MOTOROLA

Level 1 and 2 Service Manual

A835, A845

Wireless Telephones

A845: GSM 850/1800/1900 and WCDMA 1900 MHz

A835: GSM 900/1800/1900 and WCDMA 2100 MHz

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 which enable 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 the housing. 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.

Computer Program Copyrights

The Motorola products described in this manual may include Motorola computer programs stored in semiconductor memories or other media that are copyrighted with all rights reserved worldwide to Motorola. Laws in the United States and other countries preserve for Motorola, Inc. certain exclusive rights to the copyrighted computer programs, including the exclusive right to copy, reproduce, modify, decompile, disassemble, and reverse-engineer the Motorola computer programs in any manner or form without Motorola's prior written consent. Furthermore, the purchase of Motorola products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license or rights under the copyrights, patents, or patent applications of Motorola, except for a nonexclusive license to use the Motorola product and the Motorola computer programs with the Motorola product.

About This Service Manual

Using this service manual and the suggestions contained in it assures proper installation, operation, and maintenance of A835 and A845 telephones. Refer questions about this manual to the nearest Customer Service Manager.

Audience

This document aids service personnel in testing and repairing A835 and A845 telephones. Service personnel should be familiar with electronic assembly, testing, and troubleshooting methods, and with the operation and use of associated test equipment.

Use of this document 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.

Scope

This document provides basic information, 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

Special characters and typefaces, listed and described below, are used in this publication 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 appears in the display. For example, ALERTS.

Information that you need to type is printed in **boldface type**

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. Customer phones that fail very early on after the date of sale, are to be returned 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 phones 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). The Motorola High Technology 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 should be arranged 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.

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

U.S.A.	Outside U.S.A.
Phone: 800-422-4210	Phone: 847-538-8023
FAX: 800-622-6210	FAX: 847-576-3023

To order parts online, visit:
https://servicelink3.motorola.com.
(contact the EMEA Service Parts Group for the password required)

You can contact the EMEA Service Parts Group at:
+49 461 803 1638.

Specifications

Table 1. Specifications

General Function	Specification
Frequency Range GSM 850 (Model A845 Only)	TX: 824.2 - 848.8 MHz Frequency (MHz) = 824.2 + (0.2 n-128)where: 128 ≤n ≤251 RX: 869.2-893.8 MHz Frequency (MHz) = 869.2 + (0.2 (n - 128)) where: 128 ≤ n ≤251
Frequency Range EGSM	**TX**: 876 - 915 MHz Frequency (MHz) = 890 + (0.2 × n) where: 0 ≤n ≤124 Frequency (MHz) = 890 + (0.2 × (n – 1024)) where: 955 ≤n ≤1023 **RX**: 921 – 960 MHz Frequency (MHz) = 935 + (0.2 × n) where: 0 ≤n ≤124 Frequency (MHz) = 935 + (0.2 × (n – 1024)) where: 955 ≤n ≤1023
Frequency Range DCS	**TX**: 1710 to 1785 MHz Frequency (MHz) = 1710 + (0.2 × (n – 511)) where: 512 ≤n ≤885 **RX**: 1805.2 to 1879.8 MHZ Frequency (MHz) = 1805 + (0.2 × (n – 511)) where: 512 ≤n ≤885
Frequency Range PCS	**TX**: 1850 to 1910 MHz Frequency (MHz) = 1850 + (0.2 × (n – 511)) where: 512 ≤n ≤810 **RX**: 1930 to 1990 MHZ Frequency (MHz) = 1930 + (0.2 × (n – 511)) where: 512 ≤n ≤810
Frequency Range UMTS	**TX**: 1920 to 1980 MHz Frequency (MHz) = UARFCN[1] ÷ 5, where: 9612 ≤ UARFCN[1] ≤ 9888 UARFCN[1] in increments of 25 **RX**: 2110 to 2170 MHz Frequency (MHz) = UARFCN[1] ÷ 5, where: 10562 ≤ UARFCN[1] ≤ 10838 UARFCN[1] in increments of 25
Frequency Range UMTS Band II (Model A845 only)	**TX**: 1850 -1910 MHz Frequency (MHz) = UARFCN[1] ÷ 5, where: 9262 ≤ UARFCN[1] ≤ 9538 Additional channels: 1852.5, 1857.5, 1862.5, 1867.5, 1872.5, 1877.5, 1882.5, 1887.5, 1892.5, 1897.5, 1902.5, 1907.5 MHz **RX**: 1930 -1990 MHz Frequency (MHz) = UARFCN[1] ÷ 5, where: 9662 ≤ UARFCN[1] ≤ 9938 Additional channels: 1932.5, 1937.5, 1942.5, 1947.5, 1952.5, 1957.5, 1962.5, 1967.5, 1972.5, 1977.5, 1982.5, 1987.5 MHz
Channel Spacing	200 kHz (GSM, DCS, PCS), 5MHz UMTS
Channels	174 EGSM, 374 DCS, 274 PCS carriers with 8 ch. Per carrier, 12 UMTS maximum
Duplex Spacing	45 MHz GSM, 95 MHz DCS, 80 MHz PCS, 80 MHz UMTS
Modulation	GMSK AT BT = 0.3 (GSM, DCS, PCS), QPSK (UMTS)
Transmitter Phase Accuracy	5 degrees RMS, 20 degrees peak
Frequency Error	± 0.1ppm
Input/Output Impedance	50 ohms (nominal)
Nominal Operating Voltage	3.6 Vdc ±10% (battery) +4.4 Vdc ±10% (external connector)
Dimensions (Volume)	135 x 53 x 24.2 (mm), 5.3 x 2.1 x 0.95 (in)
Volume	138 cc
Weight	157 g, 5.54 oz

Table 1. Specifications

General Function	Specification
Display	TFT active full-color display (64k colors) 176 x 220 pixel EL Backlighting 5 row x 15 character: SMS & Phonebook
Battery Life (800mAh)[2]	**GSM:** Up to 460 min (Talk Time), up to 300 hours (Standby) **WCDMA:** Up to 140 min (Talk Time), up to 300 hours (Standby)
Nominal Temperature Range	-20º C to +50º C

[1]UTRA Absolute Radio Frequency Channel Number (UARFCN)

[2]All talk time and standby times are approximate and depend on network configuration, signal strength, and features selected

Table 2. GSM System

General Function	Specification
Speech Coding Type	Regular Pulse excitation / linear predictive coding with long term prediction (RPE LPC with LTP)
Bit Rate	13.0 kbps
RF Power Output	32 dBm nominal GSM, 30 dBm nominal DCS / PCS
Receive Sensitivity	-107 dBm GSM, -105 dBm DCS / PCS
RX Bit Error Rate	< 2%

Table 3. UMTS System

General Function	Specification
Speech Coding Type	Adaptive Multirate (AMR)
RF Power Output	21 dBm
Error Vector Magnitude	< 15%
PN9 Bit Error Rate (VER)	0.1% @12.2k, 0.1% @64k, 0.1% @384k
ACLR	-33 dBm @$\pm$5 MHz, -43 dBm @$\pm$10 MHz

Product Overview

The A835 and A845 are 3G (3rd generation) devices that will deliver on the "promise" of 3G by providing high speed network access and rich multimedia content all in a superior voice-centric unit. A video camera and Assisted GPS provide additional value by offering unique business and entertainment solutions.

The mechanical architecture features a 176 x 220 pixel, 0.198mm pitch TFT active color display, a built-in speaker phone, and a removable Li-Polymer battery. The architecture enables full postponement of the front housing and battery door cover by allowing the transceiver brick assembly, keypad, display, microphone, and earpiece speaker to be fully assembled and retained within the rear housing chassis.

Front covers may then be snapped in at distribution based on specific orders. Front housing branding is accomplished through thermal transfer decals.

As a 3G product, the A835 and A845 comply with all key specifications as defined by the 3GPP. Key product features are:

- UMTS: (A835 only) WCDMA 2100, GSM 900/1800 and 1900-MHz Tri-band technology,
- UMTS: (A845 only) WCDMA 1900, GSM 850/1800 and 1900-MHz Tri-band technology,
- GPRS High speed packet data (64kbps UL, 384 kbps DL)
- 176 x 220 TFT Active Color, 64K colors
- 64MB Integrated Flash Memory
- Integrated Bluetooth
- MP3 Player
- Enhanced Multimedia Capability (Audio/Video, Games, MMS)
- Unique 5-way Navigation Key
- New graphical user interface
- Enhanced internet browser (XHTML)
- Full Personal Information Manager (PIM) with SyncML Synchronization (OTA, Desktop)
- Integrated Video/Still Camera and GPS
- Voice Recognition Driven Dialing and Menu Shortcuts
- Voice Note Voice Recorder
- Polyphonic Speakerphone
- Programmable (J2ME)
- iTAP™ Predictive Text Entry
- Integrated Stereo Headset Jack

Note: The listed features may be Network, subscription, or service provider dependent. Not available in all areas.

A835 and A845: Video Camera and Location Solutions

Video Camera Features:

- JPEG Image Capture @ VGA Resolution
- MPEG4 Video Capture @ QCIF Resolution
- Streaming Video
- Tightly Coupled, Ergonomic Design
- Initial User Applications:
    - Sending captured Video Clips and Pictures through MMS, Email, or Internet channels

- Simultaneous Voice/Data – Take a picture or video clip and send while you're on the phone

- Future Capabilities:
  - Video Conferencing (2-Way Video Telephony)

Location (AGPS) Applications:

- Get to specific location, with appropriate choices of destinations and routes and guidance to destination
- Identify local places of interest for hotels, taxi companies, restaurants, theatres, sightseeing, and shopping
- Receive information through alerts or display on map ahead of traffic congestion.
- Receive roadside assistance, with rescue service network and location information from the cellular network used to complement any information the pedestrian/driver is able to separately give.
- E911 Services: When roaming on a 2-2.5G GSM E-OTD-enabled network the mobile phone will respond to a request for location when making an emergency call.
- Push, Tracking & B2B Applications such as corporate tracking, routing, fleet management, and Buddy tracking (alert)

General Operation

Controls, Indicators, and Input/Output (I/O) Connectors

The A835 and A845 telephone's controls are located on the front of the phone, and on the keyboard as shown. Indicators, in the form of icons, are displayed on the LCD (see "Color Display" on page 14).

