MOTOROLA

V3 RAZR 05
Digital Wireless Telephone

GSM 850/900/1800/1900 MHz 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

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

About This Service Manual

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.

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.	**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	90 grams (3.17 oz), with battery
Battery Life, with standard 700 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

Motorola V3 telephones represent the thinnest, compact and lightweight 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 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 4K CSTN display for caller identification and date/time, an internal 176 x 220 pixel 64K 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 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)
- Built in VGA Camera (640x480 pixels)
- 64K Thin Film Transistor (TFT) Active Color Display
- External color CLI Display
- Polyphonic Speaker
- Speaker Phone
- Bluetooth™
- 5MB User Memory

Speaker Dependant 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 (see Figure 2). 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.
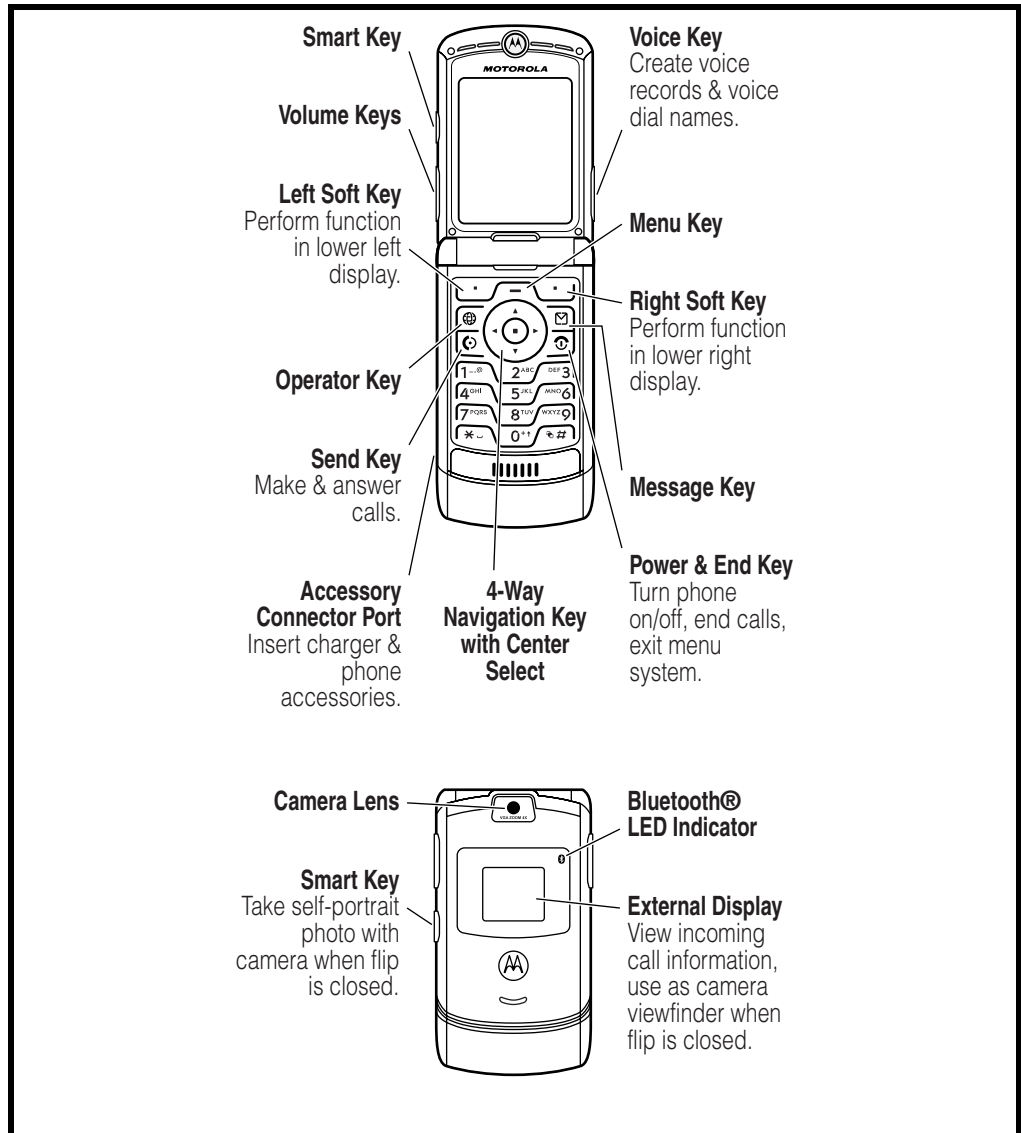
031935o

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 64k color Thin Film Transistor (TFT) 176x220 pixel display.

Display animation makes the phone's menus move smoothly as the user scrolls up and down. Turn animation off to conserve the battery.
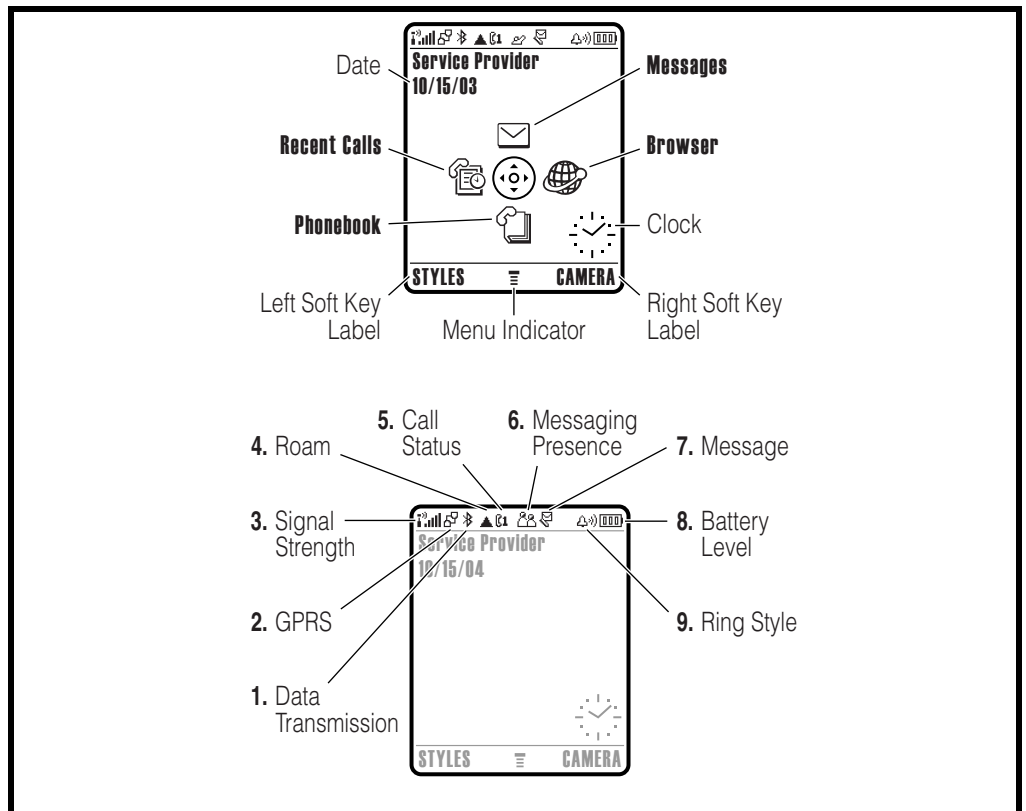
040146o, 040147o

Figure 2. Icon Indicators

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

Figure 2 shows some common icons displayed on the LCD.

