MOTOROLA

Level 1 and 2 Service Manual

6809493A76-O

U6

Digital Wireless Telephone

GSM 900/1800/1900 or 850/1800/1900 GPRS

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 U6 GSM 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 U6 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.

Keys to be pressed are represented graphically. For example, instead of “Press the Menu Key”, you will see “Press ”.

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

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. 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 this 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.

Accessories and Aftermarket Division (AAD)

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

U.S.A.

Phone: 800-422-4210

FAX: 800-622-6210

Website: http://businessonline.motorola.com

Outside U.S.A.

Phone: 847-538-8023

FAX: 847-576-3023

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 869-893 MHz Rx
Frequency Range GSM 900	880-915 MHz Tx (with EGSM) 925-960 MHZ Rx
Frequency Range DCS 1800	1710-1785 MHz Tx 1805-1880 MHz Rx
Frequency Range PCS 1900	1850-1910 MHz Tx 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) +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 740 mAh Li Ion battery	49 mm x 86.5 mm x 20 mm (1.92 inches x 3.40 inches x 0.78 inches)
Size (Volume)	69 cc (4.21 in^3), with battery
Weight	110 grams (3.88 oz), with battery
Battery Life, with standard 740 mAh Li-Ion Battery	Talk Time 204 - 400 minutes Standby time 156 - 250 hours All talk and standby times are approximate and depend on network configuration, signal strength, and features selected. Standby times are quoted as a range from DRX=2 to DRX=9. Talk times are quoted as a range from DTX off to DTX on.
Battery Charge Time	4 hours to 90% of 700 mAh capacity
Alert volume	Max 95 dB @5cm, 0.5 Watts input

Transmitter Function	Specification
RF Power Output	32 dBm nominal GSM 850/900 MHz 29 dBm nominal GSM 1800/1900 MHz
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

Speech Coding Function	Specification
Frame Duration	20 ms
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 U6 telephones provide mobile communication in a small and stylish package. This Global System for Mobile communications (GSM) General Packet Radio Service (GPRS) Wireless Application Protocol (WAP)-enabled mobile phone incorporates an icon based User Interface (UI) for easier operation, allows Short Message Service (SMS) text messaging, Multi-media Messaging Services (MMS), and includes Personal Information Manager (PIM) functionality. the U6 is a tri-band phone that allows roaming within the GSM 850, 1800.1900 or GSM 900, 1800, 1900 depending on programming.

U6 telephones support GPRS, EDGE, SMS, EMS, and MMS in addition to traditional circuit switched transport technologies. GPRS or EDGE, where available, provides substantial increases in mobile data communications performance and the efficient use of radio spectrum. Data transmission rates for GSM networks can potentially increase from the current rate of 9.6 kbps up to a theoretical maximum of 171.2 kbps (GPRS) or 384 kbps (EDGE). An increased data rate is by no means the only benefit provided by GPRS/EDGE. A key advantage is the provision of a permanent virtual connection to the network. This “always on” connection is possible because GPRS/EDGE uses packet data transfer so that, for example, email can be downloaded in “background mode.” There is no need for the user to reconnect before requesting a service, eliminating connection set-up delays and adding convenience and immediacy to data services access. The “virtual” nature of this connection means that network resources are not consumed during periods when a user is not actually sending or receiving data. Multimedia messaging allows the end user to send photos along with personalized voice messages.

U6 telephones use the clamshell form factor. They feature an externally viewable 96 x 32 4K color STN CLI display for caller identification with date/time, and an internal 167 x 220 256K TFT color display located in the flip. The bottom part of the clam (front housing) contains the keypad, transceiver printed circuit board (PCB), microphone, flex connection, external accessory connector, smart button, volume buttons, and voice button. The standard 740 mAh Lithium Ion (Li Ion) battery fits behind a removable cover.

The phone accepts 1.8v or 3V Subscriber Identity Module (SIM) card that fits into the SIM holder located under the battery. The antenna is located internally. Direct connection to a computer or handheld device is available through the USB port and an accessory data cable. The USB connector allows data, fax calls, and the synchronizing of phonebook and calendar entries using the optional mobile PhoneTools™ software.

Features

U6 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 model include:

- GSM/GPRS 900/1800/1900 MHz
- Volume 69 cc
- 176 x 220, 1.9”, 256K TFT color display
- 96 x 32, 1”, 4K color STN CLI display
- VGA image capture w/ 4X zoom and lighting solution
- CIF camera for video conferencing

- 5 way navigation key
- Dedicated camera key
- Talk time: up to 215 minutes
- Standby time: up to 260 hours
- Video clip playback
- 32 MB RAM
- 8 MB ROM
- Bluetooth 1.2

Speaker Dependant Voice Activation and Voice Note Recording

Voice tags can be used for voice dialing up to 20 phone numbers in the phonebook 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 (phonebook 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 allow you to store voice tags on the SIM card, voice tags are added to the phone's memory.

U6 telephones also include a voice note 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.

Wireless Access Protocol (WAP) 2.0 Compliancy

In the WAP environment, access to the Internet is initiated in Wireless Markup Language (WML), which is derived from Hypertext Markup Language (HTML). The request is passed to a WAP gateway, which retrieves the information from the server in standard HTML (subsequently filtered to WML) or directly in WML if available. The information is then passed to the mobile subscriber using the mobile network.

Bitmap image data will download as text. If the image is larger than the screen, only part of the image will display.

When the user receives a call while in browser mode, the browser will pause and allow the user to resume after completing the call.

SIM Application Toolkit™ - Class 2

SIM Application Toolkit is a value-added service software product 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 enter 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 enter a character.
- Numeric. The keypad produces numeric characters only. For some text areas, such as phone numbers, this is the only method available.

Caller Line Identification

Upon receipt of a call, the calling party's phone number is compared to the phonebook. If the number matches a phone book entry, that name will be displayed. If there is no phone book entry, the incoming phone number will be displayed. If no caller identification information is available, the Incoming Call message is displayed.

The user must subscribe to a caller line identification service through their service provider.

Other Features

Detailed descriptions of these and the other features can be found in the appropriate user's guide listed in the "Related Publications" section toward the end of this manual.

General Operation

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

The U6 telephone's external I/O connectors are located on the top of the phone. These consist of a headset jack and an accessory port. The external display, camera lens, and electronic flash are located on the front. A handsfree speaker is located on the back of the phone. Inside the phone, keys on the keypad indicators, in the form of icons, are displayed on the LCD (see Figure 2). See Figure 1.

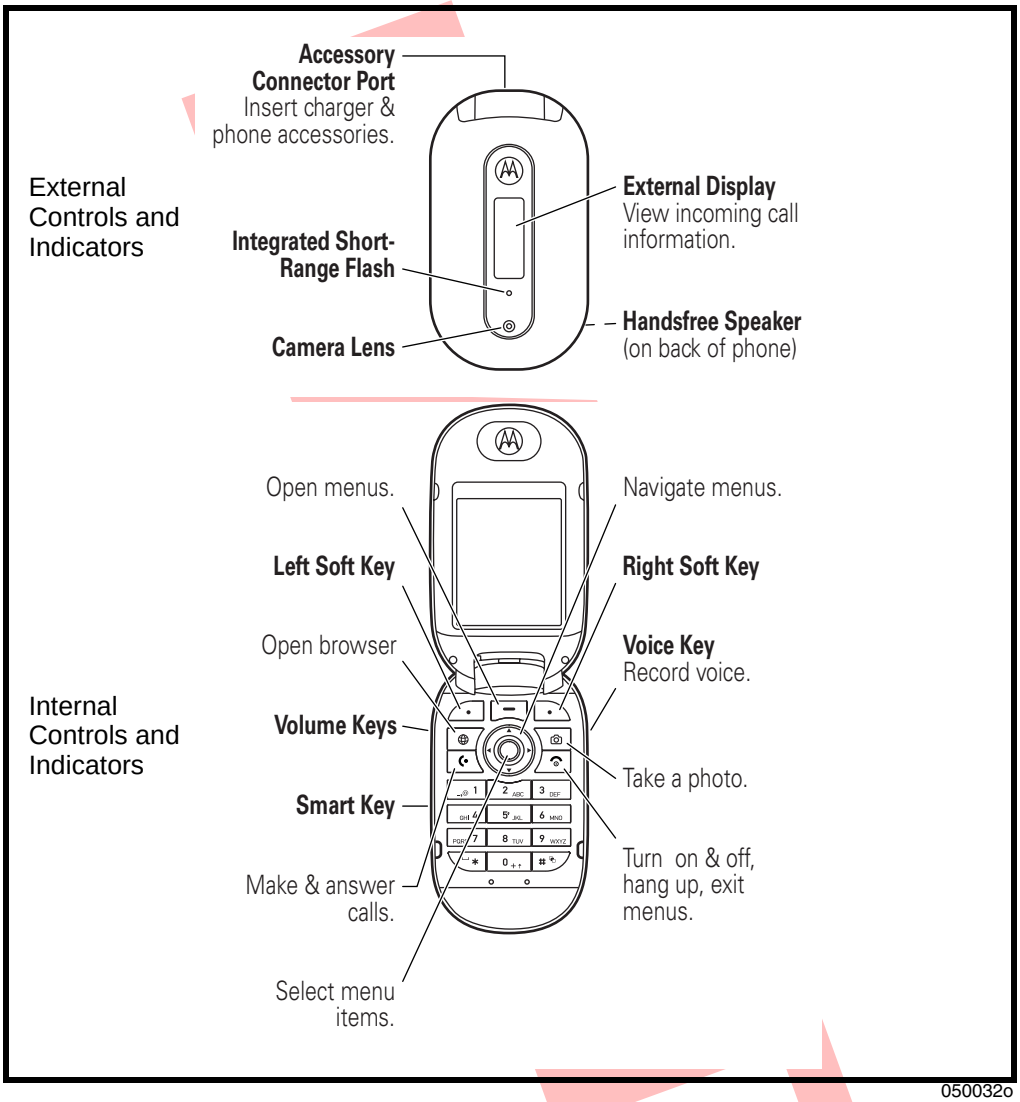


Figure 1. Telephone Controls, indicators, and I/O Connections

Main Display

The main display provides a 256k color backlit display for easy readability in all light conditions. The 176 x 220 display provides room for text, graphics, icons, and prompts.