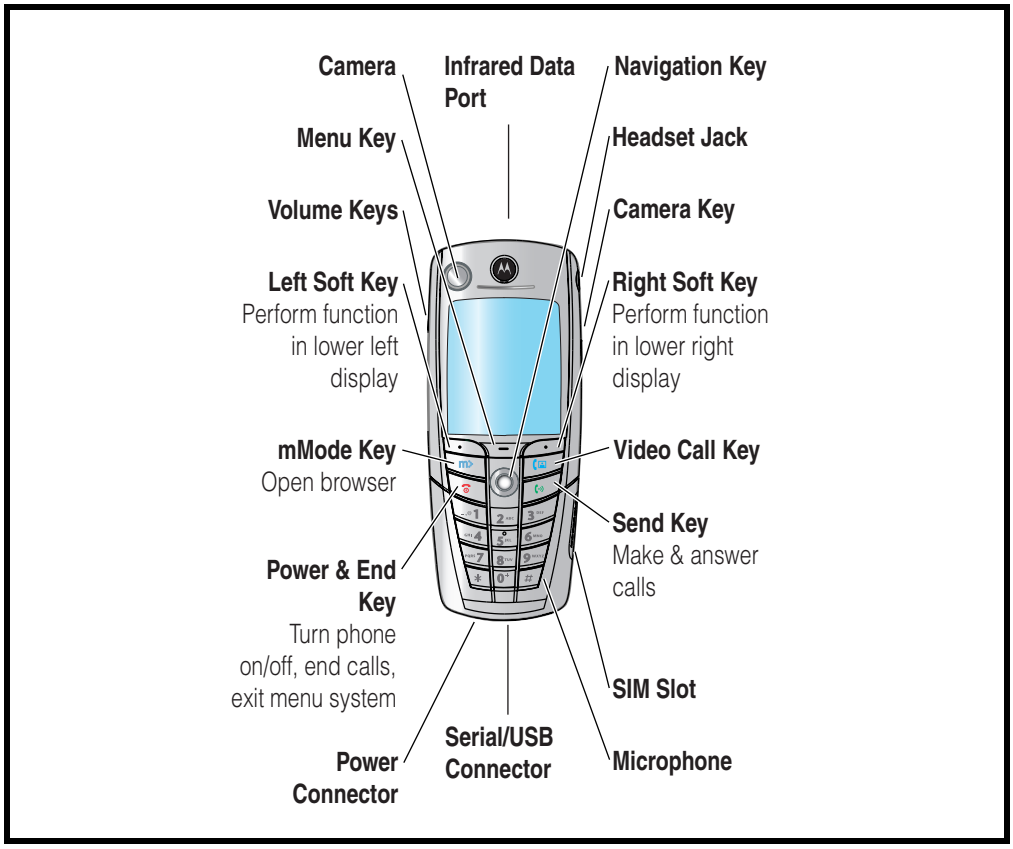

Figure 1. Controls and I/O

Color Display

The top section of the display shows phone status indicators. The following illustration shows some of the common indicators that you may see at the top of the display when using the phone.

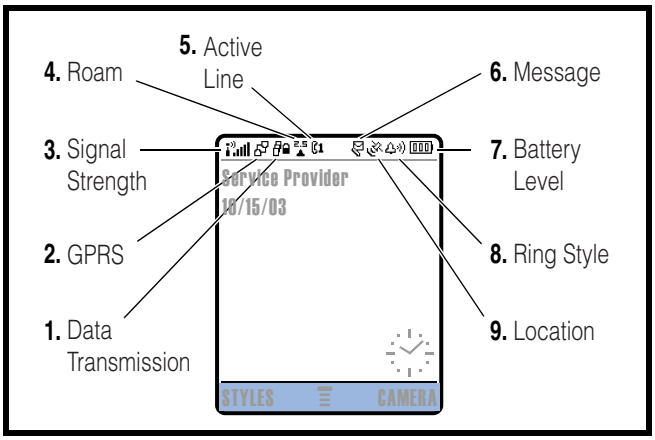

Figure 2. Typical Display

Messages, phone numbers, and menu options appear in the middle of the display. Text labels at the bottom corners of the display show the current soft key functions. A ≡ (menu) indicator in the bottom center of the display indicates that you can open the main menu or a feature sub-menu to see more options.

Some of the phone functions described in this manual must be performed from the idle display. The term *idle display* refers to the standard display that you see when your phone is on and ready to use, when you are *not* on a call or using the menu system.

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

❶ Signal Strength Indicator Shows the strength of the phone's connection with the network.

Strong  No signal

You cannot make or answer calls when the "no signal" indicator is displayed.

❷ Service Indicator Shows when a GPRS connection is available. Your service provider may indicate that a GPRS packet data connection is active. This type of connection may be used by the service provider to allow faster data transfer speeds. The GPRS indicator does not mean that you are on a call; it indicates only that you are registered on the network through a GPRS connection.

❸ Signal Security Indicator Shows when you have a secure connection for packet data transfers, embedded application connections, or circuit switch data calls.

❹ **Roam Indicator** Shows when the phone uses the home network ( ) or another network ( ). When the phone leaves the home network area, it *roams* or seeks another network.

❺ **Current Line Indicator** Shows when Voice Privacy is on, a call is in progress, or Call Forwarding is on. This icon also indicates which line is active (if a call is on hold), and whether Caps Lock, Numeric Entry, or Symbol Entry is switched on (when entering text).

❻ **Text Entry Indicator** Indicates your Text Entry Method whenever you are in a text editor (Tap, iTap, etc.).

❼ **Message Indicator** Indicates when a new voice or text message is waiting.

❽ **Location Privacy Indicator** Shows when Location Privacy is on or off, or when there is an Active Busy line.

❾ **Alert Type Indicator** Shows the currently selected alert profile. The default alert setting is a ringer.

= loud ring = soft ring
= vibrate = ring and vibrate
= silent

❿ **Battery Level Indicator** Shows the amount of charge left in the battery. The more bars visible, the greater the charge.

High Empty

User Interface Menu Structure

Menu Navigation

A835 and A845 telephones are equipped with a simplified icon and list-based user interface.

Main Menu

- **Media Center**
  - Audio
  - Pictures
  - Video
- **Games & Apps**
- **Ring Styles**
- **Shortcuts**
- **Office Tools**
  - Datebook
  - Voice Notes
  - Calculator
- **Settings**
  - (see next column)
- **Web Access**
  - Browser
  - Web Shortcuts
  - Stored Pages
  - History
  - Goto URL
  - Browser Setup
- **Services**
  - SIM Applications
  - Fixed Dial
  - Service Dial
  - Quick Dial

Extras

- **Web Sessions**
- **Phonebook**
- **Messages**
- **Recent Calls**
- **Smart Menu**

Note:
This is the standard phone menu layout. You or your service provider may have changed the menu layout or changed some feature names. Not all features may be available for all users.

Shortcuts

Change display zoom:
Press ☰, then press and hold ☰
Lock/unlock keypad:
Press ☰ *
Display my phone number:
Press ☰ #
Go to dialed calls list:
Press ✆
Exit menu system:
Press ⏻

Settings

- **Personalize**
  - Main Menu
  - Home Keys
  - Power Up
  - Greeting
  - Banner
  - Banner Graphic
  - Wallpaper
  - Screen Saver
  - Quick Dial
- **Call Forward**
  - Voice Calls
  - Fax Calls
  - Data Calls
  - Cancel All
  - Forward Status
- **Connection**
  - IrDA Link
  - Active Call
  - Bluetooth Link
  - Sync
  - Incoming Call
- **Phone Status**
  - My Tel. Number
  - Active Line
  - Battery Meter
  - User Account
  - Storage Devices
  - Location
  - Other Information
- **Security**
  - Phone Lock
  - Lock Keypad
  - Lock Application
  - Fixed Dialing
  - Call Barring
  - SIM PIN
  - Universal PIN
  - WIM PINs
  - New Passwords
- **Other Settings**
  - Initial Setup
  - Time and Date
  - 1-Touch Dial
  - Display Timeout
  - Backlight
  - Zoom
  - Scroll
  - Animation
  - Language
  - Battery Save
  - DTMF
  - Master Reset
  - Master Clear
- In-Call Setup
  - In-Call Timer
  - Call Guard
  - Call Cost Setup
  - My Caller ID
  - Talk and Fax
  - Call Waiting
  - Answer Options
- Network
  - New Network
  - Network Setup
  - Available Networks
  - My Network List
  - Service Tone
  - Call Drop Tone
- Car Settings
  - Auto Answer
  - Auto Handsfree
  - Power Off Delay
  - Charger Time
- Headset
  - Auto Answer
  - Ringer Options
- Java Tools

Battery Function

Battery Charge Indicator

The telephone displays a battery charge 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 phone to immediately shut down and any pending work (partially entered phone book entries or outgoing messages, for example) is lost.

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.

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

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

Operation

For detailed operating instructions, refer to the appropriate user guide listed in the Related Publications section.

Tools and Test Equipment

Table 4 list the tools and test equipment used on A835 and A845 telephones. Use either the listed items or equivalents.

Table 4. General Test Equipment and Tools

Motorola Part Number[1]	Description	Application
See Table 11	Charger	Used to charge battery and to power phone
0180386A82	Antistatic Mat Kit (includes 66-80387A95 antistatic mat, 66-80334B36 ground cord, and 42-80385A59 wrist band)	Protects phone from damage caused by electrostatic discharge (ESD)
0-00-00-30005[3]	Disassembly tool, black plastic with flat and pointed ends	Used to assemble/disassemble phone
6680388B01	Tweezers, plastic	Used to assemble/disassemble phone
RSX4043-A	Torque Driver	Used to remove and replace screws
—	Torque Driver Bit T-6 Plus, Apex 440-6IP Torx Plus or equivalent	Used with torque driver
HP34401A[2]	Digital Multimeter	Used to measure battery voltage

1. To order in North America, contact Motorola Aftermarket and Accessories Division (AAD) by phone (800) 422-4210 or fax (800) 622-6210; Internationally, you can reach AAD by phone (847) 538-8023 or fax (847) 576-3023.
2. Not available from Motorola. To order, contact Hewlett Packard at (800) 452-4844.
3. Not available from Motorola. To order, contact:
   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

Disassembly

This section describes how to disassemble an A835 or A845 telephone. Refer to Table 4 for a list of tools and equipment used.

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

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

Removing and Replacing the Battery Door

1. Ensure the phone is turned off.
2. Press the battery door release button and slide the battery door toward the bottom end of the phone.
3. Lift the battery door up and away from the phone.