- **Signal Strength Indicator**. Shows the strength of the phone's connection with the network. Calls cannot be sent or received when the "no signal" indicator is displayed.
- **In Use Indicator**. Appears when a call is in progress.
- **Roam Indicator**.[5] Appears when the phone uses another network system outside the user's home network. When leaving the home network area, the phone

roams, or seeks another network.

- **Message Waiting Indicator**.[5] Appears when the phone receives a text message. This is a network-dependent feature.
- **Voice Message Waiting Indicator**.[1] Appears when a voicemail message is received. This is a network-dependent feature.
- **Battery Level Indicator**. Shows the amount of charge left in the battery. The more segments visible, the greater the charge. Recharge the battery as soon as possible when the Low Battery warning message appears.
- **Clock**. Shows the current date and time.
- **Menu Indicator**. Indicates the user can press the menu soft key to open a menu.
- **Alert Setting Indicator**. Shows the current selected alert. The default alert setting is a ringer.

User Interface Menu Structure

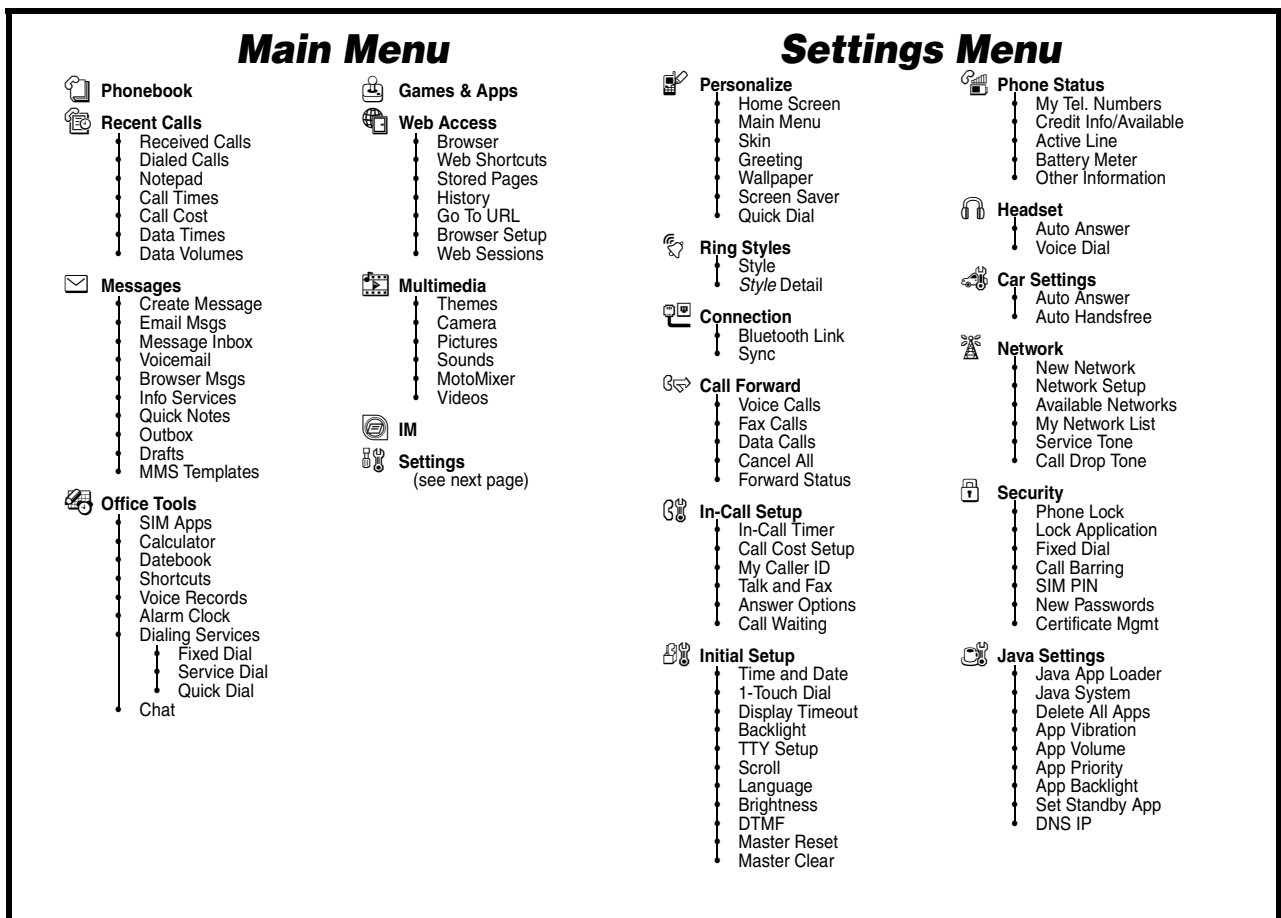Figure 3 shows the telephone menu structure.

Figure 3. Menu Structure

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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 will mute the alert.*

Battery Function

Battery Gauge

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

Battery Removal

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

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

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

Operation

For detailed operating instructions, refer to the appropriate User's Guide listed in the Related Publications section toward the end of this manual.

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.
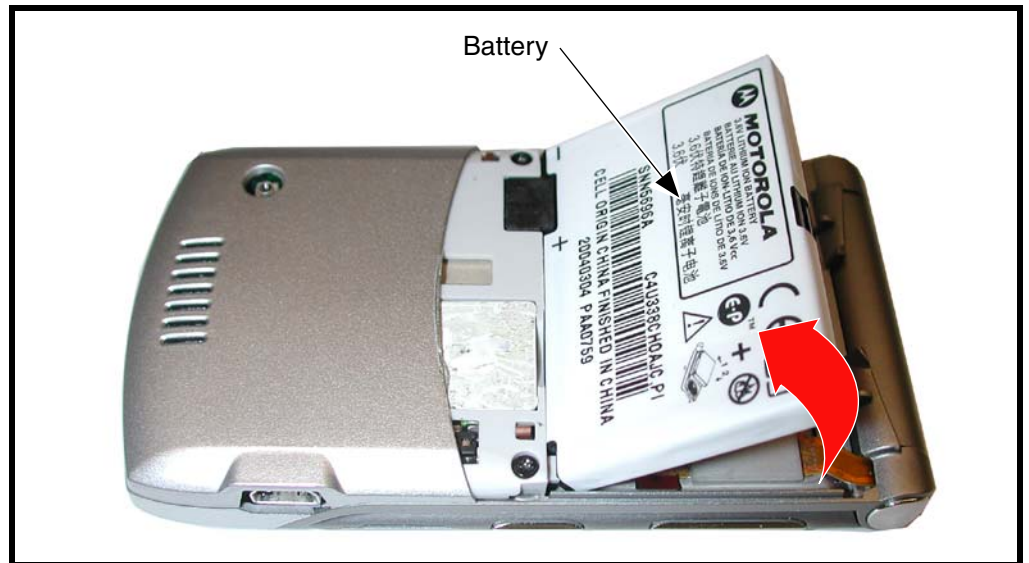2. Press in and hold the battery door latch as shown in Figure 1.
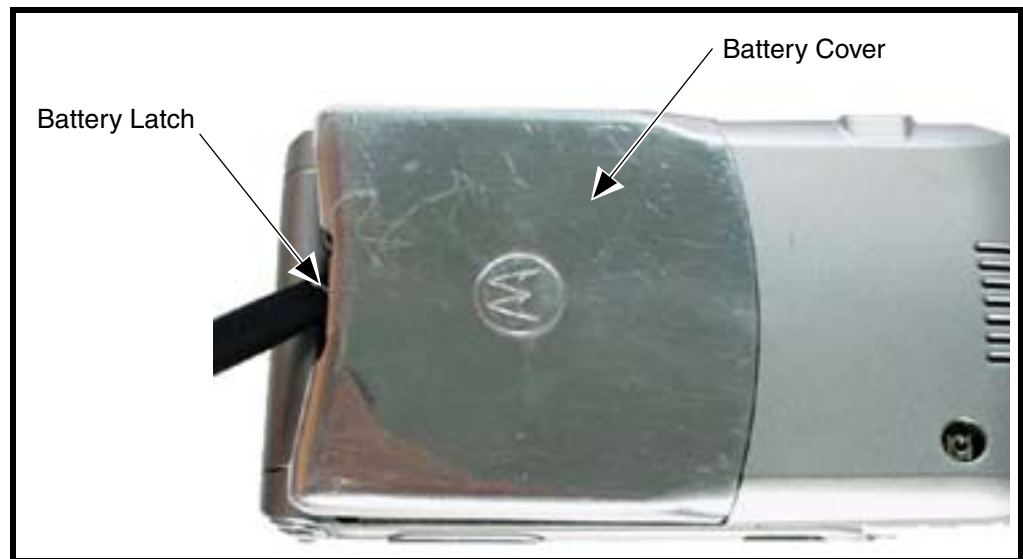
040698o

