MOTOROLA

MOTORAZR™ V3
Digital Wireless Telephone

RAZR 06 GSM 850/900/1800/1900 MHz EDGE, GPRS

Contents

Introduction

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

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

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

Product Identification

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

Product Names

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

Product Changes

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

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

Regulatory Agency Compliance

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

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

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

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

Computer Program Copyrights

About This Service Manual

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

Audience

This manual aids service personnel in testing and repairing V3 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 V3 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, PHONEBOOK.

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 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.

Replacement Parts Service Division (RPSD)

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

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

Website: http://businessonline.motorola.com

EMEA

Phone: +49 461 803 1404

Website: http://emeaonline.motorola.com

Asia

Phone: +65 648 62995

Website: http://asiaonline.motorola.com

Specifications

General Function	Specification
Frequency Range GSM 850	824-848 MHz Tx 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 500 mAh Li Ion battery	53 mm x 98 mm x 13.9 mm (2.08 inches x 3.85 inches x 0.54 inches)
Size (Volume)	65 cc (3.96 in^3), with battery
Weight	95 grams (3.17 oz), with battery
Battery Life, with standard 710 mAh Li-Ion Battery	Talk Time 6-8 hours Standby time 6.5 -10.4 days 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, 29 dBm nominal GSM 1800/1900
Output Impedance	50 ohms nominal
Spurious Emissions	-36 dBm from 0.1 to 1 GHz, -30 dBm from 1 to 4 GHz

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

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

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

MOTORAZR V3 telephones feature global system for mobile communications (GSM) general packet radio service (GPRS) wireless application protocol (WAP)-enabled mobile phones. The V3 phones incorporate a new user interface (UI) for easier operation, allows short message service (SMS) text messaging, and includes personal information manager (PIM) functionality.

The V3 is a quad-band phone that allows roaming within the GSM 900 MHz, GSM 850 MHz, 1800 MHz digital cellular system (DCS), and 1900 MHz PCS bands.

V3 telephones support EDGE, GPRS and SMS in addition to traditional circuit switched transport technologies.

V3 telephones have a clam form factor. They feature an anodized aluminum housing and have an externally viewable 96 x 80 pixel 64K CSTN display for caller identification and date/time, an internal 176 x 220 pixel 262K TFT display, and the speaker 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 700 mAh Lithium Ion (Li Ion) battery fits behind a removable back cover.

The phone accepts both 3V and 1.8V mini subscriber identity module (SIM) cards which fit into the SIM holder next to the battery. The antenna is internal. Inexpensive direct connection to a computer or handheld device via RS232 USB or Bluetooth™ for data and fax calls, and for synchronizing phonebook entries with Mobile Phone Tools software, can be accomplished by using the optional data cable and soft modem.

Features

V3 telephones use advanced, self-contained, sealed, custom integrated circuits to perform the complex functions required for GSM EDGE, GPRS communication. Aside from the space and weight advantage, microcircuits enhance basic reliability, simplify maintenance, and provide a wide variety of operational functions.

Features available in this family of telephones include:
- GSM 850/900/1800/1900 MHz GPRS (2U/4D) EDGE
- Built in VGA Camera (640x480 pixels)
- 262K Thin Film Transistor (TFT) Active Color Display
- External color CLI Display
- Polyphonic Speaker
- Speaker Phone
- Bluetooth™
- 4.5MB (Max) User memory. (varies depending on the region & carrier's software)

Speaker Dependent Voice Activation and Voice Note Recording

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

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

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

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

V3 telephones also include a voice recorder that allows up to 2 minutes of personal messages to be recorded. This feature has a complete set of record, playback, and management tools that make it easy to store and maintain a list of personal memos.

Wireless Access Protocol (WAP) 1.1 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 via the mobile network.

The V3 microbrowser can be configured for baud, idle timeout, line type, phone number, and connection type.

▶ *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^{TM} - Class 2

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

Simplified Text Entry

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

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

Caller Line Identification

Upon receipt of a call, the calling party's phone number is compared to the phone book. 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. In the event that no caller identification information is available, the Incoming Call message is displayed.

▶ *User must subscribe to a caller line identification service through their service provider.*

Other Features

Detailed descriptions of these and other V3 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 V3 series telephone's controls are located on the sides of the flip and on the keypad. Indicators, in the form of icons, are displayed on the LCD. V3 phones have an audible alert transducer on the top and I/O connectors, consisting of a charger/accessory port, located on the side of the phone. See Figure 1.
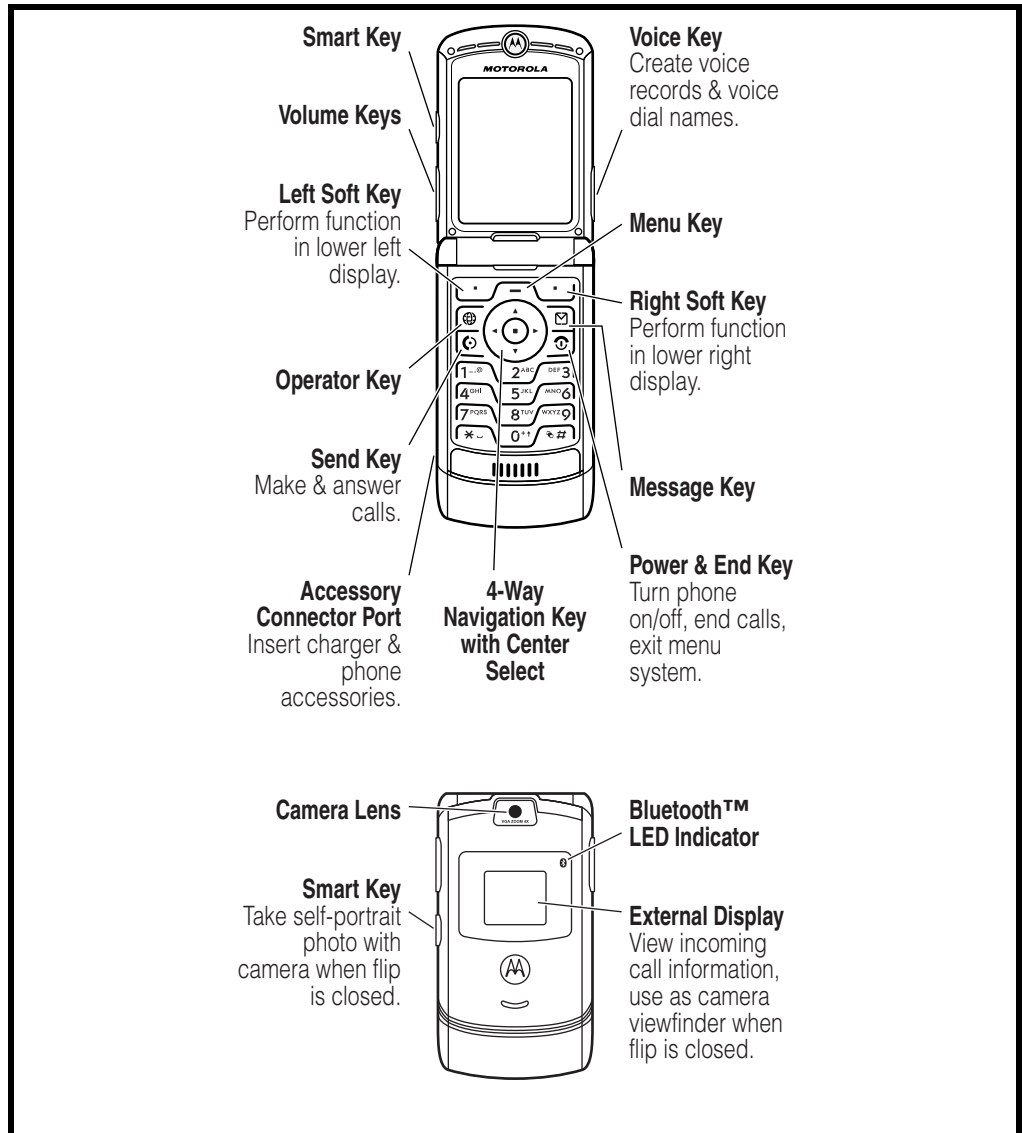
040128o, 070629o

Figure 1. Controls, indicators, and I/O

"Soft keys" refer to non-labeled keys that correspond to text options displayed on the screen. The left and right soft keys perform the function shown in the corners

of the display. The right key will usually select an option whereas the left key will usually exit a function or return to a previous screen.