Display animation makes the phone's menus move smoothly as the user scrolls up and down Turn animation off to conserve the battery. Figure 2 shows common icons displayed on the LCD.

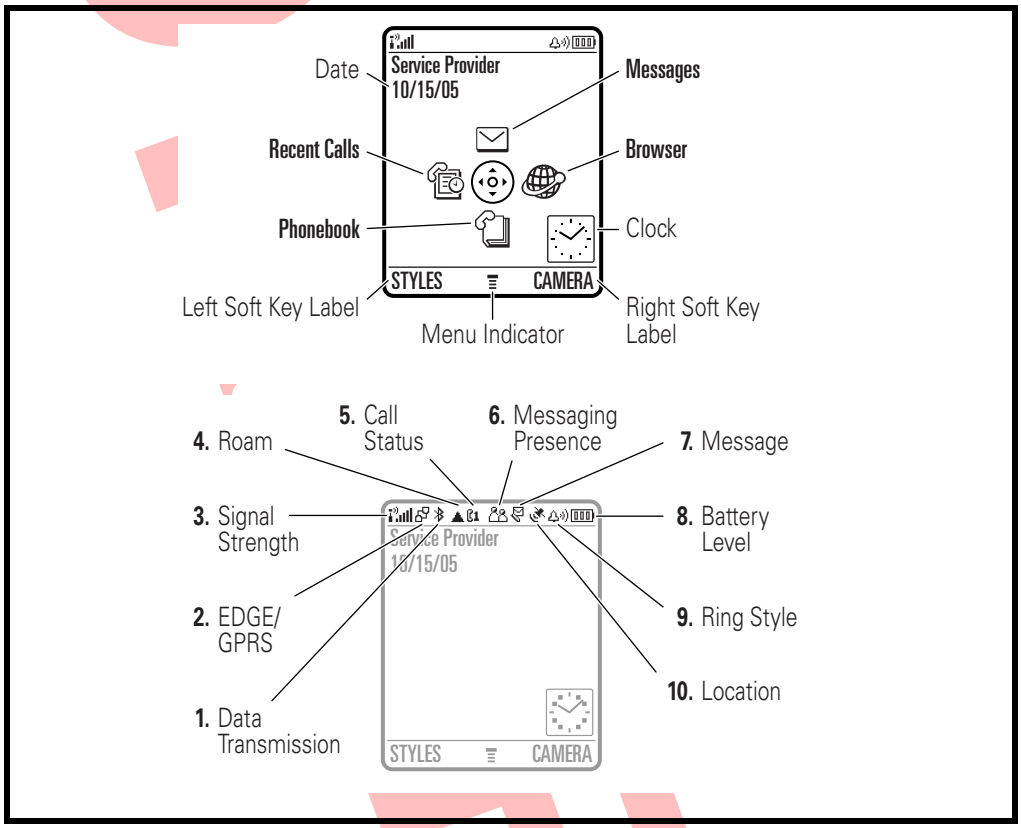
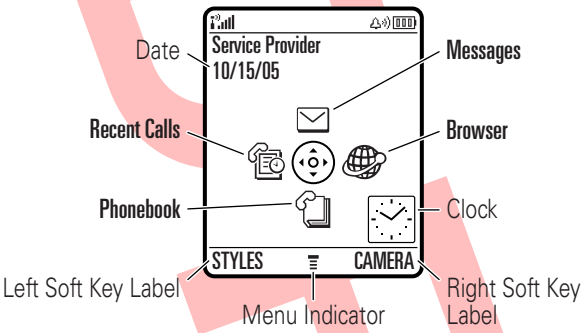


Figure 2. Icon Indicators

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

Icon Indicators

Your home screen may look different than the one below, depending on your service provider.

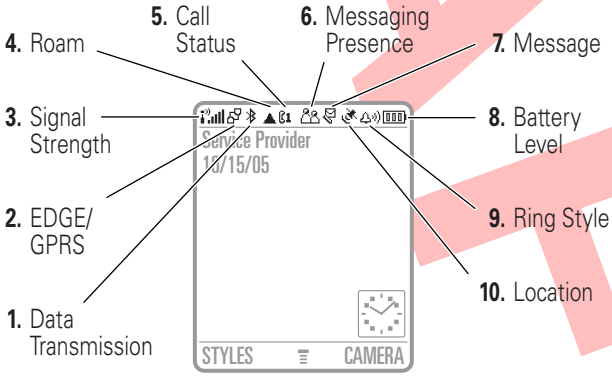


The *menu indicator* shows that you can press to open the menu. *Soft key labels* show the current soft key functions.

Press up, down, left, or right to open basic menu features identified by the *menu feature icons* in the home screen. (You can select these menu features even when the icons are hidden from view.) Press to return to the home screen.

Your phone can display news from your service provider at the bottom of the home screen. To change this news display, press > **Settings** > **Personalize** > **Home Screen**.

Status indicators can display at the top of the home screen:



Data Indicator – Shows connection 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
- =unsecureapplication connection
- = secure *Circuit Switch Data* (CSD) call
- = unsecure CSD call

EDGE/GPRS Indicator – Shows when your phone is using a high-speed *Enhanced Data for GSM Evolution* (EDGE) or *General Packet Radio Service* (GPRS) network connection. Indicators can include:

= GPRS PDP context active

= EDGE

= GPRS packet data available

Signal Strength Indicator – Vertical bars show the strength of the network connection. You can't make or receive calls when or displays.

Roam Indicator – The roam indicator ▲ shows when your phone is seeking or using a network outside your home network. Other indicators can include:

= 2G home

= 2G roam

= 2.5G home

= 2.5G roam

= 3G home

= 3G roam

Active Line Indicator – Shows to indicate an active call, or to indicate when call forwarding is on. Indicators for dual-line-enabled SIM cards can include:

= line 1 active

= line 2 active

= line 1 active, call forward on

= line 2 active, call forward on

Messaging Presence Indicator – Shows when Instant Messaging (IM) 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, can display here.

Message Indicator – Shows when you receive a new message. Indicators can include:

= text message

= voicemail message

= voicemail & text message

= IM message

= active chat session

= IM message

= AIM message

Battery Level Indicator – Vertical bars show the battery charge level. Recharge the battery when your phone shows Low Battery.

Ring Style Indicator – Shows the ring style setting.

= loud ring

= vibrate then ring

= soft ring = silent
= vibrate

= loud ring = vibrate & ring
= soft ring = vibrate then ring
= vibrate = silent

Location Indicator – Shows when your phone can send location information or not .

Alert Settings

U6 telephones include up to 32 preset ring 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 phone 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.

Operation

For detailed operating instructions, refer to the appropriate user's guide listed in "Related Publications" on page 43.

Tools and Test Equipment

Table 1 lists tools and test equipment recommended for disassembly and reassembly of U6 telephones. Use either the listed items or equivalents.

Table 1. General Test Equipment and Tools

Motorola Part Number[1]	Description	Application
RSX4043-A	Torque Driver	Used to remove and replace screws.
--	#0 Cross Point Screwdriver	Used to remove cross point screws in the flip assembly.
—	Torque Driver Bit T-6 Plus, Apex 440-6IP Torx Plus or equivalent	Used with torque driver.
See Table 7	Rapid 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)	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 phone.
6680388B01	Tweezers, Plastic	Used during assembly/disassembly of phone.
—	Digital Multimeter, HP34401A[2]	Used to measure battery voltage.
8102430Z04	GSM / DCS Test SIM	Used to enable manual test mode.

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. Not available from Motorola. To order, contact Hewlett Packard at (800) 452-4844.

Disassembly

This section provides instructions for the disassembly of U6 telephones. Tools and equipment used for the phone are listed in Table 1, preceding.

Many of the integrated devices used in these phones are vulnerable to damage from ESD. Ensure adequate static protection is in place when handling, shipping, and servicing the internal components of this phone.

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, touches exposed terminals. The conductive material may complete an electrical circuit (short circuit) and become very hot. Use 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 down on the battery latch and slide the battery cover as shown in Figure 1 then lift it off the phone.