Figure 1. 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 2.


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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, contacts side first, into the battery compartment and push down followed by the opposite edge of the battery.
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.
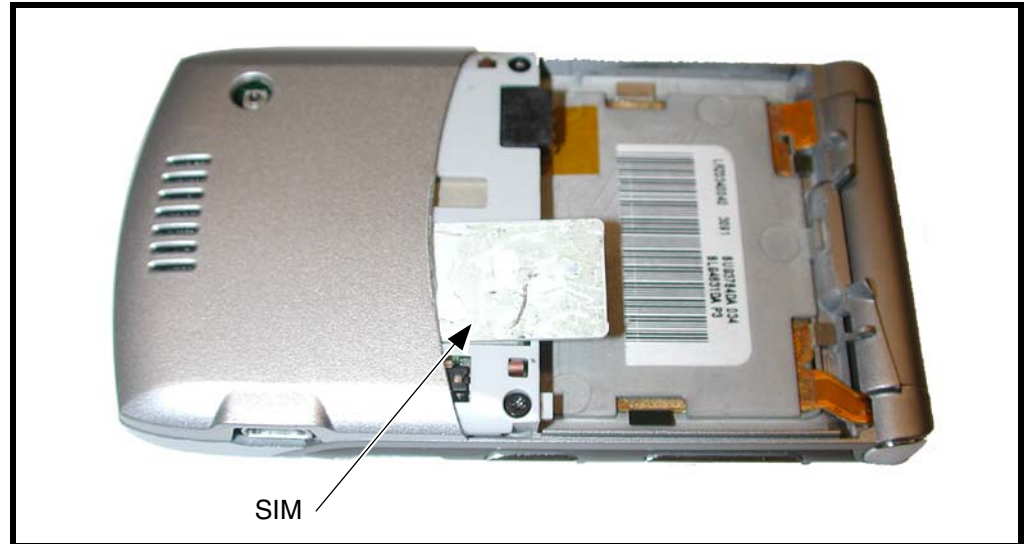
031829o

Figure 3. Removing the SIM

2. Slide the SIM card out of the phone as shown in Figure 3.
3. Carefully lift the SIM from the phone.
4. To replace, insert the SIM into the holder, ensuring the keyed corner of the SIM faces the outward edge of the phone.
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.*
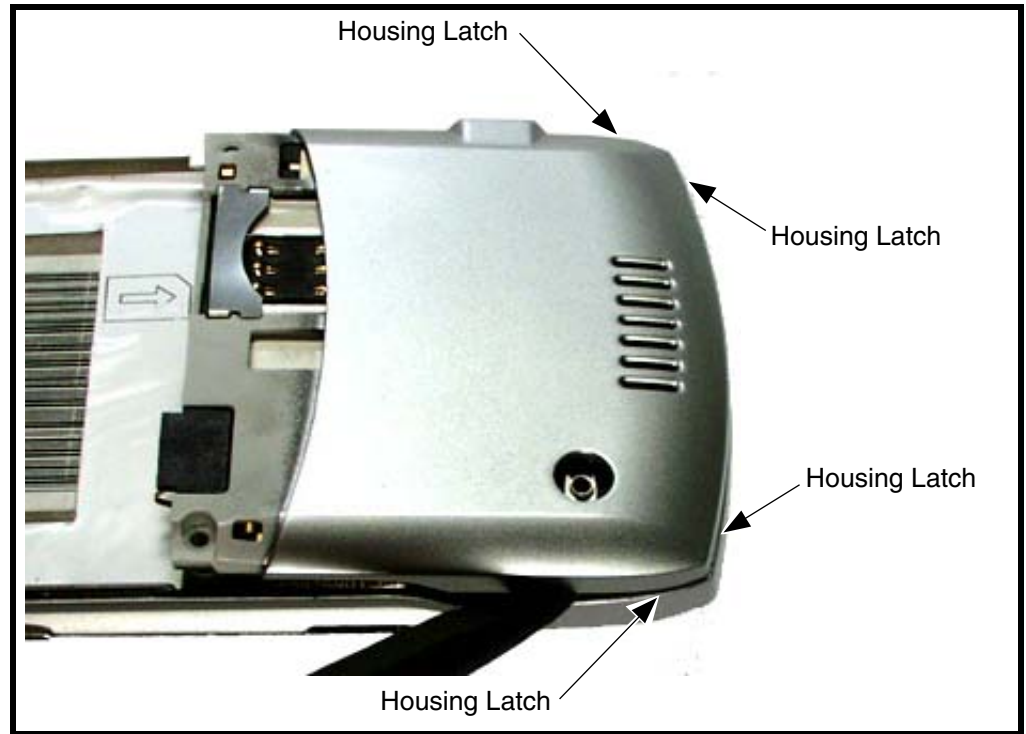
2. Using a Torx driver with a T-5 bit, remove the screws at each side of the phone. Retain the screws for reassembly. See Figure 4.
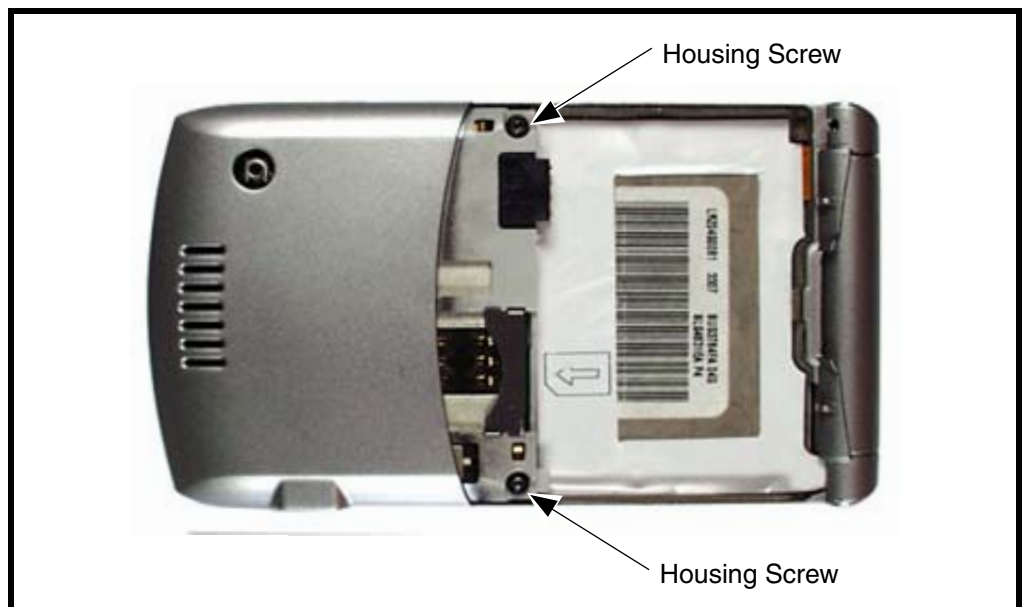
040701o

Figure 4. 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.