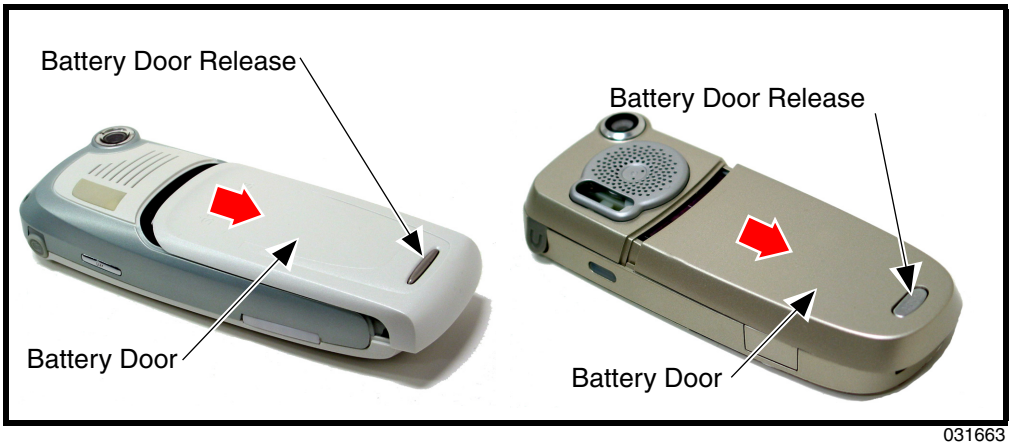

Figure 3. Removing and Replacing the Battery Door

4. To replace, align the battery door the phone.
5. Lower the battery door onto the phone.
6. Slide the battery door toward the top of the phone to lock the battery door release

Removing and Replacing the 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.

We recommend that you store batteries in their protective cases when not in use.

To remove the battery

1. Ensure the phone is turned off.
2. If the battery door is installed, remove it by pushing down the battery door release latch and lifting the door off the phone.
3. Pinch the top of the battery from the sides and lift it out of the phone, releasing it from the tab at the bottom of the battery compartment (see Figure 4).

031662o, 031725o

Figure 4. Removing and Replacing the Battery

To replace the battery

1. If necessary, remove the battery from its protective clear plastic case.
2. Insert the battery, printed arrow first, **under the tab** at the bottom of the battery compartment, then press the top of the battery into place.
3. Replace the battery as described in the procedures.

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.

Removing and Replacing the Rear Housing

To remove the rear housing (Motorola model)

1. Follow the procedures in this section to remove the:
   - Battery door
   - Battery
2. Using the Torx driver and T-6 bit, remove the 2 screws shown in Figure 5. Set the screws aside for reuse.
3. Use the disassembly tool to release the latches along the phone Lift the rear housing out of the back of the phone as shown in Figure 5.n the sides of the housing to release the boards if necessary.

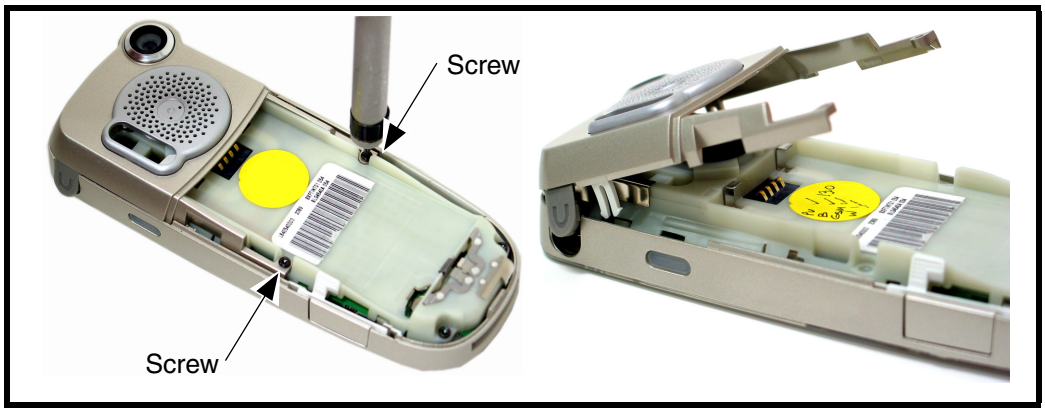

Figure 5. Removing the Rear Housing

To replace the rear housing

1. Align the display board/transceiver board with the rear housing and set it in place. If necessary, press gently to make sure that it fits all the way in.
2. Insert and tighten the 6 screws to a torque setting of 1.2 in/lbs, using the T-6 Torx driver. Do not overtighten.
3. Follow the procedures to replace the:
   - Battery
   - Battery door

To remove the rear housing (Siemens model)

1. Follow the procedures in this section to remove the:
   - Battery door
   - Battery
2. Torx driver and T-6 bit, remove the 4 screws as shown in Figure 6. Set the screws aside for reuse.

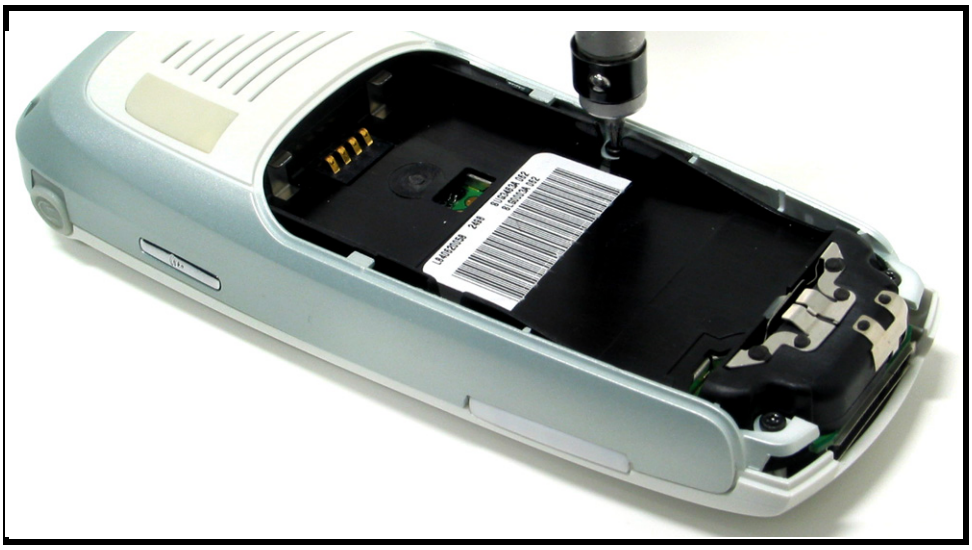

Figure 6. Rear Housing Screws Removal

3. Using the disassembly tool, release the 3 latches on each side of the phone as shown in Figure 7.

4. Carefully lift the rear housing off of the phone.

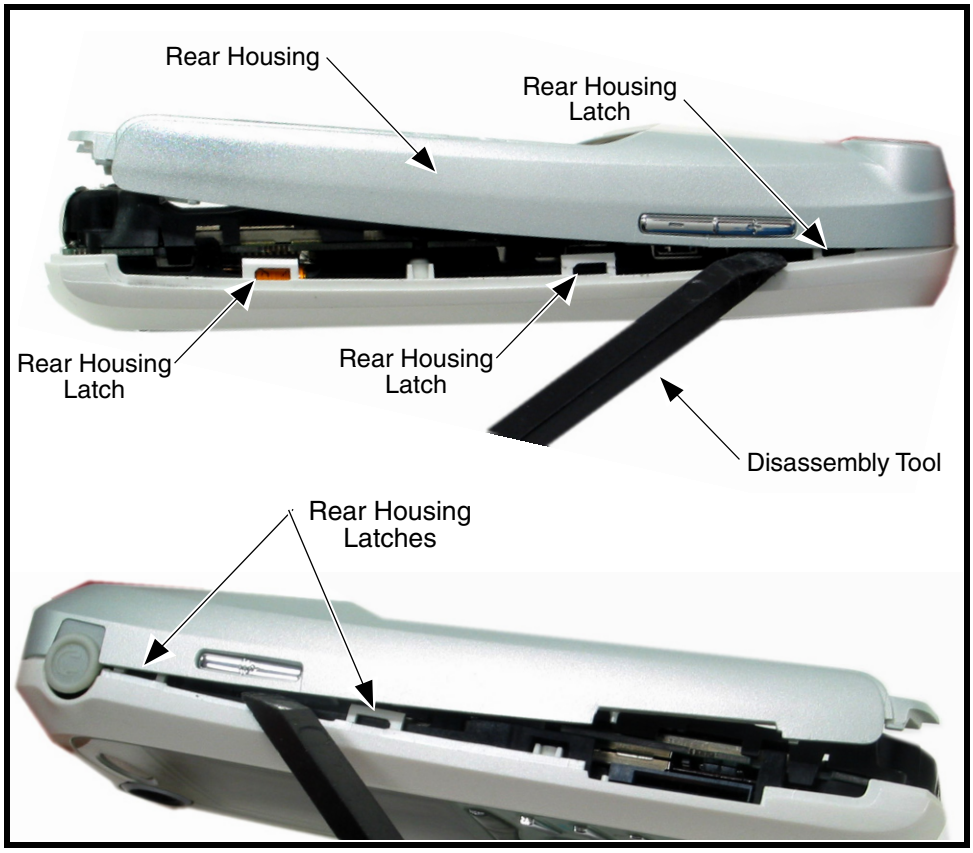

Figure 7. Rear Housing Removal (Siemens model)

To replace the rear housing

1. Align the rear housing with the phone (front housing).
2. Press the front and rear housings together until the 3 latches on each side snap into place.
3. Insert and tighten the 4 screws to a torque setting of 1.2 in/lbs, using the T-6 Torx driver. Do not overtighten.
4. Follow the procedures to replace the
   - battery
   - battery door

Removing and Replacing the Endo assembly

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

To remove the Endo assembly

1. Ensure the phone is off.
2. Follow the procedures to remove the
   - battery door
   - battery
   - rear housing
3. Remove 4 screws 2 at the top and 2 at the bottom of the endo assembly (see Figure 8).

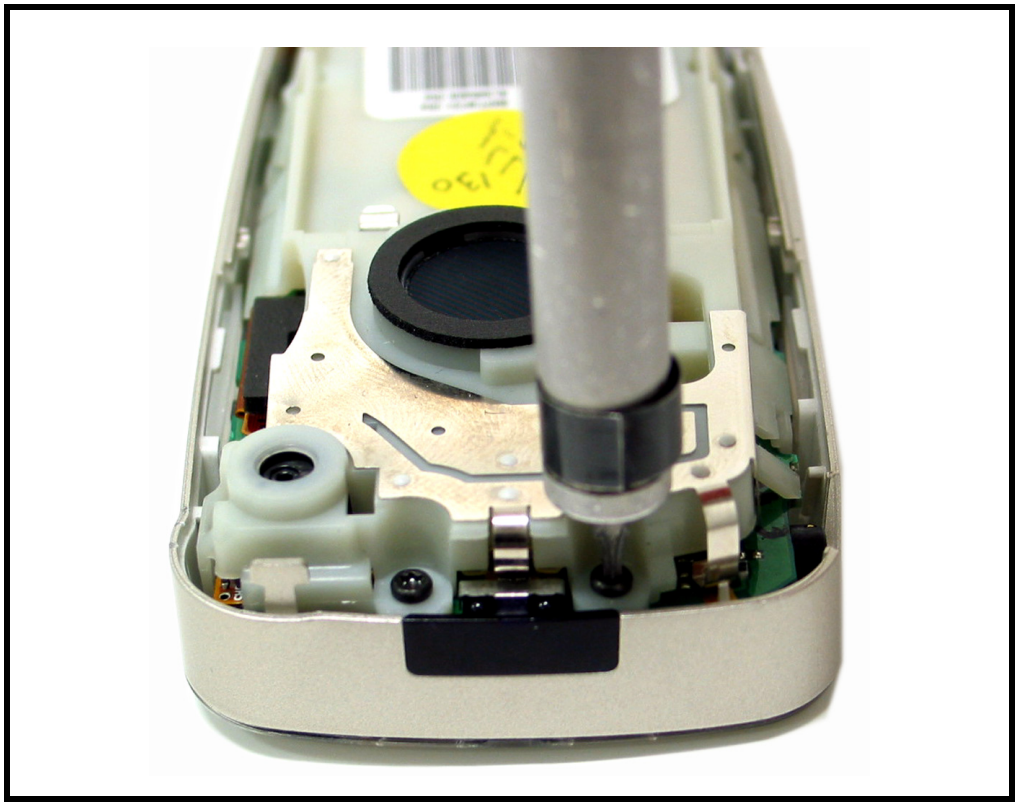

Figure 8. Removing the Endo Assembly Screws

4. Grasp the endo assembly by the keypad and the rear of the phone.

5. Bend the right side of the front housing outward until the screw boss is clear of the keypad assembly. Avoid damage to the keypad and mylar dome assemblies.

