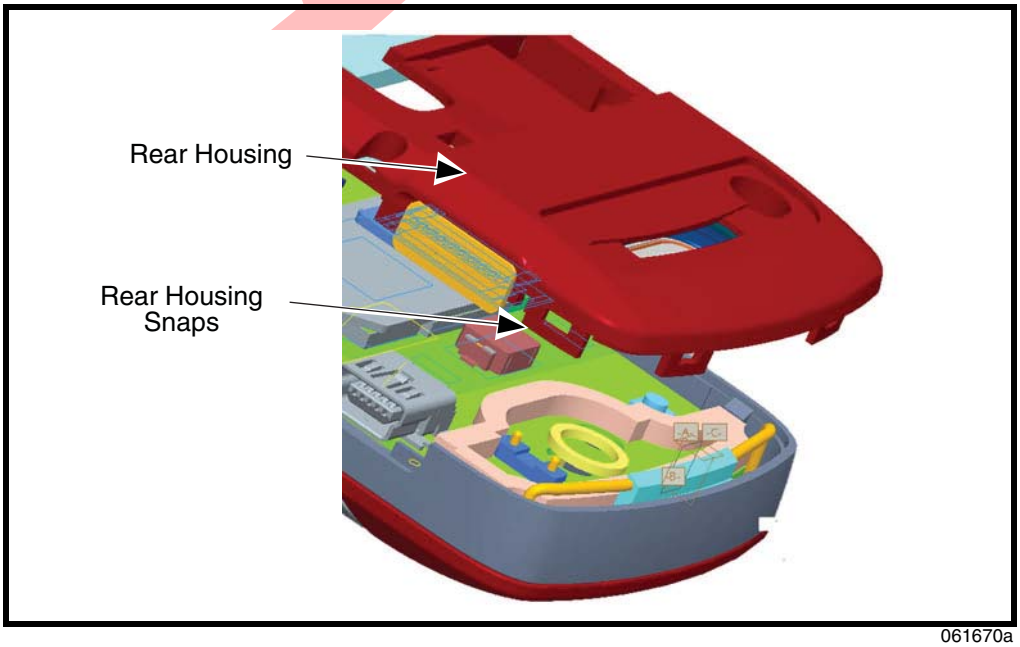


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**Figure 10. Removing the Rear Housing**

6. When all the snaps are disengaged, carefully lift the rear housing straight up and away from the phone.
7. To replace, carefully align the rear housing to the phone, then press the front and rear housings together until the catches snap into place.
8. Replace the 6 rear housing screws and tighten with a T5 driver to a final torque setting of 16 Ncm (1.5 lbf in). Do not over tighten.
9. Replace the SIM, battery, and battery cover as described in the procedures.

## Removing the Daughter Board Assembly

1. Remove the battery cover, battery, SIM, antenna, rear housing as described in the procedures.
2. Remove the acoustic gasket with the tweezers. Set the gasket aside for re-assembly unless damaged (see Figure 11).

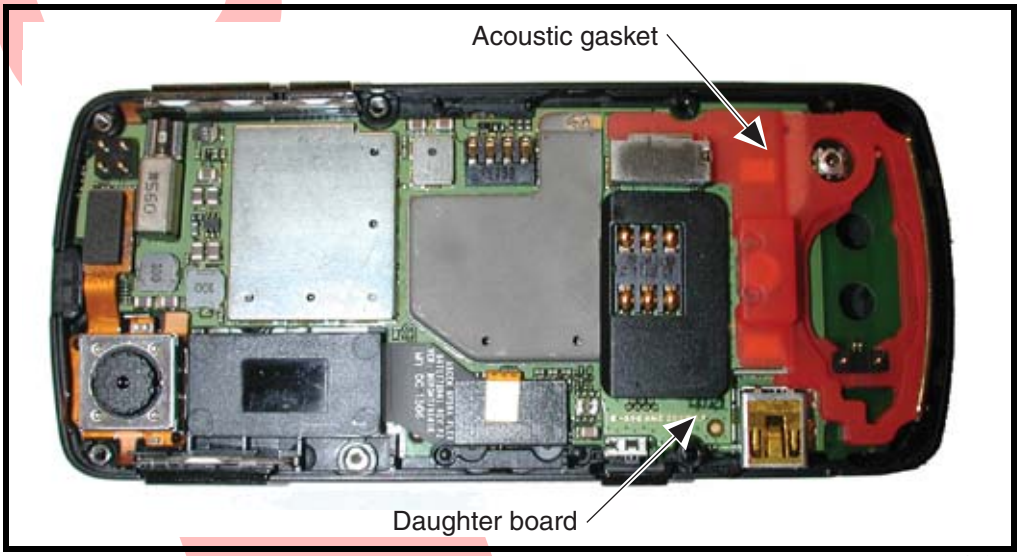


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**Figure 11. Removing the Acoustic Gasket**

3. Insert the disassembly tool under the daughter board and rotate it to unseat the daughter board connector from the transceiver board assembly.

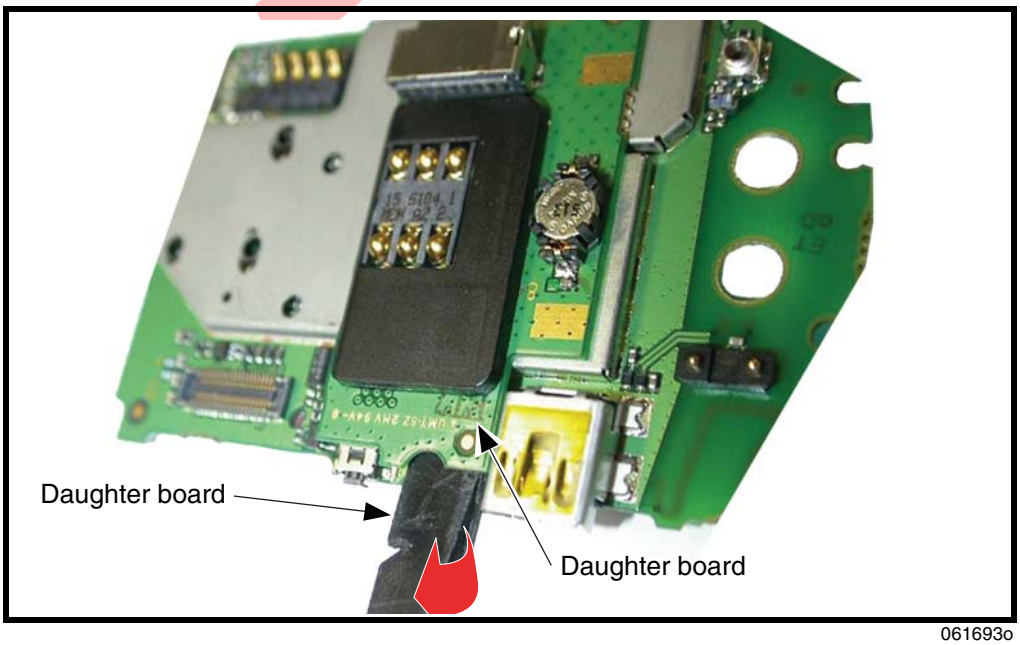


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**Figure 12. Removing the Daughter Board Assembly**

## Removing and Replacing the Transceiver Board Assembly

*This product contains static-sensitive devices. Use anti-static handling procedures to prevent electrostatic discharge (ESD) and component damage.*

1. Remove the battery cover, battery, SIM, antenna, rear housing as described in the procedures.

*The flexible printed cable (FPC) (flex) is easily damaged. Exercise extreme care when handling.*

2. Carefully slide the end of the disassembly tool under the flex connector and rotate the tool slightly to lift the connector from its socket on the transceiver board. See Figure 13. Pay special attention to the electrical components around the connector. Do not touch any components with the black stick.