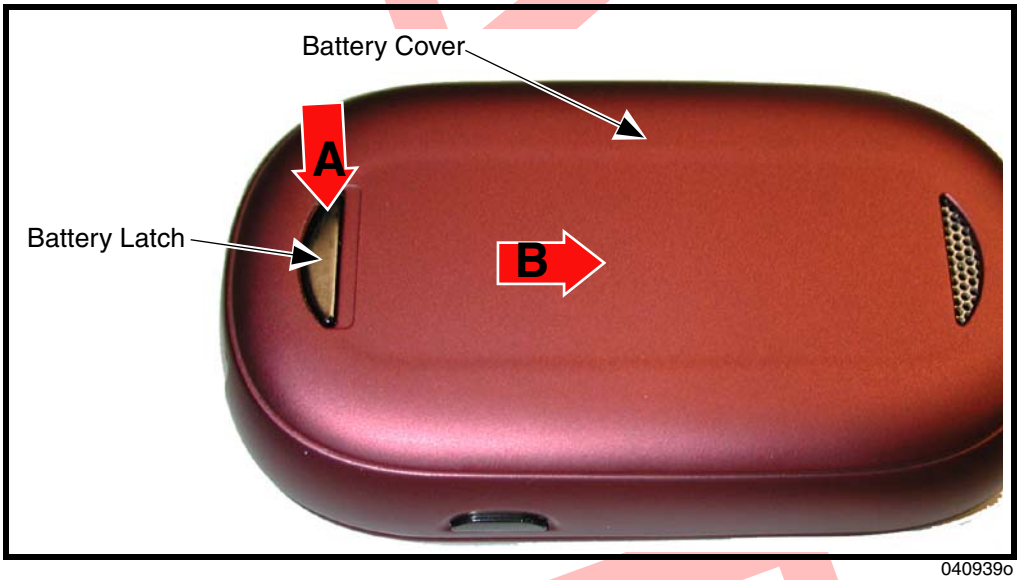


Figure 1. Removing the Battery Cover

3. Lift the side edge of the battery up and out of the battery compartment.

4. Slide the battery away from the retainer lip, and out of the phone. (see Figure 2).

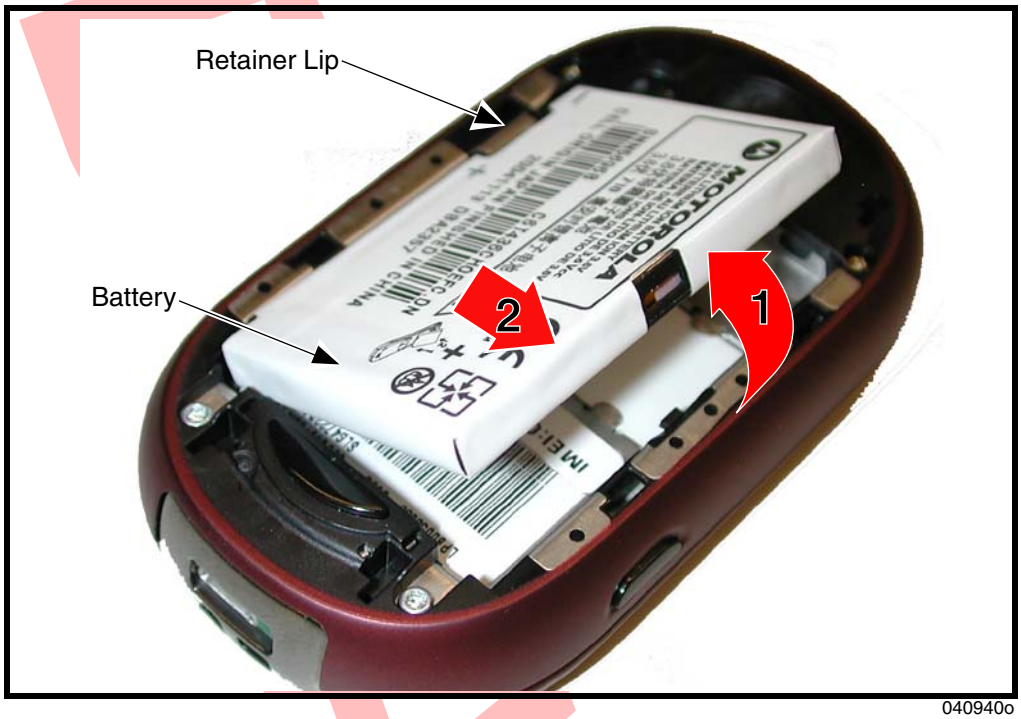


Figure 2. Removing the Battery

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 battery, side edge first, into the battery compartment.
7. Insert the opposite edge of the battery into the battery compartment.
8. Slide the battery cover over the battery compartment and snap it into place.

Removing and Replacing the Subscriber Identity Module (SIM)

1. Remove the battery cover and battery as described in the procedures.
2. Slide the SIM out of the SIM holder as shown in Figure 3.

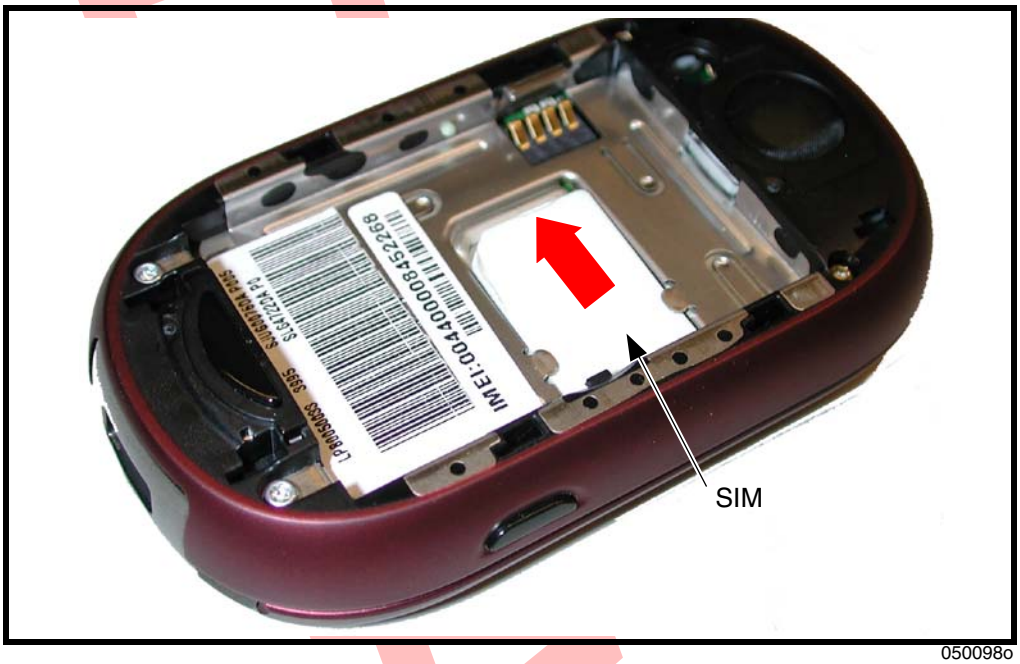


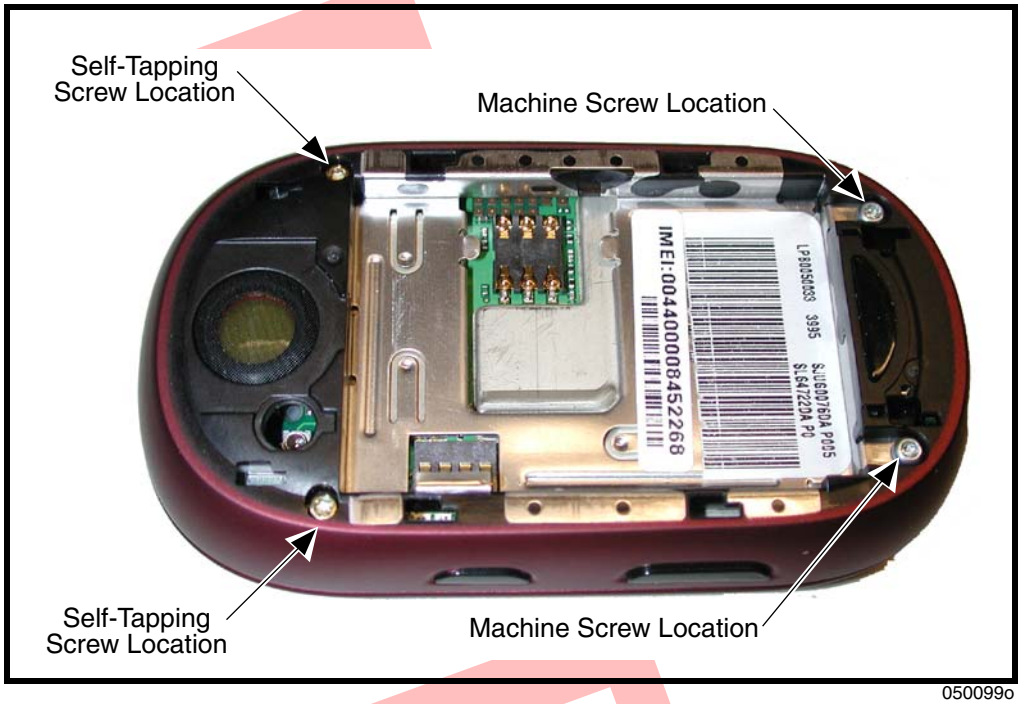
Figure 3. Removing the SIM

3. Carefully lift the SIM out of the phone.
4. To replace, slide the SIM into the holder, ensuring the notched corner of the SIM aligns with the notch in the SIM holder.
5. Replace the battery and battery cover as described in the procedures.

Removing and Replacing the Front and Rear Housings

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.
2. Using a Torx driver with a T-6 bit, remove the 2 machine screws and the 2 self tapping screws on the rear housing (see Figure 4).



050099o

Figure 4. Removing the Rear Housing Screws

3. Turn the phone over and use the disassembly tool to separate the front housing from the rear housing as shown in Figure 6. Use the disassembly to gentle pry around the sides and lift the front housing and keypad from the phone.

Figure 5. Separating the Front and Rear Housings

4. Lift the right and left side key flex away from the transceiver PC board to avoid damage to the printed flex cables (see Figure 6).

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

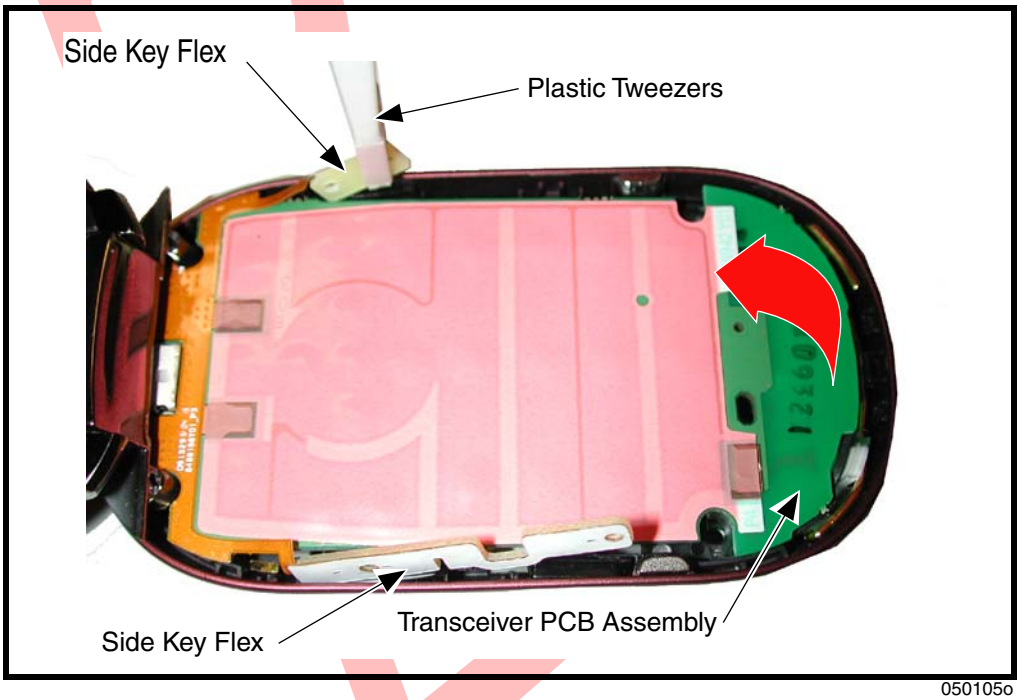


Figure 6. Removing the Side Key Flex

5. Carefully lift the entire transceiver PCB assembly and flip assembly away from the rear housing assembly (see Figure 7).