The menu key opens the initial menu structure, or allows access to a submenu whenever ☰ appears on the display.

Color Display

The V3 wireless phones feature a 262k color Thin Film Transistor (TFT) 176x220 pixel display.

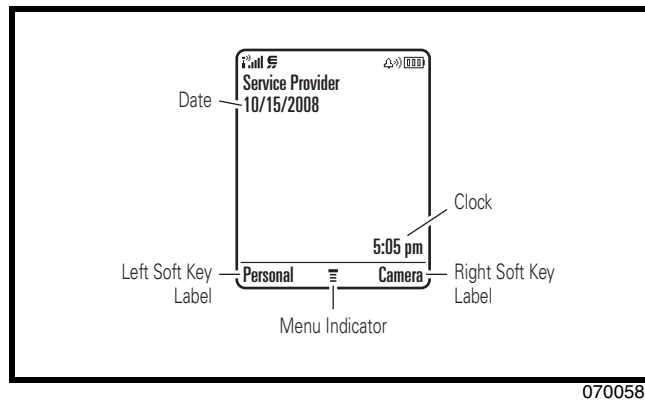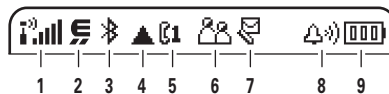The *home screen* appears when you turn on the phone (see Figure 2).

070058o

Figure 2. Home Screen Display

Your home screen may look different, depending on the service provider.

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

1 **Signal Strength Indicator –** Vertical bars show the strength of the network connection. You can't make or receive calls when 𝗂ⁿ or 𝗂ⁿ𝗫 shows.

2 **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:
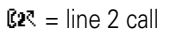
𝗘 = EDGE connection	𝗕 = GPRS connection
𝗘 = GPRS PDP context active	𝗱 = GPRS data available

3 **Data Indicator –** Shows connection status. The Bluetooth™ indicator ☩ shows when your phone is paired with another device. Other indicators can include:
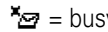
⊞ = secure data transfer	⊡ = unsecure data transfer
⊡ = secure connection	⊡ = unsecure connection
⇆ = secure *Circuit Switch Data* (CSD) call	⇆ = unsecure CSD call

4 **Roam Indicator –** The roam indicator ▲ shows when your phone is seeking or using a network outside your home network.

5 **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:
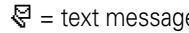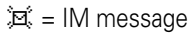
℘1 = line 1 active	℘2 = line 2 active
℘1 = line 1 call forward on	℘2 = line 2 call forward on

6 **Messaging Presence Indicator –** Shows when instant messaging (IM) is active. Indicators can include:
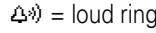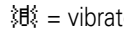
🖂 = IM active	🖂 = available for IM
🖂 = busy	🖂 = invisible to IM
℘ = available for phone calls	🖂 = offline

The Java™ indicator ☕ shows when a Java application is active.

7 **Message Indicator**[1] **–** Shows when you receive a new message. Indicators can include:

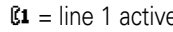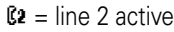|	
🖂 = text message	🖂 = voicemail message
🖂 = voicemail & text message	🖂 = IM message

8 **Ring Style Indicator –** Shows the ring style setting.

△⁾ = loud ring	△⁾ = soft ring
📳 = vibrate	📳 = vibrate and ring
📳 = vibrate then ring	△ = silent

9 **Battery Level Indicator –** 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.

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1. Network, subscription and SIM card or service provider dependent feature. Not available in all areas.

Alert Settings

V3 telephones include up to 32 preset alert tones and vibrations that can be applied to all alert events at the same time.

▶ *Pressing either volume key mutes the alert.*

▶ *When using a Bluetooth headset, if you set an MP3 ring tone, the phone speaker will play the default ring tone "Continental" instead of an MP3 ring tone. No audible alerts are heard in the headset.*

Battery Function

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.

Tools and Test Equipment

The following table lists tools and test equipment recommended for disassembly and reassembly of V3 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
—	Torque Driver Bit T-5 Plus, Apex 440-6IP Torx Plus or equivalent	Used with torque driver
See Table 7	Rapid Charger	Used to charge battery and to power device
0180386A82	Antistatic Mat Kit (includes 66-80387A95 antistatic mat, 66-80334B36 ground cord, and 42-80385A59 wrist band)	Provides protection from damage to device caused by electrostatic discharge (ESD)
6680388B67	Disassembly tool, plastic with flat and pointed ends (manual opening tool)	Used during assembly/disassembly of device
6680388B01	Tweezers, plastic	Used during assembly/disassembly
—	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

The procedures in this section provide instructions for the disassembly of V3 telephones. Tools and equipment used for the phone are listed in Table 1, preceding.

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

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

Removing and Replacing the Battery Cover and Battery

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

1.   Ensure the phone is turned off.
2.   Press in and hold the battery door latch as shown in Figure 3.

Battery Latch

Battery Cover

070583o

Figure 3. Removing the Battery Cover

3.   Rotate the battery cover upward and lift it completely off the phone.

4.   Lift the end of the battery first, then remove it from the phone. See Figure 4.
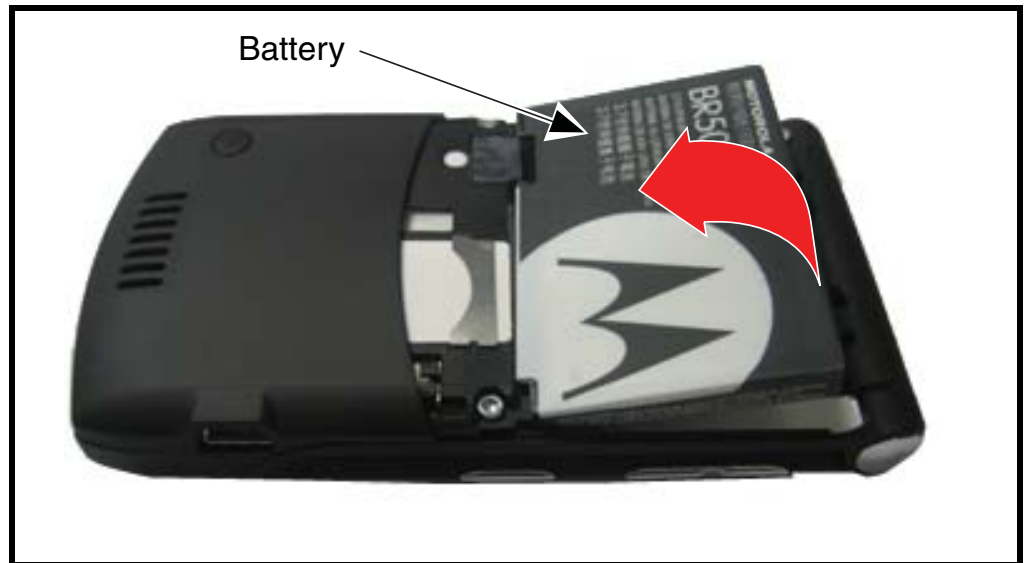
070584o

Figure 4. 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, contacts side first, into the battery compartment then lower the opposite side of the battery into the phone.
7.   Insert the bottom edge of the of the battery cover into the rear housing, then push the top edge of the cover down 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 card out of the phone as shown in Figure 5.