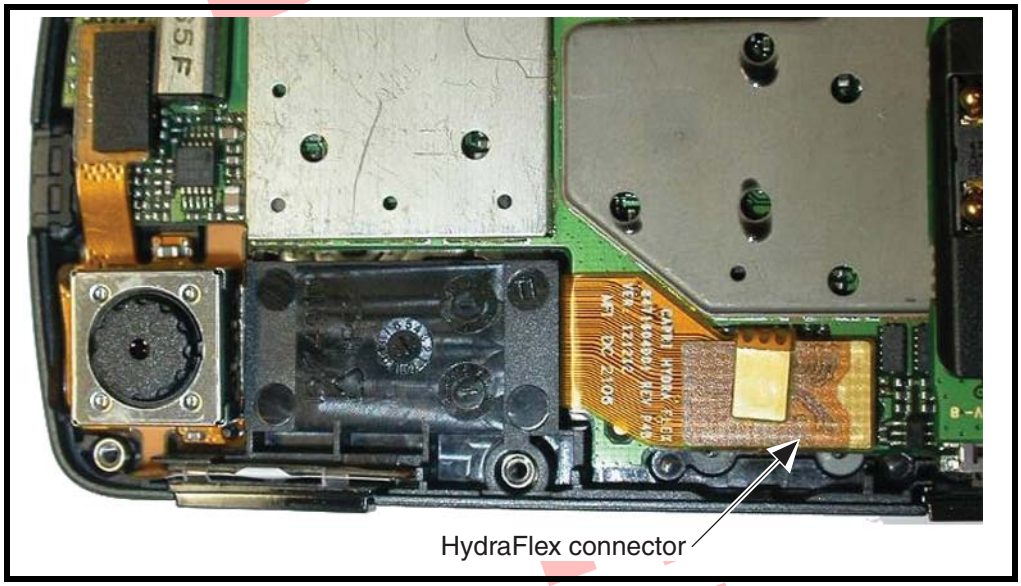


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**Figure 13. Disconnecting the Flex From the Transceiver Board**

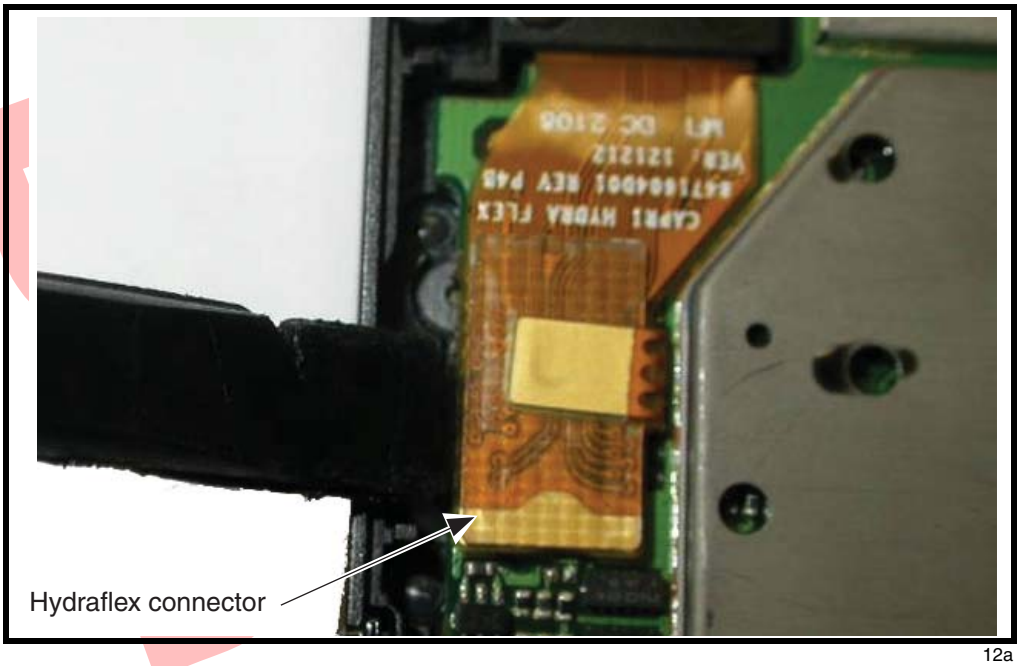


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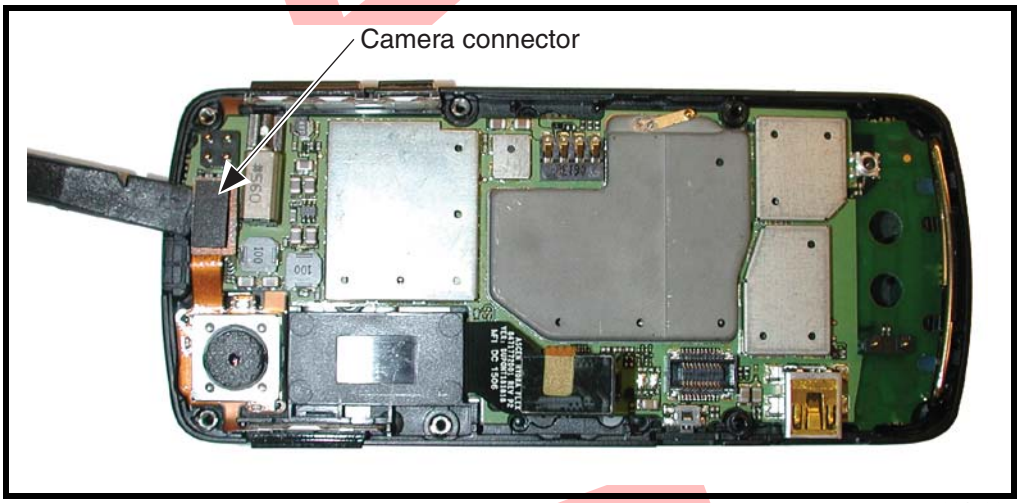
**Figure 14. Disconnecting the HydraflexConnector From the Transceiver Board**

3. Carefully slide the end of the disassembly tool under the camera flex connector and rotate the tool slightly to lift the connector from its socket on the transceiver board (see Figure 15).

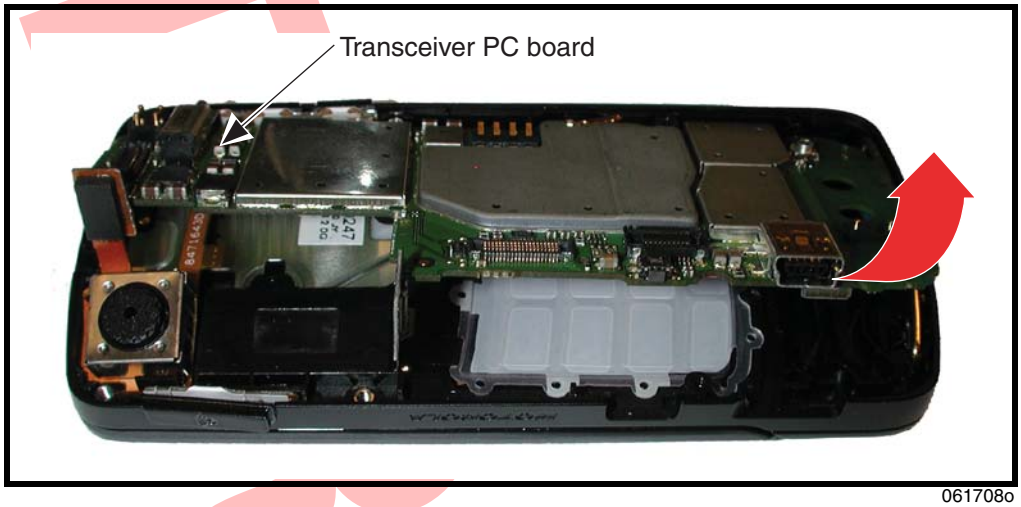



061706o

**Figure 15. Removing the Camera Connector**

*The flexible printed cable (FPC) (flex) is easily damaged. Exercise extreme care when handling.*

4. Carefully lift the EMU connector side of the transceiver board out of the front housing. Lift the PC board out of the phone (see Figure 16).