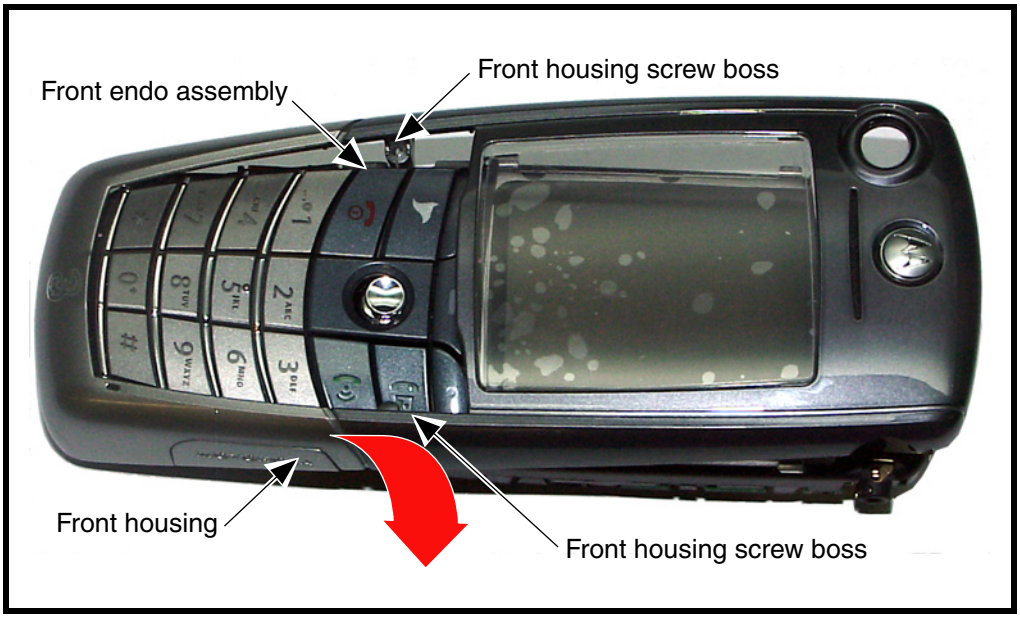

Figure 9. Removing the Endo Assembly

6. Once the screw boss is clear of the keypad lift the right side of the housing around the keypad.
7. Lift the housing away from the endo.

8. Carefully release the remaining snaps on the opposite side of the housing.

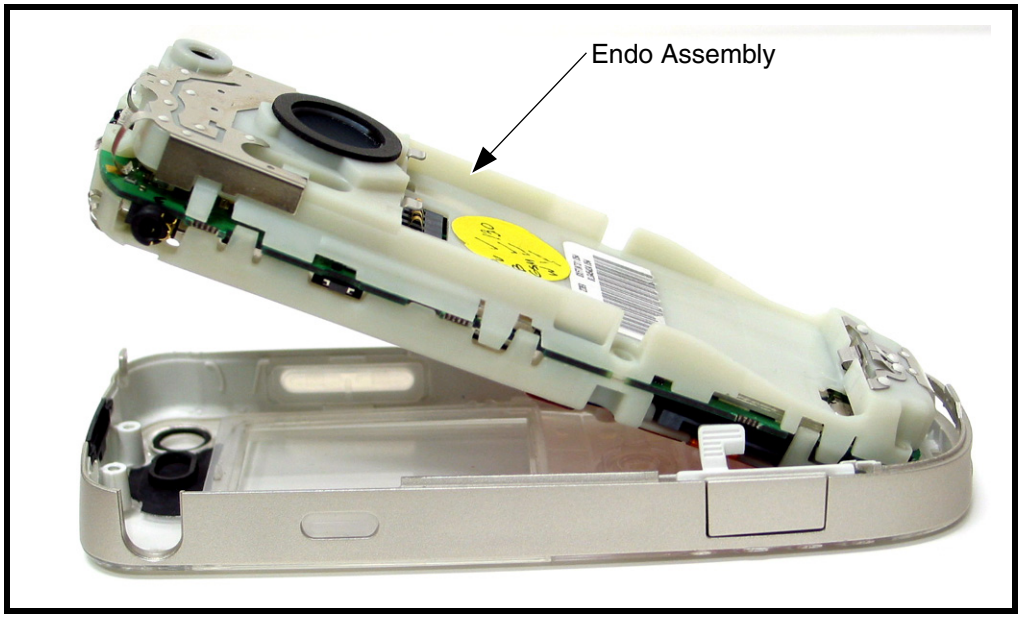

Figure 10. Removing the Endo Assembly

To replace the Endo Assembly

1. Insert the tabs at bottom end of the front housing into the rear housing.
2. Press the side snaps into place and, then, carefully press the top snap into place.

Removing and Replacing the Front and rear Endo housings

To remove the Front and Rear Endo Housings

1. Remove the Battery door, battery, Rear housing, and endo assembly as described in the procedures.
2. Carefully use the flat end of the disassembly tool to pry the camera flex connector out of its socket (see Figure 11).
3. Use the disassembly tool Release the endo assembly clips on both sides of the endo assembly
4. Carefully separate the two halves of the endo assembly.

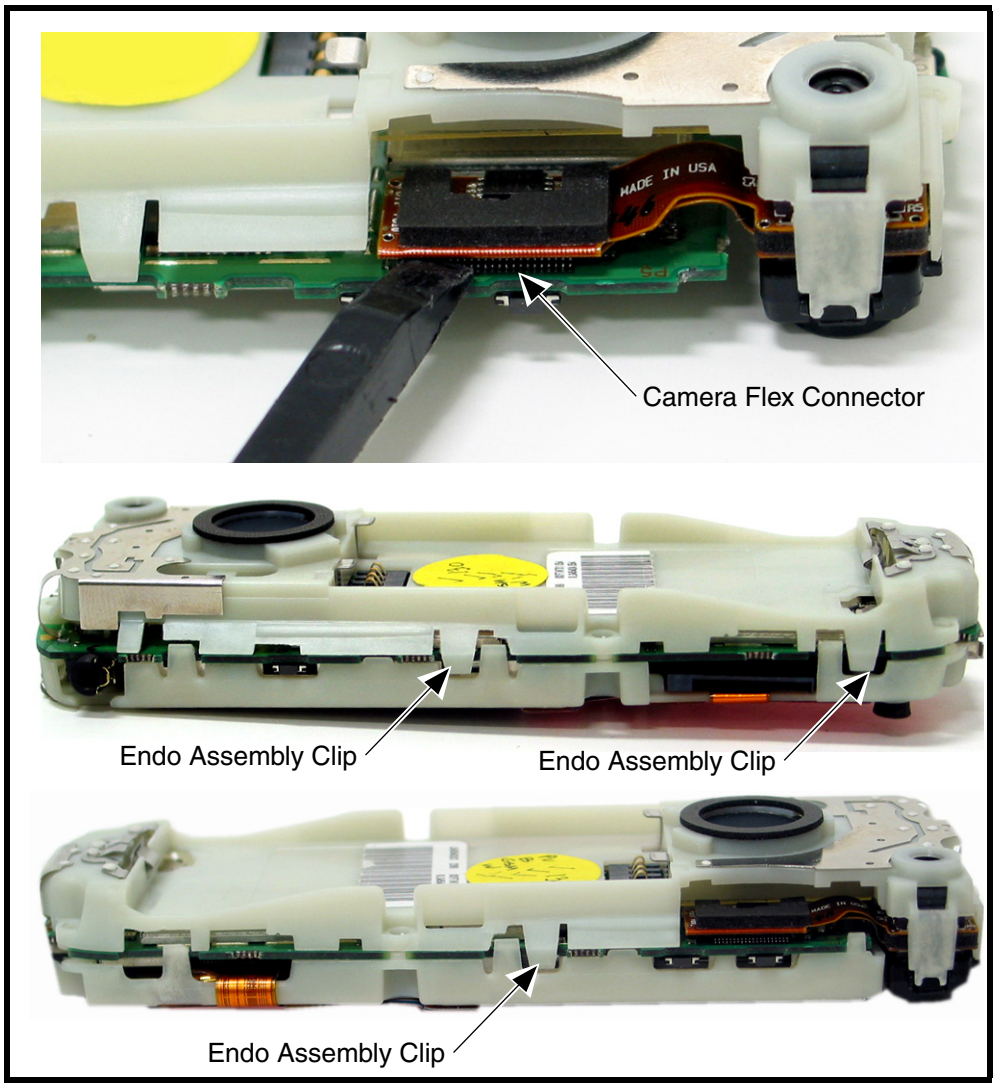

Figure 11. Removing the front and rear Endo housing

5. Using the flat end of the disassembly tool, first disconnect the display assembly flex connector and then the keypad flex connector (see Figure 9).