SIM
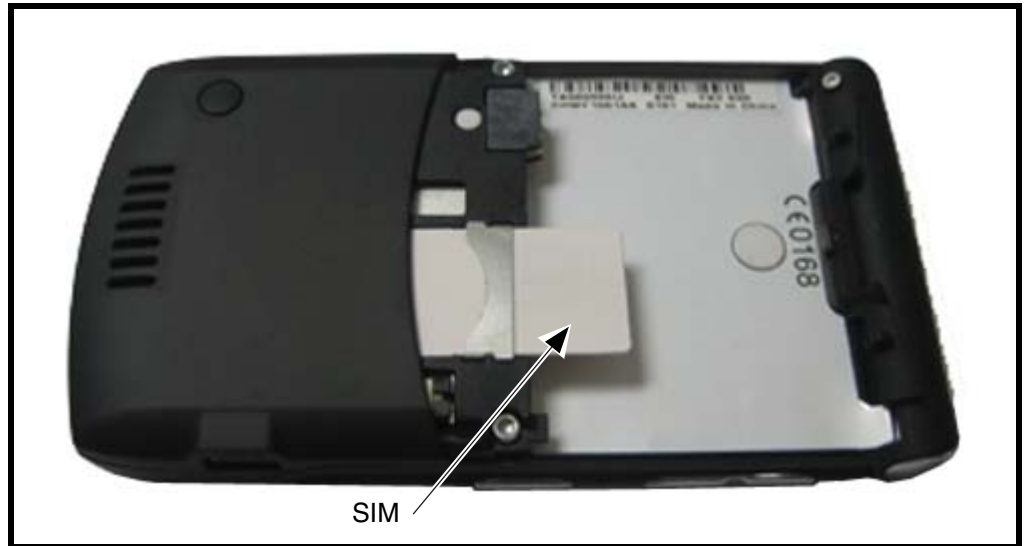
070585o

Figure 5. Removing the SIM

3. Carefully lift the SIM from the phone.
4. To replace, insert the SIM into the holder as shown on the label.
5. Replace the battery and battery cover as described in the procedures.

Removing and Replacing the Rear Housing

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

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

In addition to 2 screws, the rear housing assembly is fastened with plastic latches. These are fragile and should be released with care.

2. Using a Torx driver with a T-6 bit, remove the screws at each side of the phone. Retain the screws for reassembly. See Figure 6.
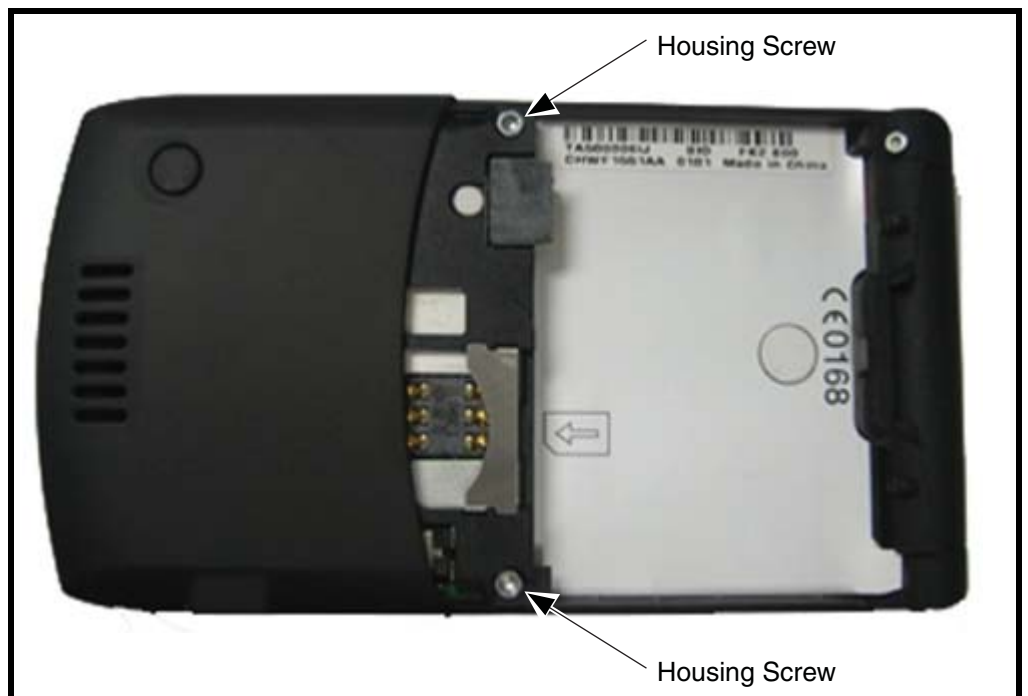
Figure 6. Removing the Rear Housing Screws

3. Release the four housing latches by inserting the pointed end of the plastic disassembly tool into the openings on the rear housing (see Figure 7).

070587o

Figure 7. Releasing the Rear Housing Latches

4.   Carefully rotate the rear housing away from the front housing and flip assembly (see Figure 8).
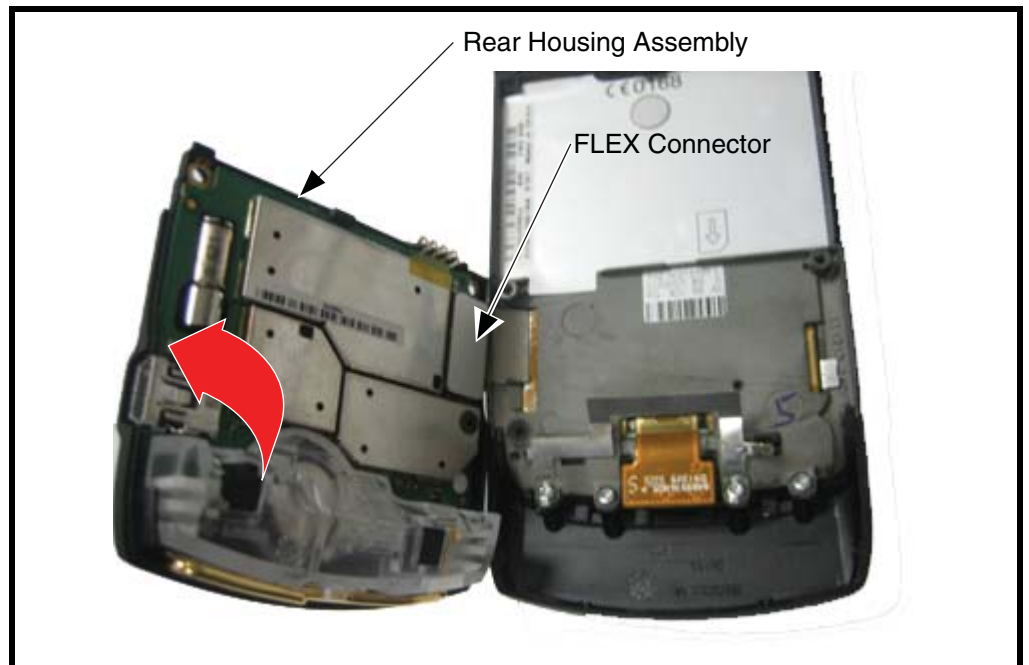
070588o

Figure 8. Removing the Rear Housing Assembly

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

5.   Use the disassembly tool to unseat the flex connector from its socket.
6.   Lift the rear housing assembly away from the phone.
7.   To replace, carefully align the flex connector to it's socket on the rear housing assembly, then gently press down on the flex connector until it is properly seated in it's socket.
8.   Rotate the rear housing assembly so it sits over the phone.
9.   Align the housing latches with the corresponding openings on the front housing. Gently press the housings together until the catches snap into place.
10. Replace the 2 housing screws and tighten to a final torque setting of (2.2 +/- 0.1 inch pounds). Do not over tighten.
11. Replace the SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Antenna