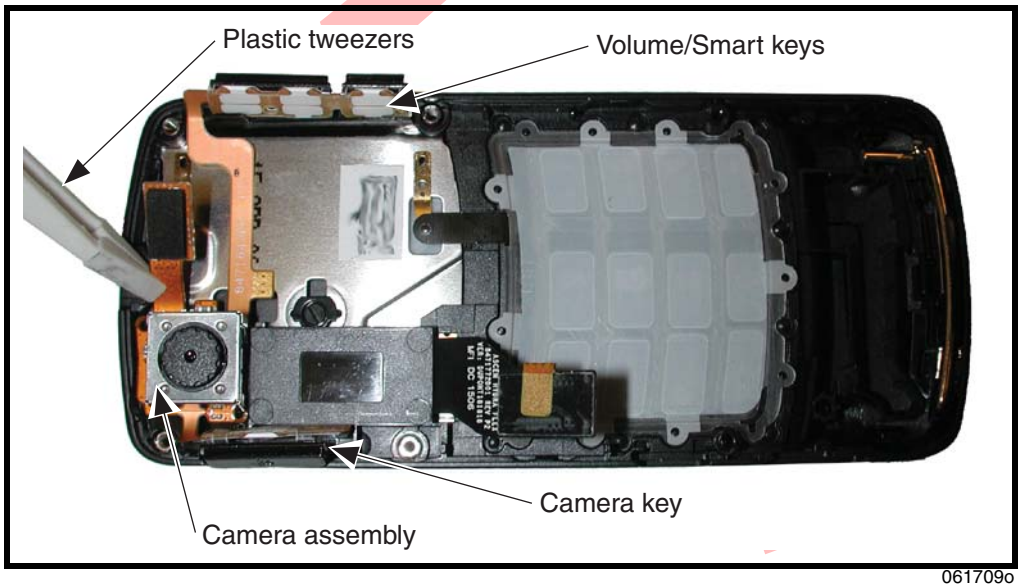



061708o

**Figure 16. Removing the Transceiver PC Board Assembly**

5. Carefully use the plastic tweezers to lift the camera assembly and side keys from the phone (see Figure 17).

*The flexible printed cable (FPC) (flex) is easily damaged. Exercise extreme care when handling.*




061709o

**Figure 17. Removing the Camera Assembly**

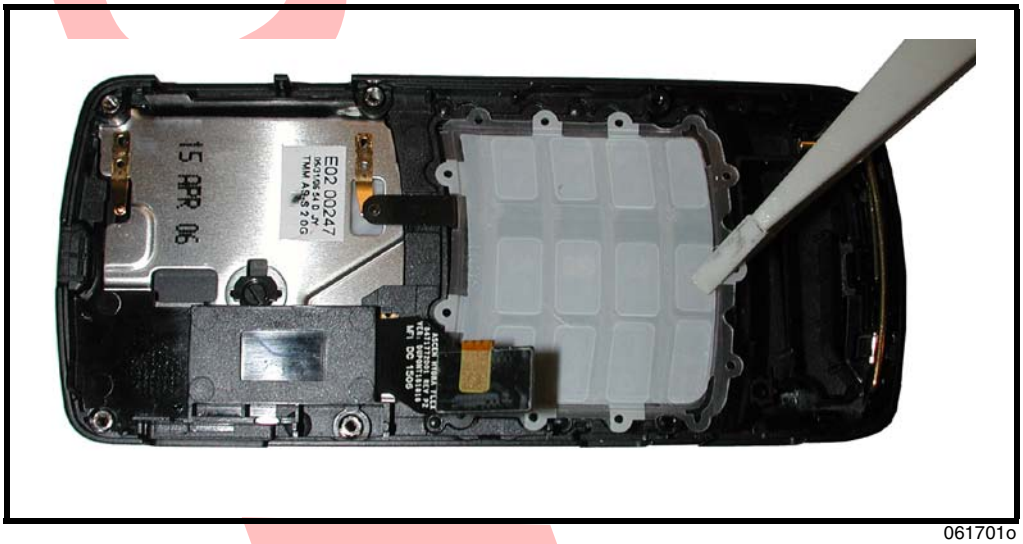
6. To replace, place the camera assembly into the housing. Ensure the external side key switchdomes on both sides of the phone are correctly inserted behind the keys.
7. Insert the transceiver board assembly into the front housing with the display flex and the camera assembly flex connector on top of the transceiver PC board assembly.

*Be sure the volume/smart buttons and voice button are correctly positioned in relation to the corresponding switches on the transceiver board. Verify operation of the buttons after replacing the transceiver board and rear chassis assembly.*

8. Insert the camera flex and display flex connectors squarely into their mating connectors on the transceiver board and press gently but firmly until they snap into place.
9. Replace the daughterboard assembly, rear housing, antenna, SIM, battery, and battery cover as described in the procedures.

## Removing and Replacing the Keypad

1. Remove battery cover, battery, SIM, antenna, rear housing, daughter board assembly, and transceiver board assembly as described in the procedures.
2. Using the plastic tweezers, lift the keypad assembly, away from the front housing assembly (see Figure 18).




061701o

**Figure 18. Removing the Keypad**

3. To replace, carefully set the keypad assembly into the front housing assembly. Ensure the volume/smart key keypads will contact the switchdome assembly on the transceiver board when installed.
4. Insert the keypad into the front housing, use the guide pins molded into the front housing to ensure the keypad is placed correctly in the front housing.
5. Replace the transceiver board assembly, daughter board assembly, rear housing assembly, antenna, SIM, battery, and battery cover as described in the procedures.

## Removing and Replacing the Antenna

1. Remove battery cover, battery, SIM, rear housing, daughter board assembly, transceiver board assembly, and keypad as described in the procedures.
2. Insert the disassembly tool under the antenna assembly and rotate the disassembly tool to raise the antenna assembly out of the front housing.