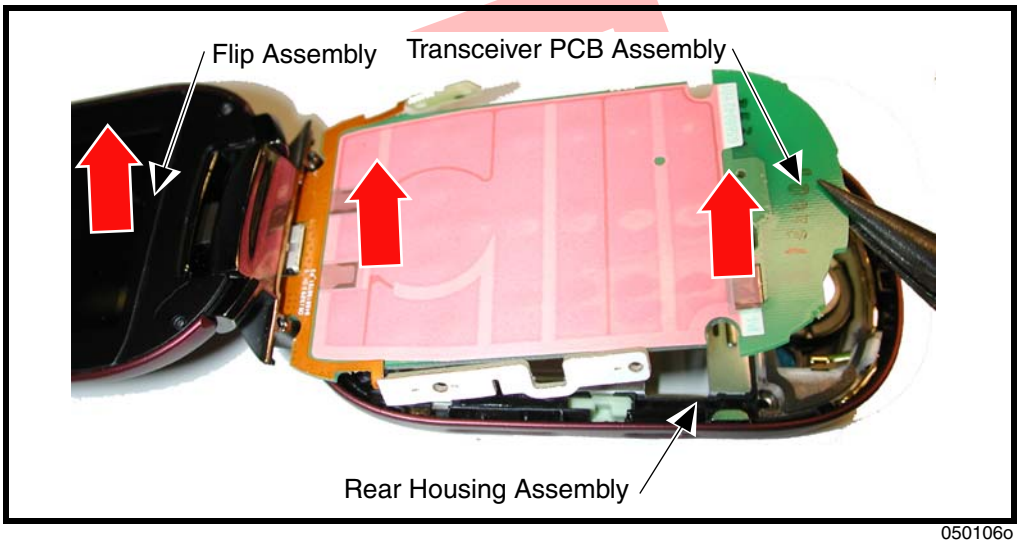


Figure 7. Removing the Rear Housing Assembly

6. Remove the plastic side keys from the rear housing. Set the side keys aside for reuse.
7. To replace, insert the side keys into the rear housing.
8. Lower the flip assembly and transceiver PCB assembly into the rear housing.

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

9. Carefully insert the side key flex on both sides of the phone into their slots. Ensure that all the side keys operate properly.
10. Align the front housing assembly to the rear housing assembly.
11. Insert the top edge of the front housing assembly onto the rear housing assembly.
12. Lower the bottom edge of the front housing assembly onto the rear housing assembly.
13. Gently but firmly press the front housing assembly into final position on the rear housing so all the edges are properly seated.
14. Hold the entire assembly carefully and turn it over to expose the four housing screw holes.
15. Insert and tighten the two machine screws near the flip assembly to a final torque setting of 1.5 inch pounds or 16 N/cm.
16. Insert and tighten the 2 self tapping screws into the screw holes near the speaker assembly to a final torque setting of 1.5 inch pounds or 16 N/cm.
17. Replace the SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Transceiver Board Assembly

This product contains static-sensitive devices. Use anti-static handling procedures to prevent ESD and component damage.

1. Remove the battery cover, battery, SIM, and the front and rear housing assemblies as described in the procedures.
2. Turn the Transceiver PCB assembly and flip assembly over to expose the display flex connector.

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

3. Use the flat end of the disassembly tool to unseat the flex connector from its socket on the transceiver PCB assembly (see Figure 8).

4. Rotate the end of the transceiver PCB assembly upward at an angle. Carefully slide the transceiver PCB assembly away from the flip assembly. Be careful not to damage the display flex cable,

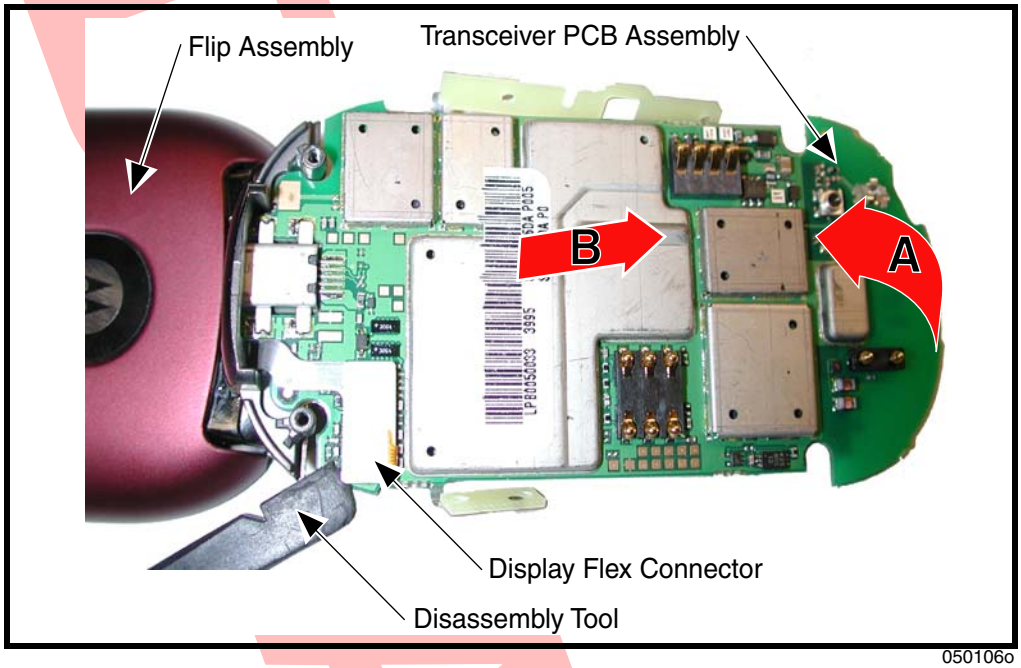


Figure 8. Removing the Transceiver PCB Assembly

5. To replace, hold the PCB assembly at a 45 degree angle and align the transceiver PCB assembly to the two screw bosses on the flip assembly.
6. Lower the transceiver PCB assembly so that the screw bosses are upright with the transceiver PCB assembly.
7. Carefully align the display flex connector to the socket on the transceiver PCB assembly then gently but firmly seat the connector into its socket.
8. Replace the front and rear housing assembly, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Keypad

1. Remove battery cover, battery, SIM, front and rear housing assemblies as described in the procedures.
2. Using the plastic tweezers, lift the keypad, away from the front housing assembly (see Figure 9).

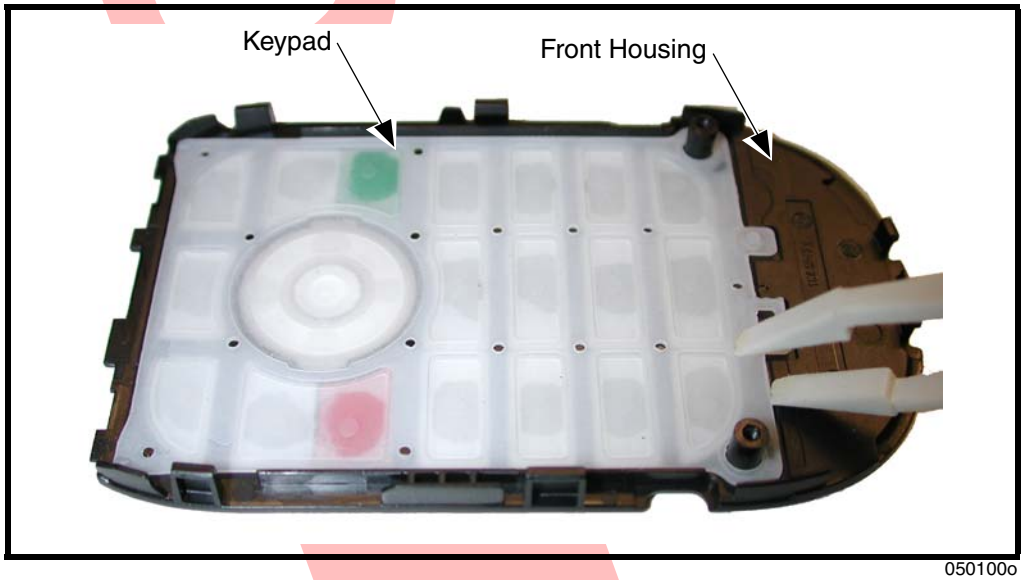


Figure 9. Removing the Keypad

3. Insert the keypad into the front housing, ensuring the keys align properly with the openings in the front housing.
4. Replace the transceiver board assembly, front and rear housing assembly, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Motor/Vibrator Assembly

1. Remove the battery cover, battery, SIM, and front and rear housings as described in the procedures.
2. Use the disassembly tool to pry the motor/vibrator assembly out of its compartment in the rear housing assembly (see Figure 10).