1. Remove the battery cover, battery, SIM, and rear housing assembly as described in the procedures.
2. Use the metal tweezers to grasp the rubber antenna grommets and carefully remove them from the antenna assembly. See Figure 9. Set the rubber grommets aside for reuse.
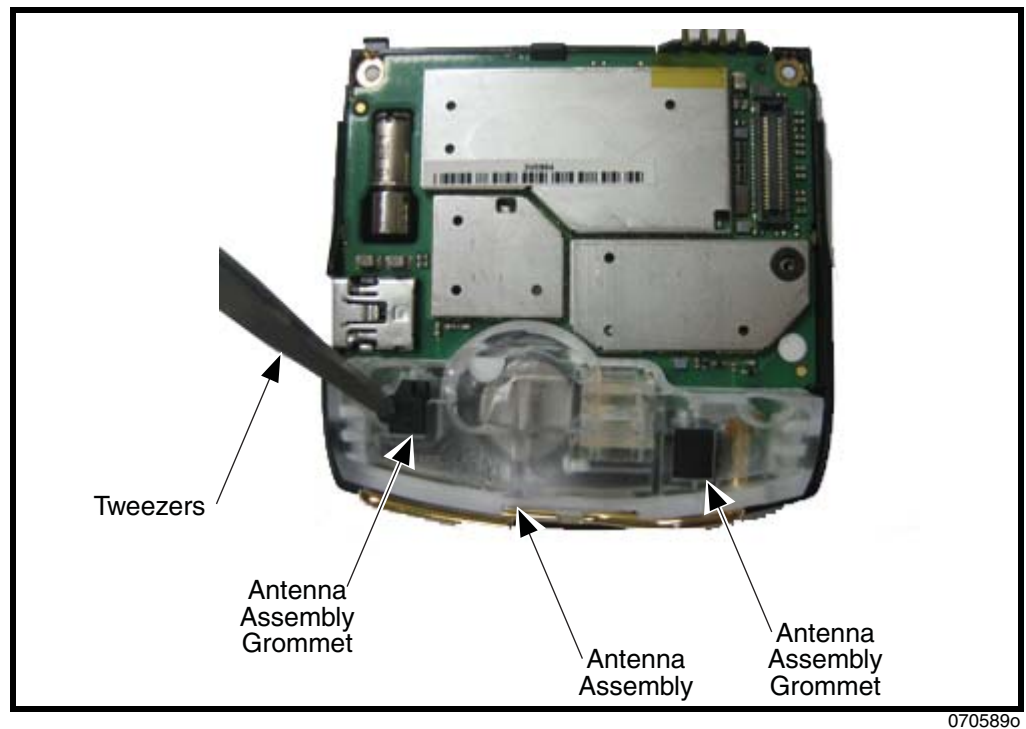
070589o

Figure 9. Removing the Antenna Grommets

3. Use the disassembly tool to release the antenna assembly as shown in Figure 10.

070590o
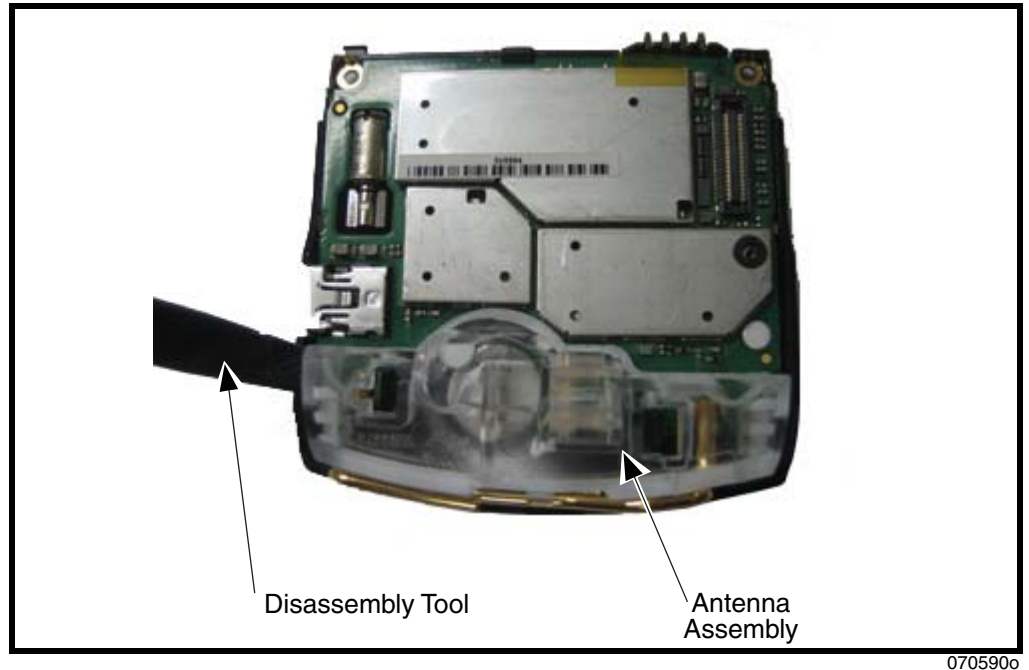
Figure 10. Removing the Antenna Assembly

4. Carefully lift the antenna assembly away from the phone.
5. To replace, align the antenna assembly to the phone.
6. Carefully press the antenna assembly into position until the antenna assembly latches snap into position.
7. Reinstall the rubber antenna assembly grommets into their slots. Each antenna grommet is uniquely shaped to fit into its respective position.
8. Replace the rear housing assembly, 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 electrostatic discharge (ESD) and component damage.*

1. Remove the battery cover, battery, SIM, rear housing and antenna module as described in the procedures.
2. Lift the transceiver board assembly out of the front housing with the disassembly tool. See Figure 11.

070592o
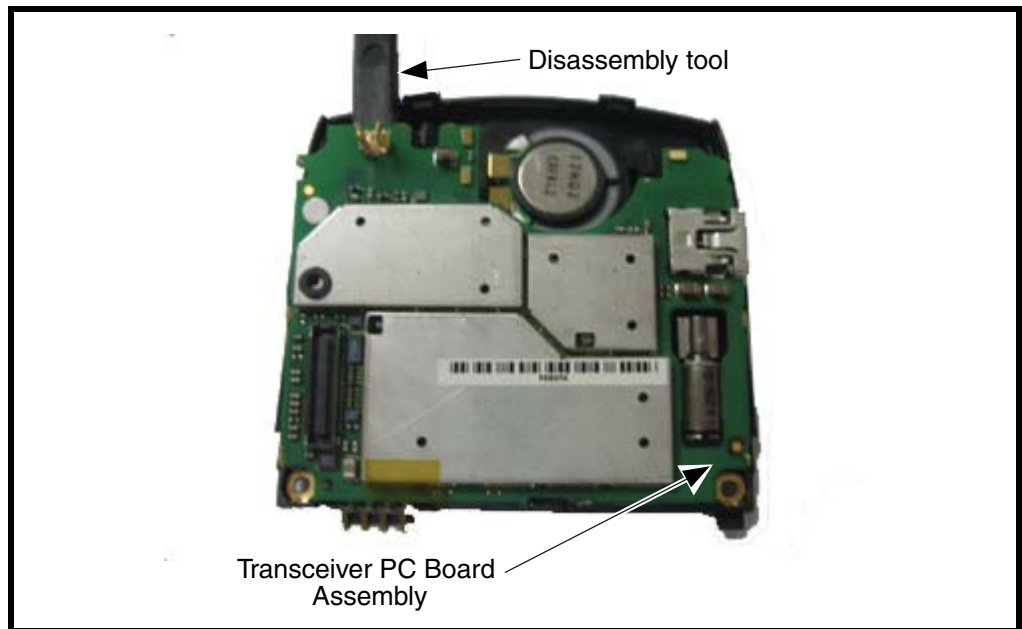
Figure 11. Removing the Transceiver PC board Assembly

3. To replace, insert the transceiver board assembly into the rear housing.
4. Carefully and gently press the transceiver board into position and until it snaps into place.
5. Replace the antenna assembly, rear housing, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Flip Assembly Cover

1. Remove the battery cover, battery, SIM, rear housing, antenna, and transceiver board assembly as described in the procedures.
2. Remove the 4 flip assembly screw caps.
3. Use the T-5 driver to remove the 4 screws from the flip assembly (see Figure 12). Retain the screws for re-assembly.