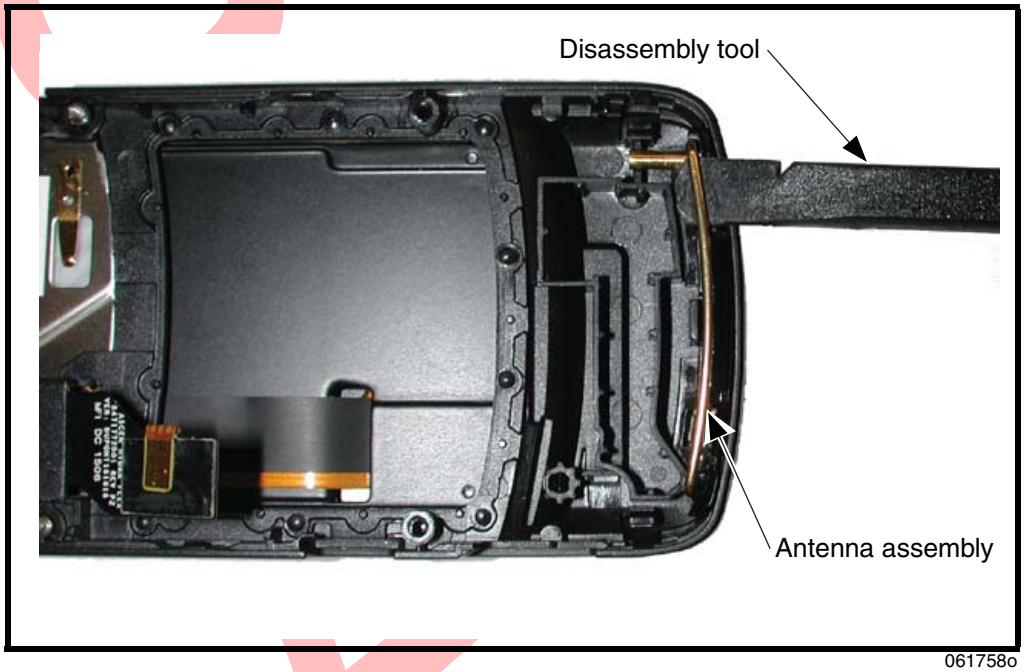



**Figure 19. Removing the Antenna**

3. To replace, align the antenna to the front housing.
4. Gently lower the antenna assembly into the front housing until the antenna assembly snaps engage the latches in the front housing.
5. Replace the keypad, transceiver board assembly, keypad, daughter board assembly, rear housing, SIM, battery, and battery cover as described in the procedures.

## Removing the Front Housing

1. Remove battery cover, battery, SIM, rear housing, daughter board assembly, transceiver board assembly, keypad, and the antenna as described in the procedures.

*The hydraflex can be easily damaged. Use extreme caution during this next step.*

2. Use the disassembly tool to disconnect the front housing snaps from the metal guide.

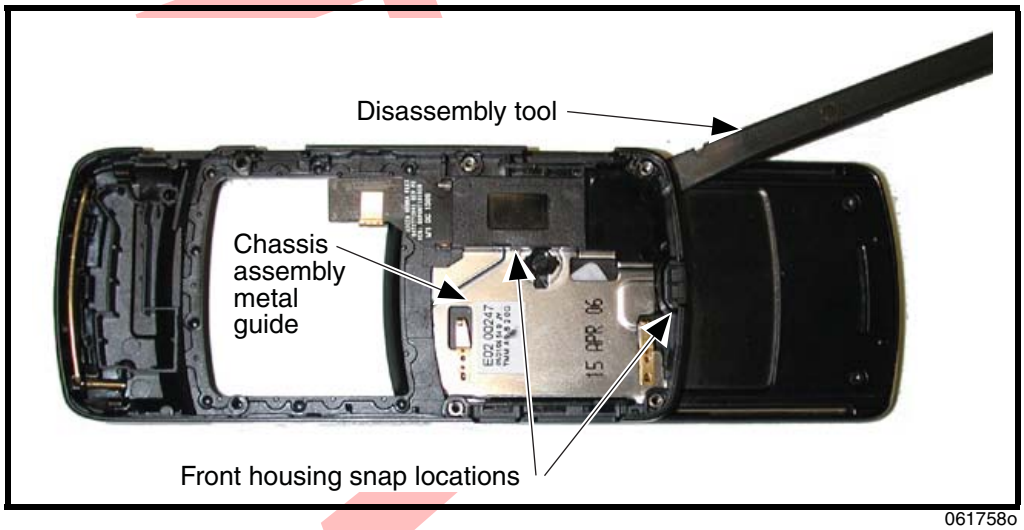



**Figure 20. Removing the Front Housing Snaps**

3. After the snaps are disengaged, lift up the front housing straight upward. Route the hydraflex carefully through the opening in the front housing without damaging the flex.

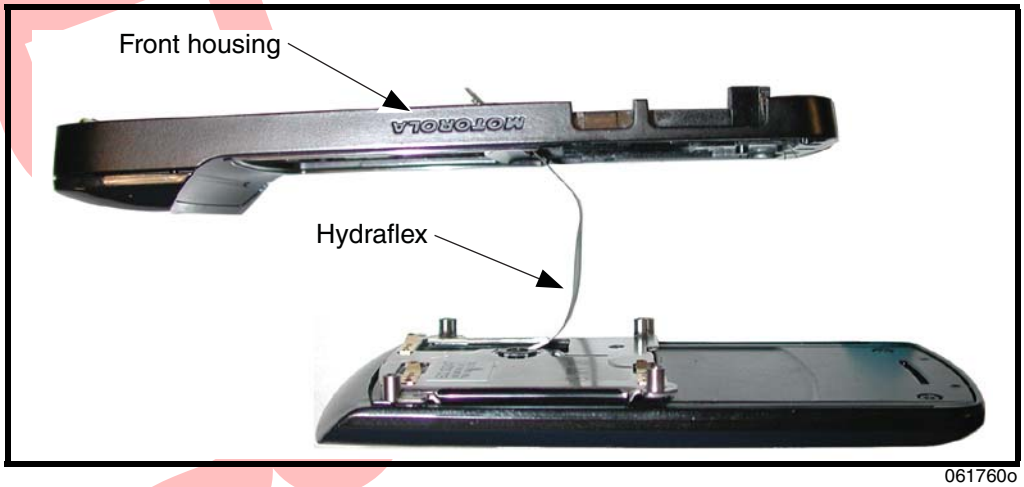



**Figure 21. Removing the Front Housing**

4. To replace, carefully thread the hydraflex through the opening in the front housing.
5. Lower the front housing onto the chassis assembly metal guide.
6. Press down on the front housing to engage the two housing snaps to the chassis metal guide.
7. Replace the keypad, transceiver board assembly, daughter board assembly, rear housing, SIM, battery, and battery cover as described in the procedures.

## Removing the Slider Assembly

1. Remove battery cover, battery, SIM, rear housing, daughter board assembly, transceiver board assembly, keypad, and front housing as described in the procedures.

*The hydraflex can be easily damaged. Use extreme caution during this next step.*

2. Use the T5 driver to remove the 2 slider screws from the slider assembly.

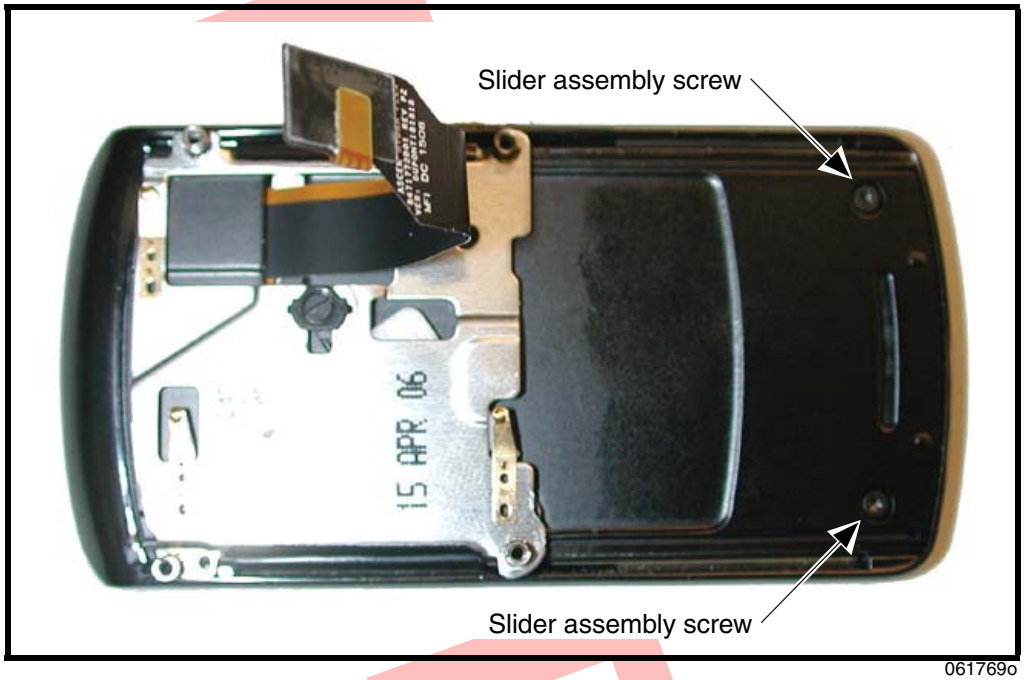



**Figure 22. Removing the Slider Assembly Screws**

3. Use the disassembly tool to lift only the top end of the slider inner assembly out of the slider outer assembly. Leave the bottom end attached.