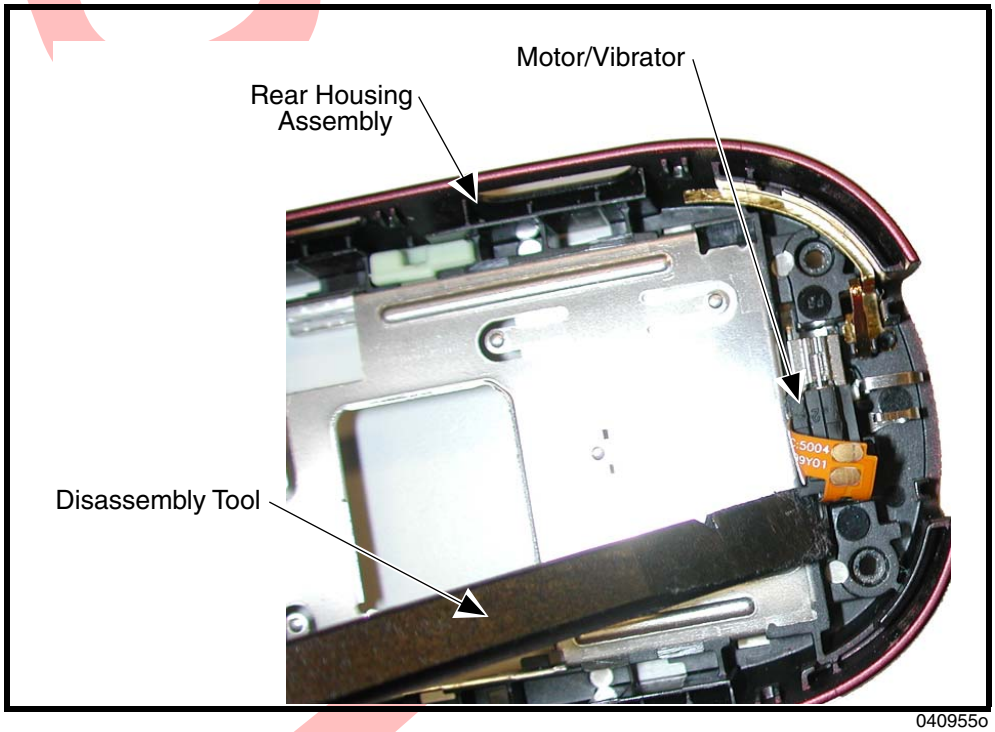


Figure 10. Removing the Motor/Vibrator Assembly

3. To replace, insert the motor/vibrator into the rear housing. Ensure that it fits snugly into the housing and that the shaft turns freely without obstruction.
4. Replace the front and rear housings, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Flip Display Lens

1. Remove the battery cover, battery, SIM, antenna, rear housing, transceiver board assembly, and keypad assembly as described in the procedures.
2. Carefully insert the disassembly tool between the flip assembly housing and the display lens.
3. Carefully lift up the display lens to separate it from the flip assembly.
4. Carefully slide the disassembly tool around the edge of the flip assembly to remove the lens from the display assembly (see Figure 11).

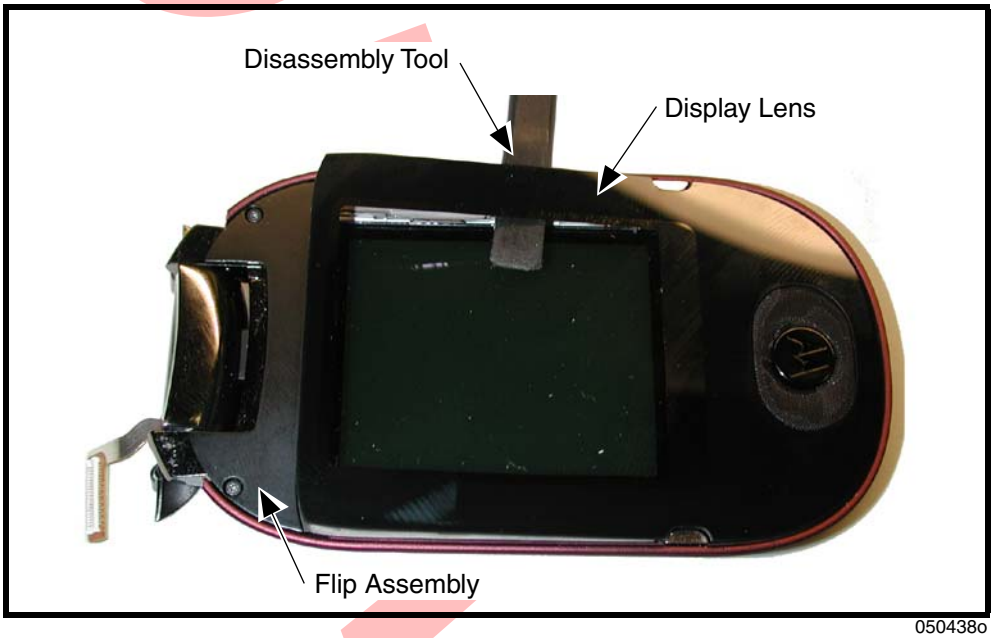


Figure 11. Removing the Flip Display Lens

5. Carefully slide the display flex cable and connector through the housing assembly. Avoid damage to the flex cable.

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

6. Lift the housing assembly away from the flip assembly. Be careful not to damage the display flex cable.
7. To replace, remove adhesive backing from new display lens.
8. Align the display lens to the flip assembly.
9. Attach the display lens to the flip assembly.
10. Replace the transceiver board assembly, front and rear housing assembly, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Flip Assembly

1. Remove the battery cover, battery, SIM, front and rear housing, and transceiver board assembly as described in the procedures.
2. Remove 2 T1 screws located near the hinge and 2 T6 screws near the top of the flip assembly (see Figure 12). Set the screws aside for reuse.

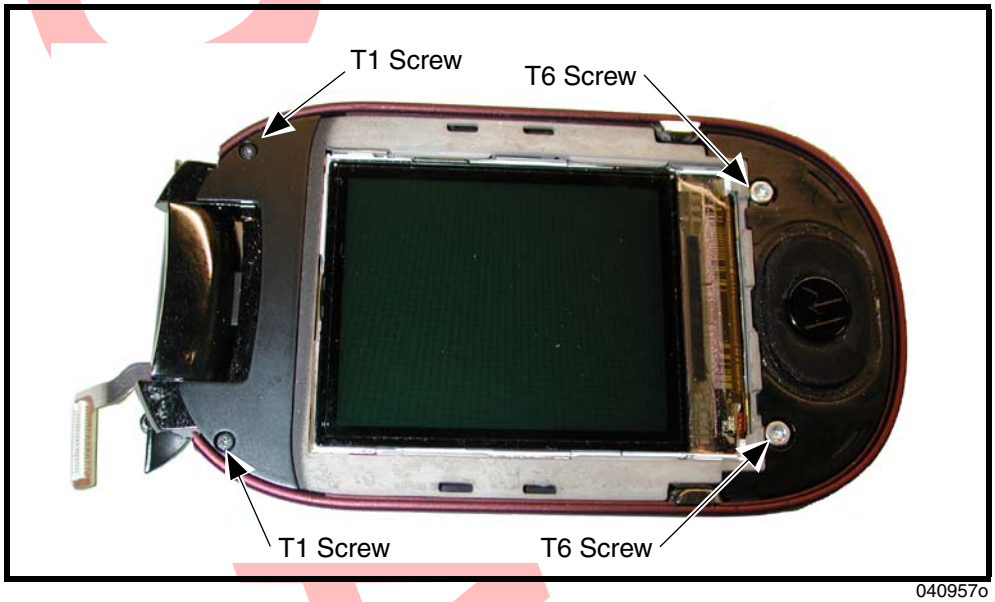


Figure 12. Removing the Flip Assembly Screws

3. Use the disassembly tool to release the 4 latches on the inside of the flip housing (see Figure 17).

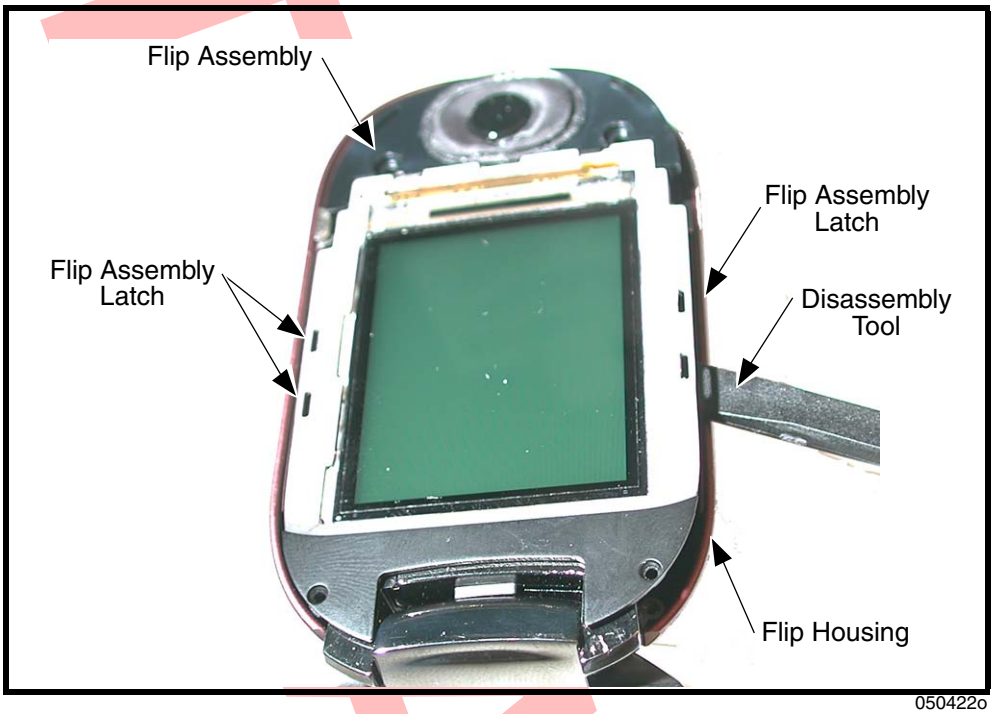


Figure 13. Removing the Flip Cover Latches

4. Carefully lift the flip cover away from the flip assembly. Avoid damaging the display flex cable and connector.
5. To replace, align the flip cover with the flip assembly. Press the flip assembly onto the flip housing until the latches are fully engaged.
6. Replace the flip display lens, transceiver board assembly, front and rear housing assembly, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Flip Display Assembly

1. Remove the battery cover, battery, SIM, antenna, rear housing, transceiver board assembly, keypad assembly, flip display lens, and flip assembly, as described in the procedures.
2. Turn the flip assembly over to reveal the CLI lens.

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

3. Use the disassembly tool to unseat the display assembly flex connector from its socket on the flip assembly. Also loosen and lift the flex ground tab from the display assembly (see Figure 14).