070593o

Figure 12. Removing the Flip Assembly Screws

4. Before removing the flip cover, note the locations of the smart buttons on the sides of the flip assembly.

5.   Use the disassembly tool to gently pry off the flip cover (see Figure 13).

Figure 13. Separating the Flip Assembly Cover

6.   Lift the flip cover away from the flip assembly. Set aside the flip cover for reassembly (see Figure 14).

070595o

Figure 14. Removing the Flip Assembly Cover

7.   Take note of the smart buttons' orientation and then remove them from the side of the flip assembly. Set them aside for re-assembly.
8.   To replace, insert the smart buttons into the phone. Ensure the buttons contact their respective switches on the display assembly.
9.   Align the flip cover to the flip assembly, gently press the flip cover onto the flip assembly until the flip cover latches engage.
10. Insert and tighten the 4 screws (1.5 +/- 0.15 inch pounds) to secure the flip cover to the flip assembly.
11. Insert the 4 rubber screw covers over the flip assembly screws.
12. Replace the transceiver board assembly, antenna assembly, rear housing, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the CLI Lens

1. Remove the battery cover, battery, SIM, rear housing, antenna, transceiver board assembly, flip assembly cover as described in the procedures.
2. Slide the flat end of the plastic disassembly tool, between the lens and the display bezel.
3. Slowly move the plastic disassembly tool along the sides of the CLI lens (see Figure 15).
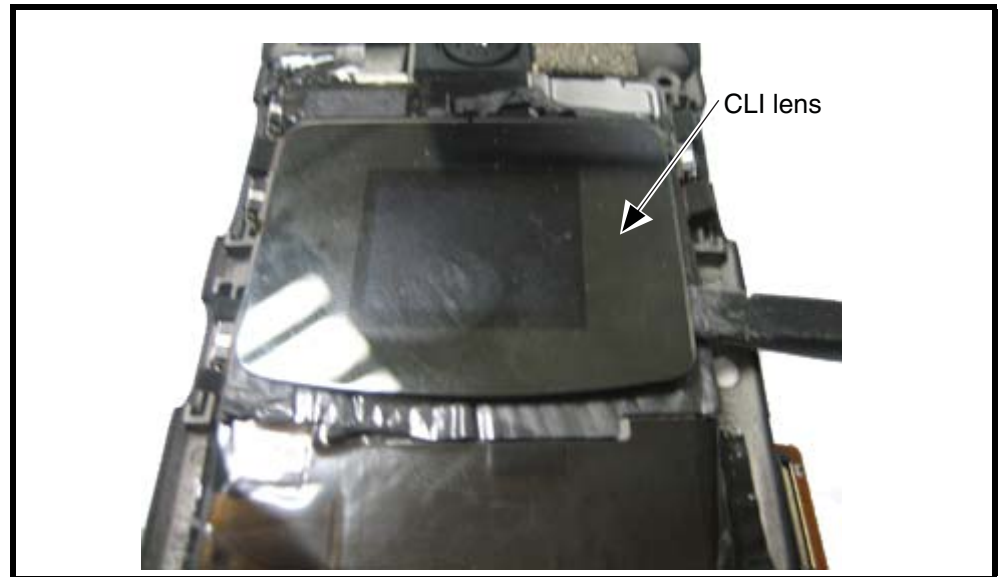
CLI lens

070622o

Figure 15. CLI Lens Removal

4. Carefully lift up the CLI Lens from the display module assembly.
5. Carefully use the plastic tool remove any remaining glue.

⚠ *Do not use any kind of liquid or spray to remove the remaining glue.*

6.   To replace, align the flip cover (without CLI lens) to the phone and press the bottom end, followed by the left side of the flip cover into place.

060698o, 060700o

Figure 16. Flip Cover Replacement

7.   Align the right and top sides of the flip cover and press into position.

060699o, 060701o

Figure 17. Flip Cover Replacement, Right Side and Top Side

8. Expose the adhesive surface of the new CLI lens and attach the replacement CLI lens to the flip assembly. Apply pressure at the corners of the CLI Lens for 3 seconds to insure good adhesion.

060703o

Figure 18. Flip CLI Lens Replacement

9. Reassemble the flip assembly, transceiver board assembly antenna, rear housing, SIM, battery, and battery cover as described in the procedures.

Removing and Replacing the Display Module Assembly

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

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

2. Using a flat tip tweezer, carefully and gently lift up the camera grommet from the camera module assembly (see Figure 19).