Figure 5. Removing the Rear Housing Latches

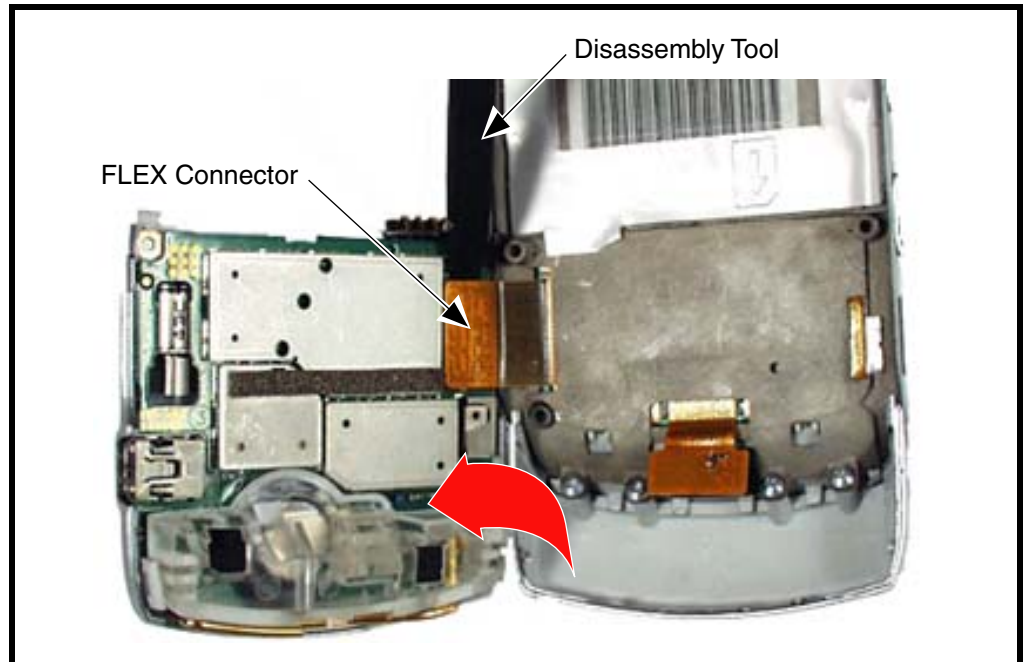4. Carefully rotate the rear housing away from the front housing and flip assembly.

Figure 6. 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 it's 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 16 Ncm (1.5 inch pounds). Do not over tighten.
11. Replace the antenna, 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 7. Set the rubber grommets aside for reuse.
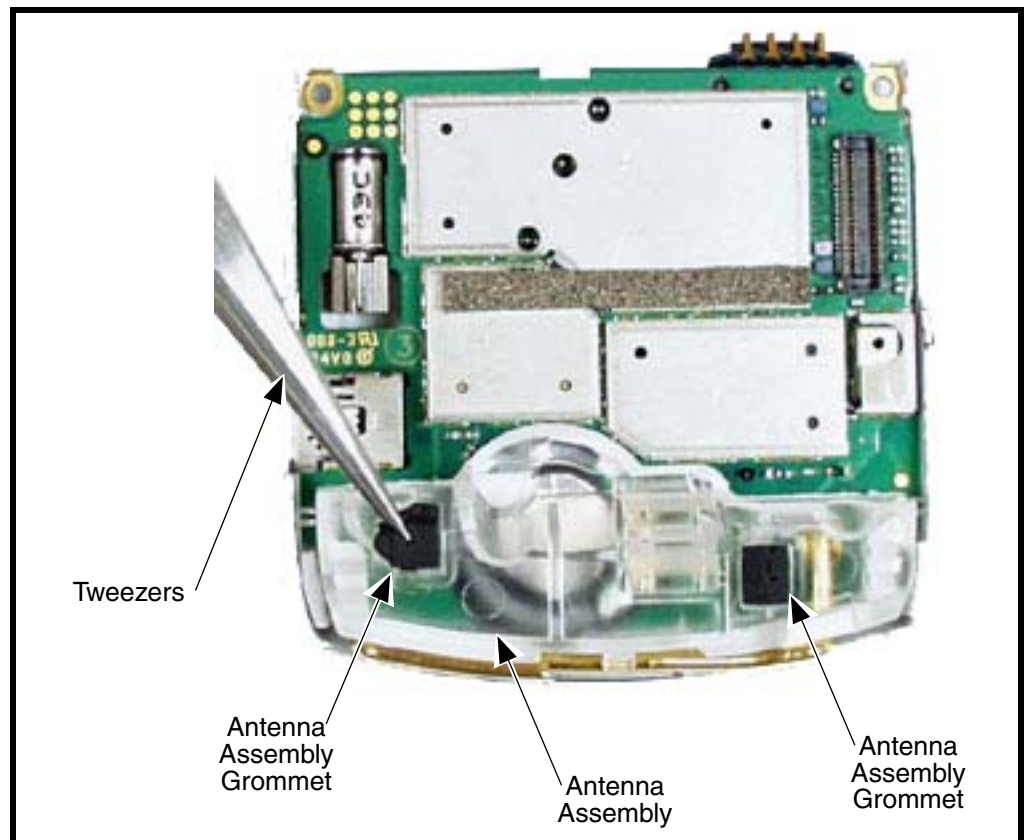

031830o

Figure 7. Removing the Antenna Grommets

3.   Use the disassembly tool to release the antenna assembly as shown in Figure 8.
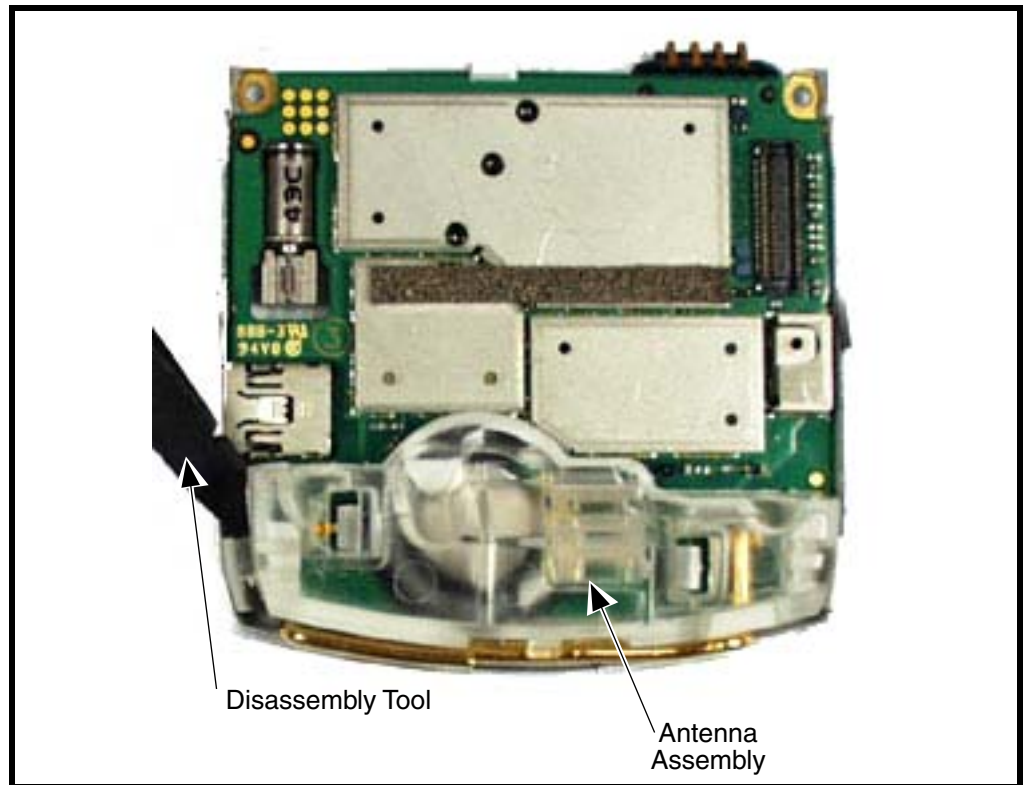