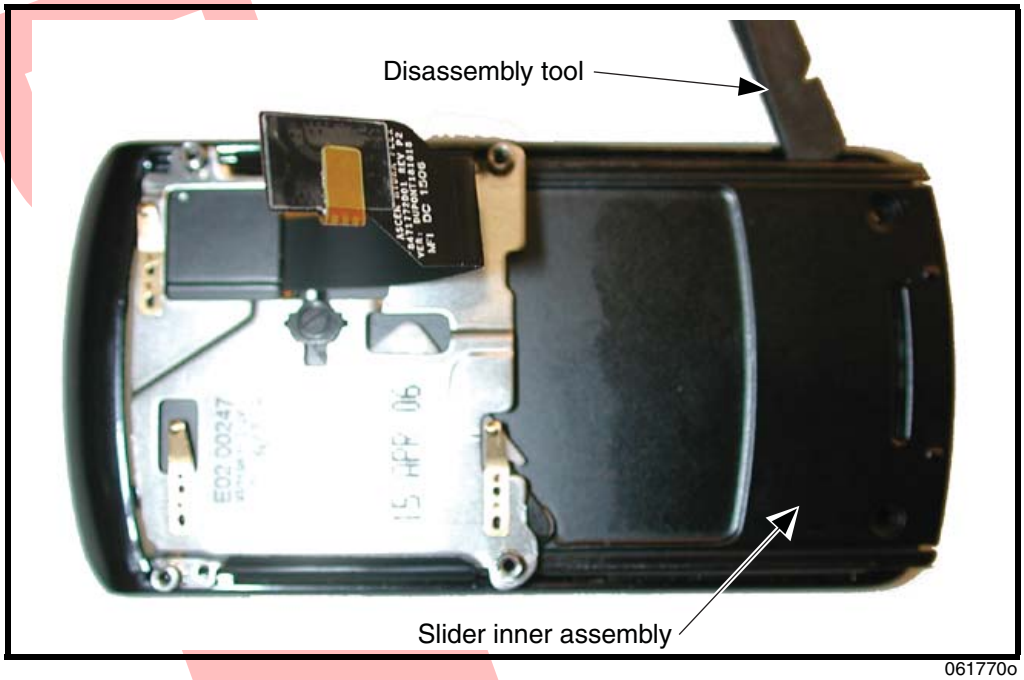



**Figure 23. Removing the Slider Assembly Screws**

4. Rotate the slider inner assembly upward, to expose the keypad flex connector which is still attached to the slider outer assembly.


**Figure 24. Removing the Keypad Flex Connector**

5. Use the disassembly tool to unseat the keypad flex connector. Ensure the electrical components around the connector are not damaged.
6. Remove the slider front housing from the slider "mag" assembly.
7. To replace, align the slider front housing to the slider "mag" assembly.
8. Insert the keypad end of the slider front housing to the slider mag assembly.
9. Connect the keypad flex connector to the slider "mag" assembly.
10. Lower the top end of the slider inner assembly onto the slider "mag" assembly.
11. Insert and tighten the 2 T5 slider assembly screws. Tighten screws to 1.1 +/- 0.1 in-lbf. Do not overtighten.
12. Replace the front housing, transceiver board assembly, daughter board assembly, rear housing, SIM, battery, and battery as described in the procedures.

## Removing and Replacing the Display Module

1. Remove the battery cover, battery, SIM, rear housing, daughter board assembly, transceiver board assembly, keypad, front housing, and slider assembly as described in the procedures.
2. Use the disassembly tool to unlock the zero insertion force (ZIF) connector.

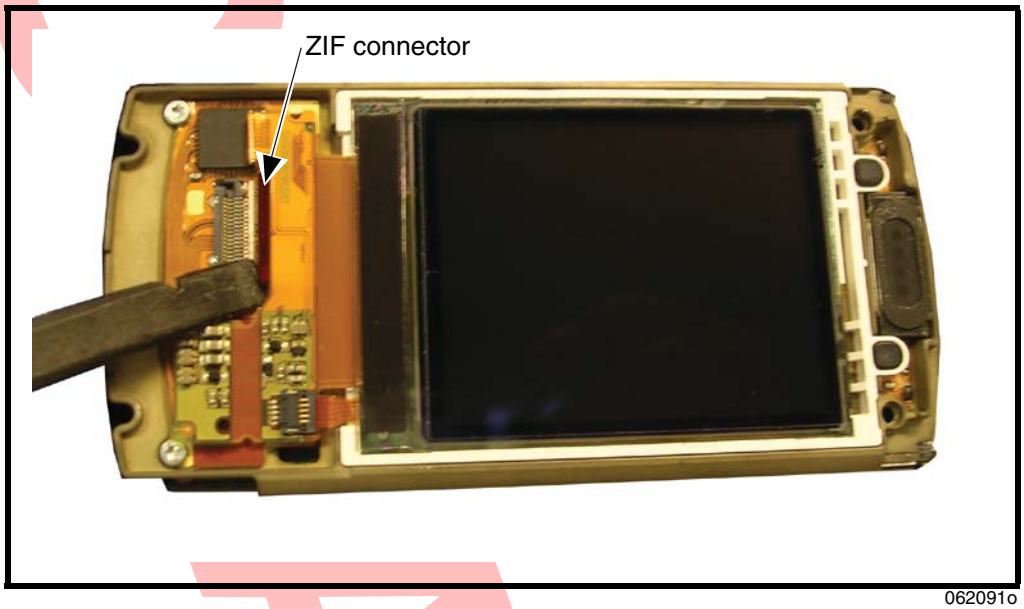



**Figure 25. Unlocking the Display Module ZIF Connector**

3. Use the plastic tweezers to lift up the opposite end of the display module.
4. Carefully remove the display module out of the ZIF connector and away from the slider assembly.
5. To replace, align the display module to the slider assembly.
6. Lower the display module into the slider assembly.
7. Insert the display module connector into the ZIF socket.
8. Use the pointed end of the disassembly tool to close and lock the ZIF connector.
9. Replace the slider assembly, front housing, keypad, transceiver board assembly, daughter board assembly, rear housing, SIM, battery, and battery cover as described in the procedures.

# Subscriber Identity Module (SIM) and Identification

## SIM Card

A SIM is required to access the existing local GSM network, or remote networks when traveling (if a roaming agreement has been made with the provider).

The SIM contains:

- All the data necessary to access GSM services.
- The ability to store user information, such as phone numbers.
- All information required by the network provider to provide access to the network.

## Personality Transfer

A personality transfer is required when a phone is express exchanged or when the main board is replaced. Personality transfers reproduce the customer's original personalized details, such as menu and stored memory, such as phone books, or even just program a unit with basic user information such as language selection. Z3 telephones use Mobile Phone Tools software to effect a personality transfer.

## Identification

Each Motorola GSM device is labeled with a variety of identifying numbers. The following information describes the current identifying labels.

### Mechanical Serial Number (MSN)

The Mechanical Serial Number (MSN) is an individual unit identity number and remains with the unit throughout the life of the unit.