070598o

Figure 19. Removing the Camera Grommet

3. Set the camera grommet aside for re-assembly.

4.   Using a flat tip tweezer, peel away the lower (Poly Ethylene Terephthalare) PET insulating tape.

Insulating
tape
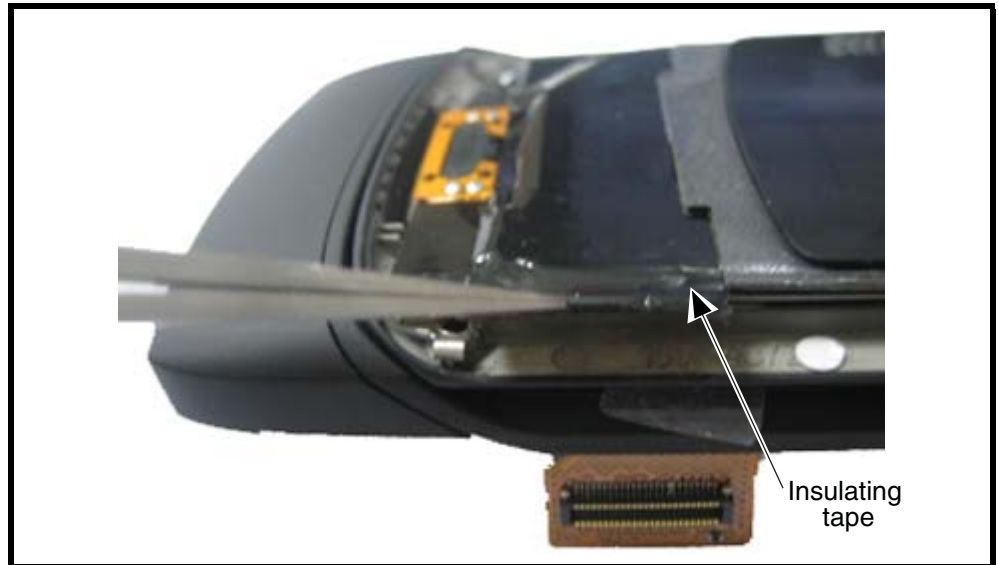
070599o

Figure 20. Removing the lower PET Insulating Tape

5.   Remove the 2 grounding clips and set them aside for re-assembly.

Grounding clip

070600o

Figure 21. Removing the Grounding Clips

6.   Using a flat tip tweezer, peel off the middle gasket.

070601o

Figure 22. Removing the Flip Display Assembly Middle Gasket

7.   Peel off the upper-PET insulating tape.
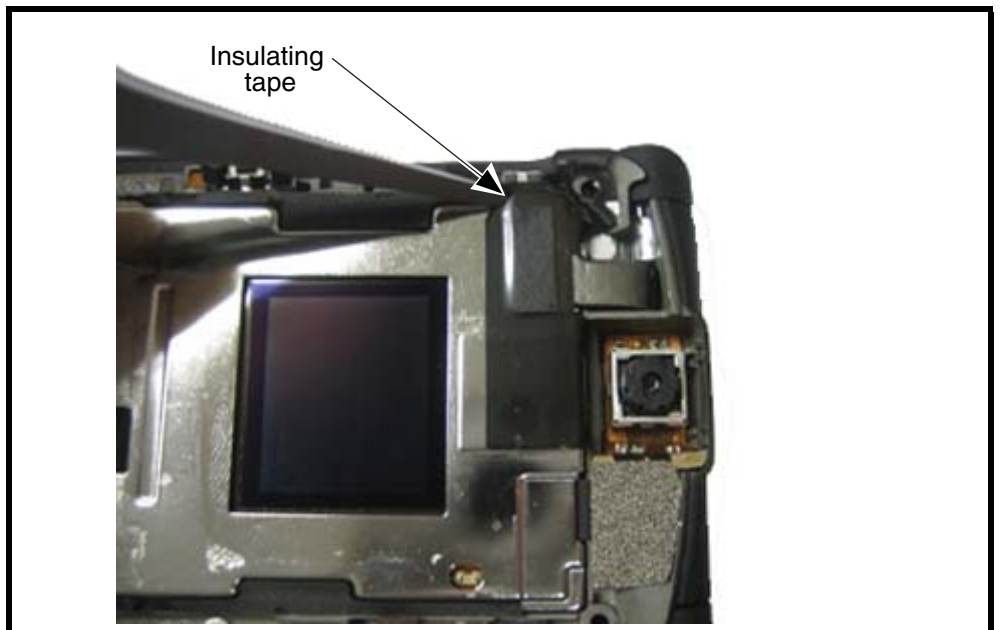
070602o

Figure 23. Removing the Upper PET Insulating Tape

8. Use the disassembly tool to unseat the display module assembly flex connector from its socket (see Figure 24).
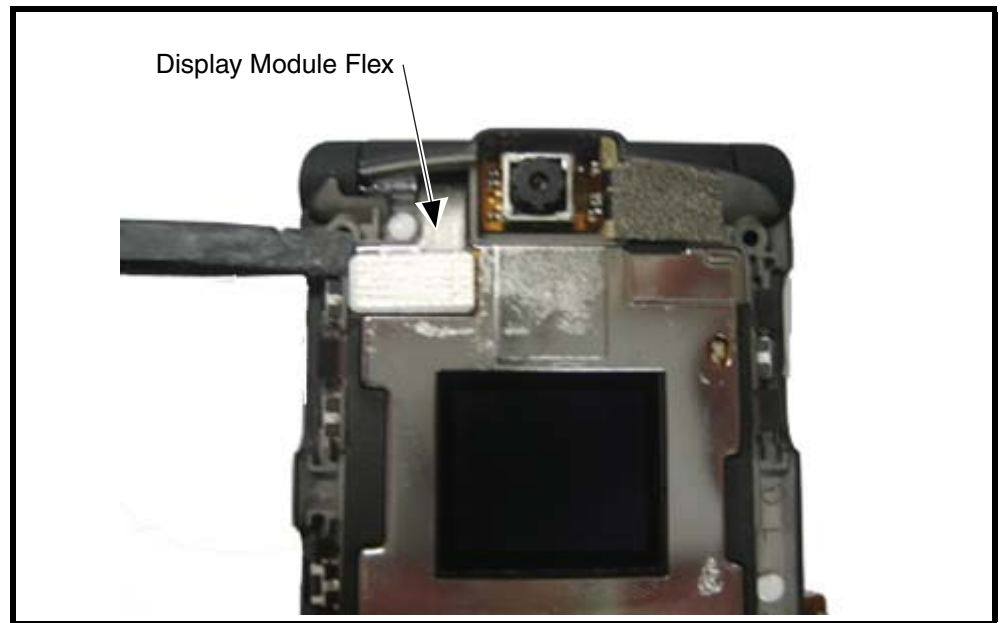
070597o

Figure 24. Display Module Assembly Flex Connector

9. Carefully and gently, separate the side key flex and speaker/backup battery flex from its position (see Figure 25).

070603o

Figure 25. Removing the Speaker/Battery Flex

10. Carefully and gently lift one corner of the display module assembly out of the flip assembly.
11. Avoid damage to the electrical components on the flex while carefully removing the display module assembly from the flip assembly.
12. Carefully lift the display module assembly away from the flip assembly (see Figure 26).
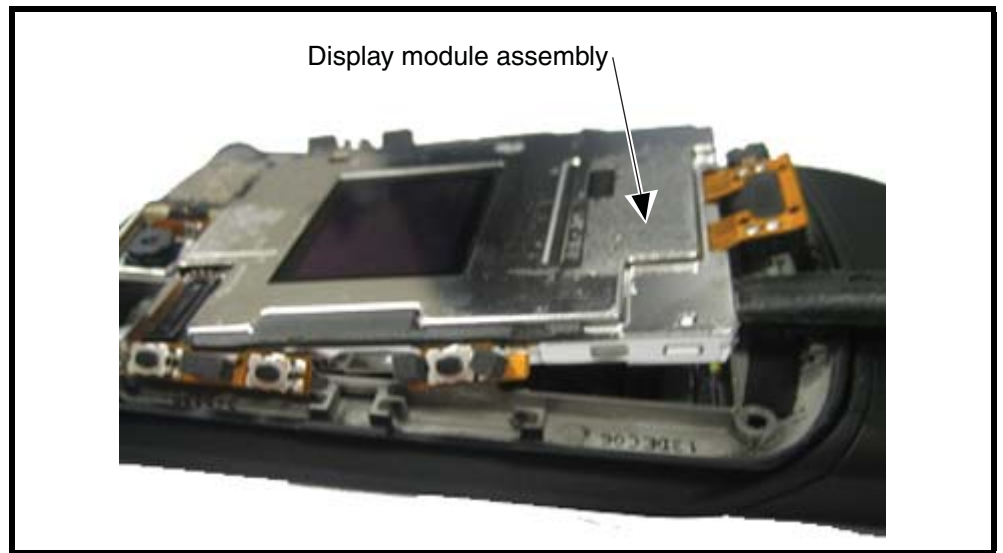
070617o

Figure 26. Removing the Display Module Assembly

13. To replace, align the display module assembly to the flip assembly.
14. Carefully lower the display module into the flip assembly. Ensure that none of the display assembly components are damaged.
15. align the hinge flex to the flex connector on the flip display assembly and gently press down on the flex connector until properly seated.
16. Align and press down the 2 grounding clips into position
17. Align and paste the new upper PET insulating tape, middle gasket and lower-PET insulating tape onto the display gasket.
18. Align and adhere the speaker/backup cell flex & side key flex onto the flip inner housing.Replace the camera assembly, flip assembly cover, transceiver board, rear housing, antenna, SIM, battery, and battery connector as described in the procedures.

Subscriber Identity Module (SIM) and Identification

SIM Card

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

The SIM contains:

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

Personality Transfer

A personality transfer is required when a phone is express exchanged or when the main board is replaced. Personality transfers reproduce the customer's original personalized details, such as menu and stored memory, such as phone books, or even just program a unit with basic user information, such as language selection. V3 telephones use Motorola Phone Tools software to effect a personality transfer.

Identification

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

Mechanical Serial Number (MSN)

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

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

The MSN is divided into 4 sections as shown in Figure 27.
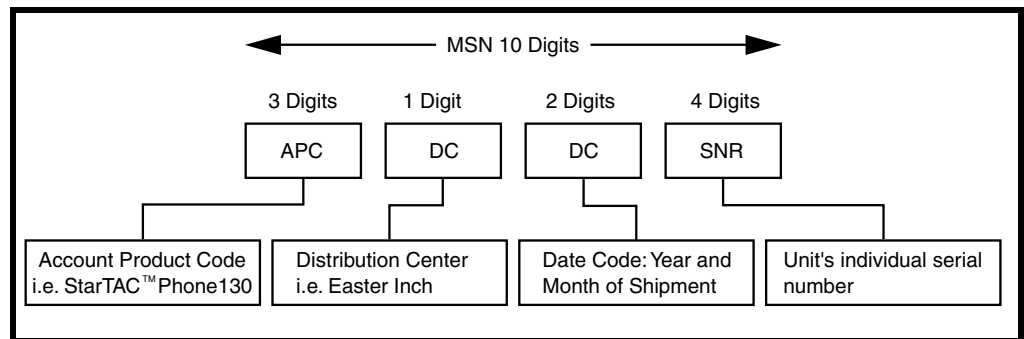
000807a

Figure 27. MSN Label breakdown

International Mobile Station Equipment Identity (IMEI)

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

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

Table 2. IMEI Number Breakdown

TAC	Serial Number	Check Digit
NNXXXXXX	ZZZZZZ	A

Where

TAC   Type Allocation Code, formerly known as Type Approval Code

NN   Reporting body identifier

XXXXXX   Type Identifier

ZZZZZZ   Individual unit serial number

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

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

Troubleshooting

Manual Test Mode

Motorola V3 telephones are equipped with a manual test mode capability. This allows service personnel to verify functionality and perform fault isolation by entering keypad commands.