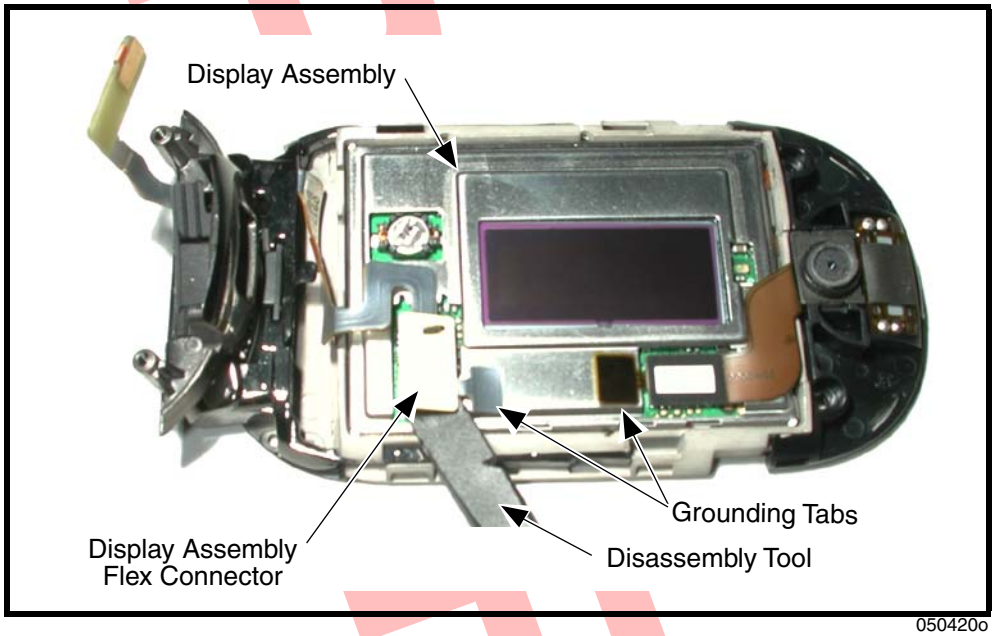


Figure 14. Removing the Flip Display Flex Connector

4. Carefully slide the hinge assembly out of the flip assembly (see Figure 15).

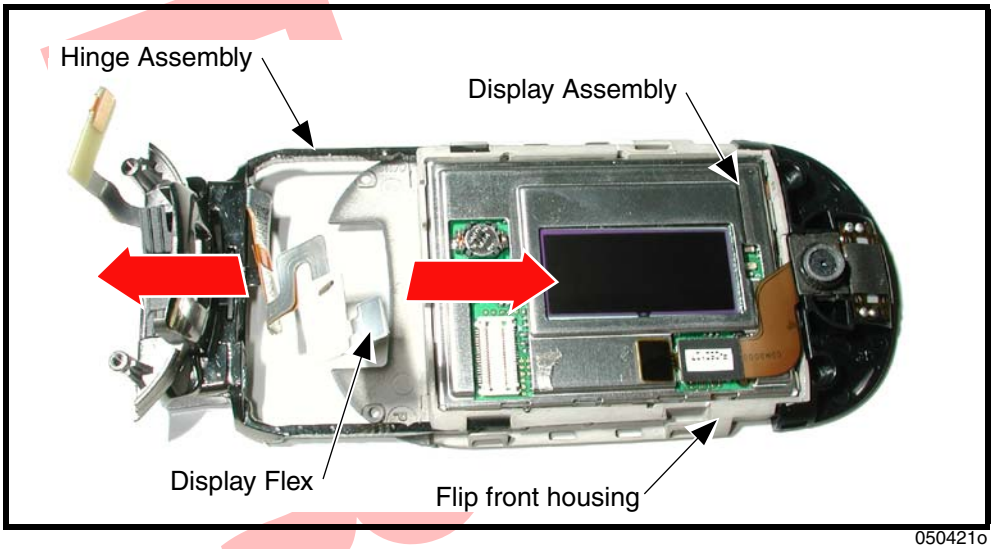


Figure 15. Removing the Flip Hinge Assembly

The FPC (flex) is easily damaged. Exercise extreme care when handling.

5. Use the disassembly tool to lift the grounding tab and from the display assembly and unseat the camera assembly flex connector from its socket (see Figure 16).

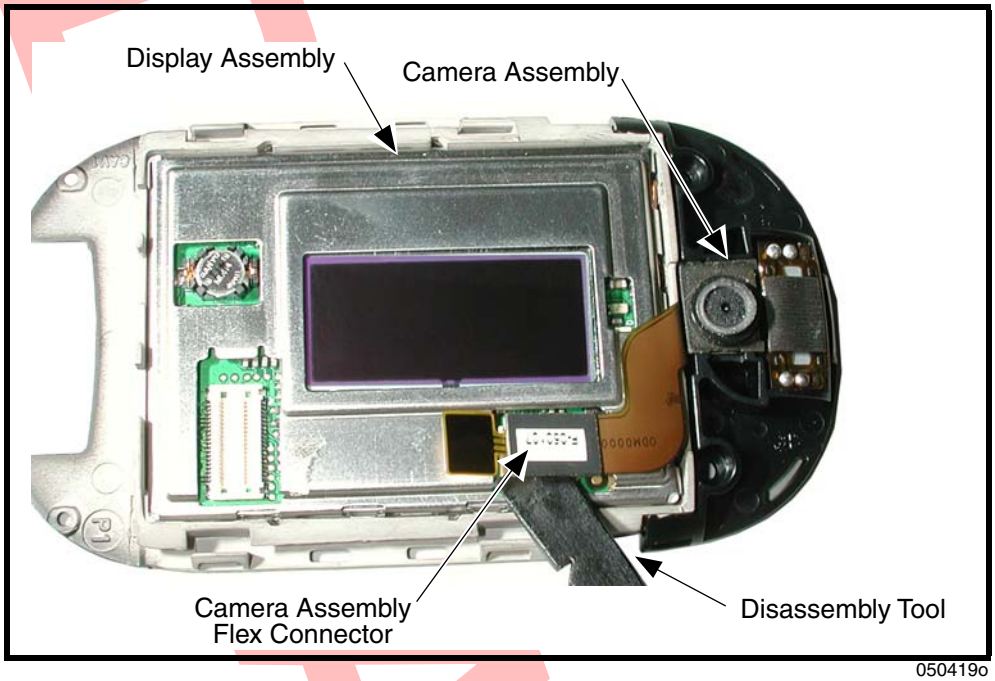


Figure 16. Removing the Camera Assembly Flex Connector

6. Disconnect the camera assembly flex connector from the display assembly.

7. Use the disassembly tool to pry the display out of the flip assembly housing (see Figure 17).

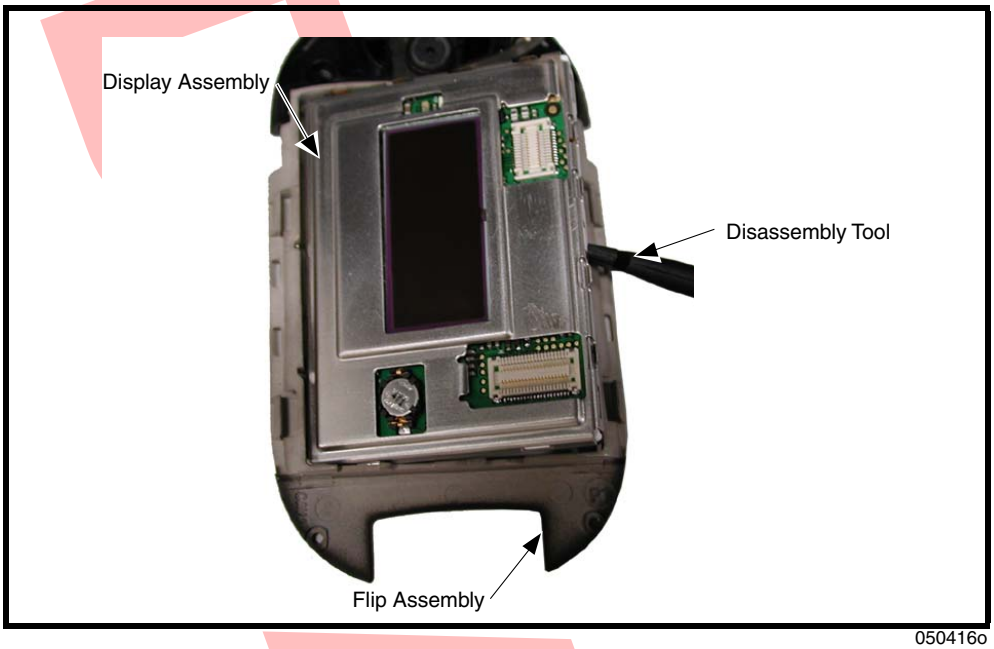


Figure 17. Removing the Display Assembly

8. To replace, align the display assembly to the flip assembly.
9. Carefully lower the display assembly onto the flip assembly. Be careful not to damage the display flex or flex connector.
10. Replace the flip assembly, flip display lens, transceiver board, rear housing, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Camera Assembly

1. Remove the battery cover, battery, SIM, antenna, rear housing, transceiver board assembly, flip assembly, and flip CLI lens assembly as described in the procedures.

The FPC (flex) is easily damaged. Exercise extreme care when handling.