Figure 8. Removing the Antenna Assembly

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, antenna, rear housing and battery tray as described in the procedures.
2. Lift the transceiver board assembly out of the front housing with the metal tweezers. See Figure 9.
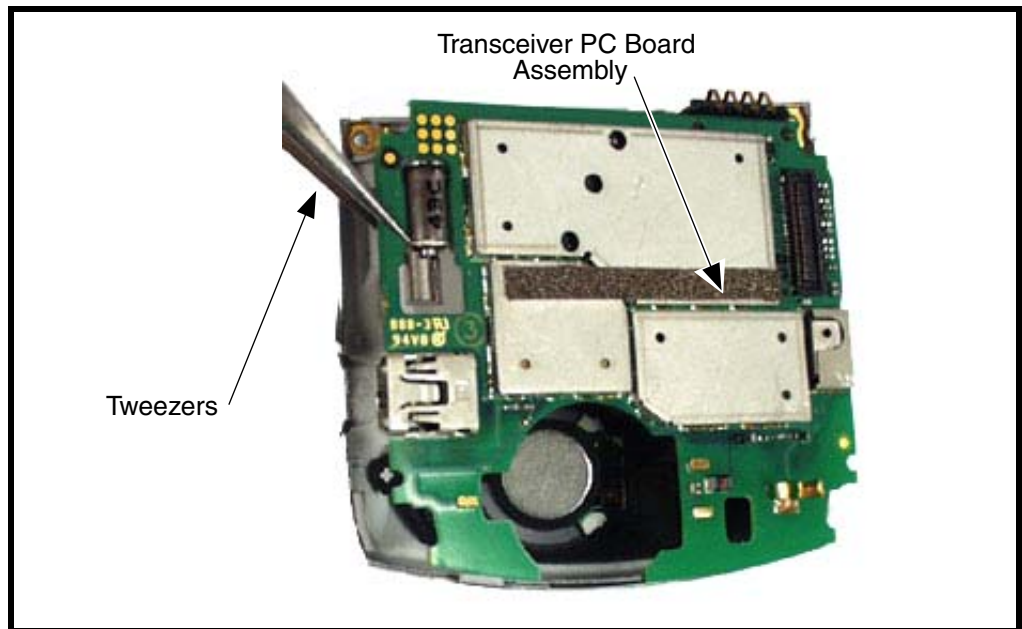
040713o

Figure 9. 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, antenna, rear housing, 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 10). Retain the screws for re-assembly.

031838o

Figure 10. 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 11).
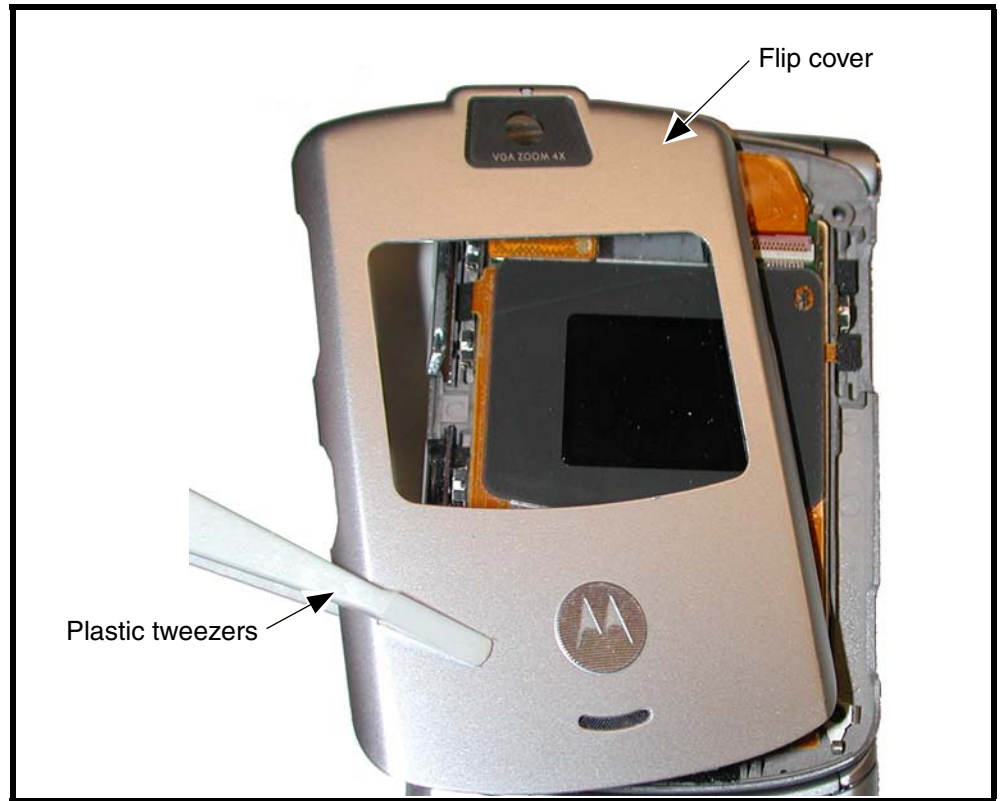