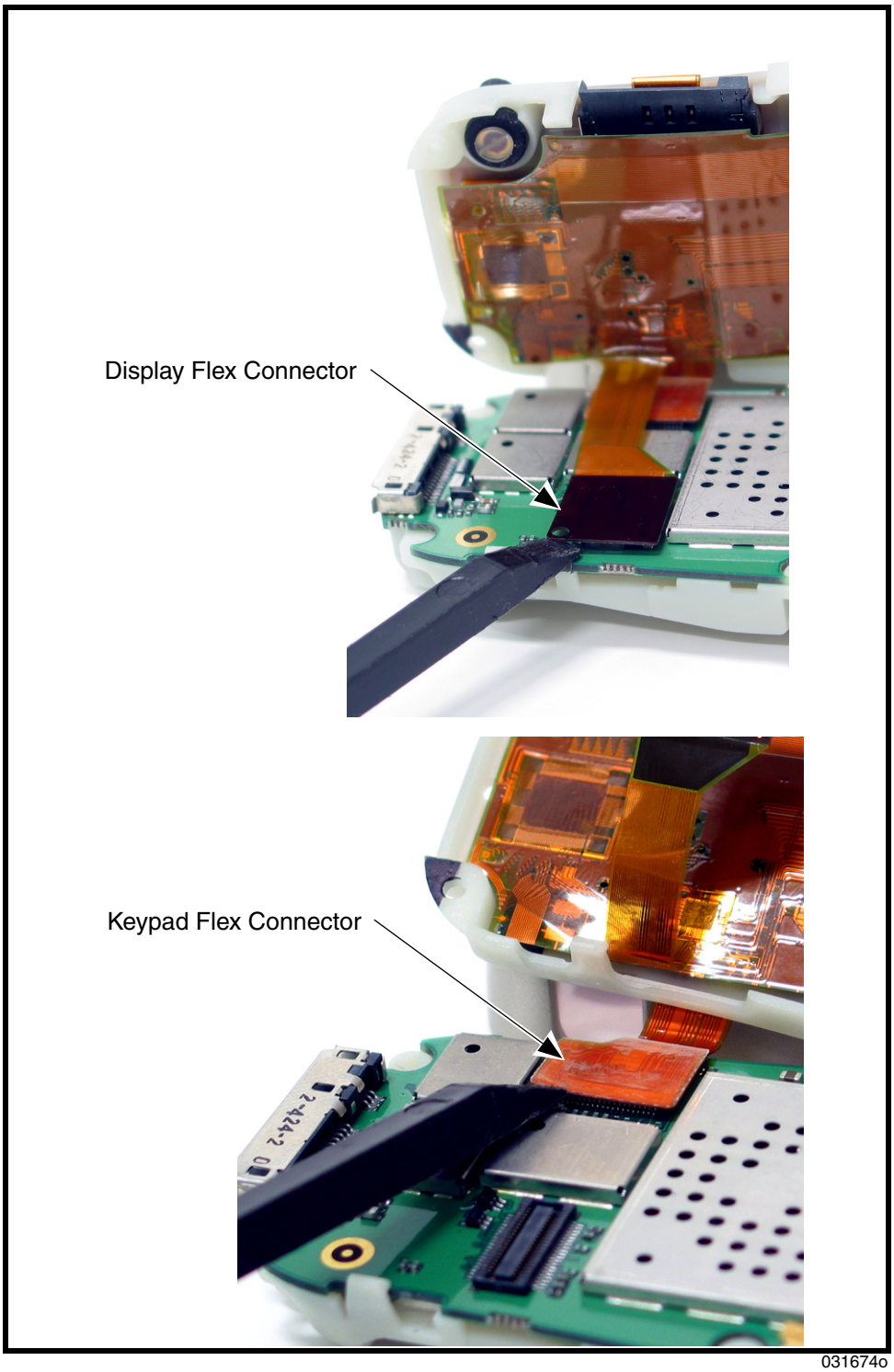

Figure 12. Removing the Display flex connector and Keypad flex connector

6. Completely separate the front and rear endo housings.

To Replace the Front and Rear Endo Housings

7. Align the front and rear endo housings.
8. Insert the keypad flex connector to its socket.
9. Insert the display flex connector into its socket.
10. Carefully press the front and rear housings together until the side clips engage.
11. Replace the front and rear housings, battery, and battery door as described in the procedures.

Removing and Replacing the Display Assembly

To remove the display assembly

1. Follow the procedures to remove the:
   - Battery
   - Front Housing
   - Rear Housing
   - Front and rear Endo Assembly
2. Peel the softkey connector strip away from the bottom of the display assembly, to disconnect the keyboard flex connector from the display.
3. Release the display assembly clips on each side of the display assembly as shown in Figure 13.

The flexible printed cable (FPC or flex) connecting the display assembly to the display board is easily damaged. Exercise extreme care when handling.

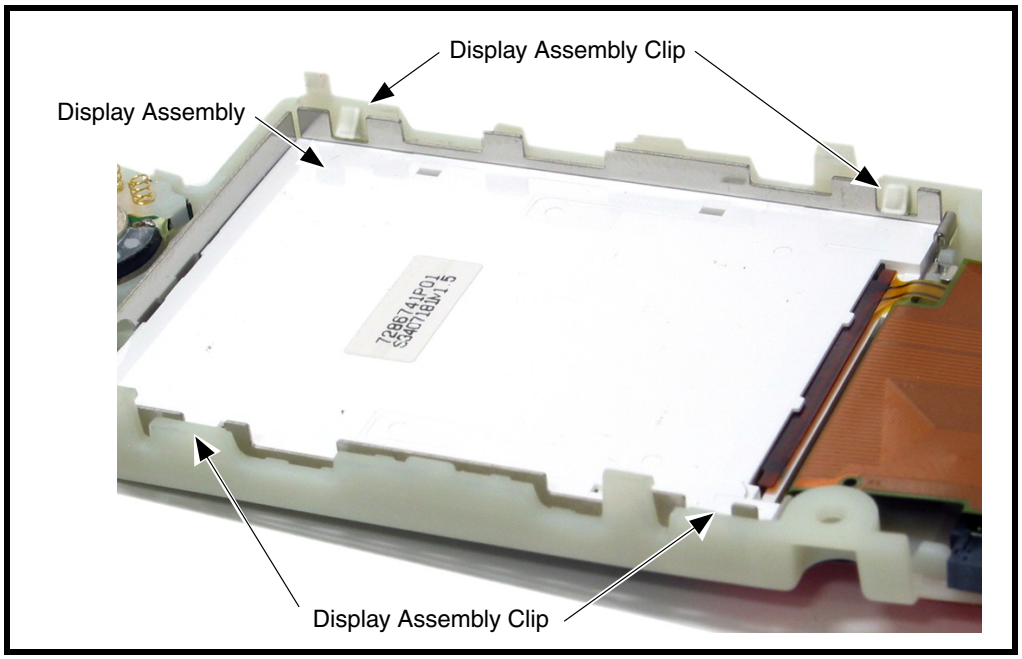

Figure 13. Removing the Display Assembly

4. Carefully lift the display assembly away from the front endo housing.

To replace the display assembly

1. Insert the display assembly into its plastic frame.
2. Carefully press the display assembly into position in the front endo housing until the display assembly clips snap into place. Ensure the front end of the display assembly is flush with the front edge of the front endo housing.
3. Follow the procedures to replace the:

- Front and Rear Endo Assembly
- Rear Housing
- Front Housing
- USIM Card
- Battery

Removing and Replacing the Keypad

To remove the keypad (Motorola model)

1. Follow the procedures to remove the:
   - Battery door
   - Battery
   - Endo assembly
2. Using a plastic disassembly tool, carefully insert the tool between the keypad and the EL backlighting layer. DO NOT insert the disassembly tool between the EL backlighting and the mylar, this will result in damage to the EL bond. The arrows show where the EL bonds are located.)

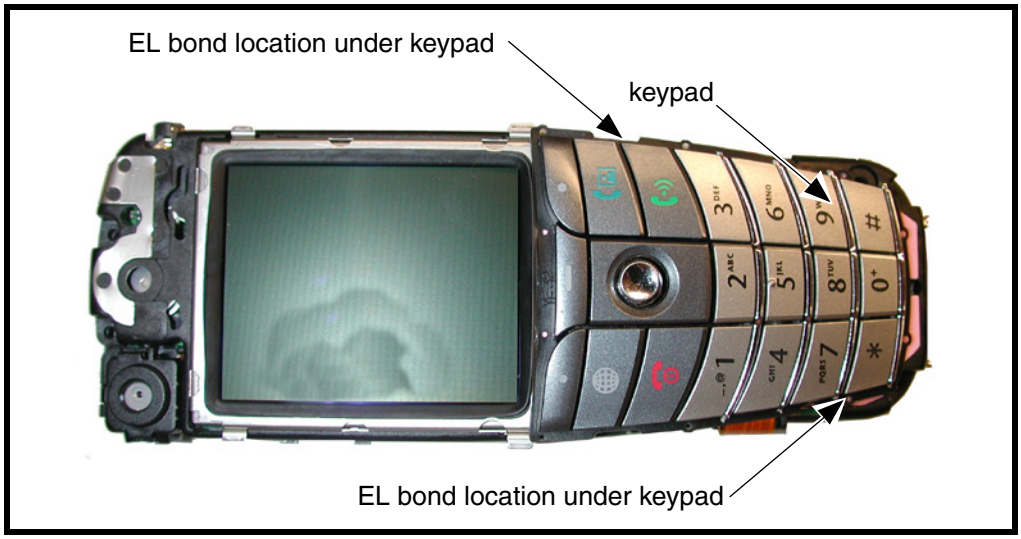

Figure 14. EL Bond locations under the keypad.

3. Use the disassembly tool carefully to break the adhesive bond between the keypad and the EL backlighting until the keypad is no longer adhered to the EL backlighting. DO NOT tear off the keypad at anytime during this procedure.