The MSN can be used to log and track a unit on Motorola's Service Center Database.

The MSN is divided into 4 sections as shown in Figure 26.

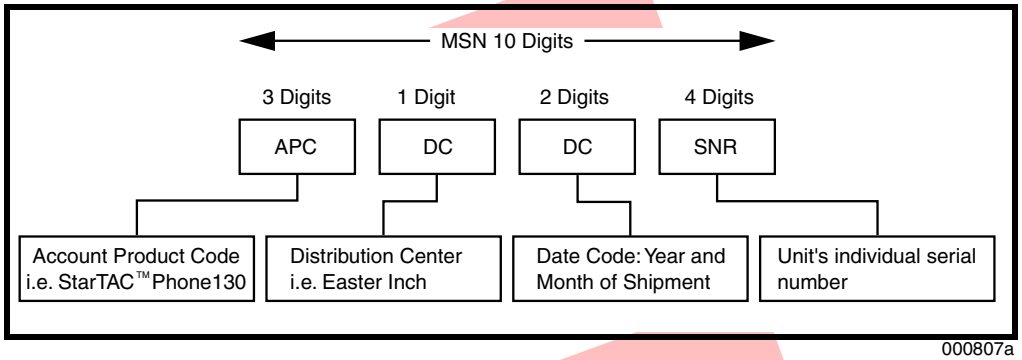



**Figure 26. MSN Label breakdown**

## International Mobile Station Equipment Identity (IMEI)

The International Mobile station Equipment Identity (IMEI) number is an individual number unique to the PCB and is stored within the unit's memory.

The IMEI uniquely identifies an individual mobile station and thereby provides a means for controlling access to GSM networks based on mobile station types or individual units. The full IMEI structure is listed in Table 2.

**Table 2. IMEI Number Breakdown**

| TAC | Serial Number | Check Digit |
|---|---|---|
| NNXXXXXX | ZZZZZZ | A |

Where

**TAC** Type Allocation Code, formerly known as Type Approval Code

**NN** Reporting body identifier

**XXXXXX** Type Identifier

**ZZZZZZ** Individual unit serial number

**A** Phase 1 = 0.
Phase 2 = check digit defined as a function of all other IMEI digits

Other label number configurations present are:

- **TRANSCEIVER NUMBER**: Identifies the product type. Normally the SWF number. (i.e. V100).
- **PACKAGE NUMBER**: Identifies the equipment type, mode, and language in which the product is shipped.

# Troubleshooting

## Manual Test Mode

Motorola Z3 telephones are equipped with a manual test mode capability. This allows service personnel to verify functionality and perform fault isolation by entering keypad commands.

To enter the manual test command mode, a GSM/DCS test SIM must be used.

1. Press ⏻ to turn the phone OFF.
2. Remove the battery as described in the procedures.
3. Remove the customer's SIM card from the phone as described in the procedures.
4. Insert the test SIM into the SIM slot.
5. Replace the battery as described in the procedures.
6. Press ⏻ to turn the phone ON.

## Manual Test Mode Commands

**Table 3. Manual Test Commands**

| Key Sequence | Test Function/Name | Remarks |
|---|---|---|
| <Menu>048263* | Enter manual test mode | |
| "End" Key | Exit manual test mode | |
| 54* | Suspend | Required for all Test Mode Operations |
| 0*0*0 | Select tone 0 | |
| 0*0*1 | Select tone 1 | |
| 0*0*2 | Select tone 2 | |
| 0*0*3 | Select tone 3 | |
| 0*0*4 | Select tone 4 | |
| 0*0*5 | Select tone 5 | |
| 0*0*6 | Select tone 6 | |
| 0*0*7 | Select tone 7 | |
| 0*0*8 | Select tone 8 | |
| 0*0*9 | Select tone 9 | |
| 0*1*X | Disable tone X | |
| 5*0*0 | Set audio level 0 | |
| 5*0*1 | Set audio level 1 | |
| 5*0*2 | Set audio level 2 | |
| 5*0*3 | Set audio level 3 | |
| 5*0*4 | Set audio level 4 | |
| 5*0*5 | Set audio level 5 | |
| 5*0*6 | Set audio level 6 | |
| 5*0*7 | Set audio level 7 | |
| 5*0*8 | Set audio level 8 | |
| 5*0*9 | Set audio level 9 | |

**Table 3. Manual Test Commands (Continued)**

| Key Sequence | Test Function/Name | Remarks |
|---|---|---|
| 5*0*10 | Set audio level 10 | |
| 5*0*11 | Set audio level 11 | |
| 5*0*12 | Set audio level 12 | |
| 5*0*13 | Set audio level 13 | |
| 5*0*14 | Set audio level 14 | |
| 5*0*15 | Set audio level 15 | |
| 6*2*2*0*0 | Set Audio Path. Int Mic, IntSpk, RX unmute, TX unmute | |
| 6*4*6*0*0 | Set Audio Path. Boom Mic, Boom Spk, RX unmute, TX unmute | |
| 10*0*3 | Set band GSM 900 | |
| 10*0*4 | Set band DCS 1800 | |
| 10*0*5 | | |
| 10*0*6 | Set dual band GSM 900 / 1800 | |
| 10*1*0 | Read band | 3= GSM 4= DCS 5= PCS 6 =GSM/DCS |
| 18*0 | Initialize non-volatile memory (Master Reset) | |
| 18*1 | Initialize non-volatile memory (Master Clear) | |
| 55*2*001 | Test Display. All pixels ON | |
| 55*2*000 | Test Display. All pixels OFF | |
| 55*2*002 | Test Display. Checkerboard pattern A | |
| 55*2*003 | Test Display. Checkerboard pattern B | |
| 55*2*004 | Test Display. Border pixels ON | |
| *#06# | IMEI Check | No Test Mode Required |
| Phone Set up --> Phone Status --> Other Information | Flex Version / Technology / S-W Version / Readiness Status | No Test Mode Required |

# Troubleshooting Chart

**Table 4. Level 1 and 2 Troubleshooting Chart**

| SYMPTOM | PROBABLE CAUSE | VERIFICATION AND REMEDY |
|---|---|---|
| 1. Telephone will not turn on or stay on. | a) Battery either discharged or defective. | Measure battery voltage across a 50 ohm (>1 Watt) load. If the battery voltage is <3.25 Vdc, recharge the battery using the appropriate battery charger. If the battery will not recharge, replace the battery. If battery is not at fault, proceed to b. |
| | b) Battery connectors open or misaligned. | Visually inspect the battery connectors on both the battery and the telephone. Realign and, if necessary, either replace the battery or refer to a Level 3 Service Center for the battery connector replacement. If battery connectors are not at fault, proceed to c. |
| | c) Transceiver board assembly defective. | Refer service to authorized Level 3 service center for replacement. |
| 2. Telephone exhibits poor reception or erratic operation, such as calls frequently dropping or weak or distorted audio. | a) Antenna assembly defective. | Check to make sure that the antenna pin is properly connected to the transceiver board assembly. If connected properly, substitute a known good antenna. If the fault is still present, proceed to b. |
| | b) Transceiver board assembly defective. | Refer service to authorized Level 3 service center for replacement. |
| 3. Display is erratic, or provides partial or no display. | a) Transceiver board connections faulty. | Remove rear chassis assembly from unit, check general condition of flexible printed cable (flex). If the flex is good, check that the flex connector is fully pressed down. If not, check connector to transceiver board connections. If faulty connector, replace the transceiver board assembly. If connector is not at fault, proceed to b. |
| | b) Flip assembly defective. | Temporarily replace the flip assembly with a known good assembly. If fault has been cleared, reassemble with the new flip assembly. If fault not cleared, proceed to c. |
| | c) Transceiver board assembly defective. | Refer service to authorized Level 3 service center for replacement. |
| 4. Incoming call alert transducer audio distorted or volume is too low. | a) Faulty alert transducer | Replace with a known good alert transducer. Verify that the fault has been cleared and reassemble the unit with the new alert transducer. If fault not cleared, proceed to b. |
| | b) Faulty transceiver board assembly. | Refer service to authorized Level 3 service center for replacement. |
| 5. Telephone transmit audio is weak. (usually indicated by called parties complaining of difficulty in hearing voice). | a) Microphone connections to the transceiver board assembly defective. | Gain access to the microphone as described in the procedures. Check connections. If connector is faulty proceed to c; if the connector is not at fault, proceed to b. |
| | b) Microphone defective. | Gain access to microphone. Disconnect and substitute a known good microphone. Place a call and verify improvement in transmit signal as heard by called party. If good, reassemble with new microphone. If microphone is not at fault, reinstall original microphone and proceed to c. |
| | c) Transceiver board assembly defective. | Refer service to authorized Level 3 service center for replacement. |