040722o

Figure 11. Separating the Flip Assembly Cover

6.   Remove the smart buttons on the side of the flip assembly. Set them aside for reassembly.

7.   Lift the flip cover away from the flip assembly. Be careful not to damage the display flex cable (see Figure 12).

051791o

Figure 12. Removing the Flip Assembly Cover

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 to secure the flip cover to the flip assembly. Avoid damage to the flex cable.
11. Insert the 4 rubber screw covers over the flip assembly screws.
12. Replace the transceiver board assembly, rear housing, antenna assembly, SIM, battery, and battery cover as described in the procedures.
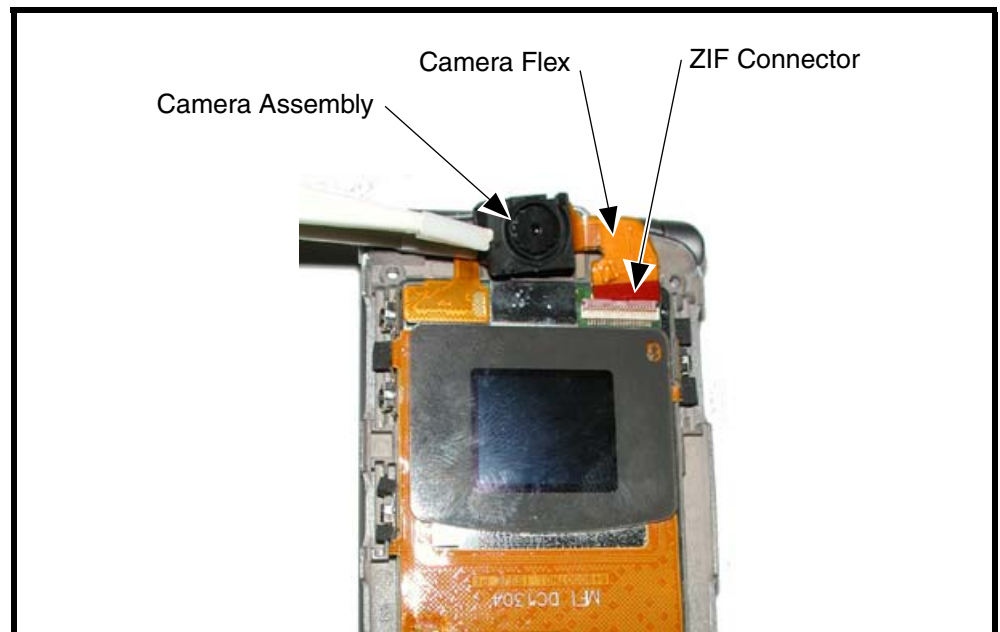
Removing and Replacing the Camera Assembly

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

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

2. Unlock the ZIF connector and remove the camera assembly flex connector.
3. Carefully lift the camera assembly and flex out of the flip assembly (see Figure 13).

060035o

Figure 13. Camera Assembly Removal

4. To replace, carefully press the camera assembly into its slot in the flip assembly.
5. Insert the end of the camera assembly flex cable into its slot in the ZIF connector on the flip display assembly. Avoid damage to the flex cable.
6. Replace the flip assembly cover, transceiver board, rear housing, antenna, SIM, battery, and battery cover as described in the procedures.
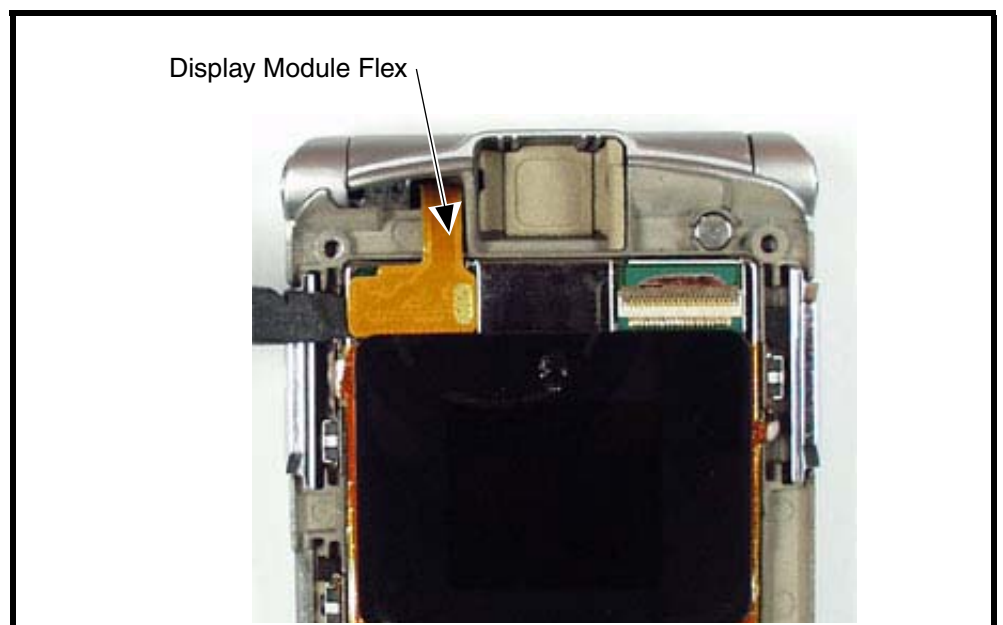
Removing and Replacing the Display Module Assembly

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

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

2. Use the disassembly tool to unseat the display module assembly flex connector from its socket (see Figure 14)

Display Module Flex

040726o

Figure 14. Display Module Assembly Flex Connector

3. Carefully and gently lift one corner of the display module assembly out of the flip assembly.
4. Avoid damage to the electrical components on the flex while carefully removing the display module assembly from the flip assembly.

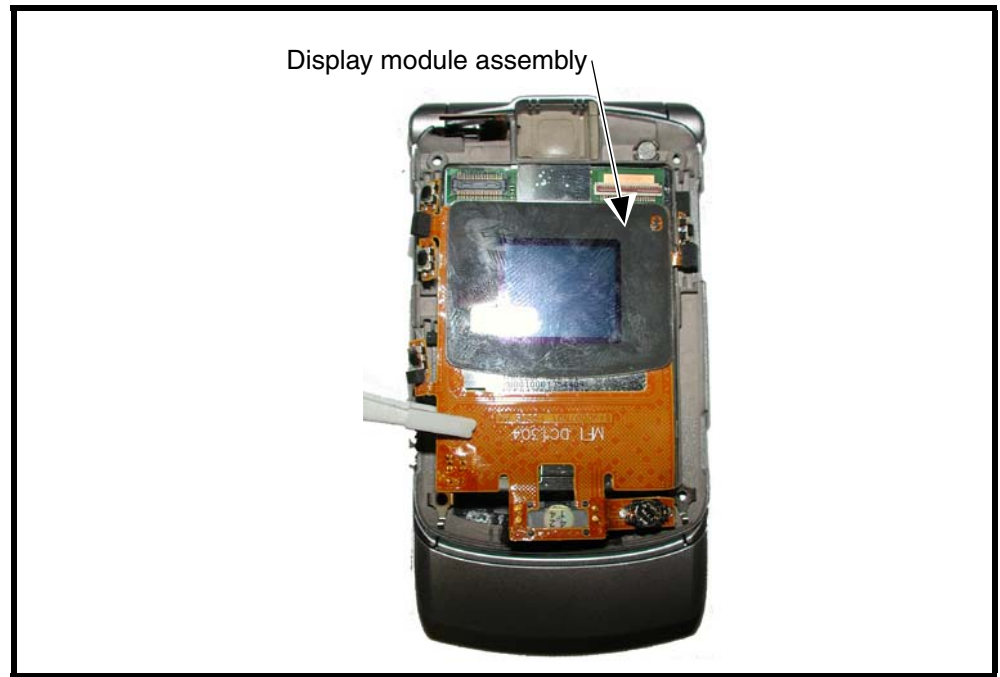5.   Carefully lift the display lens away from the flip assembly.