To remove the keypad (Siemens model)

1. Follow the procedures to remove the:
   - Battery door
   - Battery
   - Endo assembly

2. Use the plastic tweezers to lift the keypad out of the front housing.

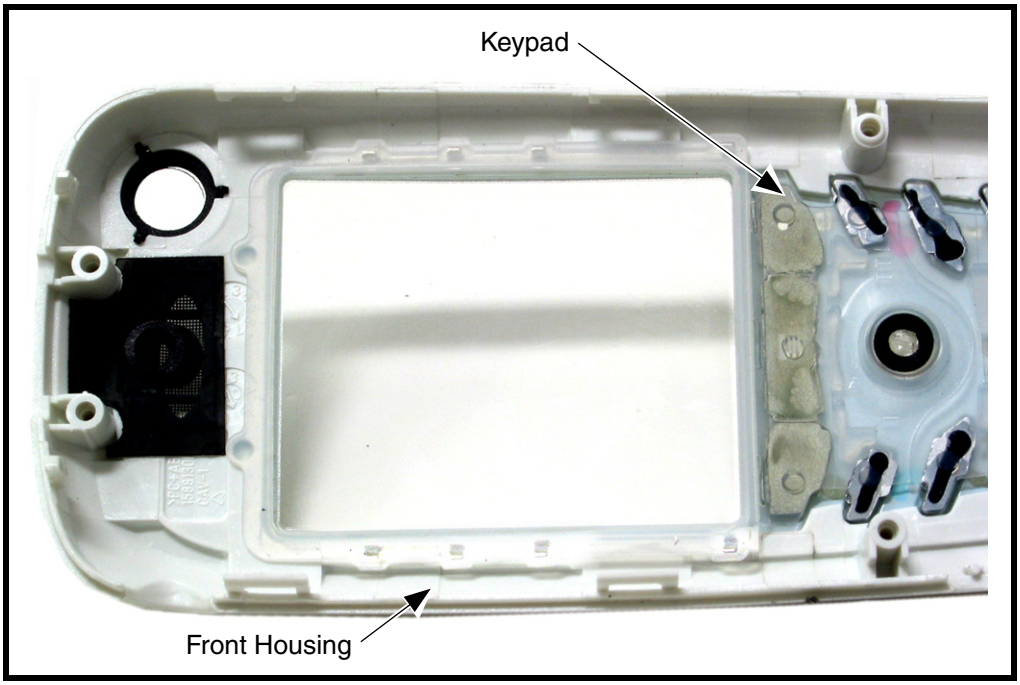

Figure 15. Removing the Keypad

To replace the keypad (Siemens model)

1. Align the keypad to the front housing.
2. To replace, insert the keypad into the front housing. Ensure the keys align with the openings and the keypad is fully seated in the front housing.
3. Follow the procedures to replace the:
   - Endo assembly
   - Battery
   - Battery door

Removing and Replacing the Camera

To remove the camera

1. Ensure the phone is turned off.
2. Remove the Battery door, battery, Front and rear housings, Endo assembly, and transceiver board as described in the procedures.
3.
4. Carefully lift the bottom of the camera away from the phone, sliding it off the phone's antenna at the top.

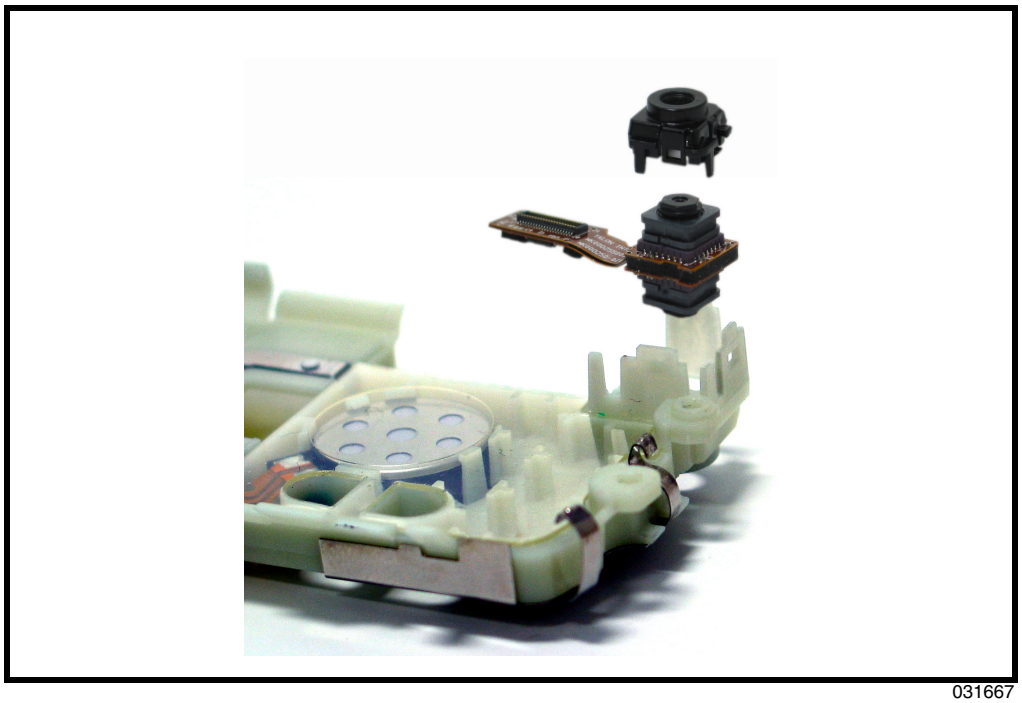

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Figure 16. Replacing the Camera

To replace the camera

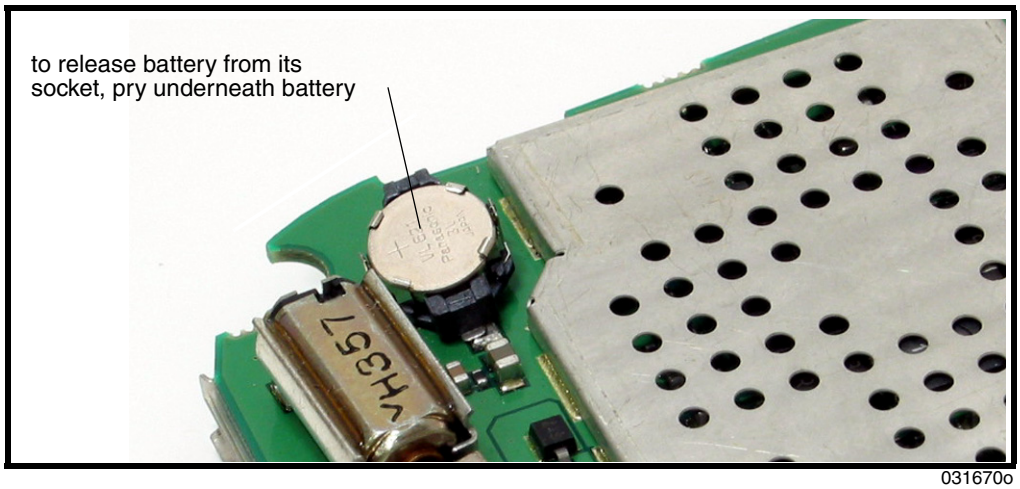
1. If necessary, remove the battery door by pushing down on the battery door release latch and lifting the door off the phone.
2. Slide the camera accessory onto the phone, inserting the phone's antenna into the accessory's antenna socket.
3. Slide the camera latch closed to secure the camera.
4. Replace the Transceiver board, Endo assembly, Front and rear housings, Battery, and Battery door as described in the procedures.

Removing and Replacing the Real-Time Clock (RTC) Battery

Use only non-conductive tools, such as the plastic disassembly tool and the plastic tweezer, when removing and replacing the RTC battery.

To remove the RTC battery

1. Follow the procedures to remove the:
   - Battery Door
   - Battery
   - Front Housing
   - Endo Assembly
   - Rear Housing
   - Transceiver Board
2. Use the pointed end of the disassembly tool to gently pry the RTC battery from its socket on the back of the transceiver board, as shown in Figure 17.
3. Use the plastic tweezer to remove the battery from the battery holder.



031670o

Figure 17. Removing the Real-Time Clock (RTC) Battery

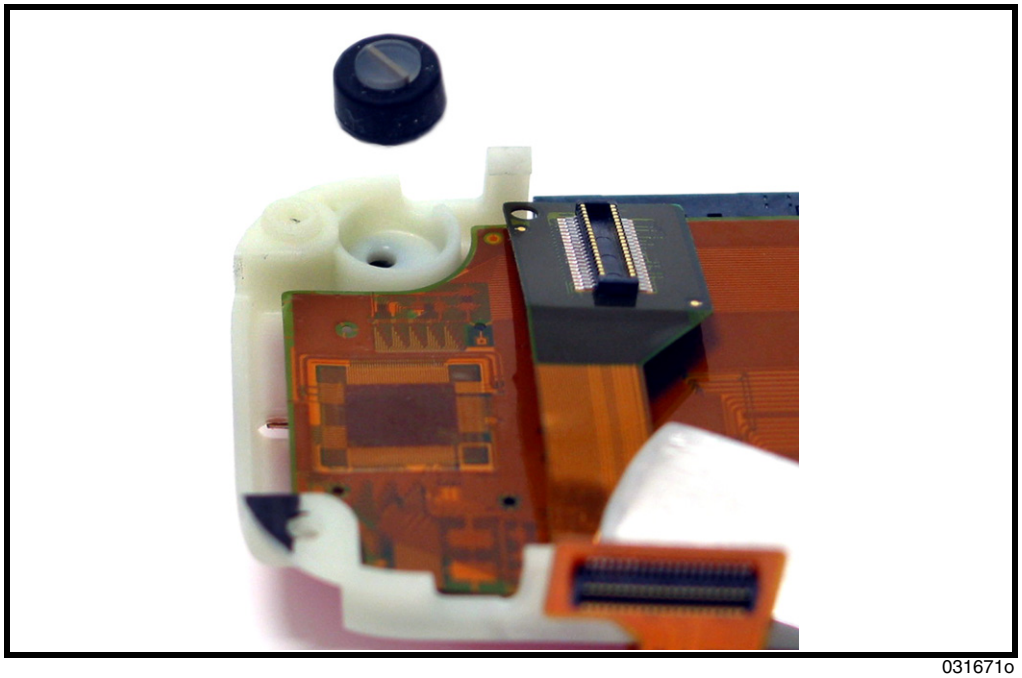
To replace the RTC battery

1. Place the RTC battery over the battery holder. Ensure that the positive terminal (+) is facing up.
2. Using the plastic tweezer or the disassembly tool, press the battery into the battery holder until it is properly seated in its socket.
3. Follow the procedures to replace the:
   - Endo Assembly
   - Rear Housing
   - Front Housing
   - Battery
   - Battery Door

Removing and Replacing the Microphone

To remove the microphone

1. Follow the procedures to remove the:
   - Battery Door
   - Battery
   - Front Housing
   - Endo assembly
   - Rear Housing
2. Use the pointed end of the disassembly tool to gently pry the microphone from its socket in the shield spacer as shown in Figure 18. The microphone should come away easily.



031671o

Figure 18. Removing the Microphone

To replace the microphone

1. Align the microphone with the hole in the shield spacer and gently press it in until fully seated.
2. Follow the procedures to replace the:
   - Rear Housing
   - Display Board
   - Front Housing
   - Battery

UMTS Subscriber Identity Module (USIM) Identification Label

USIM

A USIM 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 USIM card 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

Identification

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

Mechanical Serial Number (MSN)

The MSN is an individual unit identity number and remains with the unit throughout its life.

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

The MSN is divided into 4 sections as shown in Figure 19.

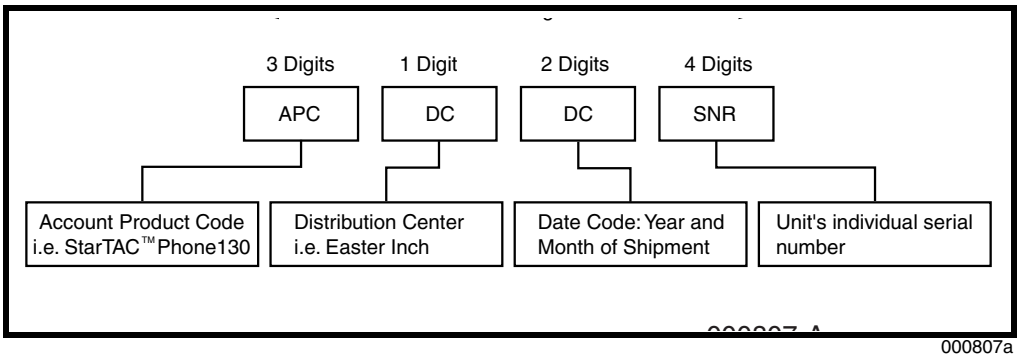


Figure 19. MSN Label Breakdown

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 5.