**Table 4. Level 1 and 2 Troubleshooting Chart (Continued)**

| SYMPTOM | PROBABLE CAUSE | VERIFICATION AND REMEDY |
|---|---|---|
| 6. Receive audio from earpiece speaker is weak or distorted. | a) Connections to or from transceiver board assembly defective. | Gain access to the transceiver board assembly as described in the procedures. Check flex and the flex connector from the slider assembly to the transceiver board assembly. If flex is at fault, replace slider assembly. If flex connector is at fault, proceed to d. If connection is not at fault, proceed to b. |
| | b) Slider assembly defective. | Temporarily replace the slider assembly with a known good assembly. If fault has been cleared, reassemble with the new slider assembly. If fault not cleared, proceed to c. |
| | c) Antenna assembly defective. | Check to make sure the antenna is installed correctly. If the antenna is installed correctly, substitute a known good antenna assembly. If this does not clear the fault, reinstall the original antenna assembly and proceed to d. |
| | d) Transceiver board assembly defective. | Refer service to authorized Level 3 service center for replacement. |
| 7. Telephone will not recognize or accept SIM. | a) SIM defective. | Check the SIM contacts for dirt. Clean if necessary and check if fault has been cleared. If the contacts are clean, insert a known good SIM into the telephone. Power up the unit and confirm that the SIM has been accepted. If the fault no longer exists, replace the defective SIM. If the SIM is not at fault, proceed to b. |
| | b) Transceiver board assembly defective. | Send unit to authorized level 3 service center for transceiver PC board replacement. |
| 8. Phone does not sense when flip is opened or closed (usually indicated by inability to answer incoming calls by opening the flip, or inability to make outgoing calls). | a) Transceiver board assembly defective. | Refer service to authorized Level 3 service center for replacement. |
| 10. Internal Charger not working. | Faulty charger circuit on transceiver board assembly. | Refer service to authorized Level 3 service center for replacement. |
| 11. Real Time Clock resetting when standard battery is removed. | Lithium button cell in the display board may be depleted. | Refer service to a Level 3 service center for replacement. |

## Programming: Software Upgrade and Flexing

Contact your local technical support engineer for information about equipment and procedures for flashing and flexing.

## Part Numbers

The following information is provided as a reference for the parts associated with Z3 telephones.