Figure 15. Removing the Display Module Assembly

6.   To replace, align the display module assembly to the flip assembly.
7.   Carefully lower the display module into the flip assembly. Ensure that all of the display none of the display assembly components are damaged.
8.   align the flip display flex to the flex connector on the flip display assembly and gently press down on the flex connector until properly seated.
9.   Replace the camera assembly, flip assembly cover, transceiver board, rear housing, antenna, SIM, battery, and battery connector 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.
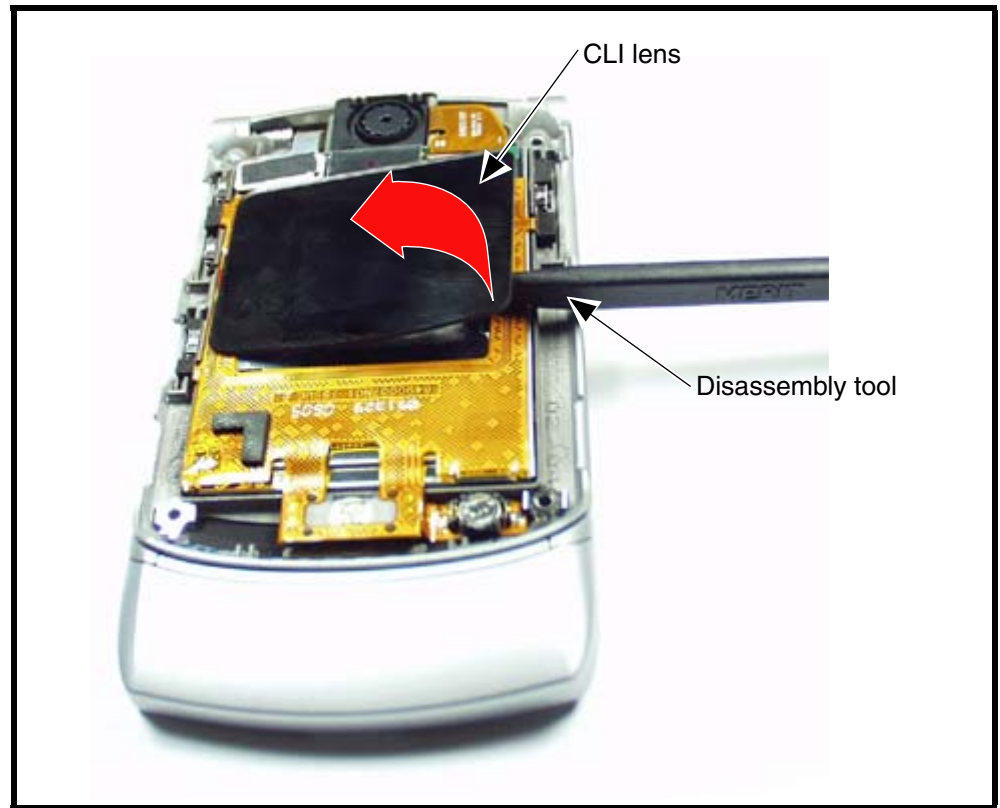2. Heat the CLI lens to a temperature of 100°C (212° F) for 20 seconds.

051637o

Figure 16. CLI Lens Removal

3. Slide the flat end of the plastic disassembly tool, between the lens and the metal frame.

4.   Slowly rotate the plastic disassembly tool by 90°.

051638o

Figure 17. CLI Lens Removal

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

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

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. V300 telephones use TrueSync® synchronization 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 18.
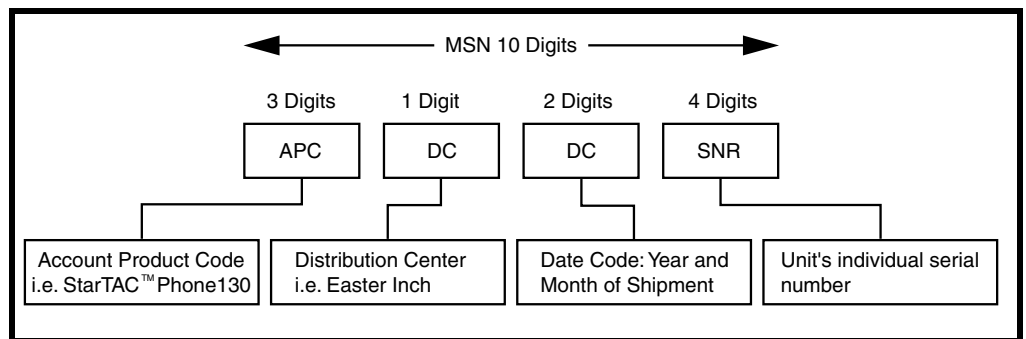
000807a

Figure 18. 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.
	c) Transceiver board assembly defective.	Remove the transceiver board assembly. Substitute a known good assembly and temporarily reassemble the unit. Press and hold the PWR button; if unit turns on and stays on, disconnect the dc power source and reassemble the telephone with the new transceiver board assembly. Verify that the fault has been cleared.
2. Telephone exhibits poor reception or erratic operation such as calls frequently dropping or weak or distorted audio.	a) Antenna 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 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.	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.
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.	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 4. Level 1 and 2 Troubleshooting Chart (Continued)

SYMPTOM	PROBABLE CAUSE	VERIFICATION AND REMEDY
6. Receive audio from earpiece speaker is weak or distorted.	a) Connections to or from transceiver board assembly defective.	Gain access to the transceiver board assembly as described in the procedures. Check flex and the flex connector from the 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.	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 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.	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.
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.	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.
9. Vibrator feature not functioning.	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.
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. 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.
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.
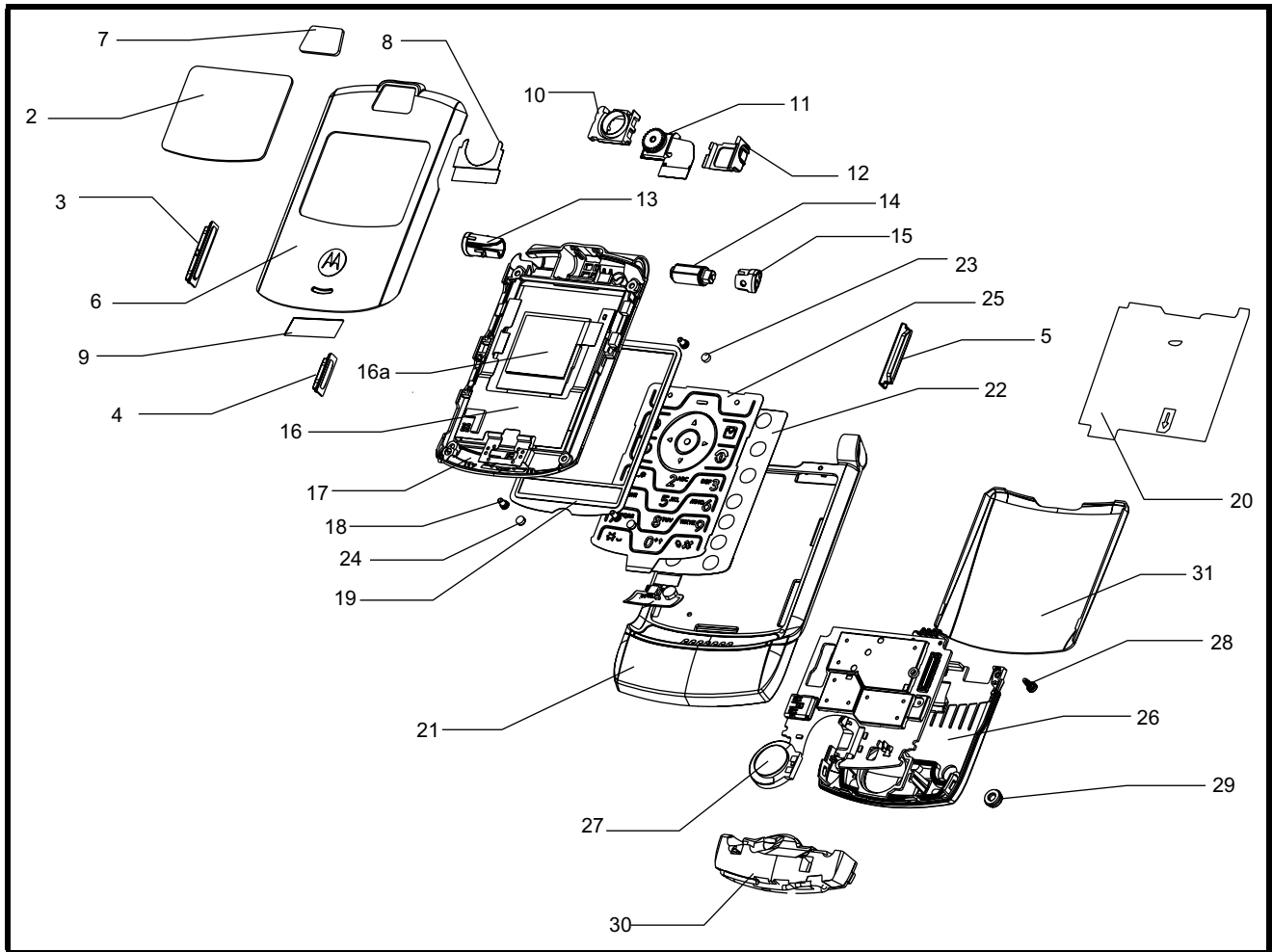
Part Numbers