Table 5. IMEI Number Breakdown

TAC	Serial Number	Check Digit
NNXXXX YY	ZZZZZZ	A

Where

TAC Type Allocation Code, formerly known as Type Approval Code

NN Reporting body identifier

XXXX Type Identifier

YY YY is set to 00 from 01/01/2003 until 31/03/2004

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

Troubleshooting Chart

Table 6. PF 0B91 Telephone: 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 terminals open or misaligned.	Visually inspect the battery terminals on both the battery and the telephone. Realign and, if necessary, either replace the battery or refer to a Level 3 Service Center for battery connector replacement. If battery terminals are not at fault, proceed to c.
	c) Transceiver board defective.	Remove the transceiver board assembly. Substitute a known good transceiver board and temporarily reassemble the unit. Press the PWR button; if unit turns on and stays on, disconnect the dc power source and reassemble the phone with the new transceiver board. Verify that the fault has been cleared.
2. Telephone exhibits poor reception or erratic operation such as calls frequently dropping or weak or distorted audio.	a) Antenna defective	Check connection between the antenna and the transceiver board. If the connection is OK, substitute a known good antenna. If the fault is still present, proceed to b.
	b) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.
3. Display is erratic, or provides partial or no display.	a) Mating connections to or from transceiver board faulty.	Check general condition of flex and flex connector. If the flex and connector are good, check that the display assembly mounting tabs are fully engaged. If connector is not at fault, proceed to b.
	b) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.
4. Incoming call alert transducer audio distorted or volume is too low.	Faulty transceiver board.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.
5. Telephone transmit audio is weak. (usually indicated by called parties complaining of difficulty in hearing voice).	a) Microphone defective.	Replace the microphone as described in the procedures. If fault is not cleared, proceed to b.
	b) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.
6. Receive audio from earpiece speaker is weak or distorted.	a) Connections to or from transceiver board defective.	Check connection from the earpiece to the transceiver board. If connection is not at fault, proceed to b.

Table 6. PF 0B91 Telephone: Level 1 and 2 Troubleshooting Chart (Continued)

Symptom	Probable Cause	Verification And Remedy
	b) Earpiece speaker defective.	Temporarily replace the speaker with a known good speaker. Ensure good connection. Place a call and verify improvement in earpiece audio. If fault is cleared, reassemble the phone with the good transceiver board. If fault is not cleared, proceed to c.
	c) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the phone with the new transceiver board.
7. Telephone will not recognize or accept USIM card.	a) USIM card defective.	Check the USIM card contacts for dirt. Clean if necessary, and check if fault has been cleared. If the contacts are clean, insert a known good USIM card into the telephone. Power up the unit and confirm that the card has been accepted. If the fault no longer exists, replace the defective USIM card. If the USIM card is not at fault, proceed to b.
	b) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the phone with the new transceiver board.
8. Vibrator feature not functioning.	a) Vibrator defective.	Replace vibrator as described in the procedures. If the fault has not been cleared, proceed to b.
	b) Transceiver board defective.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.
9. Internal Charger not working.	Faulty charger circuit on transceiver board.	Test a selection of batteries in the rear pocket of the desktop charger. Check LED display for the charging indications. If these are charging properly, then the internal charger is at fault. Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board assembly.
10. No or weak audio when using headset.	a) Headset plug not pushed in fully.	Ensure the headset plug is fully seated in the jack.
	b) Faulty jack on transceiver board.	Replace the transceiver board (refer to 1c). Verify that the fault has been cleared and reassemble the unit with the new transceiver board.

Manual Test Mode

Motorola PF 0B91 telephones are designed with a manual test mode capability. This allows service personnel to verify functionality and troubleshoot by entering keypad commands.

To enter the manual test command mode, press the following from idle:

(Menu) (0+) (4 GHI) (8 TUV) (2 ABC) (6 MNO) (3 DEF) (*)

There must be no more than 2 seconds between each of the keys pressed in the sequence. This opens the Opcode entry display, where you can enter test commands in this format:

1. (Opcode) (*) (Field)
   See "Manual Test Mode Commands" below.
2. Press OK (—)
   If you enter only the opcode, the phone prompts you for field information. The phone displays the Test Command Response Code. See “Manual Test Mode Response Codes” on page 44.

To end the test command mode, press (Power).

Note: The handset can only be suspended by executing the SUSPEND test command. The user can exit the feature and return to idle if the handset has not yet been suspended. Otherwise, exiting the feature will cause a restart.

Manual Test Mode Commands

Table 7. Level 2 3G Handset Test Commands

Opcode (Decimal)	Opcode Mnemonic	Key Entry Format	Description	Field	Field Value
0	AUD_TN_LST	0 *<Action> * <Tone Identifier>OK	Generate/ disable predefined tone	Field 1	0 = start atone
					1 = stop a tone
				Field 2	0-9 = DTMF tones
3	AUD_CTRL	3 *<Device/ Process> * <Action>OK	Control various audio functions; enable/ disable vibrator	Field 1	0 = Vibrator
					2 = Echo canceling
					3 = Noise suppressor
				Field 2	0 = Disable
					1 = Enable

Table 7. Level 2 3G Handset Test Commands (Continued)

Opcode (Decimal)	Opcode Mnemonic	Key Entry Format	Description	Field	Field Value
4	AUD_LPB	4 *<Loopback Type> * <Action>OK	Enable audio loopback	Field 1	0 = PCAP loopback
					6 = CODEC loopback
					7 = VOCODER (speech) loopback
				Field 2	0 = Disable Audio loopback
					1 = Enable Audio loopback
				Field 3	This field is valid only for VOCODER loopback
					0 = AMR 4.75
					1 = AMR 5.15
					2 = AMR 5.90
					3 = AMR 6.70
					4 = AMR 7.40
					5 = AMR 7.95
					6 = AMR 10.20
					7 = AMR 12.20
					8 = Full Rate
					16 = Enhanced Full Rate
					32 = Half Rate
5	AUD_LVL	5 *<Get/ Set>*<Volume >OK	Set audio level	Field 1	0 = Set the volume specified
				Field 2	0 = lowest, 7 = loudest
6	AUD_PATH	6 *<Input Path>*<Output Path>*<RX Mute>*<TX Mute>OK	Change audio path	Field 1	0 = As is.
					1 = Mute input path
					2 = Internal (handset) mic
					3 = Ext audio input (CE Bus)
					4 = Boom (headset) mic
					5 = Ext digital audio (USB)
					7 = Bluetooth time slot 1 audio input
					8 = Bluetooth time slot 2 audio input
					9 = Bluetooth time slot 3 audio input
				Field 2	0 = As is
					1 = Mute output path
					2 = Internal (handset) Speaker
					3 = Alert
					4 = Ext audio output (CE Bus)
					5 = Speakerphone
					6 = Boom (headset) speaker
34	RESTART	34 * OK	Generate a software restart	Field 1	As is
54	SUSPEND	54 OK	Terminate normal mode and enter test mode	Field 1	As is

Table 7. Level 2 3G Handset Test Commands (Continued)

Opcode (Decimal)	Opcode Mnemonic	Key Entry Format	Description	Field	Field Value
57	VERSION	57 *<version Type>OK	Retrieve SW version information	Field 1	016000 = DSP Version
					017000 = User (login) of process that created this file
					017001 = Build time (universal) in ISO-8601 format
					017002 = Clearcase view tag name
					017003 = Product base label from Clearcase config spec
					017004 = Product ID
					017005 = Version Number
					017006 = Build commentary
					018000 = Flash Booter version number (P2K Booter Only)

Manual Test Mode Response Codes

Table 8. Level 2 3G Handset Test Command Response Codes

Opcode (Decimal)	Field Value
0	parse error (no data follows): invalid data length for command
1	parse error (no data follows): inadequate security level for command/parameter
2	parser error (no data follows): command/parameter not supported for current protocol (CDMA, GSM, TDMA)
3	parse error (no data follows): command/parameter not supported for current mode (normal, test mode, handset test mode)
4	parse error (no data follows): unsupported/invalid opcode
5	parse error (no data follows): unsupported/invalid parameter for opcode
6	command response: generic success (no data follows)
7	command response: generic failure (no data follows)
8	command response: data follows
9	unsolicited/multiple response: data follows (sequence tag is 0)
10	error: couldn't allocate memory
11	error: internal task error
12	error: Test Command task timed out waiting for response from another SW component
13	CDMA: parse error (no data follows): command/parameter not supported for current sub-mode TDMA: command not supported in current Call Stack Test Mode
14	error: length specified in command header greater than length received by transport layer
15	error: irrecoverable error; phone state has been lost. Phone is being powered down

Level 2 Troubleshooting Procedures

A fully charged battery is all that's needed to perform the procedures described in this section. For each test, enter the Manual Test Command Mode as described in "Manual Test Mode" on page 42, then enter the codes listed.

Vibrator Test

1. 5 JKL 4 GHI (Suspend)
2. 3 DEF * 0 + * 1 .@ (Enable Vibrator)
3. 3 DEF * 0 + * 0 + (Disable Vibrator)
4. Verify vibration function when enabled.

Handset Mic/Speaker test

1. 5 JKL 4 GHI (Suspend)
2. 6 MNO * 2 ABC * 2 ABC (Enable internal mic and handset speaker)
3. 4 GHI * 7 PQRS * 1 .@ * 1 .@ 6 MNO (Enable VOCODER loopback at Enhanced Full Rate)
4. Speak into the handset mic and listen for undistorted speech in the handset speaker.

Headset Mic/Speaker test

1. 5 JKL 4 GHI (Suspend)
2. 6 MNO * 4 GHI * 6 MNO (Enable headset mic and headset speaker)
3. 4 GHI * 7 PQRS * 1 .@ * 1 .@ 6 MNO (Enable VOCODER loopback at Enhanced Full Rate)
4. Speak into the headset mic and listen for undistorted speech in the headset speaker.

Software Version Check

1. 5 JKL 7 PQRS * 0 + 1 .@ 7 PQRS 0 + 0 + 5 JKL (Read version number)
2. Returned data is read as follows: F1 (D): 80530002
   which translates to SW Version 53.00.02

Programming: Software Upgrade and Flexing

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

Part Number Charts

The following section provides a reference for the parts associated with A835 and A845 telephones.