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

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

Manual Test Mode Commands

Table 3. Manual Test Commands

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

Table 3. Manual Test Commands (Continued)

Key Sequence	Test Function/Name	Remarks
5*0*8	Set audio level 8	
5*0*9	Set audio level 9	
5*0*10	Set audio level 10	
5*0*11	Set audio level 11	
5*0*12	Set audio level 12	
5*0*13	Set audio level 13	
5*0*14	Set audio level 14	
5*0*15	Set audio level 15	
6*2*2*0*0	Set Audio Path. Int Mic, IntSpk, RX unmute, TX unmute	
6*4*6*0*0	Set Audio Path. Boom Mic, Boom Spk, RX unmute, TX unmute	
10*0*3	Set band GSM 900	
10*0*4	Set band DCS 1800	
10*0*5		
10*0*6	Set dual band GSM 900 / 1800	
10*1*0	Read band	3= GSM 4= DCS 5= PCS 6 =GSM/DCS
18*0	Initialize non-volatile memory (Master Reset)	
18*1	Initialize non-volatile memory (Master Clear)	
55*2*001	Test Display. All pixels ON	
55*2*000	Test Display. All pixels OFF	
55*2*002	Test Display. Checkerboard pattern A	
55*2*003	Test Display. Checkerboard pattern B	
55*2*004	Test Display. Border pixels ON	
*#06#	IMEI Check	No Test Mode Required
Phone Set up --> Phone Status --> Other Information	Flex Version / Technology / S-W Version / Readiness Status	No Test Mode Required

Troubleshooting Chart

Table 4. Level 1 and 2 Troubleshooting Chart

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
1. Telephone will not turn on or stay on.	a) Battery either discharged or defective.	Measure battery voltage across a 50 ohm (>1 Watt) load. If the battery voltage is <3.25 Vdc, recharge the battery using the appropriate battery charger. If the battery will not recharge, replace the battery. If battery is not at fault, proceed to b.
	b) Battery connectors open or misaligned.	Visually inspect the battery connectors on both the battery and the telephone. Realign and, if necessary, either replace the battery or refer to a Level 3 Service Center for the battery connector replacement. If battery connectors are not at fault, proceed to c.
	Transceiver board assembly defective.	Refer service to a Level 3 service center for replacement.

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

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
2. Telephone exhibits poor reception or erratic operation, such as calls frequently dropping or weak or distorted audio.	a) Antenna assembly defective.	Check to make sure that the antenna pin is properly connected to the transceiver board assembly. If connected properly, substitute a known good antenna. If the fault is still present, proceed to b.
	b) Transceiver board assembly defective.	Refer service to a Level 3 service center for replacement.
3. Display is erratic, or provides partial or no display.	a) Transceiver board connections faulty.	Remove rear chassis assembly from unit, check general condition of flexible printed cable (flex). If the flex is good, check that the flex connector is fully pressed down. If not, check connector to transceiver board connections. If faulty connector, replace the transceiver board assembly. If connector is not at fault, proceed to b.
	b) Flip assembly defective.	Temporarily replace the flip assembly with a known good assembly. If fault has been cleared, reassemble with the new flip assembly. If fault not cleared, proceed to c.
	c) Transceiver board assembly defective.	Refer service to a Level 3 service center for replacement.
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 the unit with the new transceiver board assembly.
5. Telephone transmit audio is weak. (usually indicated by called parties complaining of difficulty in hearing voice).	a) Transceiver board assembly defective.	Refer service to a Level 3 service center for replacement.
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 to make sure the antenna is installed correctly. If the antenna is installed correctly, substitute a known good antenna assembly. If this does not clear the fault, reinstall the original antenna assembly and proceed to d.
	d) Transceiver board assembly defective.	Refer service to a Level 3 service center for replacement.
7. Telephone will not recognize or accept SIM.	a) SIM defective.	Check the SIM contacts for dirt. Clean if necessary and check if fault has been cleared. If the contacts are clean, insert a known good SIM into the telephone. Power up the unit and confirm that the SIM has been accepted. If the fault no longer exists, replace the defective SIM. If the SIM is not at fault, proceed to b.
	b) Transceiver board assembly defective.	Refer service to a Level 3 service center for replacement.

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

| SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
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.
	b) Transceiver board assembly defective.	Refer service to a Level 3 service center for replacement.
9. Vibrator feature not functioning.	b) Transceiver board assembly defective.	Refer service to a Level 3 service center for replacement.
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 these are charging properly, then the internal charger is at fault. Refer service to a Level 3 service center for replacement.
11. Real Time Clock resetting when standard battery is removed.	Lithium button cell in the display board may be depleted.	Refer service to a Level 3 service center for replacement.

Programming: Software Upgrade and Flexing

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

Part Numbers

The following information is provided as a reference for the parts associated with V3 telephones.