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

Related Publications

Motorola V3 User's Guide, English   TBD

Exploded View Diagram

Figure 19. Exploded View Diagram

Exploded View Parts List

Table 5. Exploded View Parts List

Item Number	Part Number	Description
1	0187996Y10 0187996Y18 0187996Y21	Flip Front Housing Assy **Silver** Flip Front Housing Assy **Black** Flip Front Housing Assy **Pink**
2	6190015N02	Lens CLI Display
3	3890012N01	Button Volume
4	3890013N01	Button Smart
5	3890014N01	Button VR
6	1590001N02 1590001N03 1590001N04	Flip Cover Assy Silver Flip Cover Assy Black Flip Cover Assy Pink
7	6190019N02	Lens Camera
8	7588069Y01	Copper Tape
9	3588010Y01	Mesh Speaker
10	0590033N01	Grommet Camera Upper
11	8488310Y01	Camera Assy
12	0587343Y01	Grommet Camera Lower
13	1589126Y01	Hinge Cap Left
14	5590242N02	Hinge
15	1589127Y01	Hinge Cap Right
16	7290086N01	Display Assy
16a	7287518Y01	CLI Display
17	1590025N03 1590025N04	Flip Housing Silver Flip Housing Black
18	0387726M02	Screw (flip)
19	6190016N03	Lens main display
20	1487942Y01	Insulator tape
21	1590043N03 1590043N07 1590043N09	Front housing Assy Silver Front housing Assy Black Front housing Assy Pink

Item Number	Part Number	Description
22	8489976N03	Keyboard flex assembly
23	3890022N01 3890022N03	Screw cover #1 Silver Screw cover #1 Black
24	3890023N01 3890023N03	Screw cover #2 Silver Screw cover #2 Black
25	3888182Y03 3888182Y05 3888182Y06 3888182Y09	Keypad English Keypad Cyrillic Keypad Arabic Keypad Hebrew
26	1590048N01 1590048N03 1590048N04	Rear housing assembly Silver Rear housing assembly Black Rear housing assembly Pink
27	5088017N02	Alert Speaker
28	0387473K07	Screw rear housing
29	0590070N01 0590070N02 0590070N04	Grommet RF Silver Grommet RF Black Grommet RF Pink
30	1590051N03	Antenna Assembly
31	SHN8739A SHN8827A SHN8962A SHN9372A	Battery door Silver Battery door Silver (orange) Battery door Black Battery door Pink
--	SNN5696B	Battery

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

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

Accessories

Table 6. Accessories

Part Description	Part Number
Power Solutions	
Battery-Only-Charger - Razor V3, South Asia plug	CHPN4613A
Right Angle Dongle (EMU)	SKN6182
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 - 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 - MEXICO	SPN5200
Travel Charger EMU Rapid Switcher - PRC	SPN5198
Travel Charger EMU Rapid Switcher - US	SPN5202
Travel Charger EMU Rapid TWN	SPN5270
Charger Adapter - Aust/NZ Plug	SYN8127
Charger Adapter - Euro Plug	SYN7456
Charger Adapter - UK Plug	SYN7455
Charger Adapter EMU/EMU (Y-cable)	skn6222
In Vehicle Solutions	
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
Vehicle Power Adapter EMU - VC700	SYN0847
Audio and Connectivity	
Stereo Headset - EMU	SYN1301
Data Cable Mini USB/USB/Serial	SKN6371

Table 6. Accessories (Continued)

Part Description	Part Number
Headset Mono One Touch w/ Send-End (EMU)	SYN0896
Bluetooth Products	
RAZR H3 Black	SYN1437
RAZR H3 Silver	SYN1438
H500 Gloss Black	SYN1375
H500 Nickel Japan	SYN1441
H500 Pink	SYN1436
Bluetooth Class 1 USB Adapter PC850	SYN1244
H500 Bluetooth headset Black Soft touch	SYN1374
H500 Bluetooth Headset Hot Pink	SYN1525
H500 Bluetooth Headset iPOD Blue	SYN1523
H500 Bluetooth Headset iPOD Gold	SYN1524
H500 Bluetooth Headset Spa Blue	SYN1527
H500 Bluetooth Headset White	SYN1526
Bluetooth Car Kit - Asia/Americas	S9642
Bluetooth Car Kit - Euro	S9643
Bluetooth Car Kit - HF850	SJ0014
Bluetooth Car Kit - IHF1000 - Americas/Asia	98676H
Bluetooth Car Kit - IHF1000 - EMEA	CFLN1232
Bluetooth Headset - Glossy Black - HS820	SYN9951
Bluetooth Headset - Green - HS820	SYN0945
Bluetooth Headset - Grey - HS820	SYN1106
Bluetooth Headset - HS850 (Paladin Refresh - Black)	SYN1107
Bluetooth Headset - HS850 (Paladin Refresh - Blue)	SYN1226
Bluetooth Headset - Oakley RAZRWIRE (Mercury: NA) - H7	98679H
Bluetooth Headset - Oakley RAZRWIRE (Pewter/Black: NA) - H7	98677H
Bluetooth Headset - Oakley RAZRWIRE (Platinum/Rootbeer: NA) - H7	98678H
Bluetooth Headset (Aphrodite) - H700	SYN1311
Bluetooth Headset (Genie Gray) - HS801	CHYN4590AB
Bluetooth Headset (Genie Pink) - HS801	CHYN4590AC
Bluetooth Headset (Genie Refresh - Dk Blue) - HS815	SYN1201
Bluetooth Headset (Genie Silver) - HS801	CHYN4590
Bluetooth Headset (Mage) - HS830	SYN0996
Bluetooth Headset (Medusa - Pearl Dark Gray) - H300	SYN1297
Bluetooth Headset (Medusa - Pink) - H300	SYN1417
Bluetooth Headset (Medusa - Pure White) - H300	SYN1416
Bluetooth Headset (Nexus) - HS805	SYN0986
Bluetooth Headset (Paladin) - HS810	SYN9826
Bluetooth Headset (Persephone) - H605	SYN1303
Bluetooth Helmet Headset - HS830 (Mage)	SYN0997

Table 6. Accessories (Continued)

Part Description	Part Number
Bluetooth Mono Headset, Nickel- H500	SYN1290
Bluetooth PC USB Adapter	SYN0717
Bluetooth Speaker (Quadrant Refresh) - HF820	SYN0736C

6809500A08-O