Related Publications

Motorola A835 Wireless Phone User Guide	6809468A81 (SJJN5396)
Motorola A835 Wireless Phone Reference Guide	6809471A86 (SJJN5590)
Motorola A845 Wireless Phone User Guide	6809481A77 (SJJN6372A)

Exploded View Parts List

Table 9. Parts List

Item	Motorola Part No.	Description
1	6188083N01	main lens
2	See Table 10	front housing complete with lens and buttons
3	See Table 10	keypad
4	3888146N01	joy stick cap
5	7286741P01	display assembly
6	1588121N01	front endo (complete with keypad mylar)
7	5089081L01	speaker earpiece
8	5085600J02	mic
9	--	Main PC Board
10	1588311N01	camera cap front
11	0188744N01	camera assembly
12	3288074N01	Acoustic seal
13	3988072N01	speaker elastomer conn for back endo
14	1588120N01	back endo (complete with speaker)
15	0388708L04	screws
16	3888138N01	smart button
17	6188160N01	IRDA lens
18	See Table 10	rear housing
19	3888137N01	volume button
20	SNN5639	battery
21	See Table 10	battery door
--	5088905N01	speaker (part of back endo)

You may use the following web link to order parts online (Password is required):

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

For information on ordering parts in EMEA region call +49 461 803 1638.

Exploded View Diagrams

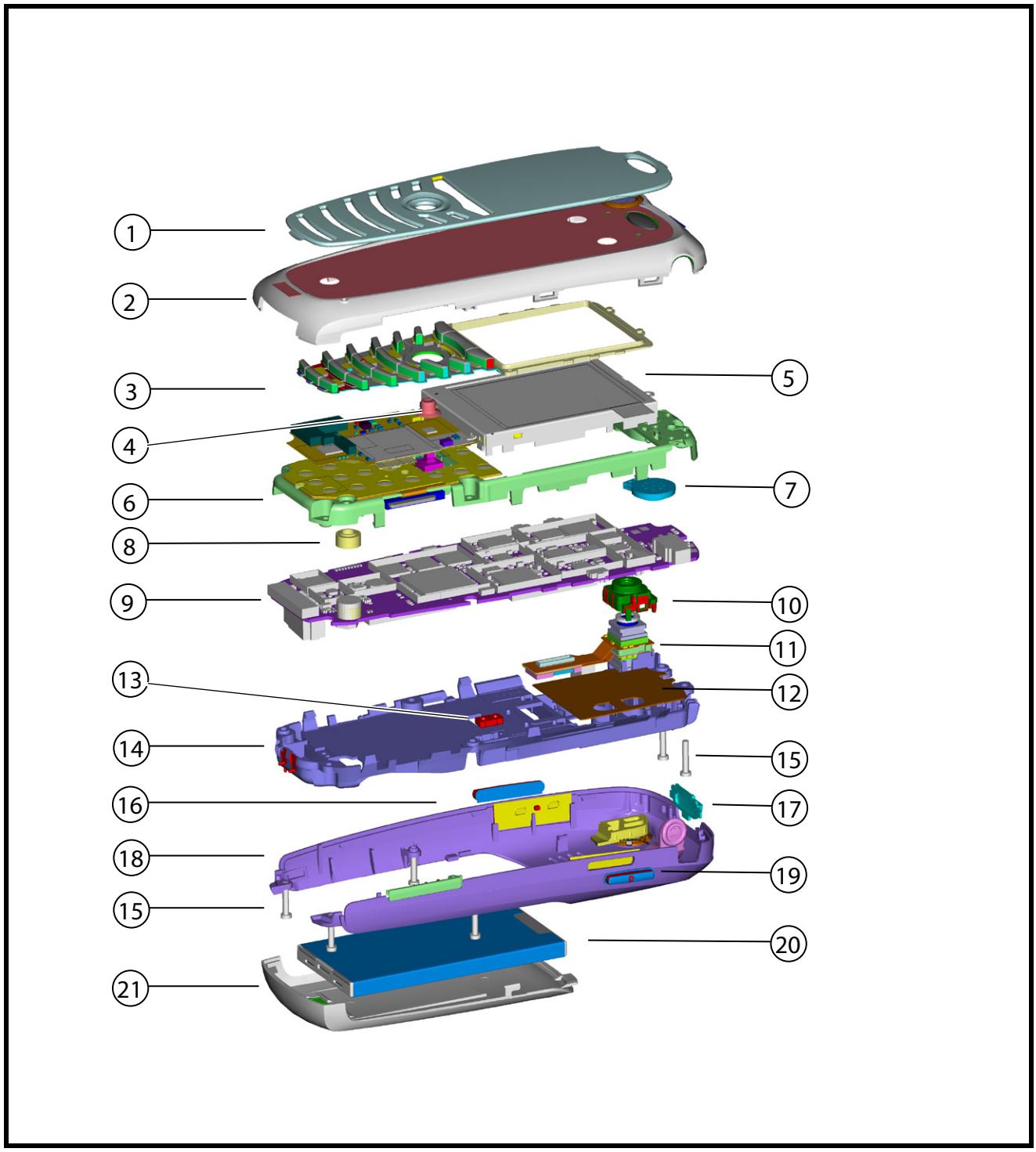


Figure 20. Exploded View Diagram (Siemens Model)

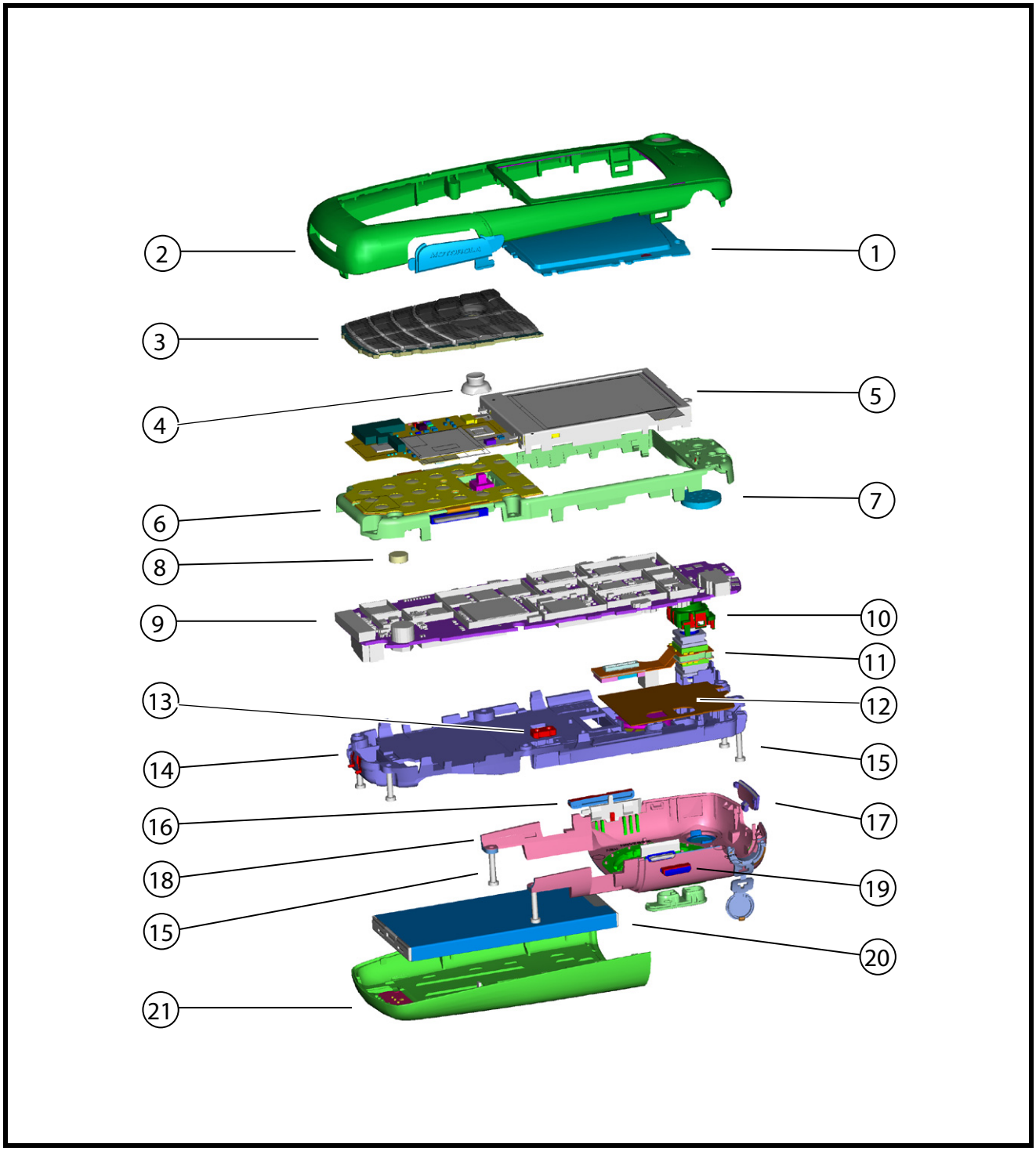


Figure 21. Exploded View Diagram (Motorola Model)

Model Dependant Housing Part Numbers

Table 10. Model Dependent Housing Part Numbers

Item	Description	Part Number
2	front housing assembly model A845	1589270N06
	front housing assembly model A835	1589270N01
	front housing assembly Siemens	1588133N02
3	keypad assembly Motorola model A845	3889260N07
	keypad assembly Motorola model A835	3889260N02
	keypad assembly Siemens	3888142N02
4	joystick cap Motorola model A835/A845	3889272N01
	joystick cap Siemens	3888377N02
18	rear housing assembly Motorola model A835/A845	1589242N01
	rear housing assembly Siemens	1588122N01
21	battery door Motorola model A845	SHN8569
	battery door Motorola model A835	SHN8426
	battery door Siemens	SHN8336

Accessories

Table 11. List of Accessories

Description	Part Number
FreeCharge	U.S. Retail: 98418H-blue & 98419H-yellow
Travel Charger	SPN4940 (switchable mid rate)
VPA (Vehicle Power Adaptor)	SYN7818
Easy Install	SYN8597 (optional external mic SYN5708)
Pro Install Car Kit	S9609 or S9609+HUC (part number TBD)
Universal Customizable One Touch (Standard Monophonic Headset)	SYN9351
Bluetooth Headset	SYN9006
Retractable Headset	SYN9050
Mono Headset (new) Universal Customizable	SYN9350
Over-the-Ear Headset	SYN8908
Neckloop	SYN7875
Bluetooth PCMCIA Card	SYN8625

Symbols

A

B

C

D

E

F

H

I

K

L

M

N

O

P

Personal Communications Sector,
789 International Parkway Room S2C
Sunrise, FL 33325-6220

6809464A28-A