## Exploded View Diagram

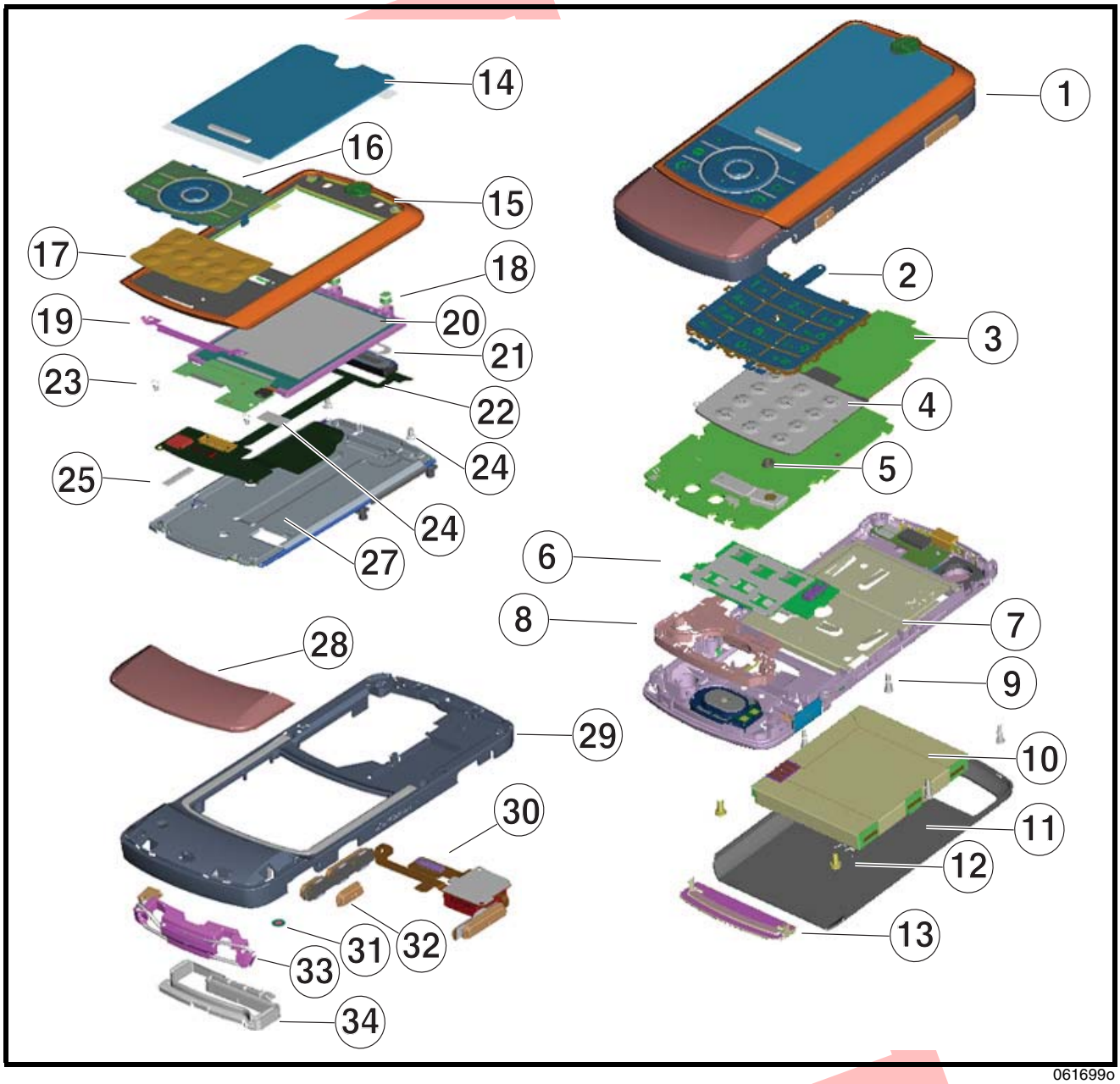



**Figure 27. Exploded View Diagram (Sheet 1)**

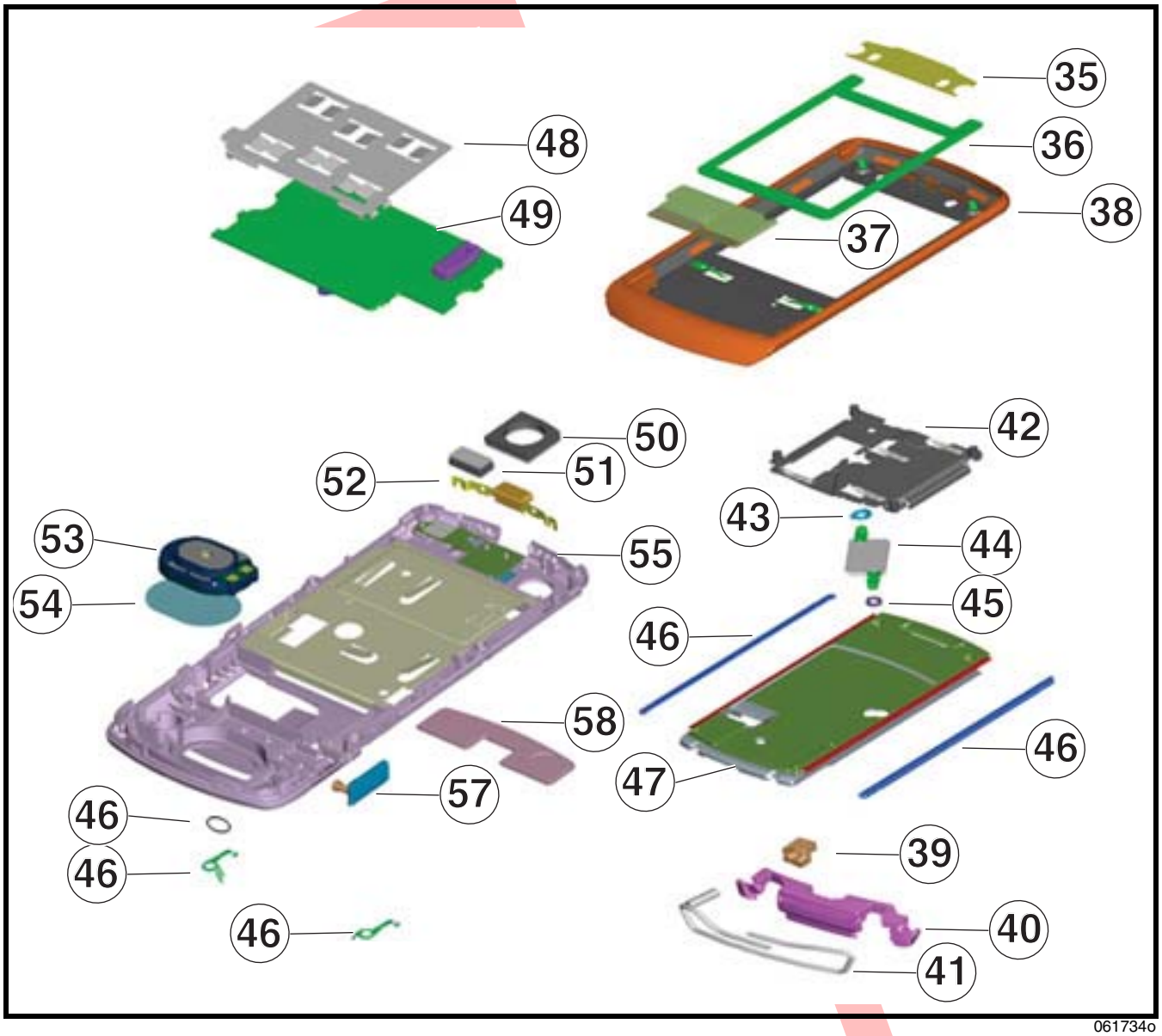



**Figure 28. Exploded View Diagram (Sheet 2)**

## Parts List

Part numbers are provided only as a reference. Contact your local Motorola parts organization for current part number information.

**Table 5. Parts List**

| Item | Motorola Part No. | Description |
|---|---|---|
| 1 | 0171646D | Slide assembly |
| 2 | 3871530D01 | Main keypad |
| 3 | 8471322D01 | Main board assembly |
| 4 | 4071686D01 | EL panel, dome array assembly |
| 5 | 3287434Y01 | Microphone mesh gasket |
| 6 | 01714220E01 | Daughter board assembly |
| 7 | 0171697D | Base back housing assembly |
| 8 | 3271526D01 | Rear side acoustic seal |
| 9 | 0371117F01 | Machined shoulder screws |
| 10 | 0188392P01 | Battery, 750 mAh, SC4 |
| 11 | 0387791L09 | Thread forming screws |
| 12 | 1571524D | Battery Cover |
| 13 | 0171893D | Rear Cap Assembly |
| 14 | 6171490D01 | Main glass lens |
| 15 | 0171696D | Slide outer housing assembly |
| 16 | 3871529D01 | Slide keypad assembly |
| 17 | 0171652D01 | Slide keypad flex assembly |
| 18 | 3271735E01 | LED gasket |
| 19 | 4171200F01 | Slide bottom ground spring |
| 20 | 7271696E01 | Display module assembly |
| 21 | 1171772E01 | Earpiece speaker gasket |
| 22 | 0171651D01 | Hydra flex assembly |
| 23 | 0371235E04 | Magnesium forming screws |
| 24 | 0371064E04 | Slide standard head screws |
| 25 | 5970377C03 | Hall effect magnet |
| 26 | 1171178F01 | Hydra flex adhesive |
| 27 | 0171647D01 | Slide inner housing assembly |
| 28 | 1571527D | Top cap housing |
| 29 | 0171648D | Base front housing assembly |
| 30 | 0171756D02 | Daughter flex camera/key assembly |
| 31 | 3587505Y01 | Mic screen |
| 32 | 3871523D03 | Side camera button |
| 33 | 0171650D01 | Antenna spacer assembly |
| 34 | 3271525D01 | Front side acoustic seal |
| 35 | 3271489D01 | Earpiece speaker gasket grill cloth |
| 36 | 3271488D01 | Display dust gasket |
| 37 | 7571867D01 | Flex poron |
| 38 | 0171417E | Slide outer medallion assembly |
| 39 | 0771222F01 | Antenna connector support |
| 40 | 1571519D01 | Antenna spacer housing |
| 41 | 8571611D01 | Main antenna |
| 42 | 2771496D01 | Guide metal chassis assembly |
| 43 | 4371944D01 | Guide metal delrin collar |
| 44 | 5571586D01 | Slider mechanism spring |
| 45 | 4371826E01 | Slide inner bushing |
| 46 | 4671486D01 | Slide rail |
| 47 | 1571485D01 | Slide inner housing |
| 48 | 4271764E01 | Waffle ground clip |
| 49 | 8471915D01 | Daughter board assembly |

**Table 5. Parts List (Continued)**

| Item | Motorola Part No. | Description |
|---|---|---|
| 50 | 7571045E01 | Camera Gasket |
| 51 | 7571046E01 | Camera connector poron |
| 52 | 5571518D01 | Door latch |
| 53 | 5071508D03 | Polyphonic speaker, 14x20 |
| 54 | 1171109E01 | Speaker adhesive |
| 55 | 1571505D | Base back housing |
| 56 | 5471536C01 | Water detect label, 3mm diameter |
| 57 | 1571495D01 | USB door |
| 58 | 6171503D01 | Camera lens |
| 59 | 4171340E02 | Battery door ground spring, right |
| 60 | 4171340E01 | Battery door ground spring, left |

To order parts you may use the following link:

https://wissc.motorola.com/wissc_root/main/BrowserOK.html

(Password is Required)

For information on ordering parts please contact EMEA at + 49 461 803 1404.

*There is a danger of explosion if the Lithium Ion battery pack is replaced incorrectly. Replace only with the same type of battery or equivalent as recommended by the battery manufacturer. Dispose of used batteries according to the manufacturer's instructions.*


MOTOROLA