2. Use the disassembly tool to pry the camera assembly from its socket (see Figure 18).

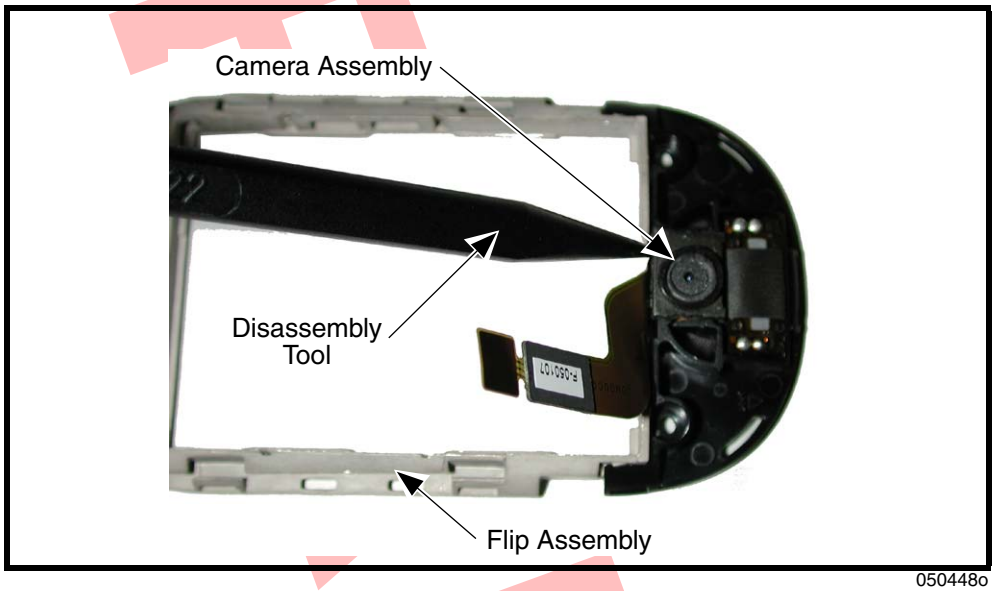


Figure 18. Camera Assembly Removal

3. Carefully lift the camera assembly away from the flip assembly.
4. To replace, carefully press the camera assembly flex connector into its socket on the display assembly until fully seated.
5. Replace the flip display assembly, flip assembly, flip display lens, transceiver board assembly, front and rear housing assembly, 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 personalized details such as menu, and stored memory, such as phonebooks, or program the customer's phone with basic user information such as language selection. V975 and V980 telephones use mobile PhoneTools® synchronization software to effect a personality transfer.

Identification

Each Motorola GSM phone is labeled with a several identifying numbers. The following section 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 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.

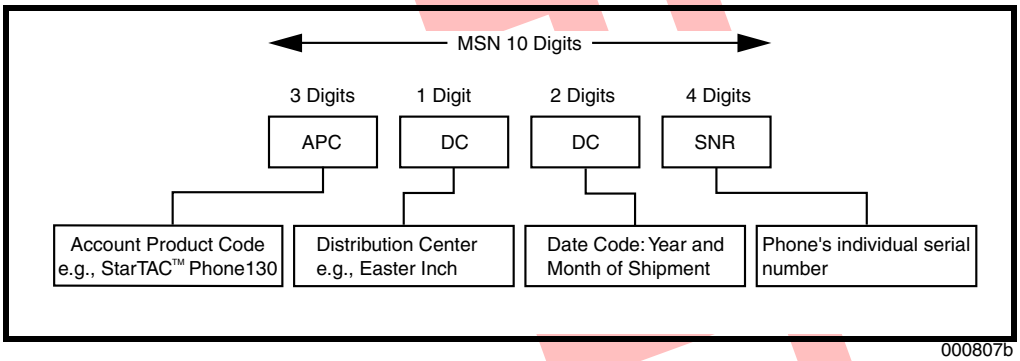


Figure 19. MSN Label Breakdown

International Mobile Station Equipment Identity (IMEI)

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

The IMEI uniquely identifies an individual mobile station provides a way to control access to GSM networks based on mobile station types or individual phones. The full IMEI structure is listed in Table 2.

Table 2. 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, usually the SWF number. (for example, V100).
- **PACKAGE NUMBER**: Identifies the equipment type, mode, and language in which the product is shipped.

Troubleshooting

Table 3. 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 battery connector replacement. If battery connectors are not at fault, proceed to c.
	c) Transceiver board assembly defective.	Remove the transceiver board assembly. Substitute a known good assembly and temporarily reassemble. Press and hold the PWR button; if the phone turns on and stays on, disconnect the dc power source and reassemble with the new transceiver board assembly. Verify that the fault has been cleared. If the fault has not been cleared then proceed to d.
	d) keyboard assembly failure.	Replace the keyboard assembly. Temporarily connect a +3.6 Vdc supply to the battery connectors. Press and hold the PWR button. If the phone turns on and stays on, disconnect the dc power source and reassemble with the new keyboard assembly.
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.	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.
3. Display is erratic, or provides partial or no display.	a) Transceiver board connections faulty.	Remove rear chassis assembly from the phone, check general condition of FPC (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.	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.

Table 3. Level 1 and 2 Troubleshooting Chart (Continued)

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
4. Incoming call alert transducer audio distorted or volume is too low.	Faulty transceiver board assembly.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble with the new transceiver board assembly.
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.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble with the new transceiver board assembly.
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 flip assembly to the transceiver board assembly. If flex is at fault, replace flip assembly. If flex connector is at fault, proceed to d. If connection 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) Antenna assembly defective.	Check that 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.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble with the new transceiver board assembly.
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 phone 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.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble with the new transceiver board assembly.
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) 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 b.

Table 3. Level 1 and 2 Troubleshooting Chart (Continued)

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
	b) Transceiver board assembly defective.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble with the new transceiver board assembly.
9. Vibrator feature not functioning.	a) Vibrator assembly defective	Temporarily replace the vibrator assembly with a known good assembly. If fault has been cleared, reassemble with the new vibrator assembly. If fault is not cleared, proceed to b.
	b) Transceiver board assembly defective.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble with the new transceiver board assembly.
10. Internal Charger not working.	Faulty charger circuit on transceiver board assembly.	Test a selection of batteries in the rear pocket of the desktop charger. Check LED display for the charging indications. If the batteries charge 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 with the new transceiver board assembly.
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.
12. No or weak audio when using headset.	a) Headset plug not fully pushed into the jack socket.	Ensure the headset plug is fully seated in the jack socket. If fault not cleared, proceed to b.
	b) Faulty jack socket on transceiver board assembly.	Replace the transceiver board assembly (refer to 1c). Verify that the fault has been cleared and reassemble with the new transceiver board assembly.

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 charts are provided as a reference for the parts associated with U6 telephones.

Related Publications

Motorola U6 User's Guide, English	68XXXXXX92

Exploded View Diagram

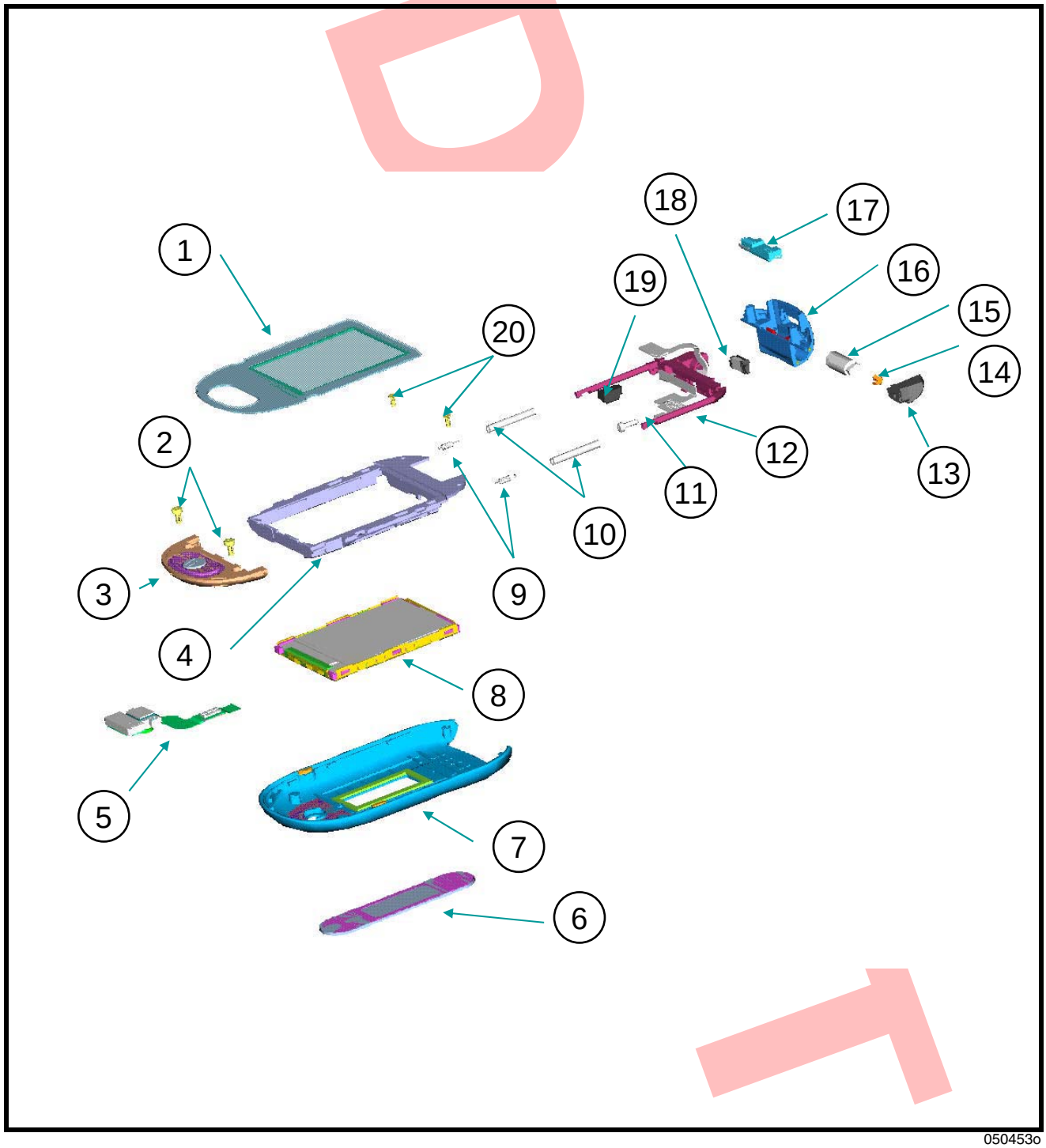


Figure 20. Exploded View Diagram (Flip Assembly)