Exploded View Diagram
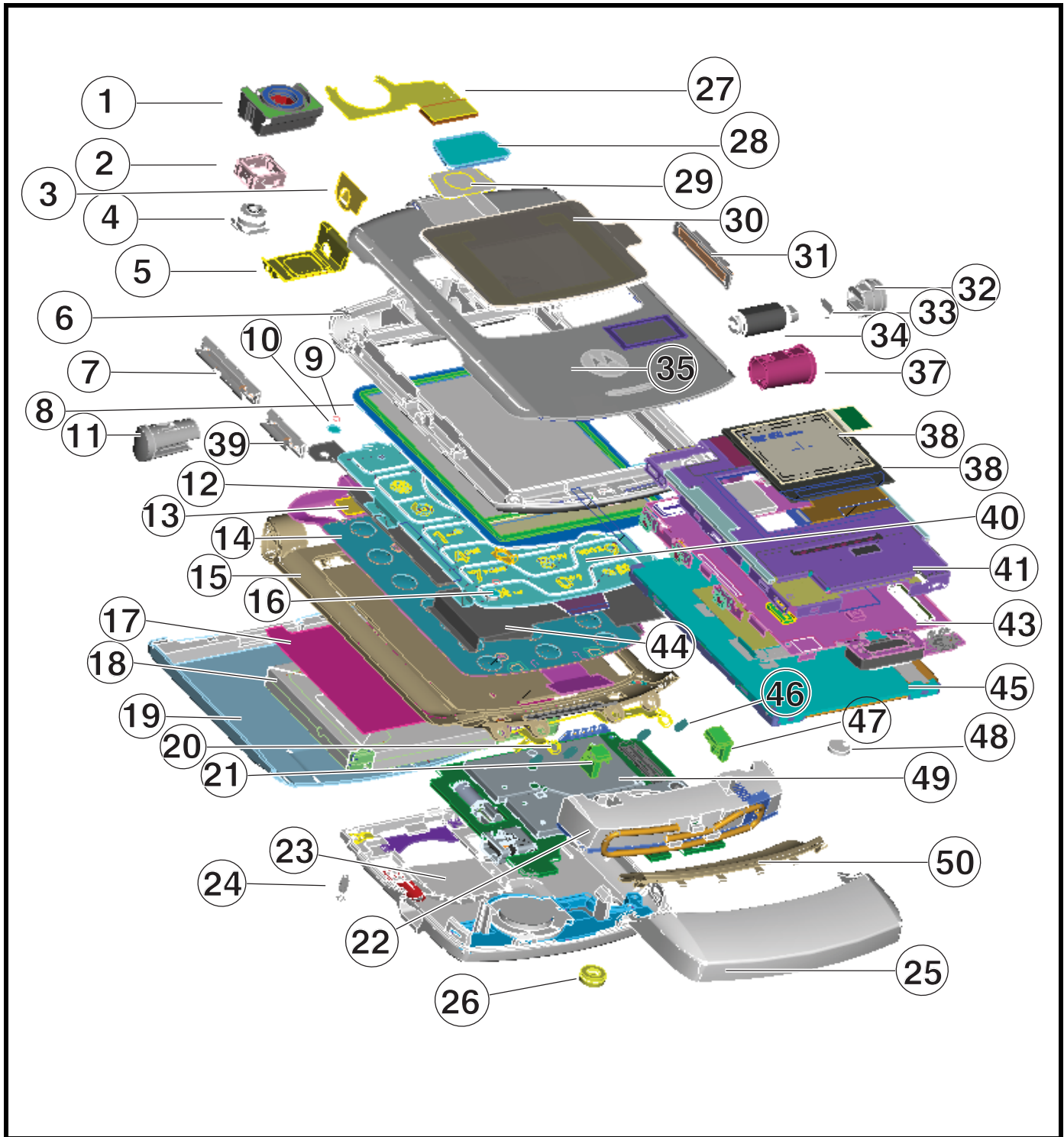
070468o

Figure 28. Exploded View Diagram

Exploded View Parts List

Table 5. Exploded View Parts List

Item	Part Number	Description	Item	Part Number	Description
1	0588721Z01	Grommet, Upper Camera	26	0590070N01	RF grommet
2	2615255H01	Camera socket cover	27	7588489Z45	Conductive pad, display bezel
3	4289441Y01	Grounding contact, Flip inner	28	6188659Z08	Lens, camera glass
4	9471516E08	066X6 VGA Camera Imager, Altus OVT, Razr	29	3288422Z21	Gasket Camera Glass
5	0588722Z01	Grommet bottom, camera	30	6188659Z05	Lens, CLI
6	1588807Z03	Housing, Flip Inner, Painted/Finished Razor	31	3890014N01	Button, carrier
7	3890012N01	Button, Volume control	32	1589127Y01	Housing, end cap/hinge
8	6190016N11	Lens, main display	33	490214N01	Grounding clip for hinge cap
9	0387726M09	Screws, X4	34	5590242N02	Hinge cam silent, 5.8mm x 5.1mm
10	3890022N01	Bumper, knuckle X2	35	3588010Y04	Mesh, speaker port
11	1571482D08	Housing, end cap shaft	--	0387726M09	Screw
12	3288422Z18	Dust resistant gasket	37	1587510Y01	Housing sleeve, hinge spacer
13	3288422Z17	Water resistant Mid	38	7287518Y01	CLI display
14	8489976N05	Keypad FLEX PCB	39	3890013N01	Button, smart
15	1590043N17 1590043N20	Front housing assembly silver Front housing assembly black	40	3888182Y03	Keypad assembly, English
16	3890023N02	Bumper nose	41	0188045Z01	Display external bezel assembly
17	1487942Y07	Battery Insulator	--	3987941Y01	Contact, grounding flip
18	0187349Y01	Battery package	43	0188045Z12	Personality Flex assembly
19	0164096T01 0164096T02	Battery door silver Battery door black	44	3288422Z19	Dust resistant gasket down
20	3988406Y01	Contact, grounding bootstrap	45	7271542E01	Assembly, LCD module display 176x220
21	3887388Y01	Button plug bladder #2	46	0387347Y01	Screws, PT custom panhead X4
22	1590051N03	Antenna assembly	47	3887389Y01	Button plug bladder #1
23	0164095T01 0164095T02	Rear housing assembly silver Rear housing assembly black	48	6087603L01	RTC battery
24	0387473K08	Screws Mag form 5 IP Black XCVR,X2	49	CHLF4604AA	Assembly, PCB XCVR
25	1587371Y01 1587371Y02	Housing front antenna cover painted silver Housing front antenna cover painted black	50	1587373Y01 1587373Y02	Housing, front antenna cosmetic cap painted silver Housing, front antenna cosmetic cap painted black

To order parts please use the following Link:

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

(Password is Required)

For information on ordering parts please contact EMEA at + 49 461 803 2690.

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.

Accessories

Table 6. Accessories

Description	Kit number
Automotive & Navigation	
Bluetooth Car Kit - High Tier, T505	SYN1717
T305 Portable Bluetooth Hands-Free Speaker, Bluetooth Car Kit, Mid Tier	SYN1716
BT Pro-Install Car Kit IHF1000r	98676K
Data & Business Communications	
Grey EMU data cable	SKN6234
Data Cable Mini USB/USB/Serial	SKN6371
Bluetooth Class 1 USB Adapter PC850	SYN1244
Digital Accessories	
Motorola Phone Tools Phase 4	SVN5539
MobileVoice (Wireless BT Headsets)	
Bluetooth Headset - HS850 (Refresh - Black)	SYN1107
Bluetooth Headset - HS850 (Refresh - Blue)	SYN1226
Bluetooth Headset -Black Licorice-H800	SYN1626
Bluetooth Headset-Fire Red-H800	SYN1640
Bluetooth Headset-Silver Moss-H800	SYN1641
Bluetooth Headset-Silver Quartz-H800	SYN1642
Mono Bluetooth Headset	SYN1971
Bluetooth Headset - H700 (silver)	SYN1311
Bluetooth Headset - H605	SYN1303
Bluetooth Headset (Pearl Dark Gray) - H300	SYN1297
Bluetooth Headset (Pink) - H300	SYN1417
Bluetooth Headset (Pure White) - H300	SYN1416
Bluetooth Mono Headset, Nickel- H500	SYN1290
Bluetooth Headset H700 D&G Gold	SYN1769
Bluetooth Headset H700 Blue/Black Cingular Only	SYN1508
Bluetooth Headset Black H700 (not available in North America)	SYN1509
Bluetooth Headset H670 Black Slate (Canary)	SYN1853
Bluetooth Headset H670 Cosmic Blue (Canary)	SYN1855
Bluetooth Headset H670 Silver Quartz (Canary)	SYN1852
Bluetooth Headset H550 Silver (SLVR)	SYN1822
Bluetooth Headset H555 Black/Black (RAZR)	SYN1854

Table 6. Accessories (Continued)

Description	Kit number
Bluetooth Headset H555 Silver/Black (RAZR)	SYN1821
Bluetooth Headset - Plum - H700	SYN1818
Bluetooth Headset - Dark Pearl Blue - H800	SYN1639
Bluetooth Headset - Fire Red - H700	SYN1820
Bluetooth Headset - MiniBlue H9 (Includes headset, charger base, and extra eartips)	SJ0095
Bluetooth Headset - Pale Lilac - H350	SYN1948
Bluetooth Headset - Project (RED) - H500	SYN1966
Bluetooth Headset H350 Dark Pearl Grey	SYN1763
Bluetooth Headset H350 Sapphire Blue	SYN1738
Bluetooth Headset H350 Silver Quartz	SYN1765
Bluetooth Headset H350 Silver Sail	SYN1764
Bluetooth Headset H350 Black	SYN1439
Bluetooth Headset H500 Black Soft Touch Japan	SYN1685
Bluetooth Headset Softtouch Black H500	SYN1374
Bluetooth Headset H500 Celery	SYN1732
Bluetooth Headset H500 Cosmic Blue	SYN1617
Bluetooth Headset H500 Fire Red	SYN1667
Bluetooth Headset H500 Hot Pink	SYN1525
Bluetooth Headset H500 Oi Branded	SYN1735
Bluetooth Headset H500 Pumpkin	SYN1733
Bluetooth Headset H500 Steel Teal	SYN1734
Bluetooth Headset H500 Nickel Japan	SYN1441
Bluetooth Headset H500 Pink	SYN1436
Modules & Emerging Technologies	
Oakley RAZRWIRE (Mercury: NA) - H7	98679H
Oakley RAZRWIRE (Pewter/Black: NA) - H7	98677H
Oakley RAZRWIRE (Platinum/Rootbeer: NA) - H7	98678H
Audex Motorola Jacket Series Electronics - Deep Spruce	SYN1712
Audex Motorola Jacket Series Electronics - Fire Red	SYN1713
Oakley Sunglass Modules Black	SYN1322
Oakley Sunglass Modules Rootbeer	SYN1323
Oakley Sunglass Modules Silver	SYN1324
Music & Entertainment	
EMU to 2.5 3-pole TTY Adapter	SKN6221
Stereo Headset - EMU	SYN1301
JBL Black On Tour Portable Speaker	SYN1451
JBL On Tour Mobile European Kit	OnTourMBBLKE
JBL On Tour Mobile portable speaker US Kit	OnTourMBBLK
JBL On Tour Mobile speaker PRC kit	CH1414A
JBL On Tour Mobile speaker UK kit	OnTourMBBLKU

Table 6. Accessories (Continued)

Description	Kit number
Adapter EMU to 2.5mm stereo	SYN1505
Adapter EMU to 3.5 mm	SYN1504
Personalization	
Phone Tattoos Printable (3-pack bulk) V3i/V3e	SYN1882
Power	
Travel Charger EMU Mid-Rate Switcher - KOREA	SPN5351
P790 Portable Charger	SPN5353
Battery BR50 (V3) Li-Ion 740mAh	SNN5696
Charger Adapter - Euro Plug	SYN7456
Charger Adapter - UK Plug	SYN7455
Charger Adapter EMU/EMU (Y-cable)	SKN6222
Standard Car Charger EMU - P310	SYN1630
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 - JAPAN	SPN5274
Travel Charger EMU Mid-Rate Switcher - MEXICO	SPN5186
Travel Charger EMU Mid-Rate Switcher - PRC	SPN5188
Travel Charger EMU Mid-Rate Switcher - TWN	SPN5216
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 - Japan	SPN5275
Travel Charger EMU Rapid Switcher - MEXICO	SPN5200
Travel Charger EMU Rapid Switcher - PRC	SPN5198