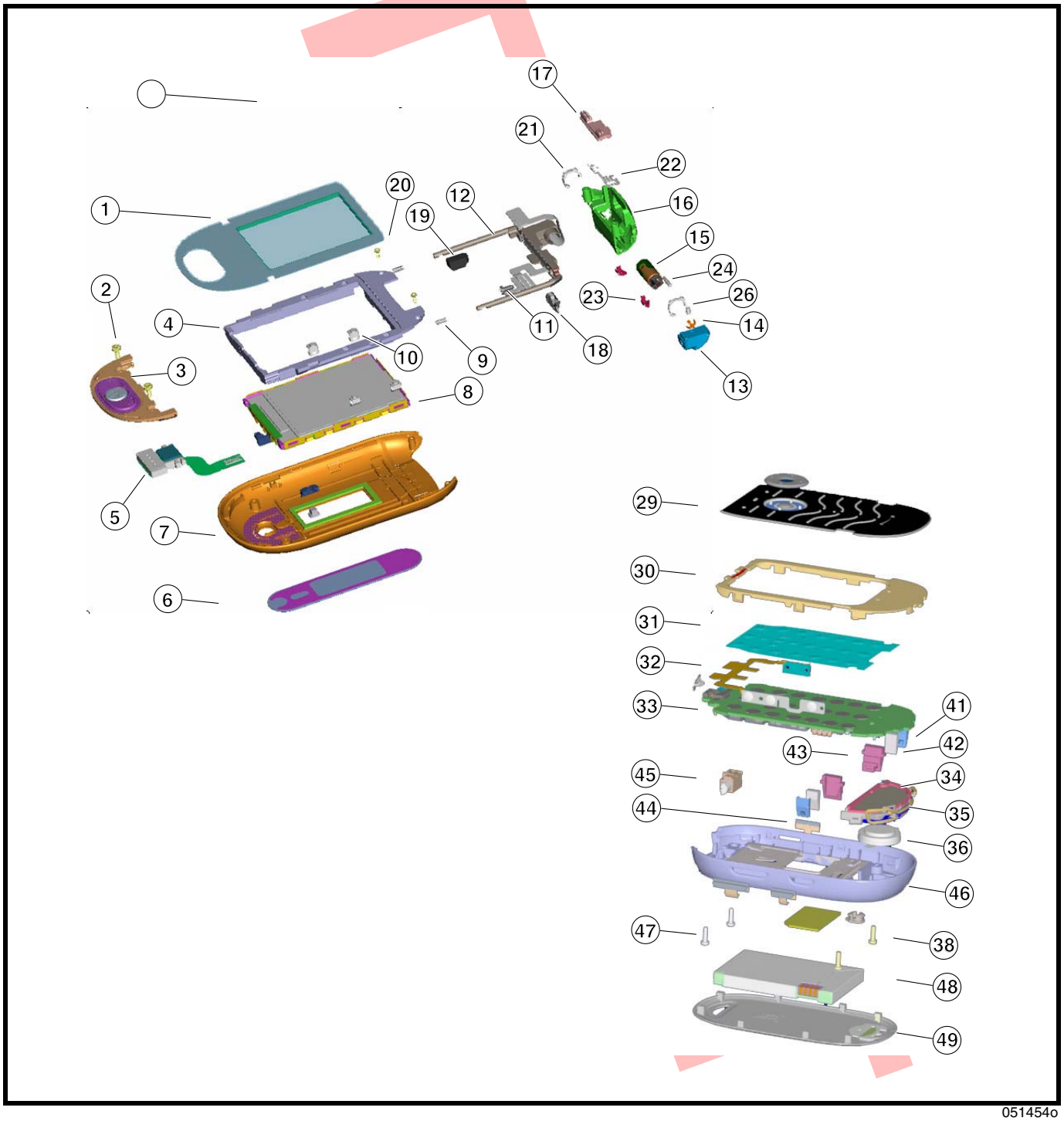


Figure 21. Exploded View Diagram

Exploded View Parts List

Table 4. Exploded View Parts list

Item #	Part #	Description	Item #	Part #	Description
1	6188596Y01	Main Display Lens	26	0371254C01	Slider Plug Set Scew
2	0389064Y01	Flip Thread Forming Screws	27	4371935B01	Flip Slider Spacers
3	2771099C01	Flip Top Chassis	28	5988631Y01	Flip Magnets
4	1571039B01	Flip Chassis	29	3889768Y01	Keypad
5	8489235Y01	Camera/Speaker Flex	30	1589712Y01	Front Housing
6	6188594Y01	CLI Lens	31	6588942Y01	EL Panel
7	1589151Y02	Flip Housing Outer	32	8488954Y01	Side Button Flex
8	0189261Y01	Main Display Assembly	33	8488750Y01	PCB
9	4189993Y01	Extension Springs	34	1588963Y01	Acoustic Chamber
10	4371310C01	Chassis Bushings	35	8588967Y01	Antenna
11	0387790L13	Slider Plug Screw	36	5088017N04	Polyphonic Speaker
12	1571328C01	Slider	37	2888980Y01	RF Grommet
13	1589119Y01	Slider Plug	38	0387791L04	XCVR Thread Forming Screws
14	4189994Y01, 4189997Y01	Ground Clip R Ground Clip L	39	3888981Y01	Smart, Camera Button
15	5571561B01	Hinge	40	3889185Y01	Volume Button
16	1589971Y01	Hinge Barrel	41	2671482C01	Magnet Shields
17	3289227Y01	Side Key Contact Plug	42	5971280C01, 5971280C02	XCVR Magnets N, S
18	0189927Y01	Hall Effect Magnet Assembly	43	4371281C01, 4371281C02	XCVR Magnet Holder L,R
19	7589347Y01	Flex Plug	44	3888981Y01	Smart, Camera Button
20	0389065Y01	Chassis Screws	45	5989188Y01	Vibrator
21	4371226C01	Barrel Collar	46	1589225Y02	XCVR Housing
22	4171020B01	Barrel Ground Clip	47	0387790L13	Machine Screws
23	0571256C01, 0571257C01	Flip Stop Caps L,R	48	0188631P01	Battery Assembly
24	3871274C01	Press Pin	49	1588964Y01	Battery Door
25	4371255C01	Hinge Collar	50	0589068Y01	USB Grommet

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.

To order parts use the following Link:

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

(Password is Required)

For information on ordering parts contact EMEA at +49 461 803 1638.

Accessories

Table 5. U6 Accessories

Description	Kit Number
Audio & Connectivity	
Data Cable Mini USB/USB/Serial	SKN6371
Headset Mono One Touch w/ Send-End (EMU)	SYN0896
Mobile Phone Tools	Region-specific
Bluetooth	
Bluetooth Car Kit - HF850	SJ0014
Bluetooth Mono Headset, Nickel- H500	SYN1290
Bluetooth Car Kit - IHF1000 - EMEA	CFLN1232
Bluetooth Headset (Genie Refresh - Dark Blue) - HS815	SYN1201
Bluetooth Speaker (Quadrant Refresh) - HF820	SYN0736C
Bluetooth Headset - Glossy Black - HS820	SYN9951
Bluetooth Headset - Grey - HS820	SYN1106
Bluetooth Headset (Nexus) - HS805	SYN0986
Bluetooth Headset (Mage) - HS830	SYN0996
Bluetooth Headset - HS850 (Paladin Refresh - Black)	SYN1107
Bluetooth Helmet Headset - HS830 (Mage)	SYN0997
Bluetooth Speaker - HF800	SYN9975
Bluetooth Headset - Green - HS820	SYN0945
Bluetooth Headset (Genie Silver) - HS801	CHYN4590
Bluetooth Headset (Paladin) - HS810	SYN9826
Bluetooth PC USB Adapter	SYN0717
Bluetooth Speaker Quadrant - HF800	SYN0736
Bluetooth Car Kit - IHF1000 - Americas/Asia	98676H
Bluetooth Car Kit - Asia/Americas	S9642
Bluetooth Car Kit - Euro	S9643
Consumer Personalization	
Carry Case URL	Licensee
Carry Case U6 leather pouch in-box	syn1335
Wrist strap with screen cleaner	SYN1336
Wrist strap U6 leather	SYN1337
Screen Cleaner U6 leather	SYN1338
In-Vehicle Solutions	
Vehicle Power Adapter EMU - VC700	SYN0847
Self Install Car Kit Universal - Mandarin - Smart Drive+	SYN0888
Self Install Car Kit Universal - Smart Car Kit - Smart Drive	SYN0890
Smart Cable EMU - Motorola	SYN1003
Power Solutions	
Travel Charger EMU Mid-Rate Switcher - TWN	SPN5216
Travel Charger EMU Rapid Switcher - MEXICO	SPN5200
Travel Charger EMU Rapid TWN	SPN5270
Travel Charger EMU Rapid Plus US EMU	SPN5256
Travel Charger EMU Rapid Plus HK	SPN5258
Travel Charger EMU Rapid Plus PRC	SPN5259

Table 5. U6 Accessories

Description	Kit Number
Travel Charger EMU Rapid Plus Japan	SPN5260
Travel Charger EMU Rapid Plus TWN EMU	SPN5263
Charger Adapter - Aust/NZ Plug	SYN8127
Charger Adapter - Euro Plug	SYN7456
Charger Adapter - UK Plug	SYN7455
Travel Charger EMU Mid-Rate Switcher - Argentina	SPN5192
Travel Charger EMU Mid-Rate Switcher - Australia	SPN5193
Travel Charger EMU Mid-Rate Switcher - BRAZIL	SPN5187
Travel Charger EMU Mid-Rate Switcher - EURO	SPN5189
Travel Charger EMU Mid-Rate Switcher - INDIA	SPN5194
Travel Charger EMU Mid-Rate Switcher - MEXICO	SPN5186
Travel Charger EMU Mid-Rate Switcher - PRC	SPN5188
Travel Charger EMU Mid-Rate Switcher - UK/HK	SPN5190
Travel Charger EMU Mid-Rate Switcher - US ENG	SPN5185
Travel Charger EMU Rapid Switcher - Argentina	SPN5197
Travel Charger EMU Rapid Switcher - BRAZIL	SPN5196
Travel Charger EMU Rapid Switcher - HK	SPN5199
Travel Charger EMU Rapid Switcher - PRC	SPN5198
Travel Charger EMU Rapid Switcher - US	SPN5202

R

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V

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